

FOR EVALUATION USE ONLY
(C) 2004 Element K Content LLC
DO NOT DUPLICATE

Crystal Reports 10.0

Level 2

LORI J. MINNEHAN

Crystal Reports

10.0

Level 2

FOR EVALUATION USE ONLY
(C) 2004 Element K Content LLC
DO NOT DUPLICATE

Lori J. Minnehan

Crystal Reports 10.0: Level 2

Part Number: 085516

Course Edition: 1.0

ACKNOWLEDGMENTS

Project Team

Curriculum Developer and Technical Writer: Lori J. Minnehan • **Contributing Technical Writer:** Kevin Ogburn • **Technical Assistance:** Cindy Kredo • **Content Manager:** Cheryl Russo and Kirsten Nelson Sitnick • **Sr. Content Editor:** Christy D. Johnson • **Copy Editor:** Kirsten Nelson Sitnick

NOTICES

DISCLAIMER: While Element K Content LLC takes care to ensure the accuracy and quality of these materials, we cannot guarantee their accuracy, and all materials are provided without any warranty whatsoever, including, but not limited to, the implied warranties of merchantability or fitness for a particular purpose. The name used in the data files for this course is that of a fictitious company. Any resemblance to current or future companies is purely coincidental. We do not believe we have used anyone's name in creating this course, but if we have, please notify us and we will change the name in the next revision of the course. Element K is an independent provider of integrated training solutions for individuals, businesses, educational institutions, and government agencies. Use of screenshots, photographs of another entity's products, or another entity's product name or service in this book is for editorial purposes only. No such use should be construed to imply sponsorship or endorsement of the book by, nor any affiliation of such entity with Element K. This courseware may contain links to sites on the Internet that are owned and operated by third parties (the "External Sites"). Element K is not responsible for the availability of, or the content located on or through, any External Site. Please contact Element K if you have any concerns regarding such links or External Sites.

TRADEMARK NOTICES Element K and the Element K logo are trademarks of Element K LLC.

Crystal Reports is a registered trademark of Crystal Decisions Inc. in the U.S. and other countries; the Crystal Decisions Inc. products and services discussed or described may be trademarks of Crystal Decisions Inc. All other product names and services used throughout this book may be common law or registered trademarks of their respective proprietors.

Copyright © 2004 Element K Content LLC. All rights reserved. Screenshots used for illustrative purposes are the property of the software proprietor. This publication, or any part thereof, may not be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, storage in an information retrieval system, or otherwise, without express written permission of Element K, 500 Canal View Boulevard, Rochester, NY 14623, (585) 240-7500, (800) 434-3466. Element K Courseware LLC's World Wide Web site is located at www.elementkcourseware.com.

This book conveys no rights in the software or other products about which it was written; all use or licensing of such software or other products is the responsibility of the user according to terms and conditions of the owner. Do not make illegal copies of books or software. If you believe that this book, related materials, or any other Element K materials are being reproduced or transmitted without permission, please call 1-800-478-7788.

HELP US IMPROVE
OUR COURSEWARE

Your comments are important to us. Please contact us at Element K Press LLC, 1-800-478-7788, 500 Canal View Boulevard, Rochester, NY 14623, Attention: Product Planning, or through our Web site at <http://support.elementkcourseware.com>.

CRYSTAL REPORTS 10.0: LEVEL 2

LESSON 1: CREATING RUNNING TOTALS

A. Create a Running Total Field	3
Running Total	3
B. Modify a Running Total Field	8
Ways to Modify a Running Total Field	8
C. Create a Manual Running Total on Detail Data	17
Variable Declaration	17
Variable Declaration Keywords	17
D. Create a Manual Running Total on Summary Data	24

LESSON 2: BUILDING CROSS-TABS IN YOUR REPORT

A. Create a Cross-tab	35
Planning a Cross-tab	36
Cross-tab	38
Summarized Field	38
B. Create a Specified Group Order	42
Specified Group Order	43
C. Filter a Cross-tab by Group	46
D. Change the Cross-tab Format	50
Formatting Options	50
E. Conditionally Format Rows and Columns	54
Cross-tab Row and Column Headings in Formulas	54
F. Keep Groups Together	59

LESSON 3: ADDING SUBREPORTS

A. Insert a Subreport	64
Plan Subreports	65

B. Link a Subreport to Data in a Primary Report	68
C. Edit a Subreport	71
D. Format a Subreport Using the Format Editor	74
Re-import When Opening	74
E. Share Formulas Between Main and Subreports	77
The Count Function	77
Shared Variables	78
Variable Scope	78
F. Create an On-demand Subreport	81
On-demand Subreport	82
 LESSON 4: CREATING DRILL-DOWNS	
A. Create a Drill-down	89
B. Create Separate Headings for Drill-down Data	95
Drill-down Level Numbering	96
 LESSON 5: ENHANCING REPORT PROCESSING USING SQL	
A. Create a Report Using SQL Queries	104
Server-side Processing	104
Factors Affecting Server-side Processing	105
SQL	105
SQL Benefits	106
Applications Using SQL	107
SQL Clauses	107
SQL Statements	107
SQL Rules	108
SQL Conventions	109
SQL Items Automatically Generated by Crystal Reports	109
B. Summarize Report Data Using SQL Aggregate Functions	115
SQL Aggregate Functions	115
SQL Aggregate Function Descriptions	116

C. Create Joins Using SQL	119
Joins	119
SQL Join Types	120
D. Create Subqueries	127
Subqueries	128
E. Create an SQL Expression Field to Promote Server-side Processing	131
SQL Expression Fields	131

LESSON 6: CHARTING DATA

A. Create a Bar Chart	140
B. Modify a Chart	144
C. Create a Top N Chart	148
D. Format a Chart	152
Chart Formatting Options	153
E. Create a Chart Template	157
Template	158

LESSON 7: REPORTING ON EXCEL DATA

A. Create a Report Based on Excel Data	164
Set Up the Data Source	165
B. Modify a Report Generated from Excel Data	169
C. Update Data in a Report Based on Excel Data	172

APPENDIX A: INSERTING A GEOGRAPHIC MAP

A. Insert a Map	180
------------------------------	------------

LESSON LABS	185
--------------------------	------------

GLOSSARY	197
-----------------------	------------

INDEX	199
--------------------	------------

FOR EVALUATION USE ONLY
(C) 2004 Element K Content LLC
DO NOT DUPLICATE

ABOUT THIS COURSE

Since you've probably completed the first course, or are familiar with the basics of building and modifying reports, you're ready to move ahead to create complex reports and data sources using Crystal Reports' tools. In this course, you'll not only learn how to create more sophisticated reports like subreports and cross-tabs, you'll also learn how to increase the speed and efficiency of your reports by using SQL queries and dictionaries.

Even though Crystal Reports is one of the most powerful report-generating applications available, it is also one of the easiest to use. By taking the time to learn how to use some of Crystal Reports' tools, you won't be slowed down by large databases or databases that you're unfamiliar with. By creating subreports, cross-tabs, and running totals, you'll turn raw data into meaningful customized reports that will help your business run more smoothly. If you work with large databases, you may find yourself faced with performance issues. In this course, you will also learn to use tools that can increase the speed in which data is retrieved.

Course Description

Target Student

This course is designed for people who know how to create basic list and group reports and need to create reports that include subreports, cross-tabs, advanced formulas, and charts based on more than one data series. They may also need to build tools to make it easier for other people to create reports. They may or may not have programming and/or SQL experience.

Course Prerequisites

Crystal Reports 10.0: Level 1, and knowledge of programming and/or SQL would be helpful.

How to Use This Book

As a Learning Guide

Each lesson covers one broad topic or set of related topics. Lessons are arranged in order of increasing proficiency with *Crystal Reports 10.0*; skills you acquire in one lesson are used and developed in subsequent lessons. For this reason, you should work through the lessons in sequence.

We organized each lesson into results-oriented topics. Topics include all the relevant and supporting information you need to master *Crystal Reports 10.0*, and activities allow you to apply this information to practical hands-on examples.

You get to try out each new skill on a specially prepared sample file. This saves you typing time and allows you to concentrate on the skill at hand. Through the use of sample files, hands-on activities, illustrations that give you feedback at crucial steps, and supporting background information, this book provides you with the foundation and structure to learn *Crystal Reports 10.0* quickly and easily.

As a Review Tool

Any method of instruction is only as effective as the time and effort you are willing to invest in it. In addition, some of the information that you learn in class may not be important to you immediately, but it may become important later on. For this reason, we encourage you to spend some time reviewing the topics and activities after the course. For additional challenge when reviewing activities, try the “What You Do” column before looking at the “How You Do It” column.

As a Reference

The organization and layout of the book make it easy to use as a learning tool and as an after-class reference. You can use this book as a first source for definitions of terms, background information on given topics, and summaries of procedures.

Course Objectives

In this course, you will create complex reports and data sources using Crystal Reports’ tools.

You will:

- create running totals in a report.
- build cross-tabs in your report.
- add subreports to a report.
- design a report that uses a drill-down.
- improve processing speed in your reports.
- chart single and multiple data series.
- report from Excel data.
- insert a geographic map.

Course Requirements

Hardware

- A Pentium II or higher processor.
- 350 MB of hard-disk space.
- 128 MB of RAM (256 MB RAM recommended).
- Either a local CD-ROM drive, DVD drive, or access to a networked CD-ROM drive.

Software

- Microsoft Windows XP, 2000 SP4, or above.
- A complete installation of Crystal Reports 10.0.
- A default installation of Excel 2000 or newer.
- An installed printer driver. (Printers are not required; however, each PC must have an installed printer driver in order to use Print Preview.)

Class Setup



This course was written using Crystal Reports 10.0 Professional Edition and Microsoft Windows XP.

1. Install a Custom copy of Crystal Reports 10.0. (On the Selected Features page, click the Geographic Mapping option and choose Entire Feature Will Be Installed On Local Hard Drive.)
2. If necessary, reboot your computer.
3. Install a Complete copy of Microsoft Excel 2000 or newer.
4. If necessary, download and install WinZip, which is available at www.winzip.com/.
5. Install a printer driver. A printer isn't necessary for class, but you must have a printer driver installed.
6. On the course CD-ROM, run the self-extracting file named 085516dd.exe. This will install a folder named 085516Data on your C drive. This folder contains the data files you will need to complete this course.
7. Copy the xtreme.mdb database file from C:\Program Files\Crystal Decisions\Crystal Reports 10\Samples\En\Databases to the C:\085516Data folder.



The xtreme.mdb file is supplied with Crystal Reports. If this file does not exist in the directory specified, it may have been copied to another directory in the file installation. If you are unable to locate this file, it will be on the Crystal Reports installation CD.

8. This is an optional step. Use the following steps to set the location (if you store the 085516Data folder in a location other than the C drive):
 - a. Launch Crystal Reports, and open the first report in the 085516Data folder.
 - b. Choose Database→Set Datasource Location to display the Set Datasource Location dialog box. In the Current Data Source list box, select the first table.

- c. In the Replace With list box, select the option that matches the data type (such as database files or ODBC), and then browse to the location of the table (if necessary).
 - d. Click Update.
 - e. Repeat for each additional report in the 085516Data folder.
9. Staged data files have been provided with this course. These files may help you find a possible solution if you get stuck at any point during the course. If you wish to use the staged data files on the course CD-ROM, run the 085516ddstaged.exe self-extracting file located within. This will install a folder named 085516Staged on your C: drive.

In the 085516Staged folder on your computer, the Lesson folders contain all the course images and data, completed up to the lesson indicated by the folder name. For example, if you would like to view the course data as it should appear at the beginning of Lesson 4, you should open the Lesson 4 folder in the 085516Staged folder on your computer.

10. In addition to the specific setup procedures needed for this class to run properly, you should also check the Element K Press product support Web site at <http://support.elementkcourseware.com> for more information. Any updates about this course will be posted there.

List of Additional Files

Printed with each activity is a list of files students open to complete that activity. Many activities also require additional files that students do not open, but are needed to support the file(s) students are working with. These supporting files are included with the student data files on the course CD-ROM or data disk. Do not delete these files.

LESSON 1

Creating Running Totals

Lesson Time*1 hour(s), 15 minutes to**1 hour(s), 45 minutes*

Lesson Objectives:

In this lesson, you will create running totals in a report.

You will:

- Create a running total field.
- Modify a running total field.
- Create a manual running total on detail data.
- Create a manual running total on summary data.

Introduction

You have already presented totals as summary information appearing at the bottom of a report and/or in a group section. Another way to create specialized summaries is to use running totals. In this lesson, you'll create manual and running totals.

Running totals are helpful because they produce a continual incremental total of data on your report. Continuous running totals can be helpful in many situations, including inventory control, sales tracking, and budgeting cash flow. Suppose you wanted a running total in your report. You could count or use a calculator but that would take a lot of time. A better way is Crystal Reports' running total command.

Customer	Order Amount	Shipped	Running Total
BBS Pty	\$29.00	True	\$29.00
BBS Pty	\$1,889.40	True	\$1,918.40
BBS Pty	\$1,095.75	True	\$3,014.15
BBS Pty	\$520.35	True	\$3,534.50
BBS Pty	\$2,654.56	True	\$6,189.06
BBS Pty	\$2,319.36	True	\$8,508.42
BBS Pty	\$1,679.25	True	\$10,187.67
BBS Pty	\$109.70	True	\$10,297.37
BBS Pty	\$3,734.10	True	\$14,031.47
BBS Pty	\$479.85	True	\$14,511.32
BBS Pty	\$33.90	True	\$14,545.22
BBS Pty	\$8,819.55	True	\$23,364.77
BBS Pty	\$5,913.60	True	\$29,278.37
BBS Pty	\$83.65	True	\$29,362.02
BBS Pty	\$51.60	True	\$29,413.62
BBS Pty	\$2,939.85	True	\$32,353.47
BBS Pty	\$3,479.70	True	\$35,833.17
BBS Pty	\$2,497.05	True	\$38,330.22
BBS Pty	\$3,355.22	True	\$41,685.44
BBS Pty	\$6,970.95	True	\$48,656.39
BBS Pty	\$39.15	True	\$48,695.54
BBS Pty	\$19.96	True	\$48,715.50
BBS Pty	\$659.70	True	\$49,375.20
BBS Pty	\$1,139.55	True	\$50,514.75
BBS Pty	\$107.80	False	\$50,622.55
BBS Pty	\$6,209.55	False	\$56,832.10
			\$56,832.10

This report includes a running total field for the order amount data.

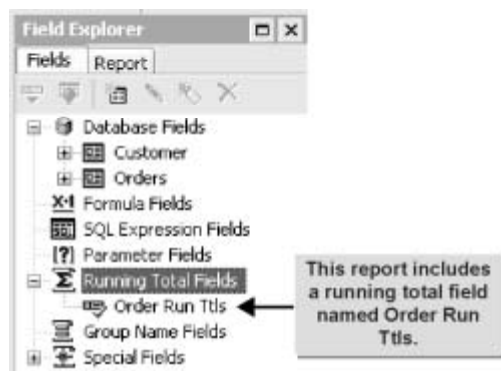
Figure 1-1: You can easily display a running total in your reports.

TOPIC A

Create a Running Total Field

You already know how to group data and generate subtotals by group. There might be times when you need a running total displayed on a record-by-record basis. In this topic, you'll display a total that evaluates each record and provides a running sum of all the values in a field.

At some point, you'll have a list of ungrouped data and only want to subtotal some of the data in the list. For example, if you have a list that contains both Florida and New York customers and you want a total of the values from just the New York customers and also a total of the values of Florida customers. You can create a running total for each to maintain separate running totals.



 A Running Total Field

Figure 1-2: A running total field allows you to easily add running totals to your reports.

Running Total

Definition:

A *running total* is a value that is displayed for each record, and that totals all records in the report or group, up to and including the current record. You can use Crystal Reports' running total field or create your own manual running total. A running total name can contain mixed characters and spaces. After the running total field is created, Crystal Reports precedes the running total field with a pound sign (#).

Example:

Figure 1-3 shows an example of a running total in a basic list report, based on order amount.

Customer Name	Order Amount	Running Total
BBS Pty		
BBS Pty	\$2,319.36	\$2,319.36
BBS Pty	\$51.60	\$2,370.96
BBS Pty	\$5,913.60	\$8,284.56
BBS Pty	\$109.70	\$8,394.26
BBS Pty	\$19.96	\$8,414.22
BBS Pty	\$8,819.55	\$17,233.77
BBS Pty	\$2,654.56	\$19,888.33
BBS Pty	\$479.85	\$20,368.18
BBS Pty	\$2,939.85	\$23,308.03
BBS Pty	\$1,889.40	\$25,197.43
BBS Pty	\$83.65	\$25,281.08
BBS Pty	\$3,734.10	\$29,015.18
BBS Pty	\$1,095.75	\$30,110.93
BBS Pty	\$520.35	\$30,631.28
BBS Pty	\$2,497.05	\$33,128.33
BBS Pty	\$6,970.95	\$40,099.28
BBS Pty	\$33.90	\$40,133.18
BBS Pty	\$29.00	\$40,162.18
BBS Pty	\$3,355.22	\$43,517.40
BBS Pty	\$1,679.25	\$45,196.65
BBS Pty	\$659.70	\$45,856.35
BBS Pty	\$39.15	\$45,895.50
BBS Pty	\$3,479.70	\$49,375.20
BBS Pty	\$1,139.55	\$50,514.75
BBS Pty	\$107.80	\$50,622.55
BBS Pty	\$6,209.55	\$56,832.10
		\$56,832.10

Each record displays both its own order amount value, and the sum of all order amount values up to and including the current record.

Figure 1-3: An example of a running total in a basic list report.

How to Create a Running Total Field

Procedure Reference:

To create a running total field:

1. In the Field Explorer, select Running Total Fields and click the New button to display the Create Running Total Field dialog box.
2. Type a name for the running total field.
 - You can use the default name given by Crystal Reports or create your own name.
 - Names can contain mixed case characters and spaces.
 - Crystal Reports assigns a pound sign (#) to running total field names.
3. From the Available Tables And Field column, select the field to summarize.
4. From the Type Of Summary drop-down list, select the type of summary you want to perform. The available summary types include sum, average, minimum, maximum, count, and about a dozen others.
5. In the Evaluation section, specify criteria to determine which data the running total field performs its evaluation on.
6. In the Reset section, specify an option to determine when, or whether, the running total value is reset.

7. Click OK.
8. Insert the field into the report.
9. If you want to adjust the field or label formatting, you can do so in either Design or Preview view. It is often useful to apply formatting while previewing the report so that you can see how the formatting affects the report data.
10. If the new field's label doesn't align with other field labels, then you can select all the labels you want to align, then choose the appropriate alignment option from the Format→Align submenu, or right-click and select from the shortcut menu's Align submenu.
 - If you want to select some, but not all, of the items within the section, then you can Ctrl-click, Shift-click, or drag a marquee that touches each object you want to select.
 - If you want to select all items within the section, then you can right-click the gray area at the left of the section, and select Select All Section Objects.

ACTIVITY 1-1

Creating a Running Total Field

Data Files:

- RT-Saddle Sales.rpt

Setup:

Crystal Reports is running. Data files have been installed in the C:\085516Data folder. The Set Location is set to the C:\085516Data\xtreme.mdb path.

Scenario:


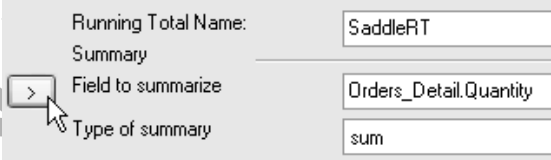
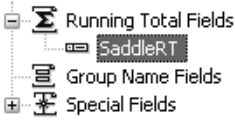
You work for a company that sells bicycles and equipment, and you're in charge of inventory for bicycle saddles. Orders are piling up, and you need to set up a delivery schedule with your supplier. To make sure you're not overstocked or short, you want to see the cumulative running total of saddle quantities sold, along with the detail items. That way you can quickly spot any unusually large orders.

If you were to just look at the total number ordered per week, for example, you might end up setting a delivery schedule that doesn't really meet your needs. One unusually large order could impact the averages greatly.



Tell students that because of different computer monitors and workstation settings, they might notice that fields are cut off and fonts look different than the instructor station. This is expected and students will need to be prepared to adjust their field sizes and fonts accordingly.

LESSON 1


What You Do	How You Do It		
1. In the RT-Saddle Sales.rpt report, create a running total field.	<div><div><div>a. Open RT-Saddle Sales.rpt.</div><div>b. In the Field Explorer, select Running Total Fields.</div><div>c. Click the New button .</div><div>d. In the Running Total Name box, type <i>SaddleRT</i></div><div>e. In the Available Tables And Fields list box, select <i>Orders_Detail.Quantity</i>.</div><div>f. Click the arrow button to the left of the Field To Summarize section.</div><div></div><div>g. Verify that Type Of Summary is set to Sum.</div><div>h. Verify that in the Evaluate section, the For Each Record option is selected.</div><div>i. Verify that in the Reset section, the Never option is selected.</div><div>j. Click OK.</div><div></div></div></div> <div></div> <tr><td>2. Place the new running total field on the Design tab and label it <i>Running Total</i></td><td><div><div>a. Drag the SaddleRT running total field to the Details section at the 4.5-inch margin position.</div><div>b. Change the field label to <i>Running Total</i></div></div></td></tr>	2. Place the new running total field on the Design tab and label it <i>Running Total</i>	<div><div>a. Drag the SaddleRT running total field to the Details section at the 4.5-inch margin position.</div><div>b. Change the field label to <i>Running Total</i></div></div>
2. Place the new running total field on the Design tab and label it <i>Running Total</i>	<div><div>a. Drag the SaddleRT running total field to the Details section at the 4.5-inch margin position.</div><div>b. Change the field label to <i>Running Total</i></div></div>		

3. Preview the report. What items might you fix?

Remove the underline and apply bold formatting to the label, align the label with the rest of the labels, increase the size of any cut-off fields, decrease decimal places, and so on.

You may want to review with your students techniques for modifying and formatting labels and other objects.


4. Format the new label to match the appearance of the other labels.

- In Design view, select the Quantity label.
- In the Standard toolbar, click the Format Painter .
- Click the Running Total label.
- Adjust the height of the label objects as necessary so that no letters, such as the letter g or y, are cut off at the bottom.
- In the gray area at the left side of the Page Header section, right-click, and from the shortcut menu, select Select All Section Objects.
- Choose Format→Align→Bottoms.
- Preview the report.

5. Which view mode should you use to remove the decimal digits from the running total field, and why?

You should use Preview view, so that you can see the decimal digit values as you modify their display. The decimal digits don't appear in Design view.

6. Remove the decimal digits from the Running Total field.

- While previewing the report, click the Running Total field for any record.
- In the Formatting toolbar, click the Decrease Decimals button  twice.

Running Total

2
4
7
10
12

- Save the report.

TOPIC B

Modify a Running Total Field

Once you insert a running total field into your report, you might find that it doesn't provide the results you wanted. In this topic, you'll learn how to edit a running total.

Let's say that your report contains a running total that calculates a sum and what you really want is a count or an average. Rather than create a new running total field, you can edit the existing field. You can also modify a running total field by changing the field that you are summarizing.

Running Total Field Modification

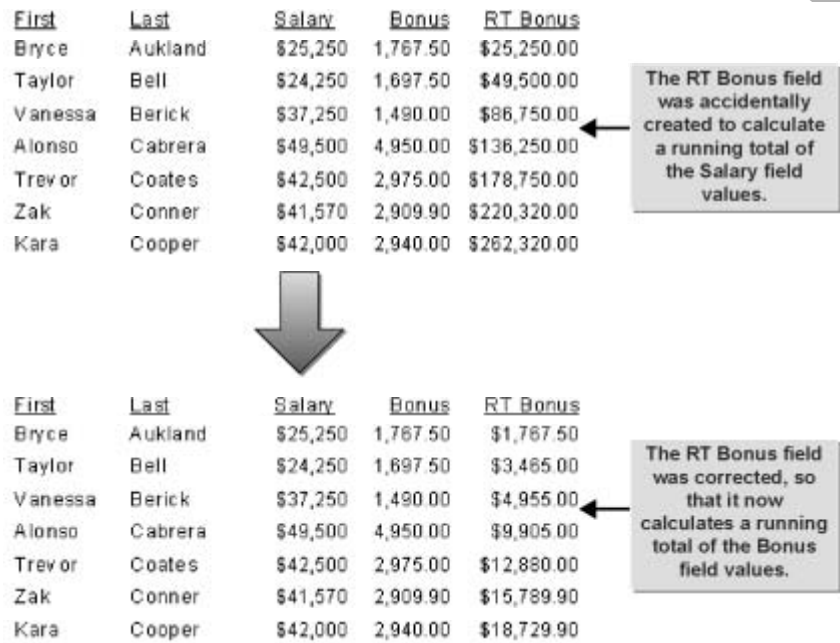


Figure 1-4: You can modify a running total field at any time.

Ways to Modify a Running Total Field

There are four common modifications made to running total fields.

Ways to Modify a Running Total Field

Change	Description	Example
Summary field	Change the field being summarized.	Find the average pay rate rather than the average number of hours worked.
Summary operation	Change the type of summary operation being performed.	Change a running total that currently sums hours to show the average hours.

Change	Description	Example
Evaluation criteria	Determine when the running total field should be incremented. The default setting is to increment the running total on each record. Other options include calculating the increment only when a field changes, a group changes, and/or an expression evaluates to true.	Increase the incremental running total only when the customer region field is equal to CA.
Reset	Determine the time when a running total field should be reset to zero. The default setting is to not perform a reset. Other options include resetting when a field changes, a group changes, and/or when an expression evaluates to true formula.	In a report showing cumulative sales for the last two years, reset the sales total to zero at the beginning of each year.

How to Modify a Running Total Field

Procedure Reference:

To modify a running total field:

1. Display the Edit Running Total Field dialog box for the field you want to modify.
 - In the Field Explorer, select the running total field, then click the Edit button.
 - In the Field Explorer, right-click the running total field, and from the shortcut menu, select Edit.
 - On the Design or Preview tab, right-click the running total field, and from the shortcut menu, select Edit Running Total.
2. If you want to modify the summary operation, then in the Summary section, select the summary type you want from the drop-down list.
3. If you want to modify the field's evaluation criteria based on a formula, then in the Evaluate section, select Use A Formula. Click the Conditional Formula button next to Use A Formula, and enter the evaluation formula in the Running Total Condition Formula window.
4. If you want to set the reset option to change on group, then in the Reset section, click On Change Of Group. Use the drop-down arrow to the right of the On Change Of Group to select the group where the counter should be set back to zero.
5. Click OK.

ACTIVITY 1-2

Modifying a Running Total Field

Setup:

The report RT-Saddle Sales.rpt is open.

Scenario:

You have been asked to separate the data in your report by calendar quarter, and to change the running total so that it only displays Saturday sales. When you're finished, your report should look like Figure 1-5.



Saddle Sales

Order Day	Order ID	Product Name	Quantity	Saturday Sales
10/2000				
Tue	1046	Vesper Comfort ATB Saddle	1	
Tue	1083	Vesper Gelflex Ladies Saddl	1	
1/2001				
Sat	1141	Roadster Jr BMX Saddle	2	2
Tue	1244	Roadster Jr BMX Saddle	2	2
Wed	1247	Roadster Jr BMX Saddle	3	2
Wed	1270	Roadster Jr BMX Saddle	3	2
Thu	1279	Roadster Jr BMX Saddle	2	2
Mon	1309	Roadster Jr BMX Saddle	2	2
Wed	1324	Roadster Jr BMX Saddle	3	2
Sat	1147	Vesper Comfort ATB Saddle	2	4
Fri	1204	Vesper Comfort ATB Saddle	1	4
Sat	1252	Vesper Comfort ATB Saddle	3	7
Mon	1315	Vesper Comfort ATB Saddle	1	7
Thu	1468	Vesper Comfort ATB Saddle	1	7
Tue	1153	Vesper Gelflex Ladies Saddl	2	7
Tue	1268	Vesper Gelflex Ladies Saddl	2	7
Wed	1453	Vesper Gelflex Ladies Saddl	3	7

Figure 1-5: The report after it is grouped.

What You Do

How You Do It

1. Group the report by Calendar Quarter.

Order Day	Order ID	Product Name	Quantity	Running Total
10/2000				
Tue	1046	Vesper Comfort ATB Saddle	1	1
Tue	1093	Vesper Gelflex Ladies Saddl	1	2
1/2001				
Sat	1141	Roadster Jr BMX Saddle	2	4
Tue	1244	Roadster Jr BMX Saddle	2	6
Wed	1247	Roadster Jr BMX Saddle	3	9
Wed	1270	Roadster Jr BMX Saddle	3	12
Thu	1279	Roadster Jr BMX Saddle	2	14
Mon	1309	Roadster Jr BMX Saddle	2	16
Wed	1324	Roadster Jr BMX Saddle	3	19
Sat	1147	Vesper Comfort ATB Saddle	2	21
Fri	1204	Vesper Comfort ATB Saddle	1	22
Sat	1252	Vesper Comfort ATB Saddle	3	25
Mon	1315	Vesper Comfort ATB Saddle	1	26
Thu	1468	Vesper Comfort ATB Saddle	1	27
Tue	1153	Vesper Gelflex Ladies Saddl	2	29
Tue	1268	Vesper Gelflex Ladies Saddl	2	31
Wed	1453	Vesper Gelflex Ladies Saddl	3	34

- a. Choose Insert→Group.
- b. From the top drop-down list, box, select **Orders.Order Date**.
- c. From the bottom drop-down list box, select **For Each Quarter** and click OK.

2. How would you identify Saturdays only?

You can use the DayOfWeek function, looking for those records where the DayOfWeek function returns a 7.

3. What does it mean to set an evaluation on a running total?

By default, Crystal Reports will increment a running total for every record. When you set an evaluation on a running total, you are asking that the increment only occur in a given circumstance. For example, increment the total only if the order date is a Saturday. If the order date is not a Saturday, do not add any value to the running total for that specific record.

4. What would the formula DayOfWeek ({Orders.OrderDate})=7 return if the order day was a Saturday?

The True value.

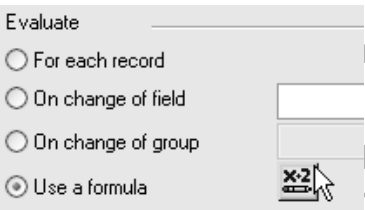
5. What would the formula DayOfWeek ({Orders.OrderDate})=7 return if the order day was a Wednesday?

The False value.

6. Edit the running total so that it only sums Saturday Sales.

- a. Right-click the running total field and choose Edit Running Total.


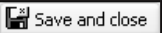
- b. Under the Evaluate section, select **Use A Formula** and click the **Conditional Formula** button.



- c. In the Functions tree, **expand the Date And Time category**.
- d. **Expand the DayOfWeek category and double-click DayOfWeek (date)**.
- e. In the Fields tree, **expand the xtreme database category**.
- f. **Expand the Orders table and double-click Order Date**.
- g. Outside the last) type **=7**

DayOfWeek ({Orders.Order Date})=7

7. Check the formula for errors, and then save and close.

- a. Click **Check** .
 - b. At the No Errors Found message, click **OK**.
 - c. Click **Save And Close** .

8. Save the changes to the running total field and change the Running Total field label to *Saturday Sales*.

- a. Click **OK**.
 - b. In the warning dialog box, click **Yes**.
 - c. **Select the Running Total field label and type *Saturday Sales***
 - d. **Save the report**.
 - e. If necessary, click **Yes**.

9. Preview the report. How has the running total changed?

The running total only increases when there is a Saturday sale.

ACTIVITY 1-3


Suppressing the Running Total

Setup:

RT-Saddle Sales.rpt is open.

Scenario:

The report you've just created shows the proper information, but the running total column is confusing your viewers. Since there are no Saturdays until the 7th record, blanks appear up to that sale. Thereafter, the running totals are shown on every record, even when it's not a Saturday. You need to hide the running totals when the sale date is not a Saturday. When you're finished, your report should look like Figure 1-6.



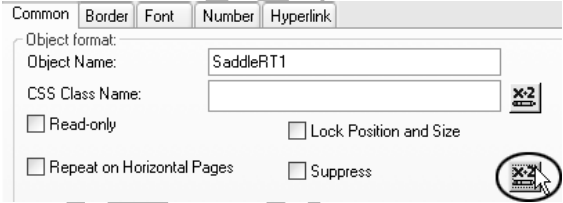
Saddle Sales

Order Day	Order ID	Product Name	Quantity	Saturday Sales
10/2000				
Tue	1046	Vesper Comfort ATB Saddle	1	
Tue	1083	Vesper Gelflex Ladies Saddl	1	
1/2001				
Sat	1141	Roadster Jr BMX Saddle	2	2
Tue	1244	Roadster Jr BMX Saddle	2	
Wed	1247	Roadster Jr BMX Saddle	3	
Wed	1270	Roadster Jr BMX Saddle	3	
Thu	1279	Roadster Jr BMX Saddle	2	
Mon	1309	Roadster Jr BMX Saddle	2	
Wed	1324	Roadster Jr BMX Saddle	3	
Sat	1147	Vesper Comfort ATB Saddle	2	4
Fri	1204	Vesper Comfort ATB Saddle	1	
Sat	1252	Vesper Comfort ATB Saddle	3	7
Mon	1315	Vesper Comfort ATB Saddle	1	
Thu	1468	Vesper Comfort ATB Saddle	1	
Tue	1153	Vesper Gelflex Ladies Saddl	2	
Tue	1268	Vesper Gelflex Ladies Saddl	2	
Wed	1453	Vesper Gelflex Ladies Saddl	3	
4/2001				
Thu	1483	Roadster Jr BMX Saddle	2	
Sat	1613	Roadster Jr BMX Saddle	1	8
Sat	1719	Roadster Jr BMX Saddle	3	11

Figure 1-6: The report showing only Saturday sales.

LESSON 1

Be sure your students right-click the field on the layout, and not within the Field Explorer.

What You Do	How You Do It
1. Suppress the running total when it's not a Saturday.	<div><div>a. Right-click the running total field.</div><div>b. Choose Format Field and select the Common tab.</div><div>c. Click the Conditional Formula button located to the right of the Suppress option.</div><div></div><div>d. If necessary, in the Functions tree, expand the Date And Time category.</div><div>e. From the DayOfWeek category, double-click DayOfWeek (date).</div><div>f. In the Fields tree, double-click Orders.Order Date.</div><div>g. Outside the last) type <> 7</div><div>h. Check the formula, and then save and close.</div><div>i. Click OK.</div></div>
2. Preview the report. When does the running total appear?	<div>Only when the order date is a Saturday.</div>

ACTIVITY 1-4

Resetting the Running Total

Setup:

RT-Saddle Sales.rpt is open.

Scenario:

The report you've created counts all Saturday sales for the entire period reflected in the report. You decide to calculate the Saturday sales within each calendar quarter starting over with a zero at the start of each calendar quarter to help determine staffing needs on Saturdays. You also want to show the running total for each quarter in the report to make the report easier to read.

What You Do

How You Do It

1. What section of the report represents a change in calendar quarter?

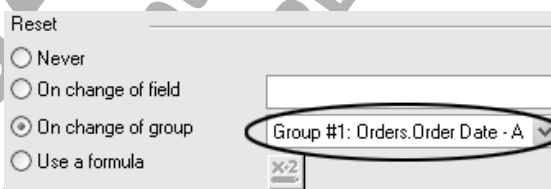
The Group Header 1 section.

2. Edit the running total so that it resets on each calendar quarter.

- a. Right-click the running total field, and choose Edit Running Total.

- b. Under the Reset section, select On Change Of Group.

- c. To the right of On Change Of Group, verify that Group #1 is selected.



- d. Click OK.

- e. If necessary, click Yes.

3. Preview the report. How do you know that the reset is occurring?

The first Saturday in each calendar quarter contains the total for just that sale and is then incremented up to the next calendar quarter.

4. How can you make the Saturday totals stand out for each calendar quarter?

Show the running total in the Calendar Quarter footer.

LESSON 1

5. Display the running total field in the order date footer.

a. In Design view, right-click the running total field and choose Copy.

b. Position the cursor in the Group Footer #1 section, right-click and choose Paste.

c. Use the mouse to place the copied formula in the Group Footer, so that it appears beneath the Running Total field in the Details section.

Quantity	Saturday Sales
Quantity	#SaddleRT
	#SaddleRT

6. Preview the report. Did the field appear in every group footer?

No. The formula you copied is suppressed when the order date is not Saturday. You need to remove the conditional formatting on your new copied formula.
7. Remove the conditional suppress formula from the running total displayed in the calendar quarter footer.

a. Right-click the running total field displayed in the calendar quarter footer and choose Format Field.

b. On the Common tab, click the Conditional Formula button located to the right of the Suppress option.

c. Delete the formula.

d. Save and close the Format Formula Editor.

e. Click OK.
8. Preview the report. Where do the totals appear now?

In the Details section when the order date is a Saturday, and in the group footer section for all groups.
9. Save and close the report.

a. Save the report.

b. Close the report.

TOPIC C

Create a Manual Running Total on Detail Data

As you begin to create more complex reports, you'll use Crystal Reports' manual running total to insert and edit running totals in your report. There might be times when you need to create your own running total because Crystal Reports' is either not available and/or not reliable. In this topic, you'll create sequential summing on a field.

In many simple reports, Crystal Reports' built-in running total feature works fine. However, running totals can be problematic in more complex reports. Reports with more than 10 group levels and/or reports with suppressed sections can cause a running total to be incorrect. Common practice is to create manual running totals rather than rely on the built-in Crystal Reports feature. It requires more work, but is a dependable solution for your running total needs. Understanding how manual running totals work is essential, especially when you need to report running totals in summary sections.

Variable Declaration

Definition:

A *variable* is a value that can change, which is used as part of a formula. Before you can use a variable in a formula, it must be "declared" or introduced in the formula by providing a name and a type. This is done by using a variable declaration followed by the name of the variable. For example, a variable declaration for a numeric variable is `NumberVar MyNumber`. An example of a variable declaration for a numeric variable that also assigns a value to the variable is `NumberVar MyNumber := 0;`.

If the concept of variables is new to students, have them go to the Crystal Help screen and type variables on the index tab.

Example:

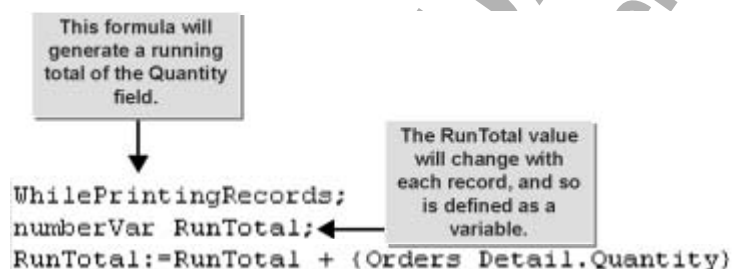


Figure 1-7: You can specify a formula value as a variable to indicate that the value can change.

Variable Declaration Keywords

The following table displays a list of the common variable declaration keywords used in Crystal Reports formulas.

Data Type	Variable Declaration
Number	NumberVar


Common Variable Declaration Keywords

Data Type	Variable Declaration
String	StringVar
Date	DateVar
Date/time	DateTimeVar
Currency	CurrencyVar

How to Create a Manual Running Total on Detail Data

Procedure Reference:

To create a manual running total on detail data:

-  Formulas can also be created directly in the Formula Workshop window. For example, selecting the Group Selection icon under Selection formulas will open the Group Selection Formula Editor. Conditional formulas can even be added by right-clicking the report object from the Formatting Formula category and choosing New Formatting Formula from the shortcut menu.
- 1. In the Field Explorer, select Formula Fields.
- 2. Click the New button, type a name for the running total field, and click Use Editor.
- 3. Type (or select) WhilePrintingRecords as the first line for the formula. If you want to select the function, rather than type it, then expand the Evaluation Time function category and double-click WhilePrintingRecords. Evaluation formulas must always be the first line in a formula because they determine when the formula will be processed.
- 4. Type a semicolon (;) and press Enter to move to a new line.
- 5. Declare the variable and variable type, such as NumberVar RunTotal. Doing this sets aside a place in the computer's memory, called an address, in which to store the variable contents. The variable type is used to determine how much space is needed; the name is used to reference the variable in the current formula and in other formulas when applicable. If a variable type and name are not specified, the variable does not exist and cannot be used in a formula.
- 6. Complete the formula to set the running total field calculations. In most cases, the variable name will be added to the field name, for example, NumberVar RunTotal := RunTotal + {table.field name}
- 7. Drag the formula into the Details section.

ACTIVITY 1-5

Creating a Manual Running Total on Detail Data

Data Files:

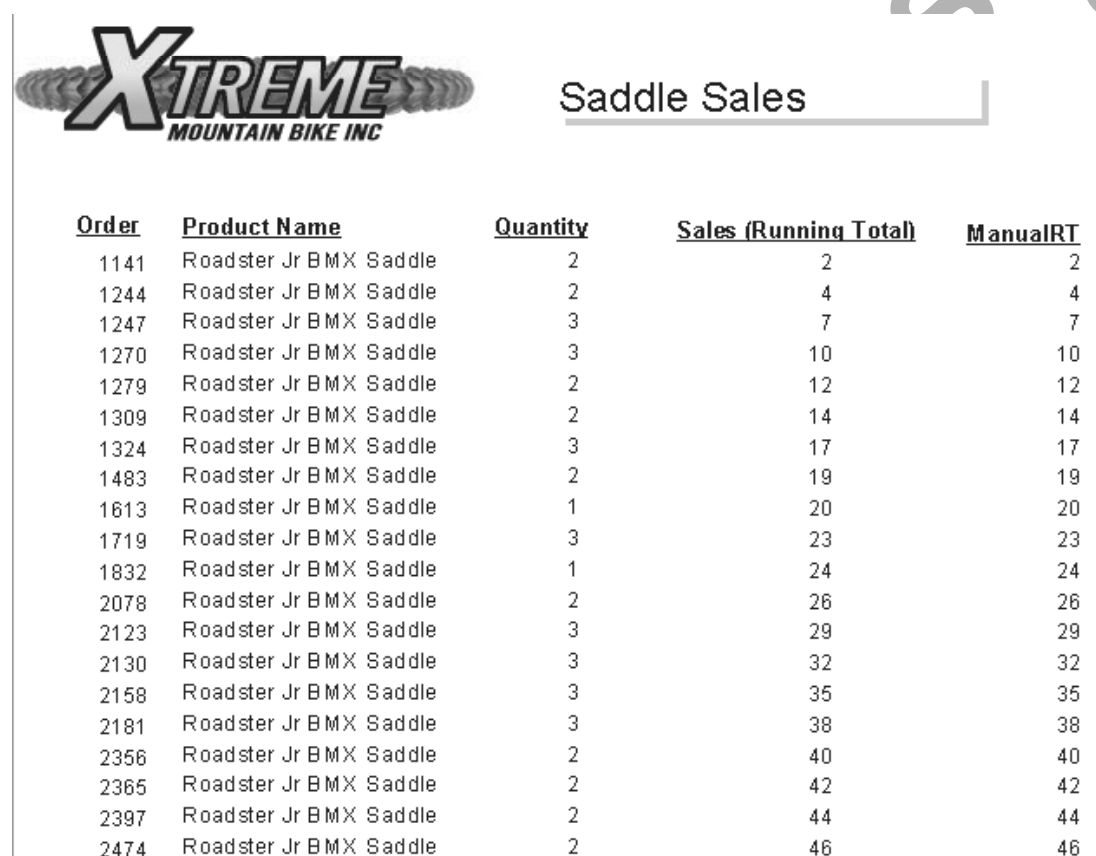
- Manual RT-Saddle Sales.rpt

Setup:

No files are open.

Scenario:

You're troubleshooting a report that you've inherited that contains a running total field, and you aren't sure if it's running properly. You want to create a manual running total to compare the results. When you're finished, your report should look like the following figure, Figure 1-8.



<u>Order</u>	<u>Product Name</u>	<u>Quantity</u>	<u>Sales (Running Total)</u>	<u>ManualRT</u>
1141	Roadster Jr BMX Saddle	2	2	2
1244	Roadster Jr BMX Saddle	2	4	4
1247	Roadster Jr BMX Saddle	3	7	7
1270	Roadster Jr BMX Saddle	3	10	10
1279	Roadster Jr BMX Saddle	2	12	12
1309	Roadster Jr BMX Saddle	2	14	14
1324	Roadster Jr BMX Saddle	3	17	17
1483	Roadster Jr BMX Saddle	2	19	19
1613	Roadster Jr BMX Saddle	1	20	20
1719	Roadster Jr BMX Saddle	3	23	23
1832	Roadster Jr BMX Saddle	1	24	24
2078	Roadster Jr BMX Saddle	2	26	26
2123	Roadster Jr BMX Saddle	3	29	29
2130	Roadster Jr BMX Saddle	3	32	32
2158	Roadster Jr BMX Saddle	3	35	35
2181	Roadster Jr BMX Saddle	3	38	38
2356	Roadster Jr BMX Saddle	2	40	40
2365	Roadster Jr BMX Saddle	2	42	42
2397	Roadster Jr BMX Saddle	2	44	44
2474	Roadster Jr BMX Saddle	2	46	46

Figure 1-8: Comparing a manual versus a running total.

What You Do

How You Do It

- In Manual RT-Saddle Sales.rpt, which field do you want to increment by its previous value?

Orders_Detail.Quantity.


LESSON 1


2. How would you write a formula that will increment the Quantity field, adding itself to the previous quantity, creating a running total?

Create a variable to hold the temporary contents, and add the Quantity field to the variable while the records are printing.

```
WhilePrintingRecords;  
numberVar RunTotal;  
RunTotal:=RunTotal + {Orders_Detail.Quantity}
```

3. In the Manual RT-Saddle Sales.rpt report, create a formula called **ManualRT** that will display a running total of sales volume. Place the formula to the right of the built-in Crystal Reports running total formula.
- In the Field Explorer, select **Formula Fields** and click the **New** button.
 - In the Formula Name dialog box, type **ManualRT** and click **Use Editor**.
 - Place the insertion point in the formula window and type **WhilePrintingRecords;** and press **Enter**.
 - In the Operators tree, expand the **Variable Declarations** category.
 - Double-click **NumberVar x := y;**
- ```
WhilePrintingRecords;
numberVar := ;
```
- Type **RunTotal** and delete the colon and equal sign, leaving the semicolon. Be sure there are no spaces between **RunTotal** and the semicolon.
  - Press **End** and then press **Enter**.
  - Type **RunTotal :=RunTotal**
  - In the Operators tree, expand **Arithmetic** and double-click **Add (x + y)**.

 Hint: The first category in the list.

 You may want to point out to your students that they could also insert the **WhilePrintingRecords** function by expanding the **Evaluation Time** function category and double-clicking **WhilePrintingRecords**.

- j. In the Fields tree, double-click Orders\_Detail.Quantity.

```
WhilePrintingRecords;
numberVar RunTotal;
RunTotal:=RunTotal + {Orders_Detail.Quantity}
```

4. Check the formula for errors, and then save and close the formula editor.

- a. Check the formula for errors and click OK.

- b. Save and close.

5. Insert the ManualRT formula into the report and preview the report.

- a. Drag the ManualRT formula to the Details section to the right of Saddle RT.

|                              |                 |
|------------------------------|-----------------|
| <b>Sales (Running Total)</b> | <b>ManualRT</b> |
| {SaddleRT}                   | {ManualRT}      |

- b. Preview the report.

- c. Format the new field's label to match the other field labels, and to align to them.

- d. Remove the decimal digits from the field itself.



You may want to remind your students to use the Format Painter to quickly format the new field label.

6. What calculation is your new formula performing?

*The manual running total displays the same answers as the built-in Crystal Reports running total, in each case incrementing itself by the current field quantity.*

**Save and close the report.**

## Multi-pass Reporting

As Crystal Reports pulls together data for presentation on a report it may need to make several “passes” through the data. Crystal Reports refers to this as “*multi-pass reporting*.” The following table identifies the report processing order:

| Name        | What is processed and in what order?                  | Examples                            |
|-------------|-------------------------------------------------------|-------------------------------------|
| Pre-Pass #1 | Constant Formulas (not dependent upon database data). | 30*234<br>DateAdd(“d”,10,PrintDate) |



Report Processing Order



# LESSON 1

| Name        | What is processed and in what order?                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Examples                                                                                                                                                                                                                                                                                                                                                         |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pass #1     | <ol style="list-style-type: none"> <li>1. Record Selecting and Sorting from the server.</li> <li>2. Formulas that don't include summary information (this formula type is called a Recurring Formula).</li> <li>3. Record Selecting and Sorting that could not be done at the server level.</li> <li>4. Sorting, grouping, and totaling.</li> <li>5. Cross-tab generation</li> <li>6. Saving of data (this is the last pass that requires record retrieval from the database)</li> </ol> | <p>Pull 6 fields from the sales table where field x=y</p> <p>{table1.fielda}*30<br/>{table1.fieldb}*{table1.fieldc}</p> <p>Data that is grouped by "specified grouping order." Filters that do not appear in the where clause of the underlying SQL query.</p> <p>Sum({orders.order quantity})</p> <p>Creation of any cross-tab object.</p> <p>N/A</p>           |
| Pre-Pass #2 | Top/Bottom N and Hierarchical Grouping                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Top N formula to return the Top 10 customers — i.e. Top 10 of Sum ({Orders.OrderQuantity},{Customers.CustomerID})                                                                                                                                                                                                                                                |
| Pass #2     | <ol style="list-style-type: none"> <li>1. Group Selection Formulas</li> <li>2. Running Totals</li> <li>3. Calculations specifically marked "While Printing Records"</li> <li>4. Charts, maps</li> <li>5. Subreports</li> </ol>                                                                                                                                                                                                                                                           | <p>Limit report based on the contents of a summary field in a group footer i.e. Sum({Orders.OrderQuantity},{Customers.CustomerID})&gt;5000</p> <p>Running totals that have been built using the Insert Running Total feature.</p> <p>Any formula where the first line is "WhilePrintingRecords;" (This includes manual running totals)</p> <p>n/a</p> <p>n/a</p> |
| Pass #3     | Total Page Count                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Page N of M (Insert, Special Field)                                                                                                                                                                                                                                                                                                                              |

These "passes" through the data can also be related to Evaluation Time functions set by the user. Assigning an Evaluation Time function to a formula forces the calculation of the data to occur in the corresponding pass shown in the following table.

| Evaluation Time Function | Pass        | Sample Use                                                                                                                                                                                  |
|--------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BeforeReadingRecords     | Pre-Pass #1 | A variable might be used to capture the system time on start of a report. Specifying BeforeReadingRecords will ensure that it doesn't get calculated after the records have been retrieved. |

| Evaluation Time Function | Pass                                                                                     | Sample Use                                                                                                                                                                                                    |
|--------------------------|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| WhileReadingRecords      | Pass #1–initial read                                                                     | This is often used as a troubleshooting tool to determine when records are evaluated. The formula checker will return an error if an expression or other part of your formula needs to be evaluated later.    |
| WhilePrintingRecords     | Pass #2 (after Group Selection formulas and built in running totals)                     | Manual running total formulas.                                                                                                                                                                                |
| EvaluateAfter(x)         | N/A–calculation is done after “x”, where x is the name of another formula in the report. | When you have two formulas that will be printed in the same evaluation time but need control over which one gets calculated first because the results of the first formula are needed for the second formula. |

## DISCOVERY ACTIVITY 1-6

### Troubleshooting a Report

#### Data Files:

- Helmet Sales by Color.rpt

#### Setup:

No files are open.

#### Scenario:

Your co-worker created a manual running total but states it is not working properly. You need to troubleshoot the report and correct any errors.

1. Open **Helmet Sales by Color.rpt** and explore the report formulas using the **Formula Workshop**.
2. Which of these formulas involves the running total calculations?  
*Only the RTBlack and RTWhite formula fields.*
3. How could you change the evaluation time of this formula, forcing it to calculate after the record sort?  
*Add WhilePrintingRecords to the first line of the formula.*
4. Modify the formula **RTWhite** to insert **WhilePrintingRecords**;

5. Make the same fix for the RTBlack formula.

6. Does this solve the problem?

Yes.

Save and close the report.

## TOPIC D

### Create a Manual Running Total on Summary Data

Sometimes, you don't need to see all the detail in a report and you only want a summary. In this topic, you'll create a manual total on summary data but you still need a running total on summary data.

It's not uncommon to want running totals of subtotals, and manual running totals are the most dependable way to do this. Let's say you have a report that shows total sales by employee per month, and you now want to see the running total over the year for the same employee. The monthly total may be a simple sum operation; the running total showing the yearly sales accumulation will be a running total on the summary field.

### How to Create a Manual Running Total on Summary Data

#### Procedure Reference:

To create a manual running total on summary data:

1. In the Field Explorer, select Formula Fields.
2. Click the New button, type a name for the running total field, and click Use Editor.
3. Type (or select) WhilePrintingRecords as the first line for the formula.
4. Type ; and press Enter to move to a new line.
5. Declare the variable and variable type, such as NumberVar RunTotal.
6. Complete the formula to set the running total field calculations. In most cases, the variable name will be added to the field name, such as NumberVar RunTotal := RunTotal + {table.field name}.
7. Drag the formula into the Group section where you want it to appear in the report.

# ACTIVITY 1-7

## Creating a Manual Running Total on Summary Data

### Data Files:


- Saddle Sales by Month.rpt

### Setup:

No files are open.

### Scenario:

You have a report called Saddle Sales by Month.rpt that is grouped by month, displaying a quantity total for each month. You want to show a running total of the month sales, with cumulative totals starting over in a new calendar year. Figure 1-9 shows the completed report. In this case, the Crystal Reports running total formula is not available.



| <u>Order Month</u> | <u>Quantity</u> | <u>Running Total</u> |
|--------------------|-----------------|----------------------|
| <b>2000</b>        |                 |                      |
| 12/2000            | 2               | 2                    |
| Annual Total:      |                 | 2                    |
| <b>2001</b>        |                 |                      |
| 01/2001            | 12              | 12                   |
| 02/2001            | 16              | 28                   |
| 03/2001            | 4               | 32                   |
| 04/2001            | 3               | 35                   |
| 05/2001            | 6               | 41                   |
| 06/2001            | 11              | 52                   |
| 07/2001            | 6               | 58                   |
| 08/2001            | 7               | 65                   |
| 09/2001            | 14              | 79                   |
| 10/2001            | 19              | 98                   |
| 11/2001            | 12              | 110                  |
| 12/2001            | 14              | 124                  |
| Annual Total:      |                 | 124                  |

Figure 1-9: This report's running totals have been created manually.

### What You Do

### How You Do It

- In Saddle Sales by Month.rpt, what formula would you use to increment the month totals?

*Store the (cumulative) previous month totals in a number variable. Add the current month total to the variable with each record.*

# LESSON 1

2. Insert a manual running total formula named *ManualRT* for the month quantity field.

a. In Saddle Sales by Month.rpt, if necessary, display the Field Explorer.

b. Select Formula Fields and click the New button.

c. Type *ManualRT* and click Use Editor.

d. In the Functions tree, if necessary, expand the Evaluation Time category and double-click WhilePrintingRecords.

e. Type ; and press Enter.

f. In the Operators tree, if necessary, expand the Variable Declarations category and double-click NumberVar x :=y;.

g. Type *SumTotal* and delete the extra characters except the semicolon.

h. On a new line, type *SumTotal :=SumTotal +*

i. In the Fields tree, expand Report Fields and double-click the summary field for Group#1 that sums the quantity.

```
WhilePrintingRecords;
numberVar SumTotal;
SumTotal:=SumTotal +Sum ([Orders_Detail.Quantity], (Orders.Order Date), "Monthly")
```

3. Check the formula, and then save and close.

a. Check the formula and click OK.

b. Save and close.
4. In the Page Header, add *Running Total* as a text object label at the 2.5-inch mark.

a. In the Page Header, create a text object called *Running Total*

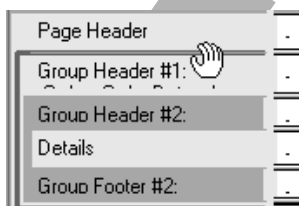
b. Place the text object approximately at the 2.5-inch mark.

c. Modify the new text object to match the formatting and alignment of the existing items in the Page Header.
- You may want to remind your students that they can use the Format Painter to quickly copy the formatting from one of the other text objects to the new text object.
- 26
- Crystal Reports 10.0: Level 2

5. Insert the formula into the group header below the Running Total text label, decrease the decimal places, and preview the report.
  - a. Drag the ManualRT formula from the Field Explorer into the Group Header to the right of Quantity, at the 2.5-inch mark.
  - b. Preview the report.
  - c. Decrease the decimal places.

6. Insert a group using the Order Date field and sort in ascending order grouped by year.
  - a. On the Insert Group dialog box, from the top drop-down list, select **Orders.Order Date**.
  - b. From the bottom drop-down list, select **For Each Year**.
  - c. Click OK.

7. Swap group 1's position with group 2's so that the first grouping is by Year and the second grouping is by Month, and preview the report.



- b. Preview the report.
8. What number does the 2001 running total start with?
 

14.
9. What do you need to do with the running total to correct this problem?
 

*Make our variable equal to zero at the start of each new year (Group #1). The formula would be:*

```
WhilePrintingRecords;
NumberVar SumTotal :=0
```

LESSON 1

10. Create a reset formula called *Reset* to reset the running totals for each year.
- a. In the Field Explorer, select Formula Fields and click New.

b. Type *Reset* and click Use Editor.

c. In the Functions tree, expand the Evaluation Time (if necessary) and double-click *WhilePrintingRecords*.

d. Type ; and press Enter.

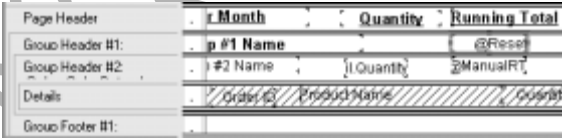
e. Type *NumberVar SumTotal :=0*

11. Check the formula, and then save and close.
- a. Check the formula and click OK.

b. Save and close.

12. Where should you position the formula so that the running total will be a zero at the start of each calendar year?  
*In Group Header #1.*

13. Position the *Reset* formula in the Year group header and suppress it.
- a. Drag the *Reset* formula from the Field Explorer to the GH#1, below the Running Total field label.

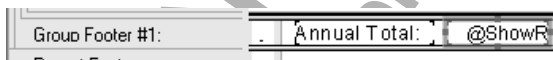


b. Right-click the *Reset* formula and choose Format Field.

c. Select the Common tab and check the Suppress check box.

d. Click OK.

14. In the Group Footer #1, create a formula called *ShowR* to show the running total for each year.
  - a. In the Field Explorer, select Formula Fields and click New.
  - b. Type *ShowR* and click Use Editor.
  - c. In the Functions tree, in the Evaluation Time category, double-click *WhilePrintingRecords*.
  - d. Type ; and press Enter.
  - e. Type *NumberVar SumTotal :=SumTotal;*
  - f. Check the formula, and save and close.
15. In the Group Footer, create a text object called *Annual Total* and drag the *ShowR* formula into the footer.
  - a. In the Group Footer, create a text object called *Annual Total*:
  - b. Drag the *ShowR* formula into the footer next to the *Annual Total* text object.



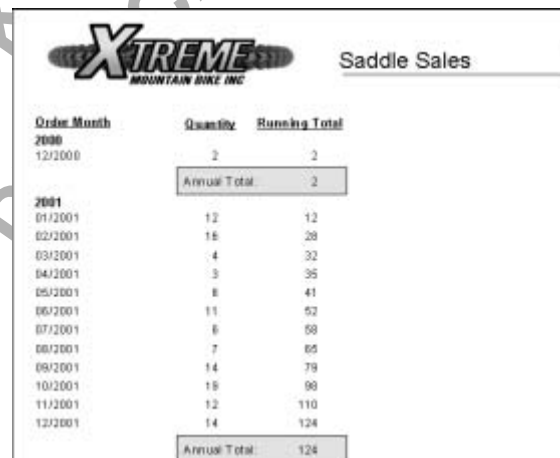
- c. Preview the report.



# LESSON 1

16. Format the fields and labels as desired.

- In Design view, drag the bottom of the Group Footer #1 section down to add space between each group.
- Move the Group Footer #1 section contents down slightly.
- Using the Insert Box tool, draw a box around the two items in the Group Footer #1 section.
- With the box selected, choose Format→Format Box.
- On the Box tab, check the Color check box.
- From the Color drop-down list, select the yellow color, then click OK.
- Right-click in the gray area at the left side of the Group Footer #1 section, and choose Select All Section Objects.
- Use the Right Arrow key to move the items to the right, then preview the report.



| Order Month          | Quantity | Running Total |
|----------------------|----------|---------------|
| <b>2000</b>          |          |               |
| 12/2000              | 2        | 2             |
| <b>Annual Total:</b> |          | <b>2</b>      |
| <b>2001</b>          |          |               |
| 01/2001              | 12       | 12            |
| 02/2001              | 16       | 28            |
| 03/2001              | 4        | 32            |
| 04/2001              | 3        | 35            |
| 05/2001              | 6        | 41            |
| 06/2001              | 11       | 52            |
| 07/2001              | 6        | 58            |
| 08/2001              | 7        | 65            |
| 09/2001              | 14       | 79            |
| 10/2001              | 19       | 98            |
| 11/2001              | 12       | 110           |
| 12/2001              | 14       | 124           |
| <b>Annual Total:</b> |          | <b>124</b>    |

- Save and close the report.

## Lesson 1 Follow-up

You now know how to use running totals in a report to provide cumulative incremental totals in your reports. Continuous running totals can be helpful in many situations, including inventory control, sales tracking, and budgeting cash flow.

1. Do you think you'll use running totals in your reports? Why or Why Not?

*Answers will vary.*

2. What do you think are some advantages to using running totals? Disadvantages?

*Answers will vary.*

FOR EVALUATION USE ONLY  
(C) 2004 Element K Content LLC  
DO NOT DUPLICATE

FOR EVALUATION USE ONLY  
(C) 2004 Element K Content LLC  
DO NOT DUPLICATE

# LESSON 2

## Building Cross-tabs in Your Report

**Lesson Time***1 hour(s), 15 minutes to**1 hour(s), 45 minutes*

### Lesson Objectives:

In this lesson, you will build cross-tabs in your report.

You will:

- Create a cross-tab.
- Create a specified group order in a cross-tab.
- Filter a cross-tab by group.
- Change the format of the cross-tab.
- Conditionally format rows and columns in a cross-tab.
- Keep groups together.

Introduction

You know how to use running totals to analyze and summarize data in your reports. A cross-tab is another tool you can use to perform a calculation on a summarized field in your reports to generate totals and grand totals. In this lesson, you'll use cross-tabs to perform calculations on report summary data.

You've probably seen a grouped report made up of many rows and columns of data. As you know, the content can be spread out over several pages making it difficult to analyze the data. A better alternative would be a cross-tab. Cross-tabs are helpful because the data is presented in a compact object made up of rows and columns that make it easy to compare data and identify trends. Figure 2-1 shows you the comparison between a list report and a cross-tab report.

List Report versus Cross-tab Report

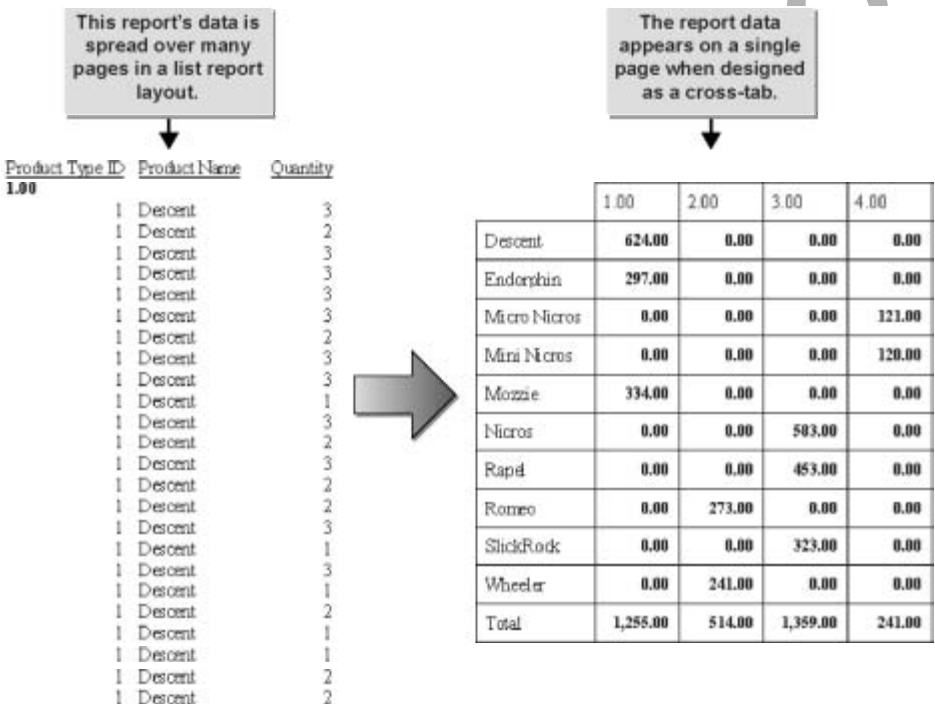


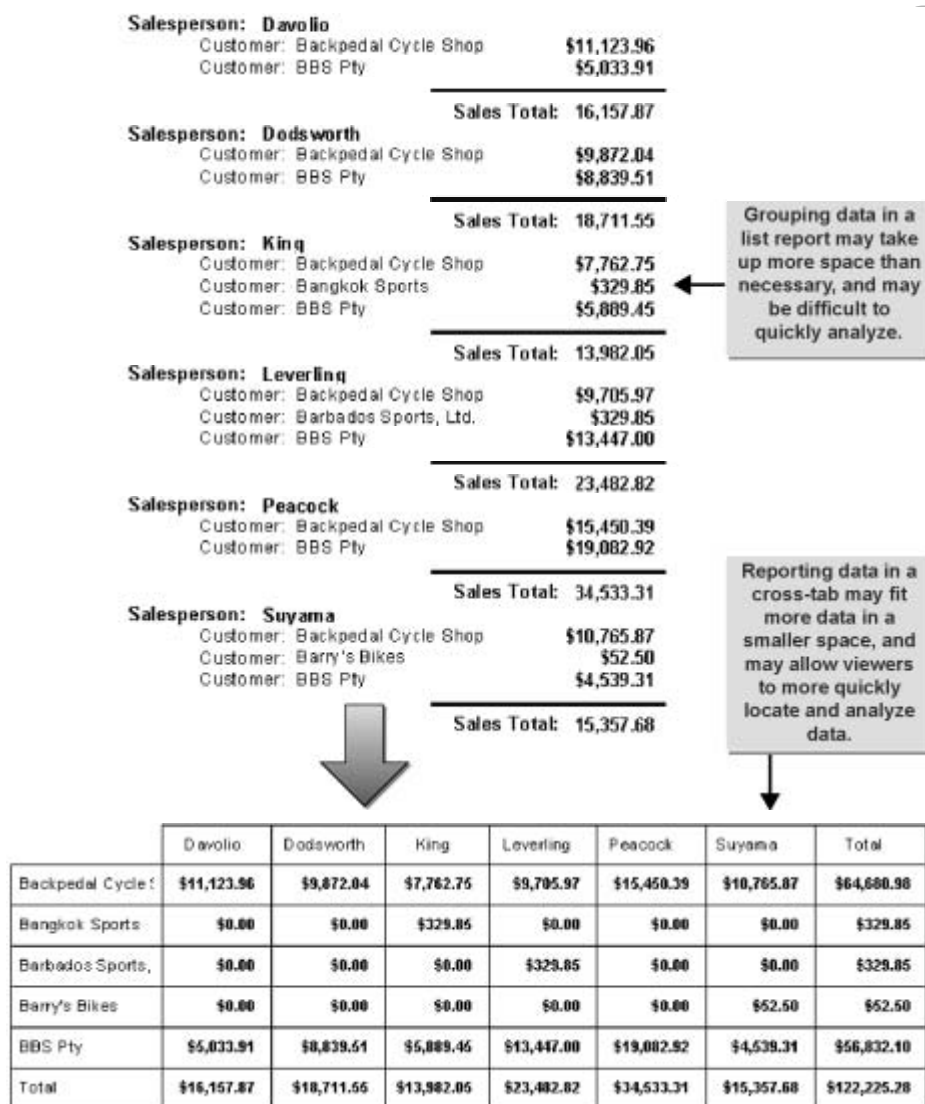
Figure 2-1: A list report versus a cross-tab report.

# TOPIC A

## Create a Cross-tab

You've already worked with grouped reports and long lists of data. A great way to consolidate summary data is by displaying it in a grid format. In this topic, you'll create a cross-tab object in your report.

Cross-tabs are useful when large amounts of summary data needs to be presented clearly in a limited space. Suppose you had a report that displayed last year's sales grouped by salesperson, and secondarily grouped by customer. You might spend a lot of time creating and formatting this report to display the data as clearly as possible. However, you could most likely create a cross-tab report for the data more quickly. In addition, a cross-tab would typically display the data in a smaller space, and in a format more easily analyzed by viewers.



**Figure 2-2:** You can use a cross-tab to quickly display complex data in a structured format.

## Planning a Cross-tab

Before you create a cross-tab it's a good idea to have a plan for the structure. Use the following list of items to identify the components you will need to produce a cross-tab.

- What field(s) or formulas will represent your row headings?
- What field(s) or formulas will represent your column headings?
- Do grouping options need to be set for the row or column headings, and if so, is the data in a format that will lend itself to this grouping easily?
- What data do you need to summarize?
- What summary operation (sum, average, count) do you need for the summary fields?

## DISCOVERY ACTIVITY 2-1

### Planning a Cross-tab

#### Scenario:

You need to create a report on bicycle sales that shows total sales by product type and name and you want all of the information on one page. Based on this information, you need to plan a cross-tab. Figure 2-3 shows the tables you will be reporting on. Your cross-tab will look like Figure 2-4.

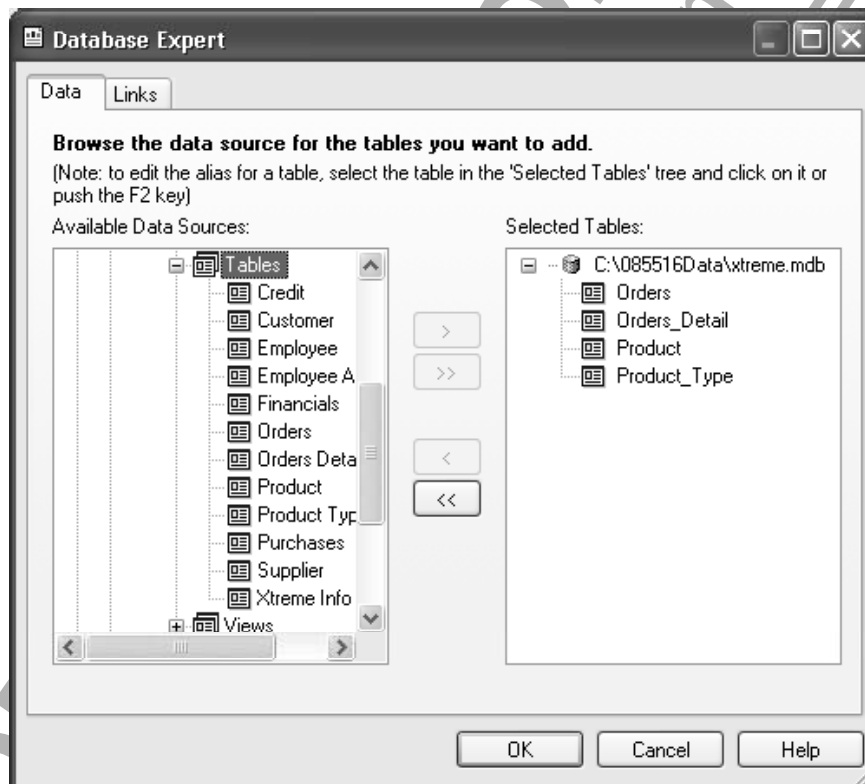


Figure 2-3: Tables needed for the cross-tab.

## Bicycles

|              | Competitio | Hybrid | Mountain | Kids   | Total    |
|--------------|------------|--------|----------|--------|----------|
| Descent      | 624.00     | 0.00   | 0.00     | 0.00   | 624.00   |
| Endorphin    | 297.00     | 0.00   | 0.00     | 0.00   | 297.00   |
| Micro Nicros | 0.00       | 0.00   | 0.00     | 121.00 | 121.00   |
| Mini Nicros  | 0.00       | 0.00   | 0.00     | 120.00 | 120.00   |
| Mozzie       | 334.00     | 0.00   | 0.00     | 0.00   | 334.00   |
| Nicros       | 0.00       | 0.00   | 583.00   | 0.00   | 583.00   |
| Rapel        | 0.00       | 0.00   | 453.00   | 0.00   | 453.00   |
| Romeo        | 0.00       | 273.00 | 0.00     | 0.00   | 273.00   |
| SlickRock    | 0.00       | 0.00   | 323.00   | 0.00   | 323.00   |
| Wheeler      | 0.00       | 241.00 | 0.00     | 0.00   | 241.00   |
| Total        | 1,255.00   | 514.00 | 1,359.00 | 241.00 | 3,369.00 |

Figure 2-4: The completed cross-tab.

1. What table and field contains the product type?

*The field can be found in two places.*

| Table        | Field           |
|--------------|-----------------|
| Product      | Product Type ID |
| Product_Type | Product Type ID |

2. Does it matter which field you use for your column heading?

*The output will look the same with either field, but performance may vary. If performance is an issue, testing should be done to see which yields faster results. Indexed fields and number of records will impact performance.*

3. What table and field represents the Product Type name?

*Product\_Type table, Product Type Name field.*

4. Could you use that field for your column heading?

*Yes. However, that field is not indexed. Using indexed fields for column and row headings, when possible, provides the best performance.*

5. What table and field contains the bicycle names?

*Product table, Product Name field.*



6. When selecting the column heading, a decision was made to use the indexed ID field to increase performance. In this example, could you use the Product ID field instead of the Product Name?  
  
*No. Even though using the product ID would result in better performance, some product IDs have the same product names. This would result in duplicate product name rows.*
7. What table and field contains the information you want summarized?  
  
*Orders\_Detail table, quantity field.*
8. What summary operation will you perform?  
  
*Summing the quantity field.*

## Cross-tab

**Definition:**

A *cross-tab* is a report presented in a column and row format that summarizes and presents data making it easy to identify trends and compare data. Rows in a cross-tab run horizontally. Columns in a cross-tab run vertically.

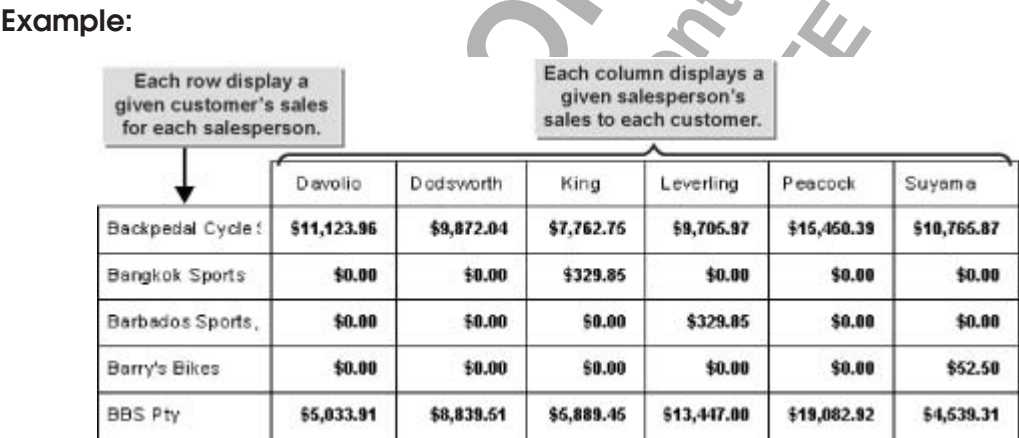


Figure 2-5: This cross-tab displays sales totals generated by each salesperson from each customer.

## Summarized Field

**Definition:**

A *summarized field* is a field that represents a summary such as a sum, count, or average of multiple values. In a cross-tab, summarized fields are found at the intersection of a row and a column.

**Example:**

The following list report and cross-tab both show summarized fields. Each value shown is the sum of all sales to a given customer by a given salesperson.

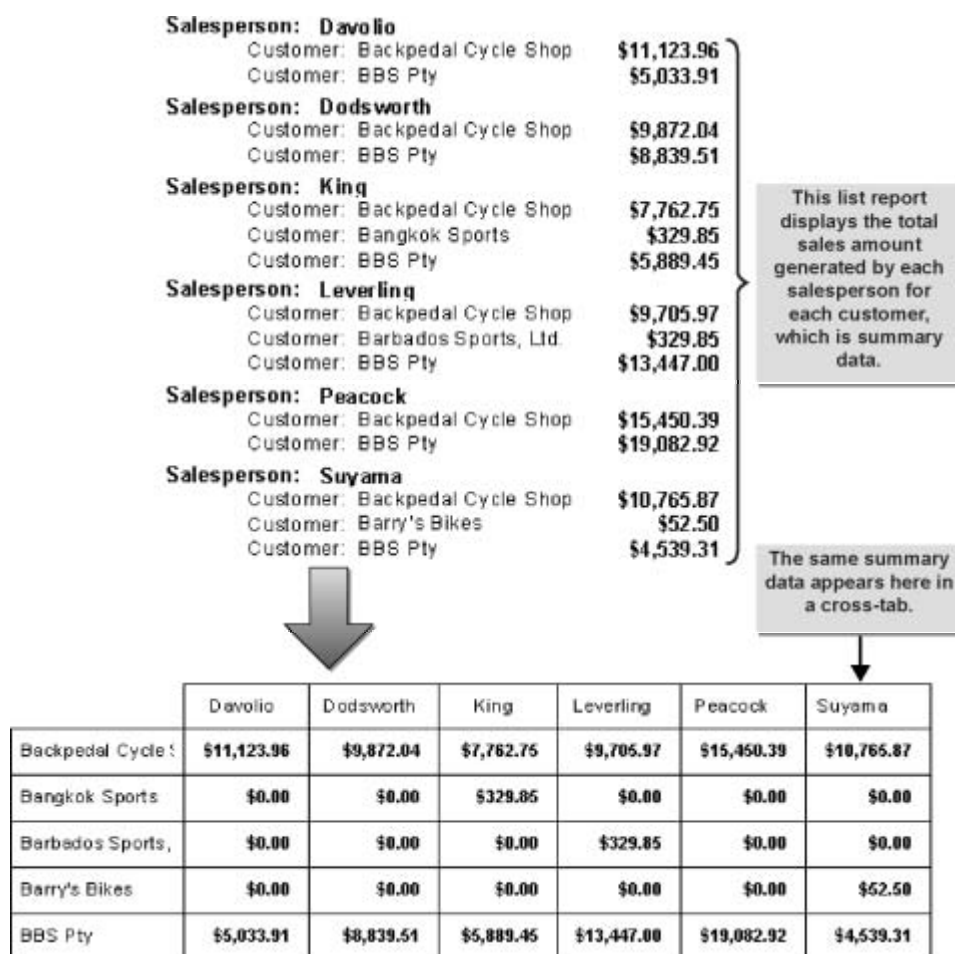


Figure 2-6: Summary data can appear in a list report or in a cross-tab.

## How to Create a Cross-tab

### Procedure Reference:

To create a cross-tab:

1. Choose Insert→Cross-Tab to open the Cross-Tab Expert dialog box.
2. In the Available Fields list box, select a field for the column and click the arrow next to the Columns box.
3. In the Available Fields list box, select a field for the row and click the arrow next to the Rows box.
4. In the Available Fields list box, select the field to be summarized and click the arrow next to the Summarized Fields box.
5. The default summary is Sum. If you want to select a different operation, click the Change Summary button.
6. If necessary, apply any additional structure such as Group Options or Formulas.
7. If necessary, apply a style.
8. Click OK to close the Cross-Tab Expert dialog box and create the cross-tab.

# ACTIVITY 2-2

## Creating a Cross-tab

### Data Files:

- 2001-02 Bike Sales.rpt

### Scenario:

You have your cross-tab planned. You know that the Product Name is the row, Product Type ID is the column, and Orders\_Detail.Quantity is the summarized field. Given this information and the steps you used to plan the cross-tab, you are now ready to create the cross-tab.

### Bicycles

|             | Competitio | Hybrid | Mountain | Kids   | Total    |
|-------------|------------|--------|----------|--------|----------|
| Descent     | 624.00     | 0.00   | 0.00     | 0.00   | 624.00   |
| Endorphin   | 297.00     | 0.00   | 0.00     | 0.00   | 297.00   |
| Micro Nicos | 0.00       | 0.00   | 0.00     | 121.00 | 121.00   |
| Mini Nicos  | 0.00       | 0.00   | 0.00     | 120.00 | 120.00   |
| Mozzie      | 334.00     | 0.00   | 0.00     | 0.00   | 334.00   |
| Nicos       | 0.00       | 0.00   | 583.00   | 0.00   | 583.00   |
| Rapel       | 0.00       | 0.00   | 453.00   | 0.00   | 453.00   |
| Romeo       | 0.00       | 273.00 | 0.00     | 0.00   | 273.00   |
| SlickRock   | 0.00       | 0.00   | 323.00   | 0.00   | 323.00   |
| Wheeler     | 0.00       | 241.00 | 0.00     | 0.00   | 241.00   |
| Total       | 1,255.00   | 514.00 | 1,359.00 | 241.00 | 3,369.00 |

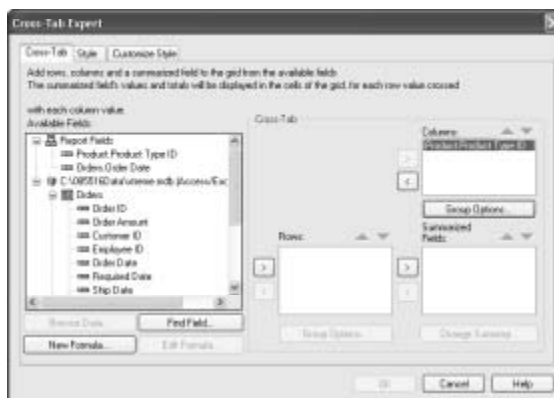
### What You Do

1. In 2001-02 Bike Sales.rpt, on the Design tab, create a cross-tab that shows the total quantity of bicycles sold, grouped by Product Name (row) and Product Type ID (column).

### How You Do It

- a. In 2001-02 Bike Sales.rpt, on the Design tab, choose Insert→Cross-Tab.
- b. In the Available Fields section, select Product.Product Type ID and click the arrow next to the Columns area.
- c. With the Product.Product Type ID field highlighted, click Group Options, and on the Options tab, check the Customize Group Name Field check box.

- d. In the Choose From Existing Field drop-down list, select **Product\_Type.Product Type Name** and click **OK**.



- e. In the Available Fields section, under **Product**, select **Product Name** and click the arrow next to the **Rows** area.
- f. In the Available Fields section, under **Orders Detail**, select **Quantity** and click the arrow next to the **Summarized Fields** box.
- g. Click **OK**.

2. Place the cross-tab in Report Header B and save the report as **2001-02 Bike Sales.rpt**.

- a. The mouse pointer is holding a box to represent the cross-tab. Place the mouse pointer in Report Header B next to the subtitle **Bicycles** and click.

|          |             |           |          |
|----------|-------------|-----------|----------|
| Bicycles |             | Column #1 | Total    |
|          | Row #1 Name | Quantity  | Quantity |
|          | Total       | Quantity  | Quantity |

- b. Save the report.

3. Preview the cross-tab. Does this match the planned cross-tab?

Yes.

## 4. What order did the groups sort?

*Product names sorted alphabetically. Product types sorted by the ID field used in the grouping. By default, Crystal Reports will sort cross-tab data alphabetically by the field used for grouping.*

## TOPIC B

### Create a Specified Group Order

Besides specifying the field that you want to use for the row and column, you can change the order of the grouped data. Crystal Reports enables you to control the sort order and group options in cross-tabs. You might want it ordered or grouped differently than the default. In this topic, you'll specify your own group order in a cross-tab.

When you create a cross-tab, groups default to an alphabetical/numerical sort order. There will be times when you need to override the alphabetical sort to present data non-alphabetically. For example, if row headings represent countries you do business in, you might be requested to put the USA in the first entry, regardless of alphabetical order. Another feature of the specified group order is that it enables you to create your own groups from existing data without the need for the group field to be in the database. An example of this would be combining all US sales into a single category, and all international sales into another category.

A Specified Group Order

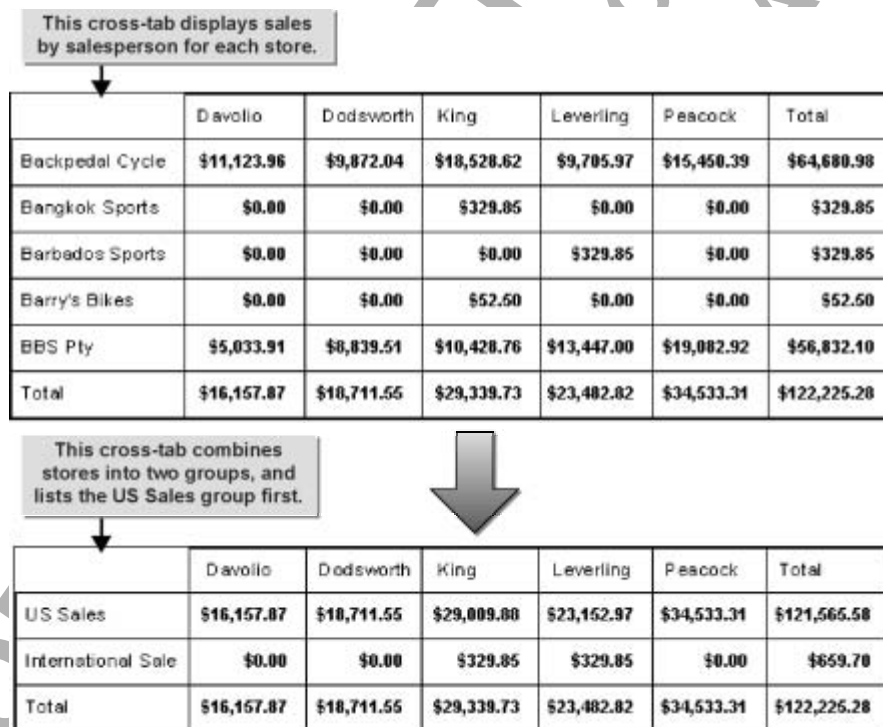


Figure 2-7: You can specify the group order for cross-tabs.

## Specified Group Order

When you are grouping data, *specified order* is an order that is determined by you, the user. The Cross-Tab Group Options dialog box contains the specified order option to enable you to create the customized groups that will appear on the cross-tab and the records that each group will contain.

## How to Create a Specified Group Order in a Cross-tab

### Procedure Reference:

To create a specified group order in a cross-tab:

1. On the Cross-Tab Expert dialog box, select the row or column field by which your cross-tab will be grouped.
2. Select Group Options to display the Cross-Tab Group Options dialog box.
3. Select In Specified Order as your sort option to display the Cross-Tab Group Options dialog box.
4. Enter a name for the group and click New.
5. Select a comparison operator and then enter the product names in the group.
6. Click OK to close the Define Named Group dialog box.
7. Click OK to close the Cross-Tab Group Options dialog box.
8. Click OK to close the Cross-Tab Expert dialog box.



The ability to sort data in specified order is not limited to cross-tabs. Specified group order can be applied to report groups using the Change Group Option menu from the shortcut menu.

# ACTIVITY 2-3

## Creating a Specified Group Order

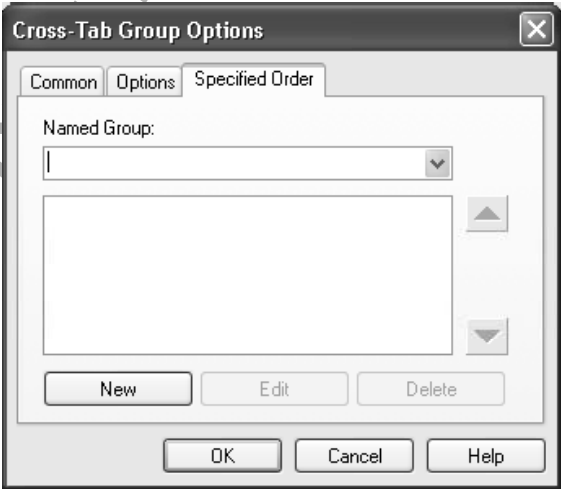
**Setup:**

2001-02 Bike Sales.rpt is open.

**Scenario:**

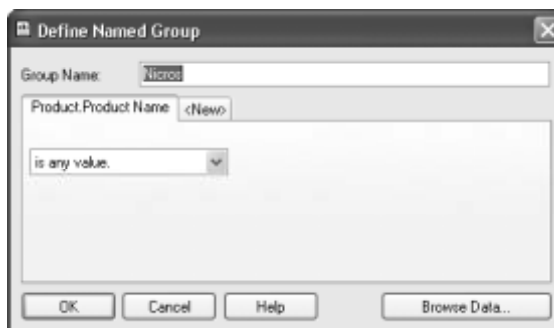
Currently the row grouping is by Product Name. Let's say that you want all the Nicros to be in one group (Micro, Mini, and ordinary Nicros should all be shown under Nicros). They don't need to be separated because they are all the same product. All others should remain in their own groups.

| What You Do                                                                                          | How You Do It                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. How many Nicros products are there?                                                               | Three. Nicros, Micro Nicros, and Mini Nicros.                                                                                                                                                                                                            |
| 2. Display all the Nicros products in one group that includes Nicros, Mini Nicros, and Micro Nicros. | <div>a. If necessary, select the cross-tab object and choose Format→Cross-Tab Expert.</div> <div>b. In the Rows box, select Product.Product Name and click Group Options.</div> <div>c. From the bottom drop-down list, choose In Specified Order.</div> |

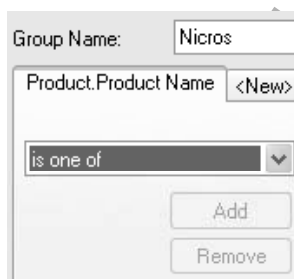




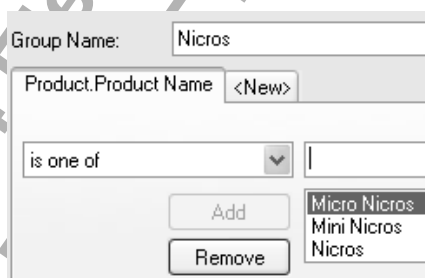
- d. In the Named Group box, type *Nicros* and click **New**.



- e. Set the Product Name comparison operator to **Is One Of**.



- f. Type *Nicros* and press Enter (or click **Add**).
- g. Type *Mini Nicros* and press Enter.
- h. Type *Micro Nicros* and press Enter.



- i. Click **OK**.
- j. On the **Others** tab, select **Leave In Their Own Groups** and click **OK**.
- k. Click **OK**.



3. Preview the report. How many times does the Nicros group appear?

Once.

Save the report.

## TOPIC C

### Filter a Cross-tab by Group

So far you have created the cross-tab and changed the grouping of data in a cross-tab. But what if you want to see the same cross-tab information as it relates to other groups in your report? Do you have to start from scratch and create an entirely new cross-tab? In this topic, you'll filter a cross-tab by group.

Cross-tabs display summary data by group. Putting a cross-tab in a report group will further filter the summary data by the group field. For example, let's say you have created a cross-tab showing last year's sales by employee. The information is presented at the beginning of your report and covers all countries. Your report also shows data that is grouped by country. You can display the employee sales cross-tab, formatted the same as at the beginning of the report but with a separate cross-tab appearing for each country.



A Cross-tab Filtered by Group

A cross-tab at the beginning of this report displays employee sales totals for each country.

|           | Davolio     | Dodsworth  | King       | Leverling  | Peacock    | Total       |
|-----------|-------------|------------|------------|------------|------------|-------------|
| Argentina | \$0.00      | \$0.00     | \$1,664.70 | \$0.00     | \$0.00     | \$1,664.70  |
| Aruba     | \$0.00      | \$0.00     | \$0.00     | \$5,879.70 | \$0.00     | \$5,879.70  |
| Australia | \$0.00      | \$5,924.70 | \$3,477.94 | \$17.50    | \$479.85   | \$9,899.99  |
| Austria   | \$17,064.63 | \$33.00    | \$5,107.55 | \$606.47   | \$5,991.76 | \$28,813.41 |

The report is grouped by country, displaying sales totals. Copying the cross-tab into the group section automatically displays the sales data for only that country.

**Singapore**

**\$18,582.45**

|           | Davolio    | Dodsworth  | Leverling   | Total       |
|-----------|------------|------------|-------------|-------------|
| Singapore | \$1,813.65 | \$2,939.85 | \$13,828.95 | \$18,582.45 |
| Total     | \$1,813.65 | \$2,939.85 | \$13,828.95 | \$18,582.45 |

**South Africa**

**\$1,947.65**

|              | Davolio  | Dodsworth | King    | Leverling | Total      |
|--------------|----------|-----------|---------|-----------|------------|
| South Africa | \$959.70 | \$101.70  | \$53.90 | \$832.35  | \$1,947.65 |
| Total        | \$959.70 | \$101.70  | \$53.90 | \$832.35  | \$1,947.65 |

**Figure 2-8:** You can copy a cross-tab into a report group to display data from only that group.

## How to Filter a Cross-tab by Group

### Procedure Reference:

To filter a cross-tab by group:

1. Determine which group you want to view the cross-tab data in. If the group does not exist, create the group using the Insert Group dialog box.
2. Select the field you want to group by and the group options and click OK.
3. Drag the cross-tab from the report header into the desired group header or footer.

# ACTIVITY 2-4

## Filtering a Cross-tab by Group

**Data Files:**

- 2001-02 Bike Sales.rpt

**Setup:**

The 2001-02 Bike Sales.rpt file is open.

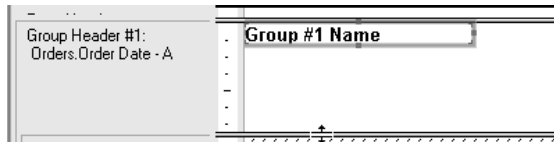
**Scenario:**

You want to see how many bikes were sold in 2001 versus 2002. You don't want all the data mashed together so you decide to create one cross-tab for 2001 another one for 2002.

| What You Do                                                                                                                                    | How You Do It                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Group the 2001-02 Bike Sales.rpt by Calendar Year using the Order Date field.                                                               | <div><div>a. In 2001-02 Bike Sales.rpt, display the Insert Group dialog box.</div><div>b. From the top drop-down list, choose Orders.Order Date.</div><div>c. From the bottom drop-down list, choose For Each Year.</div><div><div><div>Orders.Order Date</div><div>in ascending order.</div><div>The section will be printed:</div><div>for each year.</div></div></div><div>d. Click OK.</div></div> |
| 2. Format the group header so that the entire year appears and expand the group header section so the cross-tab will fit under the group name. | <div>a. Right-click the Group #1 Name field and choose Format Field. On the Date And Time tab, select 03/01/1999 and click OK.</div>                                                                                                                                                                                                                                                                   |

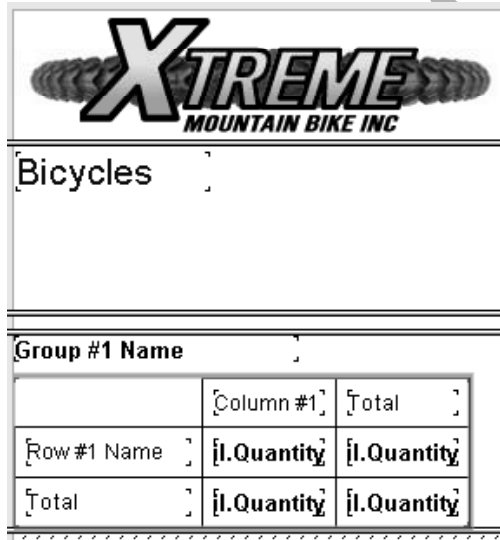
*Make sure the date options are set before you attempt this step.*

- b. In Design view, increase the size of the Group 1 header section.




3. Drag the cross-tab from the report header into the GH1 section and preview the report.

- a. Select the cross-tab object and drag it down to the Group Header #1 section.



- b. Preview the report.
- c. Because you're grouping by Year, you only see the Year data. **Save the report.**

 The cross-tab could also be copied from the report header to the group header which would result in one cross-tab summarizing all data, and then a separate cross-tab for each group.

TOPIC D

Change the Cross-tab Format

You have your cross-tab created, sorted, and filtered. But what if you don't like the way the cross-tab looks? You don't have to accept the default format of the cross-tab, you can modify its appearance to meet your needs. In this topic, you'll change the cross-tab format by modifying fonts, borders, and colors.

Not only do cross-tabs enable you to change the type of data that you want to present, you can also modify its appearance. For example, you can change colors so that the cross-tab not only looks better in the report, you can use colors and borders to highlight specific information in the cross-tab to draw attention to particular trends.

Customized Cross-tab  
Formatting

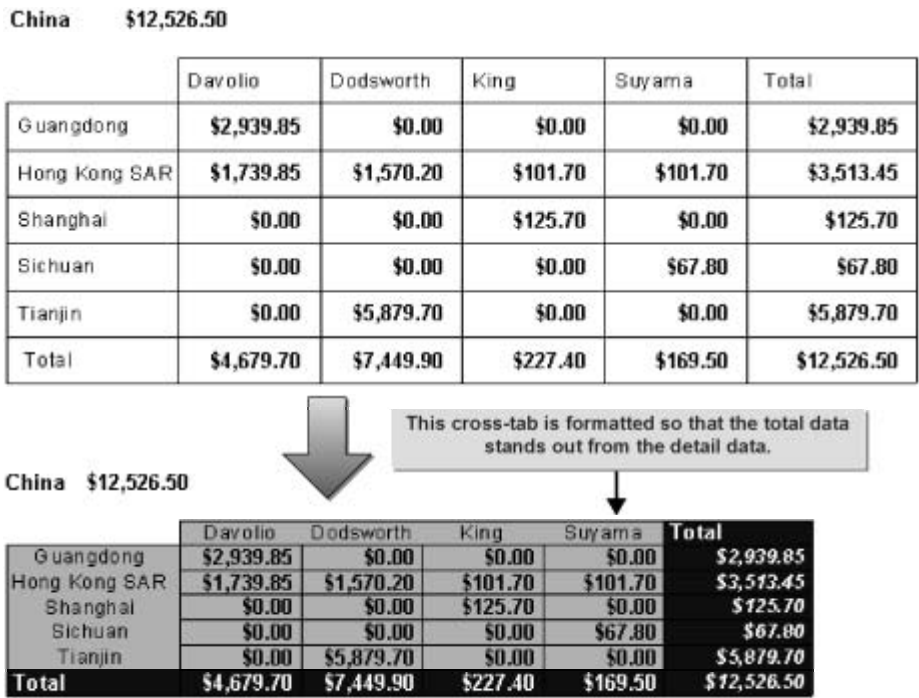


Figure 2-9: You can apply a style to format a cross-tab.

Formatting Options

The following table lists common cross-tab formatting options found on the Customize Style tab, in the Cross-Tab Expert dialog box.

| Item              | Description                                                                                                                   |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Show cell margins | This option adds white space between the text and the cell borders. Unchecking this option decreases the size of a cross-tab. |
| Indent row Labels | Set the amount of second line indentation (inch scale) in the row headings.                                                   |
| Repeat Row Labels | Use this whenever a cross-tab does not fit on one page to include the row heading on each page.                               |

Cross-tab Formatting Options

| Item                                                     | Description                                                                                                                                                                   |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Keep Columns Together                                    | Use this whenever a cross-tab does not fit on one page to avoid page breaking within a column.                                                                                |
| Column Totals On Top / Row Totals On Left                | Some cross-tab styles position column totals on the bottom and/or row totals on the right. Use these options whenever you desire to change the placement of totals.           |
| Suppress Empty Rows / Suppress Empty Columns             | Some rows or columns may contain fields with no data, in which case you can specify that those rows or columns be hidden.                                                     |
| Suppress Row Grand Totals / Suppress Column Grand Totals | Row and/or Column totals can be hidden from view when desired. This is particularly useful when your cross-tab does not contain both row and column headings.                 |
| Format Grid Lines                                        | Control the color, size, and suppression of grid lines. Useful to set row and column headings apart from summary data and/or to better separate multiple column/row headings. |

## How to Change the Cross-tab Format

### Procedure Reference: Format a Cross-tab

To change the format of a cross-tab:

1. Open the Cross-Tab Expert dialog box for the cross-tab you want to format.
  - Select the cross-tab that you want to edit, then choose Format→Cross-Tab Expert. You must be sure to select the entire cross-tab, and not only a single field within it. To select the entire cross-tab, click a blank area of the cross-tab, or drag a selection marquee around the entire cross-tab.
  - Right-click a blank part of the cross-tab, and choose Cross-Tab Expert. Right-clicking on a specific field or label will cause the shortcut menu to display commands for formatting that one item, rather than the Cross-Tab Expert command.
2. Make changes to the cross-tab object in the Cross-Tab Expert dialog box using the Style or Customize Style tab.
3. Click OK to close the Cross-Tab Expert dialog box.
4. If you want to modify the font or background colors for particular cross-tab cells, then select the desired cell, and specify options using the Formatting toolbar.



The data displayed in a cross-tab can also be formatted directly in the cross-tab using the applicable format options. For example, row height can be increased using the sizing arrows, font sizes could be changed using the formatting toolbar, and so on.

### Procedure Reference: Adjust Cross-tab Column and Row Sizes

To adjust a cross-tab column width or row height:

1. If you want to resize the columns and rows based on their contents, then click the Preview tab so the cross-tab data is visible.
2. Click a field in the column or row you want to adjust.
3. Drag the field's handles to adjust the row or height size.

- 4. If you want to specify column width and row height amounts numerically, then right-click any row or column and choose Size And Position. Specify a row height or column width, then click OK.

# ACTIVITY 2-5

## Changing the Cross-tab Format

**Setup:**

The report 2001-02 Bike Sales.rpt is open.

**Scenario:**

You want to make the 2001-02 Bike Sales.rpt cross-tab smaller so that it will fit as an insert in your annual sales report. Additionally, the audience only needs to see the total sales per product type rather than by bicycle name.

**What You Do**

**How You Do It**

- |                                                                                                                                                          |                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Format the cross-tab so that the grand total row is suppressed and the cross-tab is smaller.                                                          | a. In Design view, right-click the cross-tab's blank area at the top left, and choose Cross-Tab Expert.<br>b. Select the Customize Style tab.<br>c. Uncheck Show Cell Margins.<br>d. Check Suppress Row Grand Totals.<br>e. Click OK. |
| 2. Does the cross-tab take up less space than it did before?<br><i>Yes.</i>                                                                              |                                                                                                                                                                                                                                       |
| 3. Do the row grand totals appear?<br><i>No. They are hidden.</i>                                                                                        |                                                                                                                                                                                                                                       |
| 4. Do the column and row headings stand out from the summary data?<br><i>No. They blend together.</i>                                                    |                                                                                                                                                                                                                                       |
| 5. How can you correct this?<br><i>Answers will vary, but one possibility is to make the gridlines bolder between the summary data and the headings.</i> |                                                                                                                                                                                                                                       |

6. Make the following gridlines wider: row labels right border and column labels bottom border.
  - a. In the Cross-Tab Expert dialog box, on the Customize Style tab, under Grid Options, click Format Grid Lines.
  - b. Select Row Labels Right Border and change the Width to 1 pt.
  - c. Select Column Label Bottom Border and change the Width to 1 pt.
  - d. Click OK.
  - e. Click OK.

7. The headings are now better separated from the summary data, but is the cross-tab easier to read?

*No. When the overall size of the cross-tab was made smaller, it made it difficult to read. It would be easier to read if you made the rows larger, still keeping it smaller than the original cross-tab.*

8. Slightly increase the height of all rows.
  - a. On the Preview tab, click any row.
  - b. Drag the top or bottom selection handle to increase the row height slightly.
  - c. Adjust the height of any other rows as necessary.
  - d. Adjust the width of any columns as necessary so that all the field contents are fully displayed.

2001

|           | Competition | Hybrid | Mountain | Kids   |
|-----------|-------------|--------|----------|--------|
| Nicros    | 0.00        | 0.00   | 453.00   | 187.00 |
| Descent   | 453.00      | 0.00   | 0.00     | 0.00   |
| Enderphin | 230.00      | 0.00   | 0.00     | 0.00   |
| Mozzie    | 263.00      | 0.00   | 0.00     | 0.00   |
| Rapel     | 0.00        | 0.00   | 342.00   | 0.00   |
| Romeo     | 0.00        | 206.00 | 0.00     | 0.00   |
| SlickRock | 0.00        | 0.00   | 245.00   | 0.00   |
| Wheeler   | 0.00        | 180.00 | 0.00     | 0.00   |
| Total     | 946.00      | 386.00 | 1,040.00 | 187.00 |

- e. Save and close the report.



## TOPIC E

## Conditionally Format Rows and Columns

Now that the structure of the cross-tab is set, you might find that you need to emphasize certain parts of the cross-tab by applying formatting based on criteria you specify. In this topic, you will change the format for data that meets specified criteria within rows and columns.

A cross-tab is a moving target in that the contents of the row, column headings, and summary data are not known ahead of time. Fortunately, you can still format data based on the data values within this moving target. For example, you might want to highlight all regional sales that exceed a monthly target total, or use a different color font to identify different product types.

A Cross-tab with Conditionally Formatted Rows and Columns

Conditional formatting specifies that all totals of \$3,000 or more appear with a white font on a black background.

|               | Davolio    | Dodsworth  | King     | Suyama   | Total       |
|---------------|------------|------------|----------|----------|-------------|
| Guangdong     | \$2,939.85 | \$0.00     | \$0.00   | \$0.00   | \$2,939.85  |
| Hong Kong SAR | \$1,739.85 | \$1,570.20 | \$101.70 | \$101.70 | \$3,513.45  |
| Shanghai      | \$0.00     | \$0.00     | \$125.70 | \$0.00   | \$125.70    |
| Sichuan       | \$0.00     | \$0.00     | \$0.00   | \$67.80  | \$67.80     |
| Tianjin       | \$0.00     | \$5,879.70 | \$0.00   | \$0.00   | \$5,879.70  |
| Total         | \$4,679.70 | \$7,449.90 | \$227.40 | \$169.50 | \$12,526.50 |

**Figure 2-10:** Conditional formatting automatically formats values that meet specified criteria.

## Cross-tab Row and Column Headings in Formulas

Fields used for cross-tab rows and column headings cannot be used directly in a formula. The user must first assign a name to the field that is used for the row or column headings. This name is called an *alias*, and is set on the Cross-Tab Expert dialog box on the Customize Style tab. Formulas can then be created using the alias name rather than the field name.

## How to Conditionally Format Rows and Columns

### Procedure Reference:

To conditionally format rows and columns:

- Open the Format Field dialog box for the cross-tab field you want to format.
  - Select the field, then choose Format→Format Field.
  - Right-click the field, then select Format Field.
- Activate the tab that contains the option you want to change.
  - On the Common tab, select the Conditional Formula button to modify suppress options and horizontal alignment.

- On the Border tab, select the Conditional Formula button to modify line style, drop shadow, border, and background colors.
  - On the Font tab, select the Conditional Formula button to modify font, style, size, color, and effects such as strikeout and underline.
3. Enter the formula to apply the Conditional Formula.
  4. Check the formula and then save and close the format Formula Editor window.
  5. Click OK to close the Format Editor dialog box.

### DefaultAttribute

*DefaultAttribute* is a constant used by Crystal Basic formula syntax. You have seen the use of other constants such as *crRed*, *crPurple*, and *crDoubleLine*. These constants define a type of formatting, whether it is for color, border styles, font types, or any other type of formatting. Using the *DefaultAttribute* constant in a formula causes the format selection chosen by the user to appear whenever the conditional condition is not met.

For example, let's say the *DefaultAttribute* for the font color is teal. That is the color that was selected by the user. Conditional formatting can be applied to this same font color to cause the teal to be a different color if a particular condition is met. Using the *DefaultAttribute* in the else statement of a conditional formula in this example would cause the font color to be teal if the condition was not met. Not using the else statement with the *DefaultAttribute* constant would cause the color to be "automatic" (typically black) even when the condition was not met.

### Special Cross-tab Functions


The following table identifies the functions you can use to apply conditional formatting on fields in a cross-tab.

| Function Name       | When Would You Use It                                                                                     | Example(s)                                                                                                                                                                                                                                                        |
|---------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CurrentFieldValue   | To conditionally format a cross-tab summary field based on the numerical value of the summary field.      | Apply red font color on all summary fields exceeding \$500.<br>Formula: If<br>CurrentFieldValue>500 then<br>crRed else DefaultAttribute<br>Applied on: conditional format font color of summary field                                                             |
| CurrentFieldHeading | To conditionally format a cross-tab row or column heading based on the value of the row or column heading | Apply red font color on the Row heading named "Romeo". All other row headings retain the default color setting.<br>Formula: If CurrentFieldHeading = "Romeo" then crRed else DefaultAttribute.<br>Applied on: conditional format font color of row heading field. |



Special Cross-tab Functions

| Function Name     | When Would You Use It                                                                              | Example(s)                                                                                                                                                                                                                               |
|-------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IfGridColumnValue | To conditionally format a cross-tab summary field based on the value of the row or column heading. | Apply red font color to all summary fields where the row heading is named "Romeo".<br>Formula:<br>IfGridColumnValue ("Pname") = "Romeo" then crRed else DefaultAttribute.<br>Applied on: conditional format font color or summary field. |

 The function CurrentFieldValue can be typed or selected from the formatting functions category of the function menu. This function only appears when you are in a cross-tab object.

## ACTIVITY 2-6

### Conditionally Formatting Rows and Columns

**Data Files:**

- Bike Sales Detail 00-01.rpt

**Setup:**

No files are open.

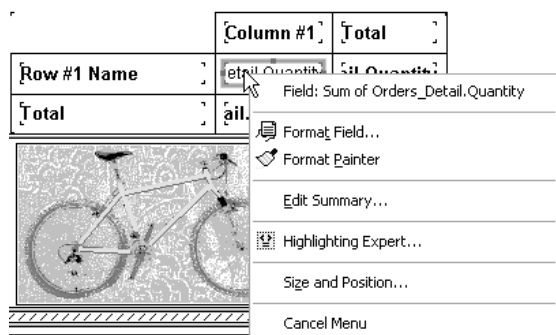
**Scenario:**

You receive a discount from your supplier for any products where the sales exceed or equal 35 for the year. You therefore want all sales that exceed or equal 35 to appear with a red font color. In addition, Nicros is your featured product this year so you want those sales to be highlighted in yellow so they stand out.

| What You Do                                                                                                           | How You Do It |
|-----------------------------------------------------------------------------------------------------------------------|---------------|
| 1. Open Bike Sales Detail 00-01.rpt in Design view. Which cell in the cross-tab represents the product summary field? |               |
| <i>The only one that's not bold.</i>                                                                                  |               |

2. Format the fields with value greater than or equal to 35 and make them red.

- a. In Design view, on the first cross-tab, right-click the summary field.



- b. Choose Format Field.
- c. On the Font tab, click the Conditional Formula button to the right of the Color drop-down box.



! Make sure you click the Color Conditional Formula button or else the formula that you enter will not work.

- d. Enter the following formula:

If CurrentFieldValue >= 35 then  
crRed else DefaultAttribute

- e. Check, save, and close the formula.
- f. Close the Format Editor.

3. Which field represents the Nicros product sales?

Product.Product Name.

4. Can you use this field in our formula to change the background color to yellow on the Nicros products?

No. Any field that represents a row or column heading needs to be assigned an alias before it can be used in a formula.

You may want to encourage your students to press Enter before the "then" and "else" parts of the formula to make the formula easier to read, which will make it easier to fix any mistakes in the formula.

The formula could also be written If CurrentFieldValue >=35 then crRed. The use of the "else DefaultAttribute" enables the user to control which font color will appear when the condition is not met.

# LESSON 2

5. Create an alias for the Product.Product Name field called *Pname*.
- a. Select the cross-tab and display the Cross-Tab Expert dialog box.

b. On the Customize Style tab, in the Rows box, select the Product.Product Name field.

c. In the Alias For Formulas box, type *Pname* and click OK.

6. Enter a formula to make all Nicros bicycle numbers highlighted with a yellow background.
- a. In the cross-tab, right-click the summary field.

b. Choose **Format Field** to display the Format Editor dialog box, and select the **Border** tab.

c. Click the **Background Conditional Formula** button and enter the following formula:

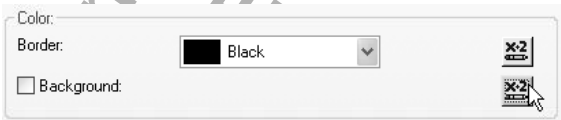
If GridRowColumnValue ("Pname")  
like "\*nicros\*" then crYellow  
else DefaultAttribute

d. Check the formula, and then save and close.

e. Click OK.

7. Preview the report. How has the cross-tab changed?
- Any number over 35 is red and the Nicros contain a yellow background.*
- Save and close the report.

If necessary, remind your students that the summary field is the only one that isn't bold.

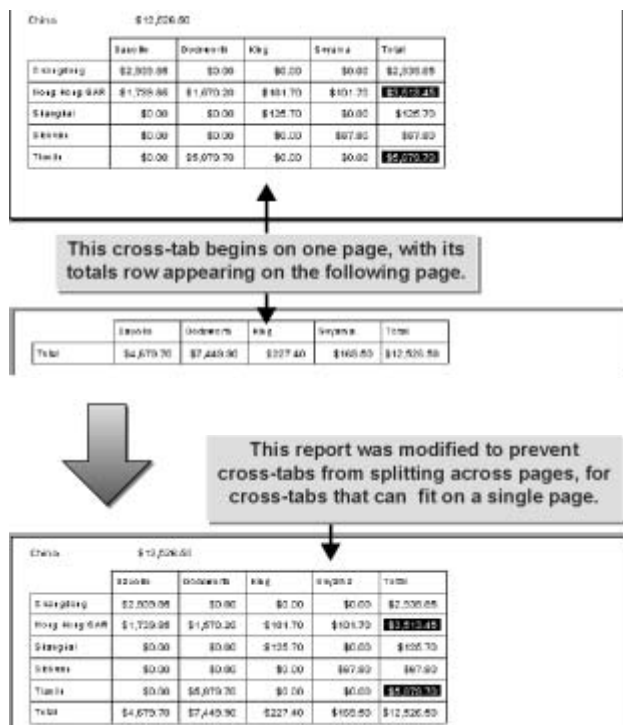


# TOPIC F

## Keep Groups Together

After creating a cross-tab, the cross-tab groups may have split across page breaks. In this topic, you will prevent group headers from being separated from the group detail.

You might find yourself in a situation in which a group header prints at the bottom of one page and the Details sections start on the following page. To make sure that a single line of data in a group header doesn't appear on a line by itself across page breaks, you can make a simple menu selection to prevent groups from being split.



Keeping Cross-tabs from Splitting Across Pages

Figure 2-11: You can specify that a cross-tab not split across pages.

## How to Keep Groups Together

### Procedure Reference:

To keep groups together:

1. Right-click the group section to display the shortcut menu.
2. Choose Change Group to display the Change Group Options dialog box.
3. On the Options tab, check the Keep Group Together check box.
4. Click OK to close the Change Group Options dialog box.

# ACTIVITY 2-7

## Keeping Groups Together

**Data Files:**

- Bike Sales Detail 01-02.rpt

**Setup:**

No files are open.

**Scenario:**

You're getting ready to hand in your cross-tab report so you're checking it for final changes. As you can see in Figure 2-12, the date 2002 appears on the bottom of the page by itself. You need to format the report so the group header appears with the rest of the cross-tab.

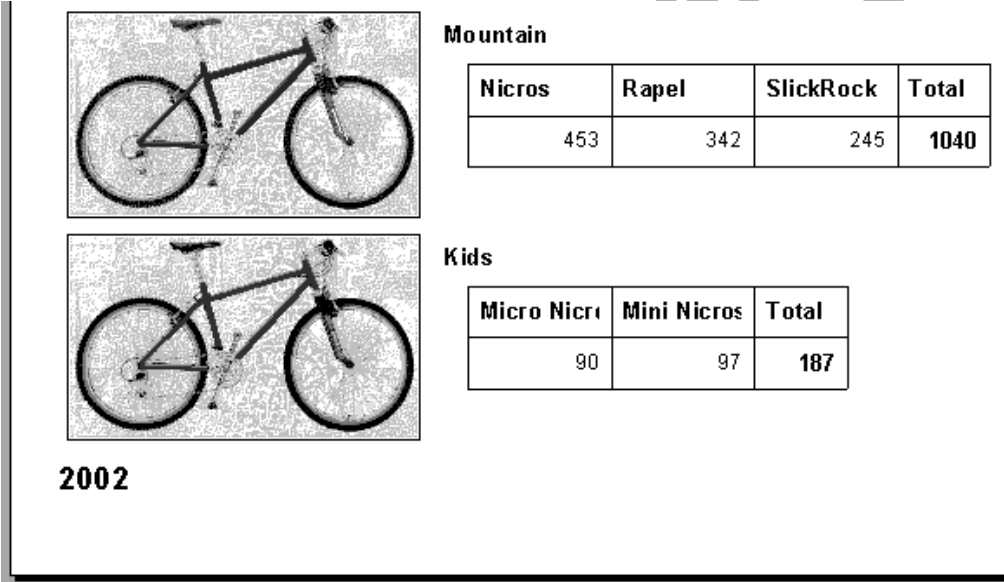


Figure 2-12: The report with the 2002 cross-tab heading displayed at the bottom of page 1.

| What You Do                                        | How You Do It                                                                                                                                                                                                                                                     |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Preview the Bike Sales Detail 01-02.rpt report. | a. Open the Bike Sales Detail 01-02.rpt report.<br>b. Click the Print Preview button.<br>c. Scroll to view the bottom of the first page.<br>d. Notice that the year 2002 appears at the bottom of the page, but the 2002 cross-tab appears on the following page. |



2. Specify that the entire 2002 group is on a page by itself.
  - a. In Design view, right-click the Group Header #1A section and choose Change Group.
  - b. On the Options tab, check the Keep Group Together check box.
  - c. Click OK.
3. Preview the report.
  - a. Preview the report.
  - b. Notice that the year 2002 now appears at the top of page 2, above its associated cross-tab.
  - c. Save the report.
  - d. Close the report.

## PRACTICE ACTIVITY 2-8

### Keeping Groups Together

#### Objective:

To keep all parts of a group together on the same report page.

#### Data Files:

- Bike Sales Detail 00-01.rpt

#### Scenario:

Since the groups in the Bike Sales Detail 01-02.rpt report were not set to stay together, you decide to check the Bike Sales Detail 00-01.rpt report.

1. Open the Bike Sales Detail 00-01.rpt report.
2. Preview the report to see whether all components of each set of grouped data appear together on a single page.
3. Specify that all group components appear together on the same page.
4. Save and close the report.



### Lesson 2 Follow-up

Now that you know how to create cross-tabs you'll be able to analyze large amounts of data to identify trends to make it easier to understand complex data.

1. **How will you use cross-tabs in your job?**

*Answers will vary.*

2. **What types of reports do you create that you can present as a cross-tab?**

*Answers will vary.*

FOR EVALUATION USE ONLY  
(C) 2004 Element K Content LLC  
DO NOT DUPLICATE

# LESSON 3

## Adding Subreports

**Lesson Time**

1 hour(s), 30 minutes to  
2 hour(s), 15 minutes

### Lesson Objectives:

In this lesson, you will add subreports to a report.

You will:

- Insert an unlinked subreport.
- Link a subreport to data in a primary report.
- Edit a subreport.
- Format a subreport object.
- Share formulas between main and subreports.
- Create an on-demand subreport.

## Introduction

You know how to use a cross-tab to analyze complex data and present different views of the same data. You can use a subreport to perform those same functions and more using a slightly different method. In this lesson, you'll add subreports to your report.

Subreports are especially useful when you need to combine unrelated reports into a single report. For example, you might want to create a single report that shows sales grouped by sales representative and sales grouped by item. Subreports enable you to coordinate data that cannot otherwise be linked and present different views of the same data within a single report.

Another use of subreports is to display data in a one-to-many relationship, with data on the many side presented in the subreport. For example, you might want to display customer information in a main report, and then have customer order information and customer credit information displayed in subreports.

## TOPIC A

### Insert a Subreport

Up to this point, you've worked with reports where the data is related and linkable. There might be times when you have unrelated data (data that cannot be linked) that you need to combine into a single report. In this topic, you'll insert a subreport into a primary report.

Let's say you have two entirely different sets of data that you want to combine into a single report. For example, you want to combine the school's football statistics with the basketball statistics. An unlinked subreport is the perfect solution since the data exists in unrelated tables.

 A Subreport

**US Customer Sales, August**

|                  | Davolio    | King       | Leverling   | Peacock    | Total       |
|------------------|------------|------------|-------------|------------|-------------|
| Alley Cat Cycles | \$6,181.54 | \$2,217.70 | \$18,416.28 | \$7,006.90 | \$32,822.42 |
| Bicycle Basics   | \$0.00     | \$0.00     | \$539.85    | \$0.00     | \$539.85    |
| First Gear       | \$33.00    | \$0.00     | \$0.00      | \$0.00     | \$33.00     |
| Hillcrest Cycle  | \$0.00     | \$0.00     | \$0.00      | \$14.50    | \$14.50     |
| Tom's Bikes      | \$0.00     | \$940.00   | \$0.00      | \$0.00     | \$940.00    |
| Total            | \$6,214.54 | \$3,157.70 | \$18,956.13 | \$7,021.40 | \$34,349.85 |

**International Customer Sales, August**

|                   | Davolio     | King     | Leverling | Total       |
|-------------------|-------------|----------|-----------|-------------|
| Ankara Bicycle Co | \$0.00      | \$0.00   | \$959.70  | \$959.70    |
| Arsenault et Meur | \$1,739.85  | \$0.00   | \$0.00    | \$1,739.85  |
| Deportes Mexico r | \$8,819.55  | \$0.00   | \$0.00    | \$8,819.55  |
| Min Dong Toy Stc  | \$0.00      | \$125.70 | \$0.00    | \$125.70    |
| Yue Xiu Bicycles  | \$2,939.85  | \$0.00   | \$0.00    | \$2,939.85  |
| Total             | \$13,489.25 | \$125.70 | \$959.70  | \$14,574.65 |

The International Customer Sales report is added as a subreport within the US Customer Sales report.

**Figure 3-1:** You can insert a report within another report.

## Plan Subreports

Before you start to create a subreport, you might want to have a plan first. In the planning stage, you will use the following list to get an idea of what you want to create before you create it.

- Determine why and if you need to create a subreport in order to display the data.
- Examine the data in both databases to see how they can be combined.
- Determine where the subreport will be located (which report section).
- Determine which link fields, if any, will be used.
- Determine what filter criteria, if any, needs to be in the subreport.

## How to Insert a Subreport

### Procedure Reference:

To insert a subreport:

1. If you want to place the subreport in a section that doesn't yet exist, then create the new section.
2. Choose Insert→Subreport to display the Insert Subreport dialog box.
3. Select Choose An Existing Report and browse to locate the name of the report you wish to insert and click Open. (If you know the name and location of the report you can type it.)
4. Click OK to display an object frame and the mouse pointer.
5. Place the mouse pointer where you want the report to appear and click to place it.

## ACTIVITY 3-1

### Inserting a Subreport

#### Data Files:

- Adult Bikes.rpt
- Kidsbikes.rpt

#### Setup:

No data files are open.

#### Scenario:

You have a report that shows all adult bike sales for 2001 and 2002. You have a second report that shows children's bike sales. You have been asked to combine this information on one page for your company's annual report. Figure 3-2 displays how the combined report will appear.



2001 - 2002 Sales

## Adult Bike Sales

|           | Competition | Hybrid | Mountain |
|-----------|-------------|--------|----------|
| Descent   | 624         | 0      | 0        |
| Endorphin | 297         | 0      | 0        |
| Mozzie    | 334         | 0      | 0        |
| Nicros    | 0           | 0      | 583      |
| Rapel     | 0           | 0      | 453      |
| Romeo     | 0           | 273    | 0        |
| SlickRock | 0           | 0      | 323      |
| Wheeler   | 0           | 241    | 0        |
| Total     | 1255        | 514    | 1359     |

## Kids' Bike Sales

|        | Kids |
|--------|------|
| Nicros | 241  |
| Total  | 241  |

Figure 3-2: One report containing both adult and kid bike sales.

### What You Do

### How You Do It

1. In Adult Bikes.rpt, create a Report header below Report Header B to contain the subreport.
2. Insert the subreport Kidsbikes.rpt in the Report Header C section.

- a. In Adult Bikes.rpt, on the Design tab, right-click Report Header B.
- b. Choose Insert Section Below.
- a. Choose Insert→Subreport.
- b. Select Choose An Existing Report, browse to and select Kidsbikes.rpt, and click Open.
- c. Click OK.

The screenshot shows a report design for 'XTREME Mountain Bike Inc' with the title '2001 - 2002 Sales'. It contains two tables. The first table, 'Adult Bike Sales', lists various bike models and their sales across three categories: Competition, Hybrid, and Mountain. The second table, 'Kids' Bike Sales', is a subreport showing sales for 'Nicros' and a 'Total' under the 'Kids' category.

|           | Competition | Hybrid | Mountain |
|-----------|-------------|--------|----------|
| Descent   | 624         | 0      | 0        |
| Endorphin | 297         | 0      | 0        |
| Mozzie    | 334         | 0      | 0        |
| Nicros    | 0           | 0      | 583      |
| Rapel     | 0           | 0      | 453      |
| Romeo     | 0           | 273    | 0        |
| SlickRock | 0           | 0      | 323      |
| Wheeler   | 0           | 241    | 0        |
| Total     | 1255        | 514    | 1359     |

|        | Kids |
|--------|------|
| Nicros | 241  |
| Total  | 241  |

- d. Place the mouse pointer in the Report Header C section and click.



- e. Preview the report.

3. What design changes might be made to the subreport object?

*Remove the border.*

4. How many tabs appear in this report?

*Three. The subreport has its own tab.*

5. Use the Border button to change the line style of the subreport border to No Border.

- a. Select the Kids' Bike Sales subreport.  
b. On the Formatting toolbar, click the down arrow next to the Border button.



- c. Click No Border.



- d. Preview the report to verify that the borders are removed.

- e. Save and close the report.

## TOPIC B

# Link a Subreport to Data in a Primary Report

It's very common for data in the subreport to be linked to the data in the primary report. Subreports provide an easy way to link data that cannot otherwise be linked. Subreports easily display information in a one-to-many relationship without having to worry about duplicated data. In this topic, you'll link a subreport to data in a primary report.

Not only is it helpful to have a linked subreport to show more information, you can also use a link to your advantage to limit information. For example, let's say you have customer data in a primary report and then use subreports to show the orders for each customer. The link will coordinate the data in the primary report with the data in the subreport so that the orders in each subreport match up with the correct customer. You can also pass filter criteria to a subreport using links to the main report in order to limit the information displayed in the subreport.

## How to Link a Subreport to Data in a Primary Report

### Procedure Reference:

To link a subreport to data in a primary report:

1. Choose Insert→Subreport to display the Insert Subreport dialog box.
2. Select Choose An Existing Report and browse to locate the report you want to insert and click Open. You could also type the name of the report.
3. Select the Link tab.
4. In the Available Fields list box, select the field that you want used as a link field in the primary report and click the arrow button.
5. Confirm that the correct link field from the subreport is displayed in the lower-right corner.
6. Repeat steps 4 and 5 for each additional link.
7. Click OK to close the Insert Subreport dialog box.

# ACTIVITY 3-2

## Linking a Subreport to Data in a Primary Report

### Data Files:

- US Customers.rpt
- US Suppliers.rpt

### Setup:

No reports are open.

### Scenario:

You have a report that shows all customers in the USA grouped by region. The data source for this report is the xtreme.mdb customer table. You have another report that shows all suppliers. The data source for that report is the xtreme.mdb suppliers table. You need to combine the data from both of these reports into one report with the suppliers appearing in the appropriate region grouping beneath the customer list.

### What You Do

### How You Do It

1. In US Customers.rpt, where would you want to put the supplier information on your report?

*In the region group footer.*



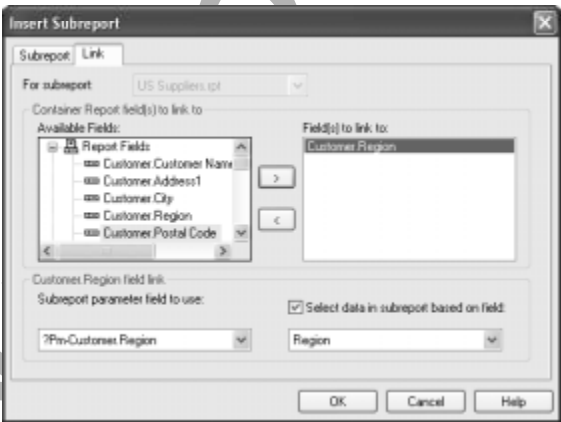
LESSON 3

2. In US Customers.rpt, insert the subreport US Suppliers.rpt in the Group Footer #1 section, link by the region field, and then preview the report.
- a. Choose Insert→Subreport.

b. Select Choose An Existing Report, browse to and select US Suppliers.rpt, and click Open.

c. Select the Link tab.

d. On the Link tab, add Customer.Region as the link field.



- e. Click OK.
- f. Place the mouse pointer in the Group Footer #1 section and click to insert the subreport.

|                                         |   |                             |
|-----------------------------------------|---|-----------------------------|
| Group Header #1:<br>Customer.Region - A | - | Group #1 Name<br>Customers: |
| Details a                               | - | Customer Name               |
| Details b                               | - | Address1                    |
| Details c                               | - | @RegionPlus                 |
| Group Footer #1:<br>Customer.Region - A | - | US Suppliers.rpt            |

- g. Preview the report.

3. How has the report changed for Michigan and Oregon?

Only MI and OR have suppliers listed. The rest of the states display a box with just the word "suppliers" in it.

This will be corrected in the next activity. Save the report.

To preview the report, be sure that your students click the Print Preview button, and not the US Suppliers.rpt tab, which they may mistake for the Preview tab.

# TOPIC C

## Edit a Subreport

After adding a subreport within another report, you may want to select and edit the subreport. In this topic, you will open a subreport within a separate tab so you can edit the subreport.

You cannot directly edit a subreport within the Design or Preview tabs. However, you may want to be able to edit the subreport directly within the primary report file in which you've placed it. The ability to display the subreport within its own tab will allow you to access and modify the report components.

The subreport was opened in a separate tab so that it could be formatted.

This subreport includes a cross-tab, which is formatted to match the cross-tab in the primary report.

|                  | Devolio    | King       | Leverling   | Peacock    | Total       |
|------------------|------------|------------|-------------|------------|-------------|
| Alley Cat Cycles | \$5,181.54 | \$2,217.70 | \$18,416.28 | \$7,006.90 | \$32,822.42 |
| Bicycle Basics   | \$0.00     | \$0.00     | \$539.85    | \$0.00     | \$539.85    |
| First Gear       | \$33.00    | \$0.00     | \$0.00      | \$0.00     | \$33.00     |
| Hillcrest Cycle  | \$0.00     | \$0.00     | \$0.00      | \$14.50    | \$14.50     |
| Tom's Bikes      | \$0.00     | \$940.00   | \$0.00      | \$0.00     | \$940.00    |
| Total            | \$5,214.54 | \$3,157.70 | \$18,956.13 | \$7,021.40 | \$34,349.85 |

|                   | Devolio     | King     | Leverling | Total       |
|-------------------|-------------|----------|-----------|-------------|
| Ankara Bicycle Co | \$0.00      | \$0.00   | \$959.70  | \$959.70    |
| Arsenault et Maur | \$1,739.85  | \$0.00   | \$0.00    | \$1,739.85  |
| Deportes Mexico C | \$8,819.55  | \$0.00   | \$0.00    | \$8,819.55  |
| Min Dong Toy Stc  | \$0.00      | \$125.70 | \$0.00    | \$125.70    |
| Yue Xiu Bicycles  | \$2,539.85  | \$0.00   | \$0.00    | \$2,539.85  |
| Total             | \$13,499.25 | \$125.70 | \$959.70  | \$14,584.65 |

Format a Subreport

**Figure 3-3:** This report includes a subreport containing a cross-tab, whose formatting was modified to match the primary report's cross-tab.

## How to Edit a Subreport

### Procedure Reference:

To edit a subreport:

1. In Design view, right-click the subreport and choose Edit Subreport to display the Design tab of the subreport.



Report header/footer sections might not appear on the report because they are collapsed. Positioning the cursor on the border of the section and dragging will open the section so it can be viewed and/or deleted.

2. Make any necessary changes to the subreport.

## ACTIVITY 3-3

### Editing a Subreport

#### Setup:

The report US Customers.rpt is open.

#### Scenario:

You inserted a subreport into a primary report and noticed that it needs some changes. There is too much white space, and the “Supplier” header appears when there are no suppliers. You will edit the subreport to make the changes as shown in Figure 3-4.

#### FL

Customers:

**Extreme Cycling**

1925 Glenaire Avenue  
Clearwater, FL 34638

**Wheels and Stuff**

2530 Bute Avenue  
Clearwater, FL 34666

Suppliers:

#### MI

Customers:

**Cyclist's Trail Co.**

4122 Panorama Place  
Sterling Heights, MI 48320

**Bikes and Trikes**

2793 Highland Boulevard  
Sterling Heights, MI 48335

**City Cyclists**

7464 South Kingsway  
Sterling Heights, MI 48358

Figure 3-4: A portion of the report after editing.

## What You Do

## How You Do It

1. In the subreport of the US Customers.rpt, delete any extra sections so that you only have one RH and RF.

- a. In Design view of US Customers.rpt, right-click the subreport and choose Edit Subreport.
- b. Right-click any extra Report Header.
- c. Choose Delete Section.
- d. Right-click any extra Report Footers and choose Delete Section.
- e. Preview the report.

2. How has the report changed?

*Extra white space has been eliminated.*

3. Move the Supplier object so it is aligned with the Customer data.

- a. On the Design tab, drag the Supplier object so it is lined up as closely as possible with the Customers object.

|                                         |   |                  |
|-----------------------------------------|---|------------------|
| Group Header #1:<br>Customer.Region - A | - | Group #1 Name    |
|                                         | - | Customers:       |
| Details a                               | - | Customer Name    |
| Details b                               | - | Address1         |
| Details c                               | - | @RegionPlus      |
| Group Footer #1:<br>Customer.Region - A | - | US Suppliers.rpt |
| Report Footer                           | - |                  |

- b. If you can't align the objects precisely by dragging, select both objects, and choose Format→Align→Left.

4. Does the Suppliers subreport title appear on all records even when there are no suppliers?

*Yes, it appears on all records, even when there are no suppliers.*

*This will be corrected in a later exercise.*

5. How can you determine the number of suppliers?

*Format the subreport.*

## TOPIC D

## Format a Subreport Using the Format Editor

You know how to edit the main report that contains a subreport, to align objects, and remove unwanted white space to produce a more consistent look. But what about the appearance of the subreport itself? In this topic, you'll focus on blending the subreport with the rest of the main report by specifying options in the Format Editor.

A subreport becomes an object on the main report. Formatting a subreport object allows the object container in the main report to be changed. For example, you can use the Format Editor dialog box to change borders, colors, fonts, on-demand actions, and re-import options to visually change the appearance of your subreport.

The Format Editor for a Subreport

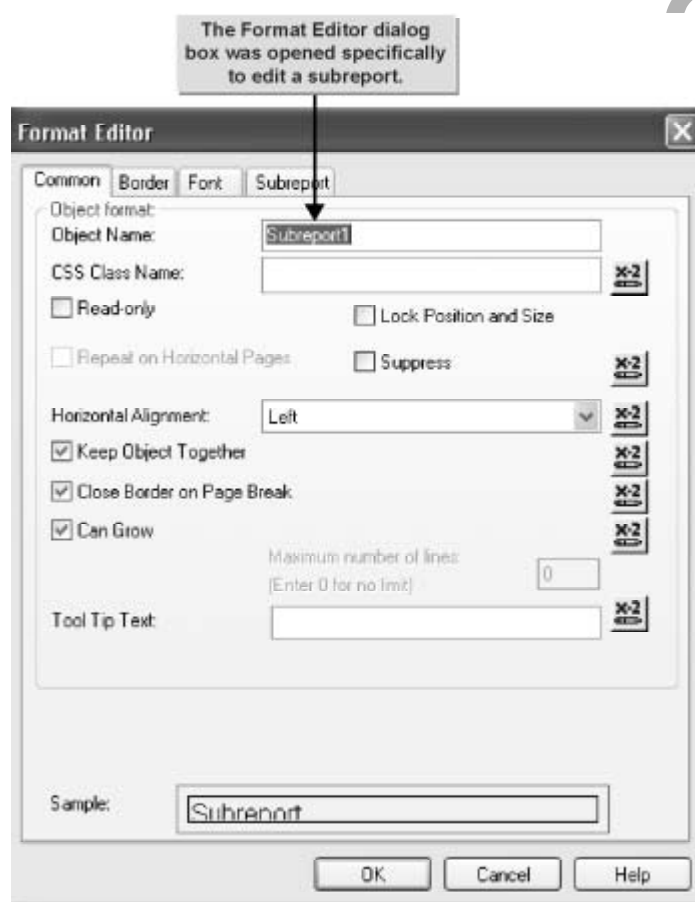


Figure 3-5: You can open the Format Editor to edit a subreport.

## Re-import When Opening

Subreports are typically created from existing reports. It is not unusual for multiple main reports to share the same subreport. When changes are made to one subreport the user might want those changes propagated to all the main reports that use the same subreport. This is possible by checking the Re-import When Opening option on the Subreport tab of the Subreport Format Editor.

However, if you want to retain any editing changes made to the subreport after import, the check box must be unchecked. Failure to do so will result in a loss of editing changes.

## How to Format a Subreport Using the Format Editor

### Procedure Reference:

To format a subreport using the Format Editor:

1. In Design view, right-click the subreport to display the shortcut menu and choose Format Subreport to display the Format Editor dialog box. Alternatively, you could select the subreport object and choose Format→Format Subreport.
2. Make any necessary changes to the following tabs.
  - a. Use the Common tab to set properties like Suppress, Horizontal Alignment, and Keep Object Together for a desired field.
  - b. Use the Border tab to format the borders, background fill, and drop shadows for selected fields on your report.
  - c. Use the Subreport tab to select or clear the On-demand subreport and Re-import when opening options.
  - d. Use the Font tab to change the fonts, the font size, and the font style for text and data fields on your reports.
3. Click OK to close the Format Editor. Use the Subreport tab to select or clear the On-demand Subreport and Re-import When Opening options. This tab also allows you to suppress subreport objects when the subreport returns no data.

## ACTIVITY 3-4

### Formatting a Subreport Object

#### Setup:

US Customers.rpt is open.

#### Scenario:

You're getting ready to submit your report and need to put some of the finishing touches on it. The borders on the subreport create an empty box when there are no suppliers so you will remove the borders. You also want to ensure that the changes you have made in your subreport will not be overridden the next time you open the report. When you're finished, your report should look like Figure 3-6.

FL

Customers:  
**Extreme Cycling**  
1925 Glenaire Avenue  
Clearwater, FL 34638  
  
**Wheels and Stuff**  
2530 Bute Avenue  
Clearwater, FL 34666

MI

Customers:  
**Cyclist's Trail Co.**  
4122 Panorama Place  
Sterling Heights, MI 48320  
  
**Bikes and Trikes**  
2793 Highland Boulevard  
Sterling Heights, MI 48335  
  
**City Cyclists**  
7464 South Kingsway  
Sterling Heights, MI 48358

Suppliers:  
**Triumph**  
707 Oxford Rd.  
Ann Arbor, MI 48104

Figure 3-6: Applying finishing touches to the subreport.

| What You Do                                                                                                        | How You Do It                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Remove the borders from the subreport.                                                                          | <div>a. In Design view, right-click the subreport and choose Format Subreport.</div> <div>b. Select the Border tab.</div> <div>c. In the Line Style section, from each of the drop-down lists, select None.</div> |
| 2. Ensure that the subreport and any changes you've made to it will be re-imported each time the report is opened. | <div>a. Select the Subreport tab.</div> <div>b. Check the Re-import When Opening check box.</div>                                                                                                                 |
| 3. Suppress the subreport when there are no records.                                                               | <div>a. On the Subreport tab, select Suppress Blank Subreport.</div> <div>b. Click OK.</div>                                                                                                                      |

## 4. What has changed in the report?

*The borders are removed, and the subreport no longer appears when there are no suppliers. However, there is still white space in the report where a blank subreport exists.*

## 5. Suppress Group Footer #1 when blank.

- a. Right-click the gray area of Group Footer #1, select Section Expert, and check Suppress Blank Section.
- b. Click OK.
- c. Save the report.
- d. Preview the report.

## TOPIC E

# Share Formulas Between Main and Subreports

You have seen that subreports operate independently from the main reports with their own sections, data, and formulas. In running totals, you used the same variable in multiple formulas, essentially sharing the result of one formula with another. In this topic, you will share a formula between the main and the subreport.

Summaries are often presented at the ends of reports and it isn't uncommon to display information from subreports in those summaries. You might also want to format a main report based on formula results in the subreport. For example, let's say you are using two subreports on a customer invoice; one subreport displays order information, the other displays credits. You would like the words "Invoice with credits applied" to appear at the top of the invoice when there are credits. If there are no credits, you simply want the word "Invoice" to appear. A formula using shared variables can be used to extract the necessary information from the credit subreport.

## The Count Function

The Count function enables you to count the values that appear in your report (with the exception of nulls) for a specified field. For example, `Count({OrderDetail.ProductType})` would return a count of the number of records in the OrderDetail table where the ProductType field was completed. If the product type field was not completed, it would not be included in the count. Counting can only occur against records that actually exist and that have a value in the field being counted.

It is common to use the count function to determine whether a subreport will return any records. If no records are found in the subreport, the count function would return a *null* value rather than a zero.



# Shared Variables


Crystal Reports provides the *shared variable* to enable you to pass data back and forth between main reports and subreports or even subreport to subreport. In order to use a shared variable, you must declare the variable and assign it a value before it can be used between the main and subreport. In order to declare a variable, you need to create a formula that declares the same shared variable in both the main and subreport.

## Variable Scope

*Variable scope* is used to define the degree in which variables in one formula are made available to other formulas. Every variable has a scope which is specified when the variable is declared. The contents of a variable can be used throughout a report. By default, any variable created in Crystal Reports is assigned a global scope, meaning that the variable contents remain available throughout the report. There are two other types of scope used with Crystal Reports variables: local and shared. The following table summarizes the difference in each.

Variable Scope

| Crystal Reports Variable Scope | Description                                                                     | Example                                                                                                                            |
|--------------------------------|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Global                         | Variable contents remain available for the entire report.                       | Global StringVar MyVar; (Note: use of the word global is optional. All variables are global by default when using Crystal Syntax.) |
| Local                          | Variable contents are only available within the formula in which it is created. | Local StringVar MyVar;                                                                                                             |
| Shared                         | Variable contents remain available for the entire report and Any subreports.    | Shared StringVar MyVar;                                                                                                            |

 The textbook covers Crystal Variable Scopes. Basic syntax uses different terminology. See the Crystal Help Screens for information on Basic syntax scope.

## How to Share Formulas Between Main and Subreports

### Procedure Reference:

To share formulas between main and subreports:

1. If the formula already exists, simply add the word “shared” before the variable declaration portion of the formula (for example, shared numberVar MyCount).
2. If you are creating a new formula, add the word “shared” before the variable declaration portion of the formula.

## Suppressing Empty Sections

The Section Expert is used to format entire sections of your report. By selecting a section of the report in the Section Expert, you can view and set formatting properties for the section. Depending on which section you select, properties will vary and some won't be available. The Suppress Blank section suppresses the entire section of all the objects inside it that are blank. This is useful in situations where you want to avoid white gaps in the report.

## ACTIVITY 3-5

### Sharing Formulas Between Main and Subreports

#### Setup:

US Customers.rpt is open.

#### Scenario:

You have a report that lists customers and suppliers within each region. You would like to include a summary statement that shows the total number of customers and suppliers in each region.

#### FL

Customers:

**Extreme Cycling**

1925 Glenaire Avenue  
Clearwater, FL 34638

**Wheels and Stuff**

2530 Bute Avenue  
Clearwater, FL 34666

Customers: 2.00 Suppliers: 0.00

#### MI

Customers:

**Cyclist's Trail Co.**

4122 Panorama Place  
Sterling Heights, MI 48320

**Bikes and Trikes**

2793 Highland Boulevard  
Sterling Heights, MI 48335

**City Cyclists**

7464 South Kingsway  
Sterling Heights, MI 48358

Suppliers:


**Triumph**

707 Oxford Rd.  
Ann Arbor, MI 48104

Customers: 3.00 Suppliers: 1.00

**Figure 3-7:** Showing a count of customers and suppliers.

LESSON 3

| What You Do                                                                                                                                                                                                                                                            | How You Do It                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. How can you determine the total number of customers?<br><i>You could do a count of customers in the main document.</i>                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 2. How can you determine the total number of suppliers?<br><i>This is already done for you in the subreport report footer.</i>                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 3. Can you use the results of the supplier count formula in your main report?<br><i>No. You would need to create the formula using a shared variable.</i>                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 4. In the subreport, create a formula called <i>SupplierCount</i> that can be shared with the main report.                                                                                                                                                             | <div>a. On the subreport's tab, create the following formula named <i>SupplierCount</i></div> <pre>WhilePrintingRecords Shared NumberVar SupplyCnt; If IsNull (Count ({Supplier.Supplier Name})) Then SupplyCnt:=0 Else SupplyCnt:=Count ({Supplier.Supplier Name})</pre> <div>b. If necessary, drag to increase the size of the Report Footer.</div> <div>c. Drag the <i>SupplierCount</i> formula into the Report Footer.</div> <div>d. Suppress the subreport's report footer.</div> |
| 5. Does this change the main report?<br><i>No. The formula results are in a suppressed report footer.</i>                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|  You will use that report to create a statement showing the number of customers versus the number of suppliers.                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 6. In the main report, create a formula called <i>SummaryText</i> that indicates how many customers and suppliers exist in each state.                                                                                                                                 | <div>a. Enter the following formula named <i>SummaryText</i></div> <pre>Shared NumberVar SupplyCnt; "Customers: " &amp; Count ({Customer.Customer Name}, {Customer.Region}) &amp; " Suppliers: " &amp; SupplyCnt</pre> <div>b. Check the formula, and then save and close.</div>                                                                                                                                                                                                        |
| 7. Why wouldn't you place the formula in the Group Header?<br><i>If the formula was positioned in the Group Header, the totals would refer to the previous group in the report. Positioning within the report becomes critical when working with shared variables.</i> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

8. Place the formula in a new group footer #1b section and preview the report.
  - a. Right-click the group footer and choose Insert Section Below.
  - b. From the Field Explorer, drag SummaryText to the new group footer #1b section.
  - c. Preview the report.
  - d. Notice that a customer and supplier count appears on the report, as shown in Figure 3-7.
  - e. Save and close the report.

## TOPIC F

### Create an On-demand Subreport

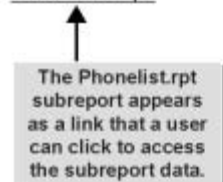
You've seen several completed subreports that display their data in the primary report. But what if you want to build a subreport and not display the data until you're ready? In this topic, you'll create a subreport that appears as a link and doesn't display or take data from the server until you request it.

You might have noticed that you have to wait a few seconds for the subreport to display in the primary report. Depending on the size of data on which you're reporting, your wait could be quite lengthy. By creating an on-demand subreport, you can minimize network traffic by formatting a subreport to display only when you specifically request the data via a link.

#### Departmental Salary Expenses

|                |              |
|----------------|--------------|
| Engineering    | \$633,555.00 |
| Office Support | \$149,930.00 |
| Publishing     | \$274,258.00 |
| Sales          | \$344,620.00 |

Phonelist.rpt




 An On-demand Subreport

Figure 3-8: An on-demand subreport appears on the report as a link.

## On-demand Subreport

An *on-demand subreport* appears as a link in the main report so that it doesn't process until a user clicks the link. Performance can be an issue when working with subreports, especially if a report contains several subreports. If users need to see subreport data only occasionally, making a subreport available "on-demand" will minimize network traffic. The data in the subreport will not be taken off the server until the user clicks the "on-demand" link. The use of on-demand subreports also frees space on your main report.

On-demand subreports open in their own Preview tab. The name of the link and the text on the tab can be customized by the user.

 When data is saved with a report that includes an on-demand subreport, the subreport data will not be saved with the report unless the subreport Preview tab is open.

## How to Create an On-demand Subreport

### Procedure Reference:

To create an on-demand subreport.

1. Choose Insert→Subreport to display the Insert Subreport dialog box.
2. Select Choose An Existing Report or Create A Report.
3. Check the On-demand Subreport check box to activate the command.



Existing subreports can be modified to be on-demand subreports by checking the on-demand subreport option in the Subreport Format Editor.

4. Click the conditional Formula button to add a caption to the subreport object.
5. Type the text that you want as the caption, and be sure to place quotes around the string.
6. If applicable, check the formulas created in steps 4 and 5 above, then click the Save And Close button to return to the Format Editor dialog box.
7. Click OK to close the Insert Subreport dialog box.

### PrintDate Function

PrintDate is a Crystal Report function that returns the system date of the PC being used. Users can override the system print date by using the Report, Set PrintDate/Time menu bar option. The override feature is particularly helpful when testing output that relies on date selection formulas.

# ACTIVITY 3-6

## Creating an On-demand Subreport

### Data Files:

- Contacts.rpt
- Phonelist.rpt

### Setup:

No files are open.

### Scenario:

You've created a report that lists the names and addresses of customers and suppliers. You would like to add a list of suppliers' phone numbers at the end of the report and know that you can do so by adding a subreport based on the phonelist.rpt file. You'll make the subreport appear as a link and click the link only when you need the phone information.

### What You Do

### How You Do It

- | What You Do                                                                                                  | How You Do It                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. In Contacts.rpt, add an on-demand subreport in the report footer displaying the file named Phonelist.rpt. | <ol style="list-style-type: none"><li>In Contacts.rpt, in Design view, open the Insert Subreport dialog box, and specify the file named Phonelist.rpt.</li><li>In the Insert Subreport dialog box, check the On-demand Subreport check box and click OK.</li><li>Place the subreport in the Report Footer.</li></ol> |

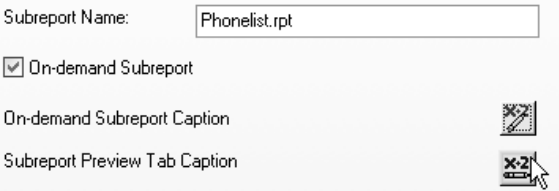
LESSON 3

2. Format the subreport to include an on-demand subreport caption Suppliers Phone List and a subreport preview tab caption that reads Suppliers as of (today's date).

- a. Right-click the Phonelist subreport.
- b. Choose Format Subreport.
- c. On the Subreport tab, click the Conditional Formula button to the right of On-demand Subreport Caption.



- d. Type "Suppliers Phone List" and save and close the Formula Editor.
- e. On the Subreport tab, click the Conditional Formula button to the right of Subreport Preview Tab Caption.



- f. Type "Suppliers as of " & PrintDate and save and close the Formula Editor.
- g. Click OK.

3. Where is the link displayed?

The last page.

4. Test the on-demand subreport.

- a. Deselect the subreport.
- b. Click the link.
- c. Notice that the subreport is displayed and the on-demand subreport preview tab includes a caption.
- d. Save and close the report.

## Lesson 3 Follow-up

Now that you know how to create subreports, you'll never have to struggle to combine unrelated reports into a single report or coordinate data that cannot otherwise be linked.

1. How will you benefit by using subreports in your office?

*Answers will vary.*

2. What kinds of subreports will you be creating?

*Answers will vary.*

FOR EVALUATION USE ONLY  
(C) 2004 Element K Content LLC  
DO NOT DUPLICATE



FOR EVALUATION USE ONLY  
(C) 2004 Element K Content LLC  
DO NOT DUPLICATE

# LESSON 4

## Creating Drill-downs

**Lesson Time**

1 hour(s) to 1 hour(s),  
15 minutes

### Lesson Objectives:

In this lesson, you will design a report that uses a drill-down.

You will:

- Create a report that includes summaries with drill-down data.
- Specify that drill-down data headings appear with the drill-down data.

## Introduction

As you create reports that include data summaries, you may want to specify that only the summary data is visible initially, with the detail data available as a drill-down. In this lesson, you will create a report so that it initially displays summary data, with the additional data accessible via drill-down.

Suppose you are creating a report to display the total salary expenses for each department in your company. Although you only want the report to primarily display the summary information, you also want the detail data on which the summary data is based to be accessible via drill-down. That way, viewers will be able to easily scan the report to view the total salary amounts for each department, and can then drill-down to view the individual salaries for each employee within a given department.

A Drill-down Report

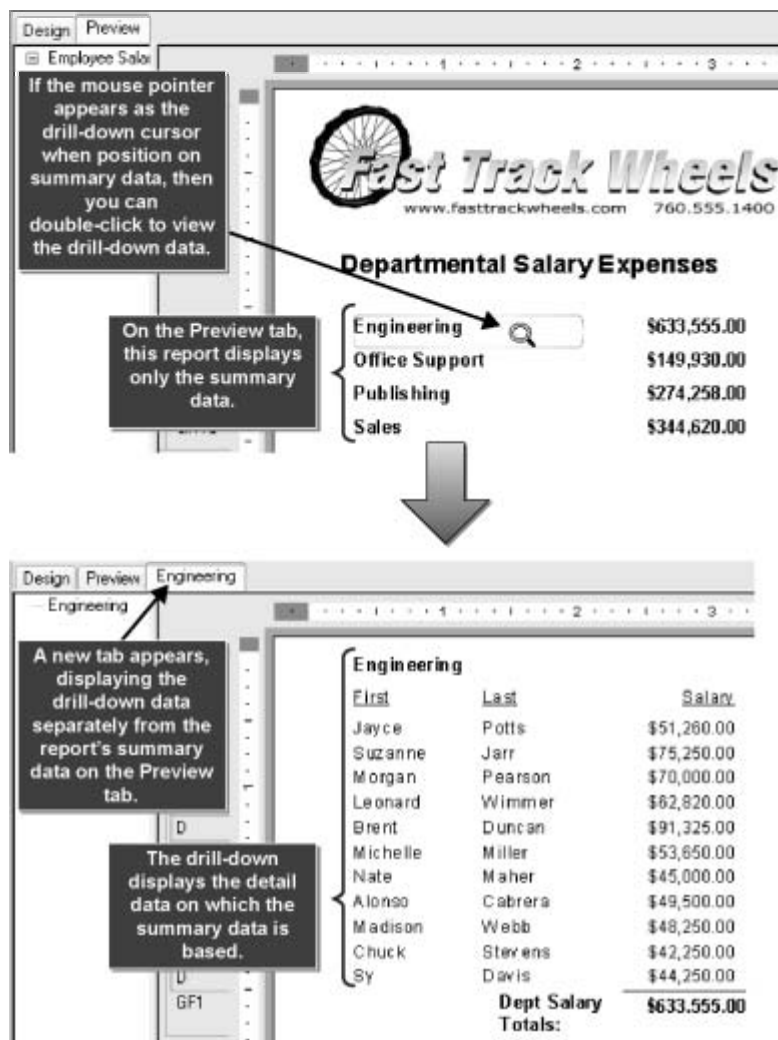


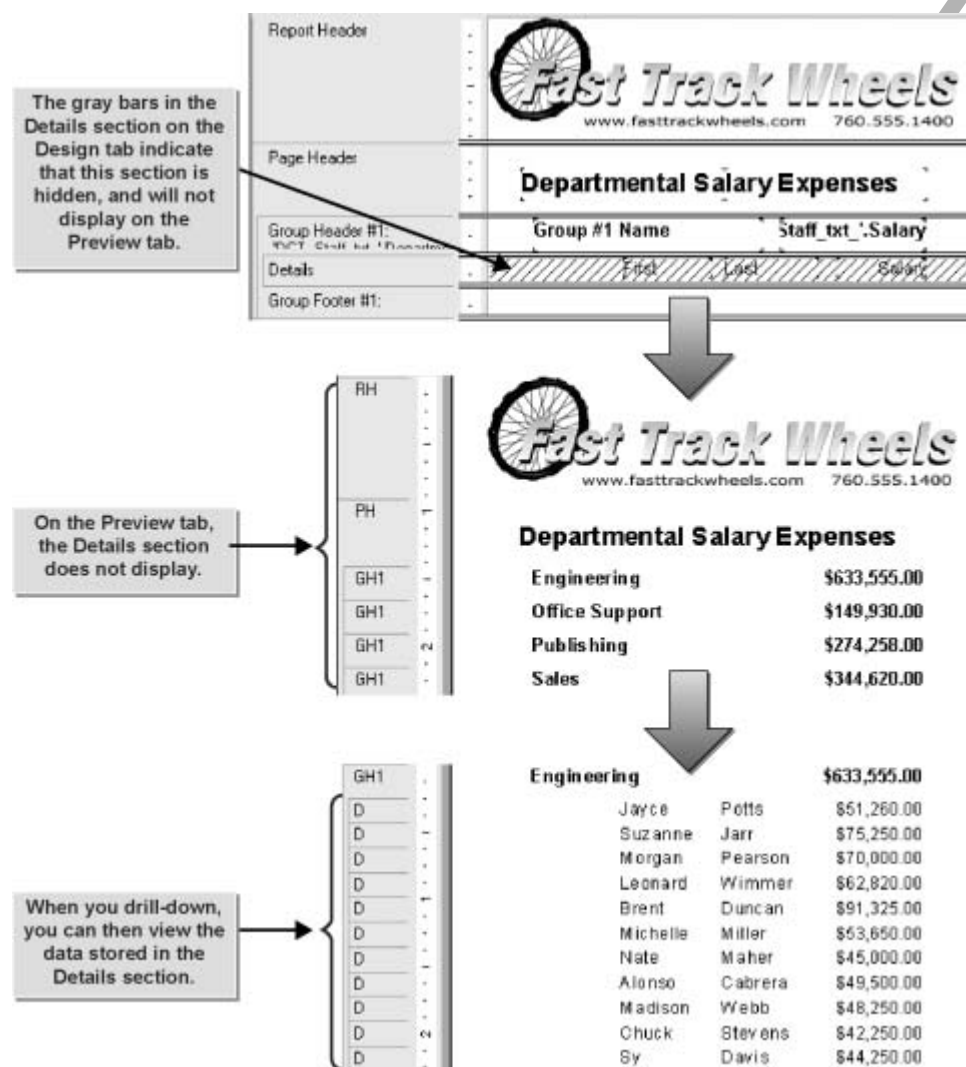
Figure 4-1: A drill-down report allows you to display detail data separately from summary data.

# TOPIC A

## Create a Drill-down

When you want to create a report that initially displays summary data, with the rest of the data available by double-clicking the summary data, then you must create a drill-down. In this topic, you will structure a report as a drill-down.

Creating a drill-down report is useful when your report contains large amounts of data that you want to summarize so that only the data summaries themselves appear initially. That way, people viewing your report can easily see the most important data. However, the drill-down structure allows viewers to easily locate the detailed data on which any given summary is based.



**Figure 4-2:** This report's preview tab displays only summary data, and you must drill-down to view the detail data.



Drill-down Report Structure

## How to Create a Drill-down

### Procedure Reference:

To create a report that includes summaries with drill-down data:

1. Create a new report that includes the desired data.
2. Create summaries for the desired fields.
3. Insert a group to display the summary data.
4. In the Details section, add the data that should only appear when viewers drill-down.
5. Specify that the Details section be hidden, with its contents available via drill-down.
  - In Design view, right-click within the gray area at the left side of the Details section, and from the shortcut menu, select Hide (Drill-Down OK).
  - In the Section Expert, select the Details section, then check the Hide (Drill-Down OK) check box.
6. If you want to view the drill-down data, then while previewing the report, double-click the summary data whose detail data you want to view. The detail data then opens in its own tab.
7. If you want to close the tab displaying the drill-down data, then while viewing the drill-down data, click the Close View button.

## ACTIVITY 4-1

### Creating a Drill-down

#### Data Files:

- xtreme.mdb

#### Setup:

Crystal Reports is running, with no reports open.

#### Scenario:

You're creating a report for your next sales meeting. The primary purpose of the report is to display the total order amounts for each customer. However, during the meeting, you may need to also access some of the data for an individual sale. The data you need is stored in the xtreme.mdb database, within the Customer and Orders tables.


## What You Do

## How You Do It

1. Create the report.

- Choose **File**→**New**, select **As A Blank Report**, and click **OK**.
- From the **xtreme.mdb** data source, select the **Customer** and **Orders** tables, then click **OK**.
- The **Links** tab indicates that the tables are linked by the **Customer ID** field. Click **OK**.

2. Summarize the **Order Amount** field, grouping the report by customer.

- On the **Insert Tools** toolbar, click the **Insert Summary** button .
- From the **Choose The Field To Summarize** drop-down list, select **Order Amount**.
- From the **Calculate This Summary** drop-down list, verify that **Sum** is selected.
- You will create a group in which to store the summary data. Click **Insert Group**.
- In the **Insert Group** dialog box, from the top drop-down list, select **Customer Name**, then click **OK**.
- You return to the **Insert Summary** dialog box. Click **OK**.

|                  |   |               |
|------------------|---|---------------|
| Report Header    | . | .             |
| Page Header      | . | .             |
| Group Header #1: | . | Group #1 Name |
| Details          | . | .             |
| Group Footer #1: | . | Order Amount  |
| Report Footer    | . | .             |

# LESSON 4

- g. Move the summary data into the group header section.

|                  |               |              |
|------------------|---------------|--------------|
| Group Header #1: | Group #1 Name | Order Amount |
| Details          |               |              |
| Group Footer #1: |               |              |

3. Save and preview the report.

- a. Save the report as *Customer Sales Totals*
- b. Preview the report.
- c. Position the cursor on the report summary data.
- d. The drill-down cursor appears. Double-click to view the drill-down data.

4. What happens when you double-click to drill down?

*You still view only the summary data for the item you double-clicked. A new tab appears to display this data individually.*

Click the Close View button to close the drill-down tab.

|                                  |         |                  |      |
|----------------------------------|---------|------------------|------|
| Design                           | Preview | Alley Cat Cycles | 8:28 |
| ..... Alley Cat Cycle:           |         |                  |      |
| GH1 Alley Cat Cycles \$54,565.39 |         |                  |      |

5. Add the Customer Name, Order Date, and Order Amount data to the Details section.

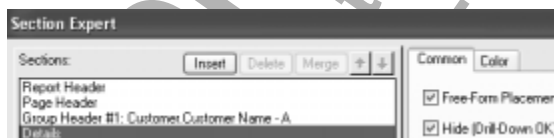
- a. Return to Design view.
- b. In the Field Explorer, expand the Customer table.
- c. Drag the Customer Name field to the left side of the Details section.
- d. Drag the Order Date field to right of the Customer Name field.
- e. Drag the Order Amount field to the right of the Order Date field.
- f. Format the Order Date to display only the date.

g. Preview the report.

| <u>Customer Name</u>          | <u>Order Date</u> | <u>Order Amount</u> |
|-------------------------------|-------------------|---------------------|
| <b>7 Bikes For 7 Brothers</b> |                   | <b>\$53.90</b>      |
| 7 Bikes For 7 Brothers        | 5/26/01           | \$53.90             |
| <b>Against The Wind Bikes</b> |                   | <b>\$479.85</b>     |
| Against The Wind Bikes        | 5/26/01           | \$479.85            |
| <b>AIC Childrens</b>          |                   | <b>\$101.70</b>     |
| AIC Childrens                 | 6/21/01           | \$101.70            |
| <b>Alley Cat Cycles</b>       |                   | <b>\$54,565.39</b>  |
| Alley Cat Cycles              | 6/24/01           | \$1,551.30          |
| Alley Cat Cycles              | 11/19/01          | \$2,059.05          |
| Alley Cat Cycles              | 9/27/01           | \$43.50             |
| Alley Cat Cycles              | 1/31/02           | \$9,290.30          |

6. Specify that the Detail section be hidden, with its contents accessible via drill-down.

- On the Expert Tools toolbar, click the Section Expert button.
- In the Sections list, select Details.
- Check the Hide (Drill-Down OK) check box.



d. Click OK.

| <u>Customer Name</u>          | <u>Order Date</u> | <u>Order Amount</u> |
|-------------------------------|-------------------|---------------------|
| <b>7 Bikes For 7 Brothers</b> |                   | <b>\$53.90</b>      |
| <b>Against The Wind Bikes</b> |                   | <b>\$479.85</b>     |
| <b>AIC Childrens</b>          |                   | <b>\$101.70</b>     |
| <b>Alley Cat Cycles</b>       |                   | <b>\$54,565.39</b>  |
| <b>Ankara Bicycle Company</b> |                   | <b>\$959.70</b>     |

e. Save the report.



## LESSON 4

7. View the drill-down data.

a. Position the mouse pointer on the summary data for Alley Cat Cycles.

| <u>Customer Name</u>   | <u>Order Date</u> | <u>Order Amount</u> |
|------------------------|-------------------|---------------------|
| 7 Bikes For 7 Brothers |                   | \$53.90             |
| Against The Wind Bikes |                   | \$479.85            |
| AIC Childrens          |                   | \$101.70            |
| Alley Cat Cycles       |                   | \$54,565.39         |
| Ankara Bicycle Company |                   | \$959.70            |

b. The drill-down cursor appears. Double-click to view the drill-down data.

|                         |          |                    |
|-------------------------|----------|--------------------|
| <b>Alley Cat Cycles</b> |          | <b>\$54,565.39</b> |
| Alley Cat Cycles        | 6/24/01  | \$1,551.30         |
| Alley Cat Cycles        | 11/19/01 | \$2,059.05         |
| Alley Cat Cycles        | 9/27/01  | \$43.50            |
| Alley Cat Cycles        | 1/31/02  | \$9,290.30         |
| Alley Cat Cycles        | 1/8/01   | \$5,879.70         |
| Alley Cat Cycles        | 1/28/01  | \$101.70           |
| Alley Cat Cycles        | 12/11/01 | \$1,718.60         |

c. Click the Close View button to close the tab displaying the drill-down data.

8. What problem do you notice with the report headings in the Page Header section?

*The three field headings that appear in the Page Header section, Customer Name, Order Date, and Order Amount, display with the summary data, rather than with the drill-down data.*

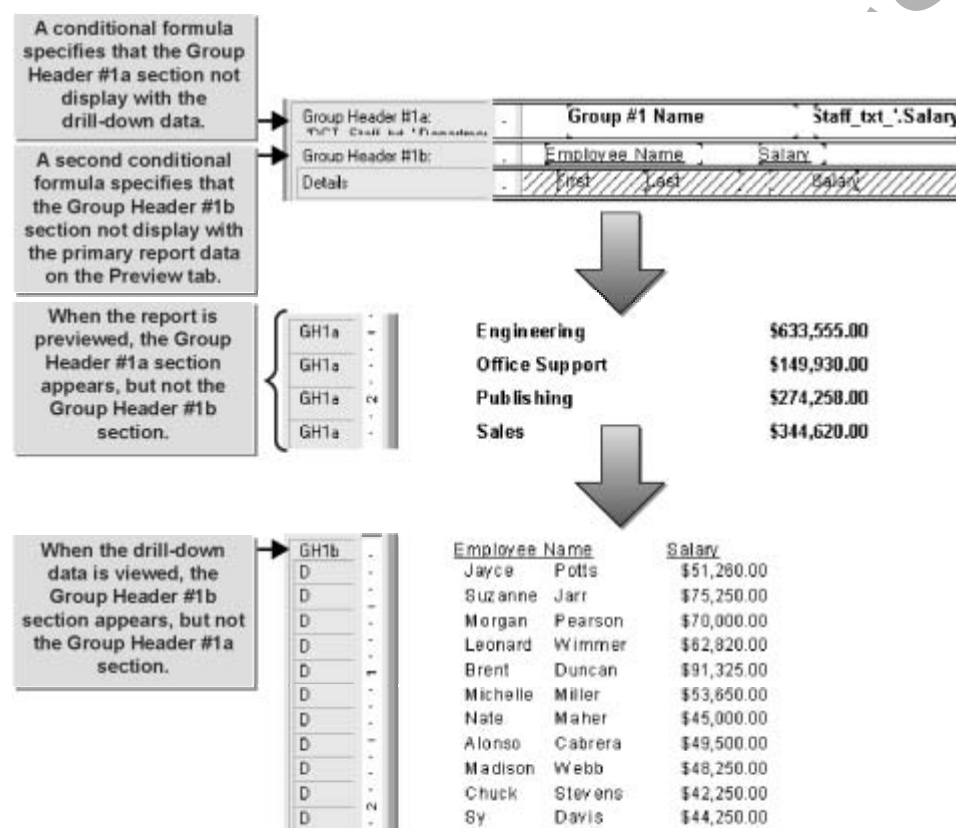
You will fix this in the next topic.

# TOPIC B

## Create Separate Headings for Drill-down Data

After creating a report that includes drill-down data, you may need to specify that different headings appear for the drill-down data than for the summary data. In this topic, you will specify that separate headings appear when the drill-down data is displayed.

When you add fields to the Details section, corresponding headings typically appear above each field in the Page Header section. However, if you then hide the Details section data so that it only appears when you drill-down, then the corresponding headings will still display in the Page Header with the summary data, rather than with the drill-down data. The ability to create separate headings for the drill-down and summary data ensures that the correct headings appear with each report component.



Separate Headings for Drill-down Data

**Figure 4-3:** You can use conditional formulas to suppress specified sections when displaying a given drill-down level.

## Drill-down Level Numbering

A report can contain several levels of drill-downs. Each drill-down level can be identified numerically within formulas using the DrillDownGroupLevel function. For example, if a report includes two drill-down levels, then the primary report preview displaying the summary data can be identified using the formula `DrillDownGroupLevel = 0`. The first drill-down can be identified using the formula `DrillDownGroupLevel = 1`, and the second drill-down can be identified using the formula `DrillDownGroupLevel = 2`. The `DrillDownGroupLevel` function can be useful in conditional formulas, for example, to suppress a particular report section when a specified drill-down level is viewed.

## How to Create Separate Headings for Drill-down Data

### Procedure Reference:

To specify that drill-down headings display only with the drill-down data:

1. Create a second Group Header section.
2. Add the drill-down data headings to the new Group Header section.
3. In the Section Expert, select the new Group Header section that contains the drill-down data headings.
4. Next to the Suppress (No Drill-Down) check box, select the Conditional Formula button.
5. In the Formula Workshop, enter the formula `DrillDownGroupLevel = 0`. This indicates that the Group Header section should be suppressed in the primary report preview.
6. If the report includes another Group Header section that should not appear with the drill-down data, then in the Section Expert, select that Group Header, select the Conditional Formula button next to the Suppress (No Drill-Down) check box, and specify the formula `DrillDownGroupLevel = 1`. This indicates that the Group Header section should be suppressed in the first drill-down level.

# ACTIVITY 4-2

## Creating Separate Headings for Drill-down Data

### Scenario:

The report you created for the sales meeting is almost finished. However, the field headings that should appear with the drill-down data are instead appearing with the summary data. In addition, the summary data appears with the drill-down data, which is unnecessary.

### What You Do

1. Place the drill-down data field labels in a new Group Header section.

### How You Do It

- a. In Design view, position the mouse pointer in the Group Header section's gray area.
- b. Right-click the Group Header, and select Insert Section Below.

|                  |               |              |              |
|------------------|---------------|--------------|--------------|
| Page Header      | Customer Name | Order Date   | Order Amount |
| Group Header #1a | Group #1 Name | Order Amount |              |
| Group Header #1b |               |              |              |
| Details          | Customer Name | Order Date   | Order Amount |
| Group Footer #1: |               |              |              |

- c. In the gray area of the Page Header section, right-click, and from the shortcut menu, choose Select All Section Objects.
- d. Press the Down Arrow key until the three selected items move to the Group Header #1b section.

|                  |               |              |              |
|------------------|---------------|--------------|--------------|
| Page Header      |               |              |              |
| Group Header #1a | Group #1 Name | Order Amount |              |
| Group Header #1b | Customer Name | Order Date   | Order Amount |
| Details          |               |              |              |
| Group Footer #1: |               |              |              |

- e. Preview the report.
- f. Notice that the labels in the new Group Header section display with the drill-down data, but also still display with the summary data.

# LESSON 4

2. Specify that the new Group Header section should be suppressed when you preview the summary report data.
  - a. Close any drill-down data tabs.
  - b. Open the Section Expert dialog box.
  - c. Select the Group Header #1b section.
  - d. Next to the Suppress (No Drill-Down) check box, select the Conditional Formula button.
  - e. In the Formula Workshop, enter the formula *DrillDownGroupLevel = 0*
  - f. Check the formula, then save and close it.
  - g. In the Section Expert dialog box, click OK.
  - h. Preview the report data, and notice that the three headings no longer appear.
  - i. Double-click the Alley Cat Cycles summary data to view the drill-down, and notice that the three headings now appear.

---

3. The summary data appears above the drill-down data. How could you specify that the summary data not display with the drill-down data?

*The summary data appears in the Group Header #1a section. You could specify a conditional formula to suppress the Group Header #1a section when you display the drill-down data. The formula you would use is *DrillDownGroupLevel = 1*.*

---

4. Specify that the report summary data not appear with the drill-down data.
  - a. Close any drill-down data tabs.
  - b. In the Section Expert, select the Group Header #1a section.
  - c. Next to the Suppress (No Drill-Down) check box, select the Conditional Formula button.
  - d. In the Formula Workshop, enter the formula *DrillDownGroupLevel = 1*
  - e. Check the formula, then save and close it.
  - f. In the Section Expert dialog box, click OK.

- g. On the Preview tab, double-click the Alley Cat Cycles summary data to view the drill-down, and notice that the summary data no longer appears at the top.

| Customer Name    | Order Date | Order Amount |
|------------------|------------|--------------|
| Alley Cat Cycles | 6/24/01    | \$1,551.30   |
| Alley Cat Cycles | 11/19/01   | \$2,059.05   |
| Alley Cat Cycles | 9/27/01    | \$43.50      |
| Alley Cat Cycles | 1/31/02    | \$9,290.30   |
| Alley Cat Cycles | 1/8/01     | \$5,879.70   |
| Alley Cat Cycles | 1/28/01    | \$101.70     |
| Alley Cat Cycles | 12/11/01   | \$1,718.60   |
| Alley Cat Cycles | 2/21/00    | \$3,479.70   |
| Alley Cat Cycles | 8/5/01     | \$1,409.55   |
| Alley Cat Cycles | 5/27/01    | \$72.90      |

5. For the main preview of the summary data, add the heading *Customer Sales Totals*

### Customer Sales Totals

|                        |             |
|------------------------|-------------|
| 7 Bikes For 7 Brothers | \$53.90     |
| Against The Wind Bikes | \$479.85    |
| AIC Childrens          | \$101.70    |
| Alley Cat Cycles       | \$54,565.39 |
| Ankara Bicycle Company | \$959.70    |

- a. Click the Preview tab.
- b. Select the Insert Text Object tool, then click within the Page Header section.
- c. Type *Customer Sales Totals*
- d. Format the heading as 14 pt bold.
- e. Position the heading at the left edge of the Page Header section.

# LESSON 4

6. Move the Customer Name field to the Group Header #1b section.

## Alley Cat Cycles

| Order Date | Order Amount |
|------------|--------------|
| 6/24/01    | \$1,551.30   |
| 11/19/01   | \$2,059.05   |
| 9/27/01    | \$43.50      |
| 1/31/02    | \$9,290.30   |
| 1/8/01     | \$5,879.70   |
| 1/28/01    | \$101.70     |

- a. In Design view, in the Group Header #1b section, delete the Customer Name label.
- b. In the Details section, select the Customer Name field.
- c. Press the Up Arrow key to move the field into the Group Header #1b section.

|                   |               |                         |
|-------------------|---------------|-------------------------|
| Group Header #1a: | Group #1 Name | der Amount              |
| Group Header #1b: | Customer Name | Order Date Order Amount |
| Details           | Order Date    | Order Amount            |

- d. Increase the height of the Group Header #1b section to a bit more than twice its original size.
- e. Move the Order Date and Order Amount labels to the bottom of the Group Header #1b section.
- f. Move the Order Date and Order Amount fields and their labels to the left.
- g. Format the Customer Name field to display with bold formatting.

|                   |                          |
|-------------------|--------------------------|
| Page Header       | Customer Sales Totals    |
| Group Header #1a: | Group #1 Name der Amount |
| Group Header #1b: | Customer Name            |
| Details           | Order Date Order Amount  |

- h. Preview the report's summary data and drill-down data.
- i. Save and close the report.

## Lesson 4 Follow-up

You now know how to create a drill-down report. The ability to specify a drill-down report allows you to create summary reports that don't overwhelm the viewer with too much data, while also allowing them to quickly access the detailed data.

1. For what types of data might you create drill-down reports in your own work?

*Answers will vary.*

2. What aspects of this lesson will be most useful in your own work?

*Answers will vary.*

FOR EVALUATION USE ONLY  
(C) 2004 Element K Content LLC  
DO NOT DUPLICATE



FOR EVALUATION USE ONLY  
(C) 2004 Element K Content LLC  
DO NOT DUPLICATE

# LESSON 5

## Enhancing Report Processing Using SQL

**Lesson Time***1 hour(s), 15 minutes to**1 hour(s), 45 minutes*

### Lesson Objectives:

In this lesson, you will improve processing speed in your reports.

You will:

- Create a report that accesses data using an SQL query.
- Summarize report data using an SQL aggregate function within an SQL query.
- Specify SQL queries that join tables.
- Create queries that include subqueries.
- Create an SQL Expression field.

## Introduction

You have used Crystal Reports to add and link tables for your reports, as well as to filter and sort the report data. As you work with larger and more complex reports, the tools provided by Crystal Reports may not be sufficient to meet all of your needs. In this lesson, you will create SQL commands and expressions to allow Crystal Reports to process data more efficiently, and to perform reporting tasks not otherwise possible.

Writing your own SQL commands and expressions within Crystal Reports can increase performance and provide more flexibility than is offered by the Crystal Reports tools alone.

## TOPIC A

---

### Create a Report Using SQL Queries

When you create a new report, you may want to write SQL queries to specify the report data you want to display. In this topic, you will create a report by specifying a simple SQL query.

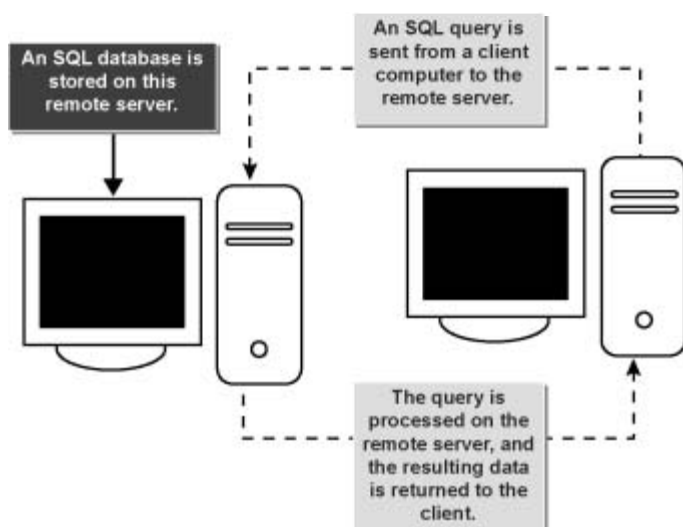
Accessing data for a report by writing an SQL query is often the most efficient way to acquire the report data, since the SQL query ensures that the data processing will occur on the remote database server, rather than on your computer. In addition, if you're familiar with SQL, you may prefer to write SQL queries to access the data you want, rather than specify commands within Crystal Reports to display the data you want.

### Server-side Processing

#### Definition:

*Server-side processing* is report processing that is carried out on the remote server containing the database, rather than on the client computer that accesses the server remotely. Server-side processing applies to reports that need sorting, filtering, grouping, and/or totaling, and works only for reports based on SQL data sources.

**Example:**



**Figure 5-1:** Server-side processing frees up the client computer to perform other tasks.



Server-side Processing

## Factors Affecting Server-side Processing

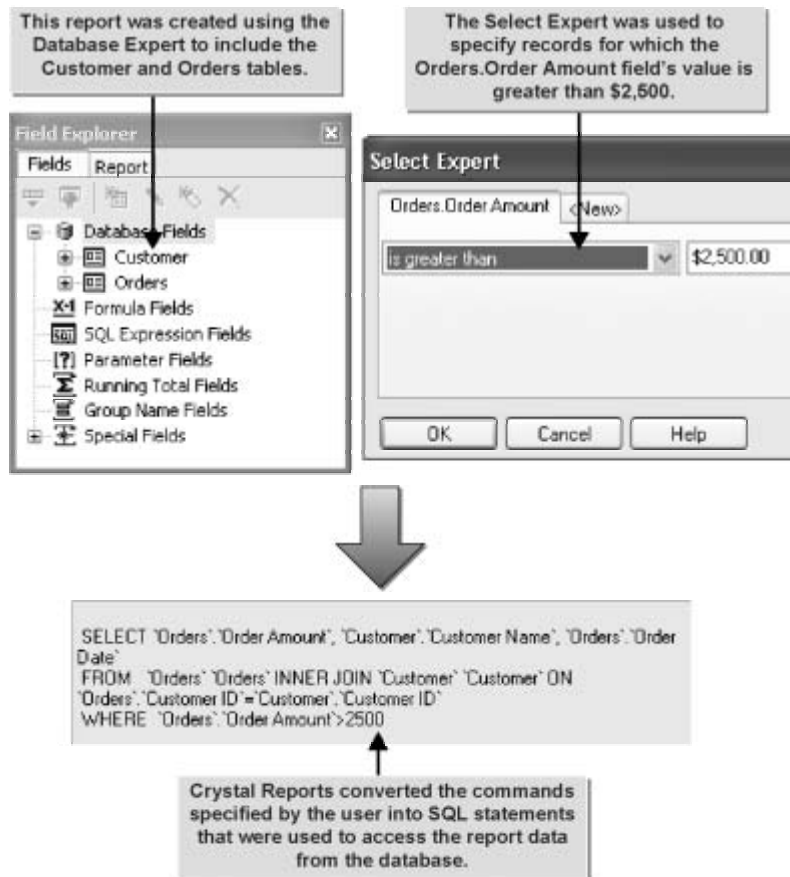
Many factors in a report can prohibit or restrict the amount of processing that can be done on a server. In an ideal world, all record selection, sorting, grouping, and totaling would be done at the server level. Unfortunately, the use of many of Crystal Reports' most valuable features results in situations where processing cannot be done on the server. In some cases, only partial server processing can be done. Reports with drill-down capability, running totals with variables, specified grouping, or Crystal Reports functions are just a few examples of some of the factors that will inhibit server-side processing. Specifying report tasks using SQL can greatly enhance the likelihood that processing will occur on the server.

## SQL

### Definition:

*SQL*, or Structured Query Language, is the standard query language by which people access and manipulate relational database data that is stored on a computer network. When using Crystal Reports to access data from SQL and ODBC database sources, the filters, sorts, groups, and totals you specify are converted by Crystal Reports to SQL statements in an attempt to communicate directly with the database to retrieve records. In addition, you can manually write out SQL statements within Crystal Reports. SQL expressions can always be interpreted by the underlying database. However, formulas that are built with Crystal Reports functions and operators often require all the data to be brought into the Crystal Reports report engine for processing.

## Example:



**Figure 5-2:** Many commands you specify in Crystal Reports are converted to SQL statements used to access data.

## SQL Benefits

A primary benefit of using SQL queries within Crystal Reports is that the remote SQL database uses the query to locate and isolate only the data you've requested, and then sends only that data to your computer. Since the processing occurs on the remote server, and only the requested set of data is sent to your computer, your computer's resources are available for other tasks. Remember that the Crystal Reports engine converts many of your Crystal Reports commands to SQL automatically, so in many cases, it is not necessary to manually enter the SQL yourself. However, since formulas built with Crystal Reports functions and operators often require that the data be brought into Crystal Reports for processing, there are times when you must create the SQL yourself if you want the data to be processed by the SQL server.

Another benefit of using SQL queries within Crystal Reports is that you can at times use them to access data in a way not possible using the commands in Crystal Reports. In these cases, you will manually enter the SQL.

## Applications Using SQL

Many applications support the use of SQL in order to access and manipulate SQL databases. In applications supporting SQL, the user may write out SQL statements manually, or may select options that the software converts to SQL statements, or both. SQL is a standardized language, which means that specific features must be present in any version of SQL used within a given software application. However, many applications that support SQL actually use a customized version of SQL to allow for advanced capabilities not available in standard SQL.

## SQL Clauses

### Definition:

*SQL clauses* are the components of an SQL statement that you use to indicate the task you want the database to perform.

### Example:

| Clause   | Required | Purpose                                                             |
|----------|----------|---------------------------------------------------------------------|
| SELECT   | Yes      | Indicates the names of the fields whose data you want to retrieve.  |
| FROM     | Yes      | Indicates the table containing the field data you want to retrieve. |
| WHERE    | No       | Sets record filter criteria.                                        |
| GROUP BY | No       | Establishes grouping.                                               |
| HAVING   | No       | Sets group filter criteria.                                         |
| ORDER BY | No       | Determines sort order.                                              |

 SQL Clauses

For querying data, only the SELECT and FROM clauses are required for all queries. You can use other clauses to get more control over the data you're retrieving.

### The DISTINCT Keyword

When the DISTINCT keyword appears within the SELECT clause, it indicates that only unique data values will be retrieved, without repetitions. For example, the following statement would retrieve only one repetition of each customer name from the Purchases table, even though that table may contain many repetitions of each customer name:

```
SELECT DISTINCT custname
FROM Purchases
```

## SQL Statements

### Definition:

An *SQL statement* is a request written using SQL clauses that is sent to a server containing an SQL database, and directs the server to perform specific database tasks. You can use SQL statements to create a database file, add tables and fields to a database, add records to tables, or retrieve data from databases.

## Example:

One type of SQL statement is an SQL query, which requests data from an SQL database. This is the only type of SQL statement you will use in this course. A query must include both the SELECT and FROM clauses, but may also include additional clauses. The SELECT clause keyword is followed by the name of the field or fields you want to retrieve, with each field separated by a comma. The FROM clause keyword is followed by the name of the table containing the field or fields you want.

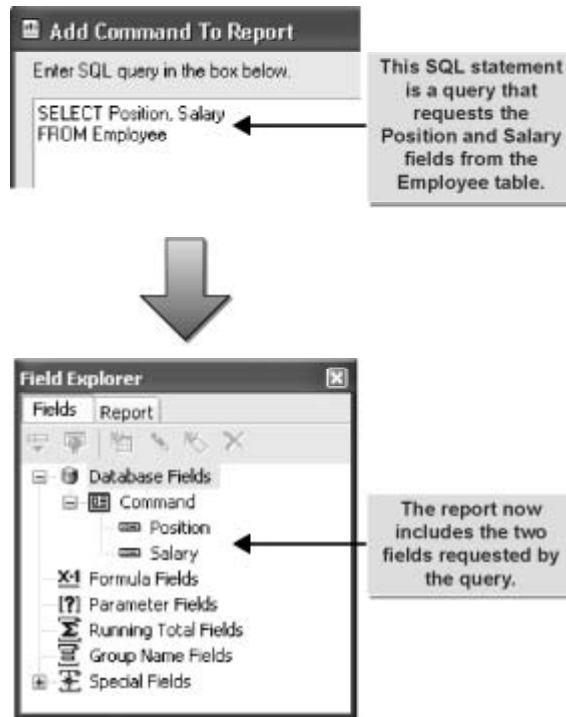


Figure 5-3: This simple SQL statement uses only the SELECT and FROM clauses.

## The \* Character

When the \* character appears following the SELECT clause keyword, the SQL statement will retrieve all fields in the specified table. For example, the following SQL query would retrieve all fields from the Orders table. When you want to retrieve all fields in a table, using the \* character saves you from having to type out the names of all the fields.

```
SELECT *
FROM Orders
```

## SQL Rules

- When creating an SQL query, the clauses you use must appear in this order: SELECT, FROM, WHERE, GROUP BY, HAVING, ORDER BY. Only the SELECT and FROM clauses must be included in all queries, but for all clauses that are used, they must follow this order. Some people find it useful to remember the acronym SoFtWareGHOS as a reminder of the correct order of the clauses. The uppercase characters in the acronym represent the query clauses.
- You must type a space after each clause keyword, such as SELECT and HAVING.
- When a SELECT clause specifies multiple fields, you must type a comma between each field.



- Table and field names that include more than one word separated by a space must be entered within ' (grave) characters, quotation characters, or brackets [ ]. The grave character, also known as a back tick, is typed using the key near the keyboard's top left, typically next to the 1 key. A report generated from a Microsoft Access connection uses the grave mark, and so in this case quotation marks will not be interpreted correctly if added around field or table names containing spaces. When Crystal Reports generates SQL statements based on Crystal Reports commands you specify, the grave or quotation characters are added automatically to field and table names, regardless of whether the names include spaces.
- If a referenced field uses a name that is also used by other fields in other tables within the database, you must precede the field name with the table name and a period, as in

```
SELECT Contacts.Name
FROM Contacts
```

## SQL Conventions

There are several SQL conventions that are not strictly necessary, but that should be followed to ensure your Crystal Reports SQL queries are clear and effective.

| Convention                                                                                                                        | Example                             |
|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Clause keywords appear using uppercase characters so they are easily distinguishable among the other components of the statement. | SELECT Amount<br>FROM Orders        |
| Each clause appears on its own line to keep the statement from becoming confusing to read.                                        | SELECT Orders.Amount<br>FROM Orders |

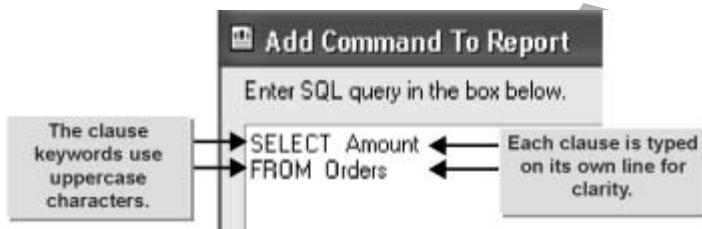


Figure 5-4: This simple SQL query follows basic SQL conventions.

## SQL Items Automatically Generated by Crystal Reports

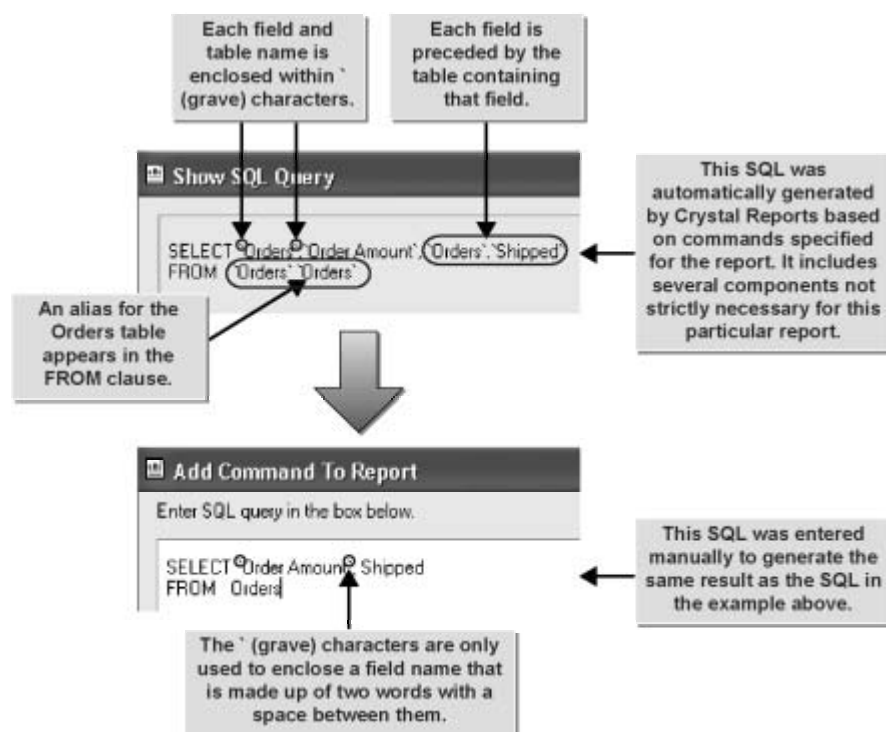
When you view the SQL automatically generated by Crystal Reports based on Crystal Reports commands specified by the user, the SQL may look different from SQL you may have created yourself to achieve the same result. Crystal Reports may add several items to the automatically generated SQL that are sometimes necessary, but that are not necessary in all cases.

SQL Conventions

SQL Items Automatically  
Generated by Crystal Reports



| SQL Item Generated in Crystal Reports                                                                                                                                                                                           | Reasons for Using This Component                                                                                                                                                                                                                                                                                                      | Example                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| All field names may appear preceded by the table name, with a period separating the table and field name.                                                                                                                       | This is useful to add clarity to your SQL statements when you're accessing a database that includes many tables, and is required when you're accessing a field whose name matches another field name used in a different table.                                                                                                       | <pre>SELECT Contact.Name FROM Contact</pre>                |
| Field, table, and other object names may be enclosed within grave (') or quotation marks. The character generated by Microsoft Access connections is a grave mark, so you will see that in many of the examples in this course. | These special enclosing grave or quotation marks are only required when object names include spaces, which is considered poor style in database design, and so is rarely used. The Crystal Reports generator adds these characters to all fields and tables, whether or not they use a space.                                         | <pre>SELECT 'Income'. '1st Qtr' FROM 'Income'</pre>        |
| In the FROM clause, the table name appears twice.                                                                                                                                                                               | The second instance of the table name is actually an alias. Crystal Reports automatically specifies an alias name for all report tables, which by default, matches the name of the original table. An alias is often created to provide a shorter name that can be used throughout the statement in place of the original table name. | <pre>SELECT 'Contact'. 'Name' FROM 'Income' 'Income'</pre> |



**Figure 5-5:** Automatically generated SQL in Crystal Reports may include items that aren't always necessary.

## How to Create a Report Using SQL Queries

### Procedure Reference: Create a Report Using an SQL Command

To create a report based on an SQL query:

1. Choose File→New, and in the Crystal Reports Gallery dialog box, select As A Blank Report, then click OK.
2. In the Database Expert dialog box, browse to the connection of your choice.
3. Expand the connection and double-click the Add Command option.
4. In the Add Command To Report dialog box, in the Enter The SQL Query In The Box Below section, specify the SQL query, then click OK.
5. In the Field Explorer, expand the Database Fields item, then expand the Command item within it to display the fields retrieved from the database, as specified by the SQL.
6. Drag the fields onto the report as desired.

### Procedure Reference: Modify an SQL Command

To modify an SQL command:

1. Open the Database Expert dialog box.
2. In the Selected Tables column, right-click the Command item, and select Edit Command.
3. In the Modify Command dialog box, make any changes to the SQL query, then click OK to return to the Database Expert dialog box.

- 4. Click OK.

**Procedure Reference: View Automatically Generated SQL Queries**

To view an SQL query automatically generated by Crystal Reports based on the commands and options you specified:

- 1. Choose Database→Show SQL Query.
- 2. After viewing the SQL query in the dialog box, click OK.

# ACTIVITY 5-1

## Creating a Report Using an SQL Query

**Scenario:**

You want to generate a report that displays the name of each employment position in your company’s sales department alphabetically, along with the Supervisor ID for the person who oversees each position. You want to begin entering SQL manually to generate reports, but aren’t sure that you could do so correctly.

**What You Do**

**How You Do It**

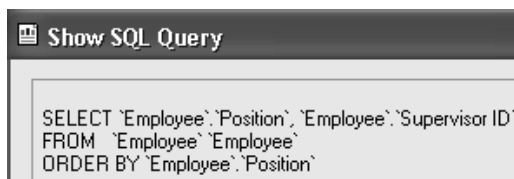
- 1. Create the report without manually specifying the SQL.

| Position                 | Supervisor ID |
|--------------------------|---------------|
| Advertising Specialist   | 13            |
| Business Manager         | 2             |
| Inside Sales Coordinator | 5             |
| Mail Clerk               | 10            |
| Marketing Associate      | 13            |
| Marketing Director       | 2             |
| Receptionist             | 10            |
| Sales Manager            | 2             |
| Sales Representative     | 5             |
| Sales Representative     | 5             |
| Sales Representative     | 5             |
| Sales Representative     | 5             |
| Sales Representative     | 5             |
| Sales Representative     | 5             |
| Vice President, Sales    |               |

- a. Open the Database Expert for a blank new report.
- b. Browse to and expand the C:\085516Data\xtreme.mdb connection.
- c. Add the Employee table to the report, then click OK.
- d. From the Field Explorer, drag the Position and Supervisor ID fields to the Details section.
- e. Preview the report.
- f. Using the Record Sort Expert dialog box, sort the data by the Position field in ascending order.

2. View the SQL query created by Crystal Reports to request the data.

- a. Choose Database→Show SQL Query.



- b. Click OK.

- c. Close the report without saving it.

3. Create the report by manually specifying an SQL query.

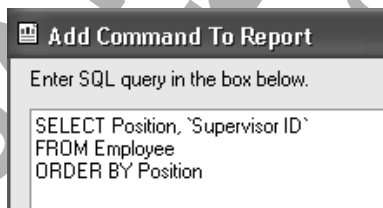
- a. Open the Database Expert for a blank new report.

- b. Browse to and expand the C:\085516Data\xtreme.mdb connection.

- c. Double-click the Add Command item.

- d. In the Add Command To Report dialog box, type

```
SELECT Position, 'Supervisor ID'
FROM Employee
ORDER BY Position
```



- e. Click OK.

- f. In the Database Expert dialog box, click OK.

- g. In the Field Explorer, expand the Database Fields and Command items, then drag the Position and Supervisor ID fields to the Details section.

- h. Preview the report, and notice that the data is already alphabetized by the Position field, as specified by the SQL you entered.

Be sure that your students enclose the Supervisor ID field name within ' characters, since it is a field name made up of two words separated by a space.

# LESSON 5

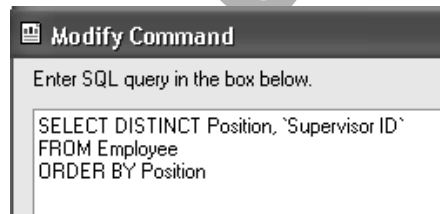
4. This report includes several repetitions of the same Position field. How could you modify the SQL to return only one instance of each position?

Modify the query to include the *DISTINCT* clause.

5. Modify the query so that it only lists each position once.

| <u>Position</u>          | <u>Supervisor ID</u> |
|--------------------------|----------------------|
| Advertising Specialist   | 13                   |
| Business Manager         | 2                    |
| Inside Sales Coordinator | 5                    |
| Mail Clerk               | 10                   |
| Marketing Associate      | 13                   |
| Marketing Director       | 2                    |
| Receptionist             | 10                   |
| Sales Manager            | 2                    |
| Sales Representative     | 5                    |
| Vice President, Sales    |                      |

- a. Open the Database Expert dialog box.
- b. In the Selected Tables list, right-click **Command**, and select **Edit Command**.
- c. Following the **SELECT** keyword, type **DISTINCT**



- d. Click **OK**.
- e. In the Database Expert dialog box, click **OK**.

6. Save and close the report.

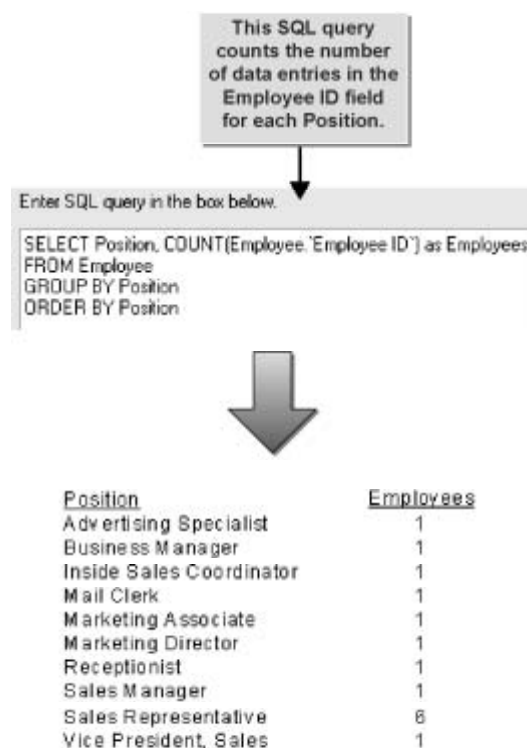
- a. Save the report as *Sales Positions*
- b. Close the report.

# TOPIC B

## Summarize Report Data Using SQL Aggregate Functions

When you create a report using SQL queries, you may want to summarize some of the report data. In this topic, you will include aggregate functions within an SQL query to summarize report data.

Imagine that you're generating a report using an SQL query. You want to access the Position field from the Employee table, and display the total number of employees in each position. Using an SQL aggregate function causes the number of employees for each position to be calculated on the remote server, which allows the grouped data to appear in a detail section.



An Example of an SQL Aggregate Function

Figure 5-6: You can use the COUNT aggregate function to summarize report data.

## SQL Aggregate Functions

### Definition:

An *SQL aggregate function* is a function that produces a single summary value for a group of values in a specified field. You can use aggregate functions in two clauses: the SELECT clause and the HAVING clause. Aggregates require an expression, which is enclosed in parentheses. In general, aggregate functions appear as follows, where the expression is typically a field name:

```
aggregate_function(expression)
```

Example:

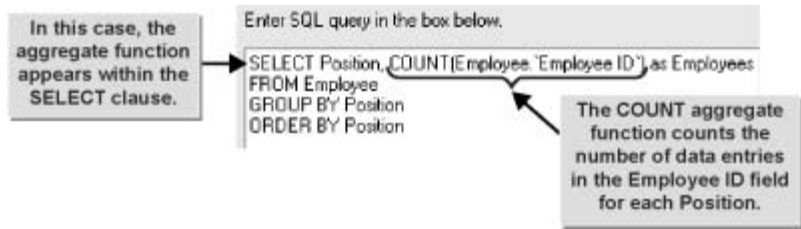


Figure 5-7: This COUNT aggregate function will display the number of employees with a given position title in the company.

SQL Aggregate Function Descriptions

SQL Aggregate Function

| Function | Description                                                       |
|----------|-------------------------------------------------------------------|
| AVG      | Calculates an average of values in a numeric field or expression. |
| COUNT    | Determines the number of records that match specified criteria.   |
| MAX      | Determines the greatest value in a specified field or expression. |
| MIN      | Determines the smallest value in a specified field or expression. |
| SUM      | Calculates a total of values in a numeric field or expression.    |

Aggregate Functions with Grouped Data

An aggregate function that performs an operation on a group level cannot be used in a simple SELECT clause without a corresponding GROUP BY clause.

How to Summarize Report Data Using SQL Aggregate Functions

Procedure Reference:

- To summarize report data using an SQL aggregate function:
1. In the Add Command To Report dialog box, in the SELECT clause, specify the aggregate function keyword you want to use.
  2. Within parentheses, specify the name of the field you want to summarize.
  3. After the closing parenthesis, type AS, followed by the name you want to use for the resulting summary field.
  4. Specify any additional elements you want to include in the SQL query, then click OK.
  5. Drag the generated summary element from the Field Explorer onto the report layout.



# ACTIVITY 5-2


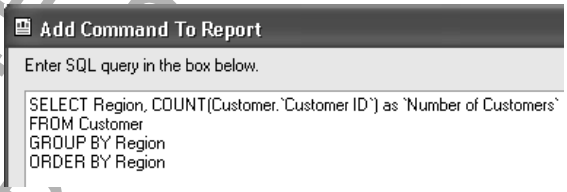
## Summarizing Report Data Using the COUNT Function

### Setup:

Crystal Reports is running and there are no files open.

### Scenario:

You have been working with SQL and know how to create simple SQL statements. You have been asked to create a simple report counting the number of customers you have in each region.

| What You Do                                                                                           | How You Do It                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Create a new, blank report, opening the Add Command option for the xtreme.mdb database file.       | <p>a. Choose File→New. Select As A Blank Report and click OK.</p> <p>b. In the Database Expert, browse to and expand the xtreme.mdb.</p> <p> The file will be located in the History folder if you've done previous exercises.</p> <p>c. Double-click the Add Command option.</p>                                                                                                                                                                                                                                                         |
| 2. Write an SQL statement that will return a count of all customers in each region, sorted by region. | <p>a. Type the following in the Enter SQL Query In The Box Below text box:</p> <pre>SELECT Region, COUNT(Customer.'Customer ID') as 'Number of Customers' FROM Customer GROUP BY Region ORDER BY Region</pre> <div data-bbox="711 1396 1274 1585">  <p><b>Add Command To Report</b></p> <p>Enter SQL query in the box below.</p> <pre>SELECT Region, COUNT(Customer.'Customer ID') as 'Number of Customers' FROM Customer GROUP BY Region ORDER BY Region</pre> </div> <p>b. Click OK.</p> <p>c. In the Database Expert, click OK.</p> |



Make sure that your students do not type a single quote, but type the grave ( ` ) accent mark located on the upper-left corner of the keyboard.



LESSON 5

3. Add the two fields from the query to the Details section of the report.
- a. In the Field Explorer, expand Database Fields and expand Command.

b. Insert the fields labeled "Region" and "Number of Customers" in the Details section.

|             |        |                     |
|-------------|--------|---------------------|
| Page Header | Region | Number of Customers |
| Details     | Region | Number of Customers |

4. Preview and save your report as *Customer Count by Region.rpt*.
- a. Preview the report.

b. Save the report as *Customer Count by Region* and then close it.

c. Close the report.

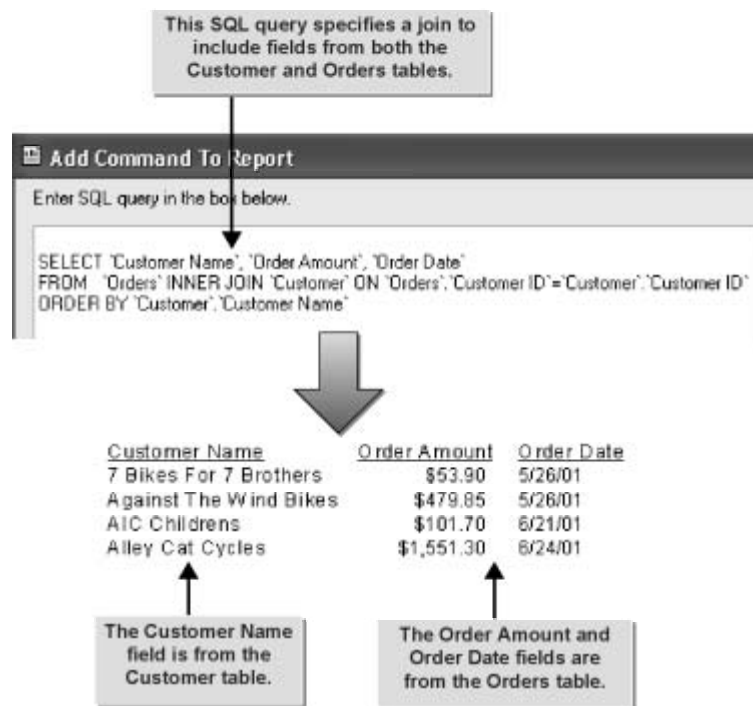
| Region          | Number of Customers |
|-----------------|---------------------|
| Abu Dhabi       | 1                   |
| AL              | 3                   |
| Alsace          | 2                   |
| Ankara          | 1                   |
| Aquitaine       | 2                   |
| AR              | 1                   |
| Auckland        | 1                   |
| Auvergne        | 2                   |
| Avon            | 1                   |
| AZ              | 2                   |
| Bangkok         | 1                   |
| Basse Normandie | 2                   |
| Bayern          | 1                   |
| BC              | 5                   |
| Belo Horizonte  | 1                   |
| Berkshire       | 1                   |
| Berlin          | 2                   |
| Bourgogne       | 1                   |
| Bridgetown      | 1                   |
| Brussels        | 1                   |
| Bucharesti      | 1                   |
| Budapest        | 1                   |

# TOPIC C

## Create Joins Using SQL

As you generate reports using SQL queries, you'll often need to include data from multiple tables. In this topic, you will create joins using SQL queries, so that you can include data from multiple tables in your reports.

Suppose you want to create a report that includes fields from both the Customer and Orders tables. You plan to generate the report using SQL. You can specify a join using SQL so that all the data you want will be available.



 A Join Specified by SQL

Figure 5-8: You can specify joins within your SQL queries.

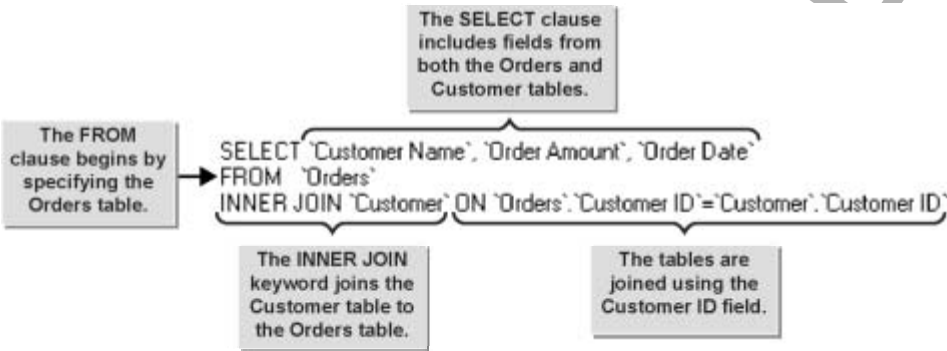
## Joins

### Definition:

A *join* is a specification that links two or more tables together so that data from all the linked tables can be used within a single report. You can only join tables that include a field in common.

**Example:**

Suppose you want to use fields from both the Customer and Orders tables within a single report, and you want to use an SQL query to generate the report. Both of these tables include a Customer ID field, which you can use to join the tables. To include the Customer Name field from the Customer table, along with the Order Date and Order Amount fields from the Orders table, you could specify the query shown in Figure 5-9.



**Figure 5-9:** Specifying a join allows you to access data from multiple tables in a single report.

SQL Join Types

There are several types of joins that you can specify within an SQL query. The join type you use can limit or expand the records that will be included in the available set of data.

| Join Type        | Description                                                                                                                                                                                                        | Example                                                                                                                                                                                                                                                                 |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Inner Join       | Accesses all the records in which the linked field value in both tables is an exact match.                                                                                                                         | <code>SELECT Name, Amount<br/>FROM Orders<br/>INNER JOIN Customer<br/>ON Orders.ID = Customer.ID</code><br>This query includes all records from each table whose ID field has a corresponding match in the other table.                                                 |
| Left Outer Join  | Accesses all records in which the linked field value in both tables matches, as well as all records from the table whose name directly follows the FROM keyword within the query, also known as the primary table. | <code>SELECT Name, Amount<br/>FROM Orders<br/>LEFT JOIN Customer<br/>ON Orders.ID = Customer.ID</code><br>This query includes all records from each table whose ID field has a corresponding match in the other table, along with all records from the Orders table.    |
| Right Outer Join | Accesses all records in which the linked field value in both tables matches, as well as all records from the table whose name directly follows the JOIN keyword, also known as the lookup table.                   | <code>SELECT Name, Amount<br/>FROM Orders<br/>RIGHT JOIN Customer<br/>ON Orders.ID = Customer.ID</code><br>This query includes all records from each table whose ID field has a corresponding match in the other table, along with all records from the Customer table. |

## Joins via the WHERE Clause

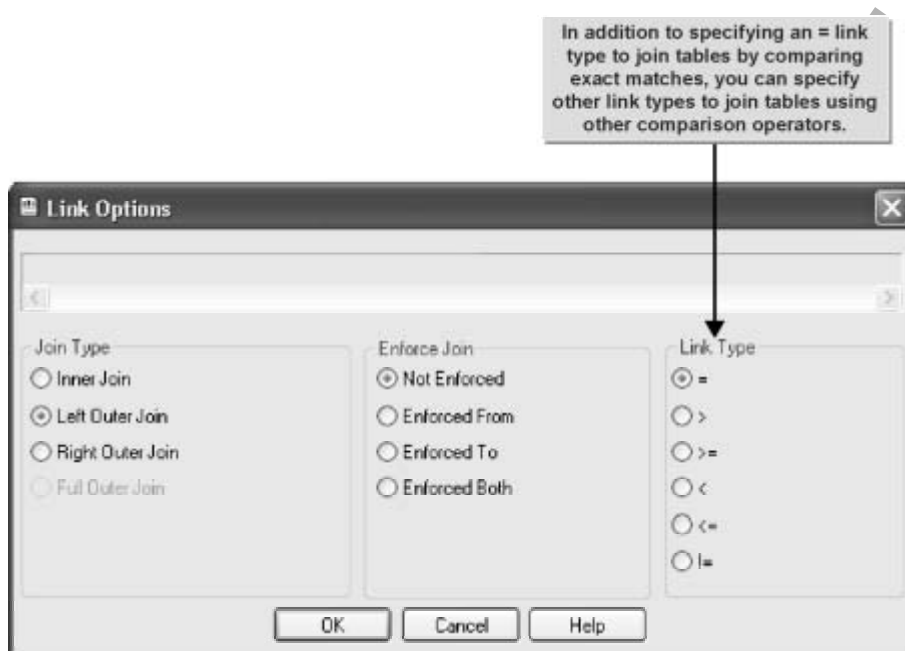
You may sometimes see joins specified within the WHERE clause, as in:

```
SELECT Name, Amount
FROM Customer, Orders
WHERE Customer.ID = Orders.ID
```

The preceding example would return the Name field from the Customer table, and the Amount field from the Orders table. The two tables are joined via the ID field.

## Join Conditions

This course focuses on comparing join values based on equality, but in most databases, a comparison can be done using other comparison operators, such as < and >, as shown in Figure 5-10.



**Figure 5-10:** The Link Options dialog box allows you to specify the type of comparison operator used in specifying a join.

## How to Create Joins Using SQL

### Procedure Reference: Specify a Join in an SQL Query

To join tables using an SQL query:

1. In the Add Command To Report dialog box, in the SELECT clause, specify the fields you want to include from each table, with commas separating each field name.
2. In the FROM clause, specify the primary table.
3. Specify the JOIN keyword you want to use, followed by the name of the lookup table.
4. Type the ON keyword, followed by the link field that links the two tables, using the following format: `primary table.link_field = lookup table.link_field`.
5. Drag the generated fields from the Field Explorer onto the report layout.

Procedure Reference: Specify a Join Type Using Crystal Reports Commands

To specify a join type using the commands within Crystal Reports:

- 1. In the Database Expert dialog box, select the Links tab.
- 2. Select the links line that connects two tables.
- 3. Select the Link Options button.
- 4. In the Join Type section, specify the type of join you want to use, then click OK.
- 5. Click OK to close the Database Expert dialog box, and refresh data if necessary.

# ACTIVITY 5-3

## Creating SQL Joins

Scenario:

You need to create a report that lists the names of all employees, along with the country in which they’re based. The employee name fields are in the Employee table, but the country data is in the Employee Addresses table. Fortunately, each of those tables include the Employee ID field.

What You Do

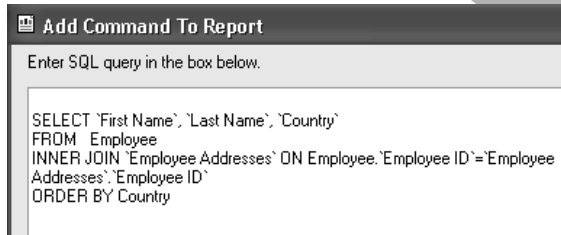
How You Do It

- |                                                                                                                                                 |                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>1. Create a new, blank report, opening the Add Command option for the xtreme.mdb database file.</li></ul> | <ul style="list-style-type: none"><li>a. Choose File→New. Select As A Blank Report and click OK.</li><li>b. In the Database Expert, browse to and expand the xtreme.mdb database.</li><li>c. Double-click the Add Command option.</li></ul> |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

2. Write an SQL statement that will include the data you need, sorted by country.

- a. Type the following in the Enter SQL Query In The Box Below text box:

```
SELECT 'First Name', 'Last Name',
 'Country'
FROM Employee
INNER JOIN 'Employee Addresses'
ON Employee.'Employee ID'=
 'Employee Addresses'.'Employee ID'
ORDER BY Country
```



- b. Click OK.
- c. In the Database Expert, click OK.

3. Add the fields to the report.

- a. In the Field Explorer, expand Database Fields and expand Command.
- b. Insert the First Name, Last Name, and Country field in the Details section.



# LESSON 5

4. Preview the report, and save it as *Employees by Country*.

| <u>First Name</u> | <u>Last Name</u> | <u>Country</u> |
|-------------------|------------------|----------------|
| Caroline          | Patterson        | Canada         |
| Tim               | Smith            | Canada         |
| Albert            | Hellstern        | Canada         |
| Laura             | Callahan         | Canada         |
| Margaret          | Peacock          | Canada         |
| Janet             | Leverling        | Canada         |
| Andrew            | Fuller           | Canada         |
| Nancy             | Davolio          | Canada         |
| Laurent           | Pereira          | France         |
| Xavier            | Martin           | France         |
| Justin            | Brid             | France         |
| Anne              | Dodsworth        | UK             |
| Robert            | King             | UK             |
| Michael           | Suyama           | UK             |
| Steven            | Buchanan         | UK             |

- a. Preview the report.
- b. Adjust the field positions and sizes as necessary.
- c. Save the report as *Employees by Country*
- d. Close the report.

## ACTIVITY 5-4

### Changing the Join Type

#### Scenario:

One of your colleagues created a report titled Customer Credit Amounts.rpt. You want to locate the credit data for a company named AIC Children.

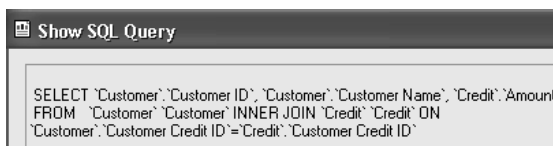
#### What You Do

1. View the Customer Credit Amounts.rpt file.

#### How You Do It

- a. In the Standard toolbar, click the Open button.
- b. Navigate to the 085516Data folder, and open the Customer Credit Amounts.rpt report.
- c. Notice that there is no entry for the AIC Children company.

d. Choose Database→Show SQL Query.



2. As you view the SQL query, why do you think that the report doesn't display an entry for the AIC Children company?

*This SQL query specifies an inner join, so only records that exist in both tables, with a matching Customer Credit ID value will appear in the report. The AIC Children company exists in the Customer table, but may not have a corresponding record in the Credit table.*

3. How could you modify the join so that all records from the Customer table were included in the report?

*Change the join type from an inner join to a left outer join.*

Click OK.

4. How could you change the join type for this report?

*The SQL query for this report was generated automatically by Crystal Reports, and was not manually entered by the report's creator. Therefore, rather than directly editing the SQL query, you will use the Links tab in the Database Expert dialog box.*

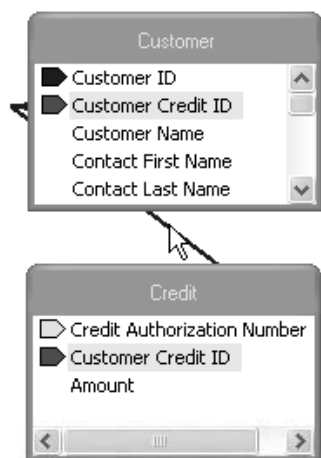


## LESSON 5

5. Change the join type.

a. Open the Database Expert dialog box, then select the Links tab.

b. Select the links line that joins the two tables.



c. Select Link Options.

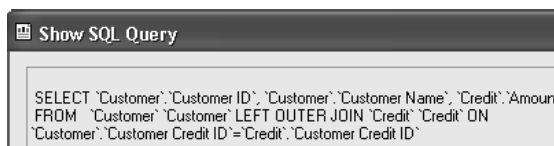
d. In the Link Options dialog box, in the Join Type section, select Left Outer Join, then click OK.

e. In the Database Expert dialog box, click OK, then click OK to refresh the report data.

f. Notice that many additional records now appear in the report, representing records that existed in the Customer table, but without a corresponding record in the Credit table.

6. View the updated SQL query.

a. Choose Database→Show SQL Query.



b. Notice that the SQL query now specifies a left outer join.

c. Click OK.

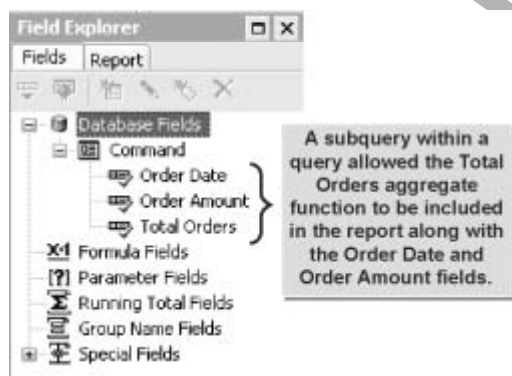
d. Save and close the report.

## TOPIC D

### Create Subqueries

As you create more complex reports using SQL queries, you may need to include subqueries. In this topic, you will create subqueries within your queries.

Subqueries allow you to create complex queries that extract data not available through other querying methods. For example, you may want to create a report that includes an aggregate function to display the total count of orders, along with the Order Date and Order Amount fields. Using the simple SELECT clause structures you've used in the past would not work to produce the fields you wanted. However, a subquery would allow you to generate the desired report data.



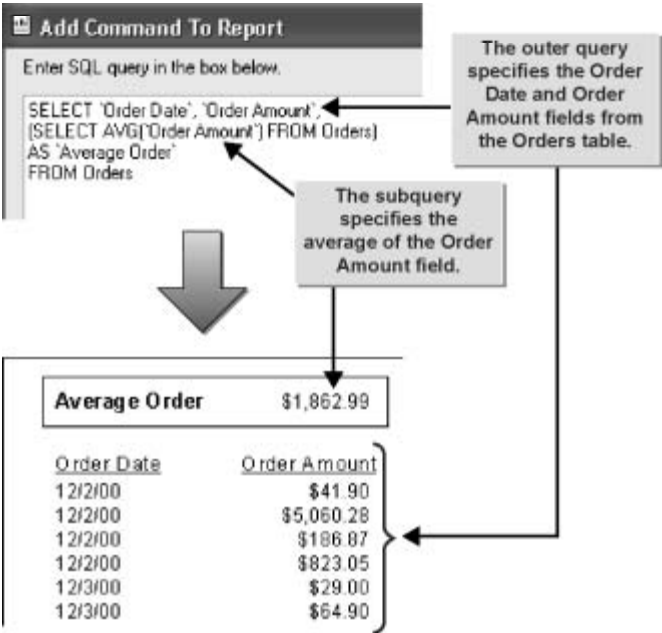
**Figure 5-11:** A subquery can produce results that may not be possible using a standard SELECT clause.

## Subqueries

**Definition:**

A *subquery* is a second SELECT clause that is nested inside an outer query. You can use a subquery within the SELECT, FROM, WHERE, or HAVING clauses. Subqueries must be enclosed in parentheses.

**Example:**



**Figure 5-12:** This query includes a subquery that specifies the average order amount.

## How to Create Subqueries

- Procedure Reference:**
- To create subqueries within your SQL queries:
1. In the Add Command To Report dialog box, specify the SQL query you want to use.
  2. Within parentheses, specify the subquery you want to use.
  3. Drag the generated fields from the Field Explorer onto the report layout.

# ACTIVITY 5-5

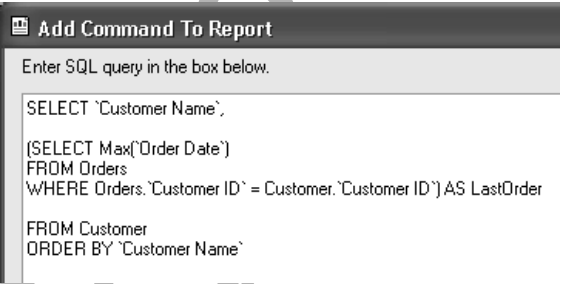
## Creating Subqueries

### Scenario:

You have a report named Latest Orders.rpt, which lists the most recent order date for each customer. You want to ensure that the database server is processing the report data, and sending only the necessary data to your computer.

| What You Do                                                                                                                           | How You Do It                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Determine whether the SQL server is designated to process all the data.                                                            | <ol style="list-style-type: none"> <li>Open the Latest Orders.rpt file.</li> <li>Display the Select Expert, and select Show Formula.</li> <li>Notice that the formula is a group selection formula, limiting the records based on an aggregate calculation on the Customer Name group.</li> <li>Close the Select Expert.</li> <li>Choose Database→Show SQL Query.</li> <li>Notice that the SQL query automatically generated by Crystal Reports pulls down all records, causing Crystal Reports to perform the processing that limits the records based on the formula you viewed in the Select Expert.</li> <li>Click OK, then close the file.</li> </ol> |
| 2. Create a new report that generates the same data, but uses an SQL query to specify that the processing occur on the remote server. | <ol style="list-style-type: none"> <li>Choose File→New. Select As A Blank Report and click OK.</li> <li>In the Database Expert, browse to and expand the xtreme.mdb database.</li> <li>Double-click the Add Command option.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                     |

- d. Type the following in the Enter SQL Query In The Box Below text box:
- ```
SELECT 'Customer Name',  
  
(SELECT Max('Order Date') FROM  
Orders WHERE Orders.'Customer  
ID' = Customer.'Customer ID') AS  
LastOrder  
  
FROM Customer  
ORDER BY 'Customer Name'
```



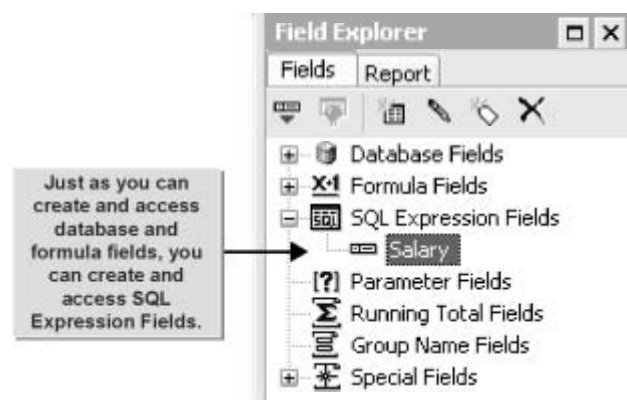
- e. Click OK.
- f. In the Database Expert, click OK.
-
3. Add the fields to the report.
- a. Add the Customer Name and Last Order fields to the report.
- b. Preview the report.
-
4. Save and close the report.
- a. Save the report as Latest Orders Revised.rpt.
- b. Close the report.
-
-

TOPIC E

Create an SQL Expression Field to Promote Server-side Processing

Another way to process data more efficiently in your reports using SQL is to create SQL expression fields. In this topic, you will create and use SQL expression fields to enhance the ability of your report to select, sort, and group report data on the database server.

SQL expressions you create can often improve your report's performance, since the tasks they specify are typically performed by the database server, rather than on your computer. On the other hand, regular formulas you create in Crystal Reports are often performed on your computer, rather than on the database server, slowing performance.



An SQL Expression Field

Figure 5-13: The Salary field was created as an SQL expression field.

SQL Expression Fields

Definition:

An *SQL expression field* is a formula written in SQL rather than in the Crystal Reports formula language, which you can use to sort, group, and select data. SQL expressions are typically implemented on the SQL database server, which frees up your computer's resources for other tasks. SQL expressions will almost always increase your report efficiency, but the options available are limited. You will find there is much more flexibility offered by the functions and operators available in the Crystal Reports formula language, both Crystal Syntax and Basic Syntax.

Example:

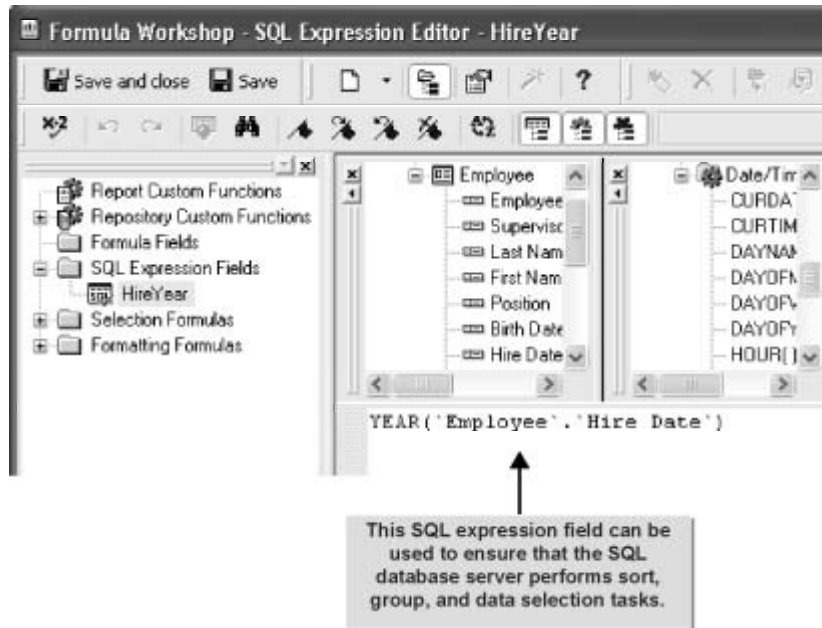


Figure 5-14: You can create SQL expression fields within the Formula Workshop.

How to Create an SQL Expression Field to Promote Server-side Processing

Procedure Reference: Enable Server-side Processing

To enable server-side processing:

1. Choose File→Report Options to display the Report Options dialog box.
2. Check the Perform Grouping on Server check box.
3. Click OK.

Procedure Reference: Create an SQL Expression Field

To create an SQL expression field:

1. On the Field Explorer, select SQL Expression Fields and click the New button.
2. In the SQL Expression Name box, type a name for the SQL expression and click OK to display the SQL Expression Editor.
3. Type the expression in the SQL Expression Editor.
4. Click OK to close the SQL Expression Editor dialog box.

Procedure Reference: Select Records Using an SQL Expression

To select records using an SQL expression field:

1. Display the Select Expert dialog box.
2. If necessary, delete the current field selection.
3. Click the New tab to display the Choose Field dialog box.

4. From the Fields list box, select the SQL expression and click OK. An SQL expression appears in the Fields tree with a % prefix.
5. Use the drop-down list to enter your selection criteria for the indicated field.
6. Click OK to generate the selection formula based on your specifications, limiting the report to the records you indicated.

ACTIVITY 5-6

Selecting Data Using SQL Expression Fields

Data Files:

- 2002 Canada Sales.rpt

Setup:

No data files are open.

Scenario:

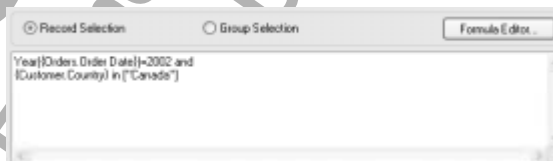
The 2002 Canada Sales.rpt report summarizes 2002 sales. Although the report runs fine now, you anticipate that as the amount of data displayed by the report increases, it will take several minutes to run. You have been asked to speed the processing of this report. You want the filtering of the data to be done on the network server.

What You Do

How You Do It

1. In 2002 Canada Sales.rpt, view the selection formula.

- a. Open 2002 Canada Sales.rpt and click the Select Expert button .
- b. Click Show Formula.



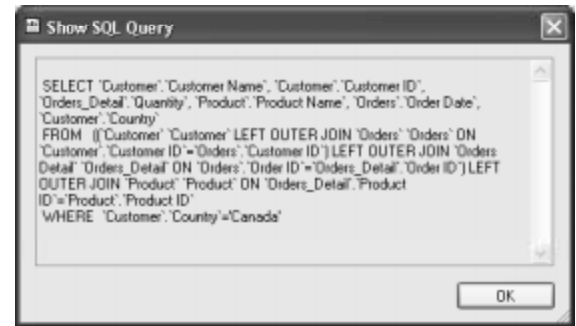
2. How many filters are in the formula and what are they?

There are two filters: Country = Canada and Order Date = 2002. In other words, records are selected based on the country Canada only and the Order Date is set to 2002.

3. Close the Select Expert dialog box and open the Show SQL Query dialog box to view the query.

- a. On the Select Expert dialog box, click the Close button.

b. Choose Database→Show SQL Query.



4. What is the selection criteria limiting?

The selection criteria limits the country to Canada as shown in the WHERE clause. The criteria for the order date (Year = 2002) does not appear.

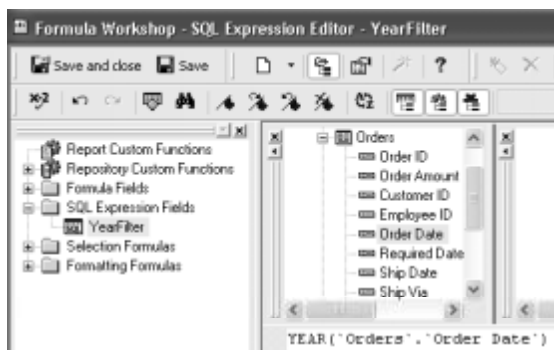
5. How could you fix this?

By building an SQL expression that allows the filtering to be done at the server level.

6. Build an SQL expression called **YearFilter** that will represent the year of the order date field enabling filtering to be done at the server level.

- Close the Show SQL Query dialog box.
- In the Field Explorer, select SQL Expression Fields and click New.
- Type **YearFilter** and click OK.
- In the SQL Expression Editor window, expand the Functions tree for the Date/Time category.
- Within the Date/Time category, double-click **Year()**.
- Notice that the insertion point is inside the parentheses.

- g. In the Fields tree, expand the Orders table and double-click the Orders.Order Date field.



- h. Check, save, and close the formula.
- i. Save the report.

7. You will now delete the non-SQL selection formula already in the report. **Select and delete the Orders.Order Date formula.**

- a. Click the Select Expert button.
- b. Select the Orders.Order Date tab and click the Delete button.

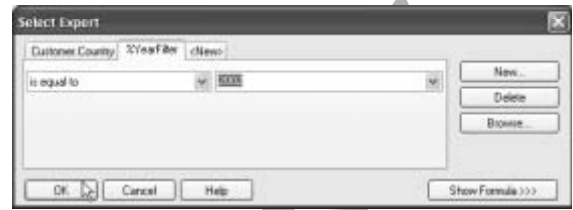


8. Replace the %YearFilter formula on a new tab that is equal to 2002 and refresh the records.

- a. Select the New tab.
- b. From the Fields list, select the %YearFilter SQL expression and click OK.

LESSON 5

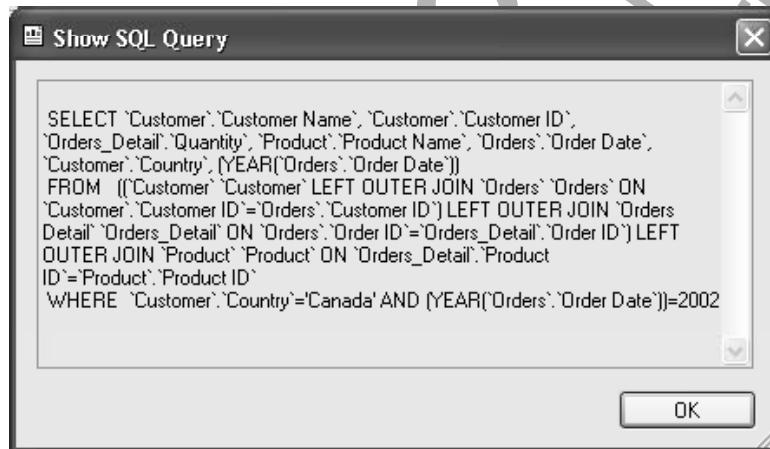
- c. From the drop-down list, select **Is Equal To**. In the next box, type **2002** and click **OK**.



- d. Click the **Refresh Data** button.
- e. Notice that the same **37 records** get returned.

-
- 9. View the SQL Query to examine the **WHERE** clause.
 - a. Choose **Database** → **Show SQL Query**.
 - b. If necessary, scroll down to view the **WHERE** clause.

-
- 10. What has changed about the **WHERE** clause shown in the following graphic?



All the selection criteria is listed in the WHERE clause, including the year filter.

Click **OK**, then save and close the report.

Lesson 5 Follow-up

You now know how to enhance your reports using SQL. The ability to incorporate SQL into your reports will allow you and others to access report data quickly and efficiently, and to perform reporting functions not otherwise possible.

1. How could you incorporate SQL to enhance your own reports?

Answers will vary.

2. What did you learn in this lesson that will be most useful for you in your work?

Answers will vary.

FOR EVALUATION USE ONLY
(C) 2004 Element K Content LLC
DO NOT DUPLICATE

FOR EVALUATION USE ONLY
(C) 2004 Element K Content LLC
DO NOT DUPLICATE

LESSON 6

Charting Data

Lesson Time

1 hour(s), 30 minutes to
2 hour(s)

Lesson Objectives:

In this lesson, you will chart single and multiple data series.

You will:

- Create a bar chart.
- Modify a chart.
- Create a Top N chart.
- Format a chart.
- Create a template based on an existing chart.

Introduction

You already know how to create a pie chart with single data series. In this lesson, you'll create and modify a bar chart with multiple data series.

Imagine you had to review pages and pages of summary data to make comparisons of certain products and identify trends. It would be much faster and easier to identify these results if they were presented in a chart. With a quick glance on a color-coded one-page document you can find the results you're looking for quickly and easily.

TOPIC A

Create a Bar Chart

You've already learned how to create a pie chart that represents percentages for each item. There will be times when you'll need to create a chart that shows how each item compares to each other in terms of volume, size, dollars, and so on. In this topic, you'll create a bar chart.

Imagine you're looking at a report that contains lots of information displayed in columns and rows. You look at the report to try to identify which salesperson made the most sales. Now imagine you're looking at a bar chart and have to identify which salesperson made the most sales. It's much easier and faster to interpret the information and provide feedback when information is presented in a chart as shown in Figure 6-1.

Displaying Data as a Bar Chart

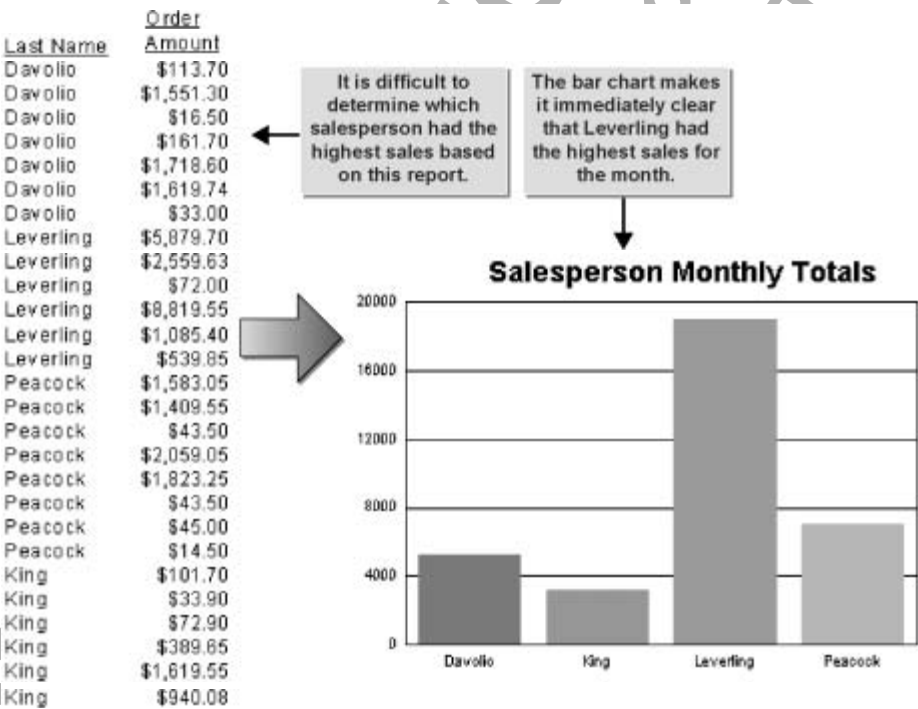


Figure 6-1: It is often easier to understand and analyze data when it is displayed as a bar chart.

How to Create a Bar Chart

Procedure Reference:

To create a bar chart:

1. Choose Insert→Chart to display the Chart Expert dialog box.
2. On the Type tab, select Bar as the type of chart.
3. If you want to specify options that the Chart Expert typically specifies by default, then uncheck the Automatically Set Chart Options check box. The Axes and Options tabs then appear.
4. On the Data tab, select the placement of the chart and how often the chart will appear on the report.
5. On the Options tab, select the type of labels that will appear (data points), the legend placement, and the bar size.
6. On the Text tab, select and enter the titles, footnotes, and axis titles for the chart.
7. Click OK to close the Chart Expert dialog box.

ACTIVITY 6-1

Creating a Bar Chart

Data Files:

- Glove-Helmet Sales.rpt

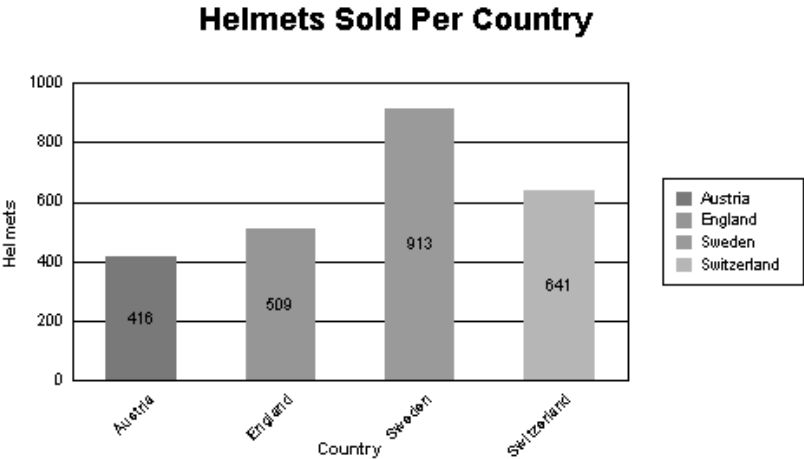
Setup:

Crystal Reports is running and there are no files open.

Scenario:

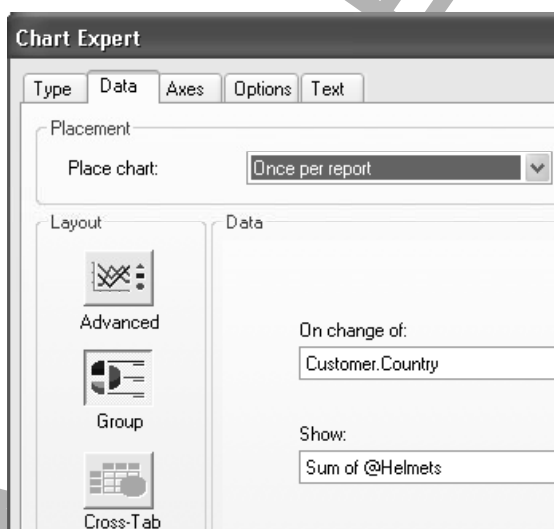
You're getting ready to go to the company's weekly sales meeting and you have to show the glove and helmet sales for the European division. The report you print out doesn't have the purpose of the data represented properly and it's not easy to identify trends in sales. Rather than present a boring and difficult-to-read report, you decide to create a chart based on the data.

	Glove Sales	Helmet Sales
Austria	\$110.50	\$416.22
England	\$438.40	\$508.70
Sweden	\$455.65	\$912.95
Switzerland	\$139.50	\$641.15



What You Do	How You Do It
1. In Glove-Helmet Sales.rpt, in Design view, display the Chart Expert dialog box.	a. Open Glove-Helmet Sales.rpt and, if necessary, change to Design view. b. Choose Insert→Chart.

2. Create a bar chart showing total helmets sold by country.
 - a. On the Type tab, verify that Bar is selected.
 - b. Uncheck Automatically Set Chart Options.
 - c. On the Data tab, in the Layout box, verify that Group is selected.
 - d. From the On Change Of drop-down list, if necessary, select Customer.Country.
 - e. From the Show drop-down list, if necessary, select Sum of @Helmets.



3. Make the bar size smaller than the default setting, and display the total helmets sold per country on each of the bars.
 - a. Select the Options tab.
 - b. From the Bar Size drop-down list, select Average.
 - c. In the Data Points box, select Show Value.

4. Title the chart "Helmets Sold Per Country," and title the Data "Helmets."
 - a. Select the Text tab.
 - b. Uncheck the Title box and type *Helmets Sold Per Country*
 - c. Uncheck the Data Title box and type *Helmets*
 - d. Click OK.
 - e. Preview the chart, then save it.

5. How many sets of data (data series) are displayed in this chart?
One. The data series being displayed is the total helmet sales per country. There are no other data series shown in this chart.

 If the chart displayed multiple sets of data, there would be additional bars representing other totals.

TOPIC B

Modify a Chart

After creating a chart, you might want to make some changes to it. You might want to change the chart from a pie chart to a bar chart, change the titles that appear on the chart, or change it from an Advanced to a Grouped chart. In this topic, you will modify a chart.

As you already know from building several types of reports, you don't often get the results you want the first time. Luckily, Crystal Reports makes modifying reports quick and easy. The same is true for charts. If you don't like a chart's initial results, you can quickly and easily make changes to the chart data or its appearance.

A Bar Chart Changed to a Pie Chart

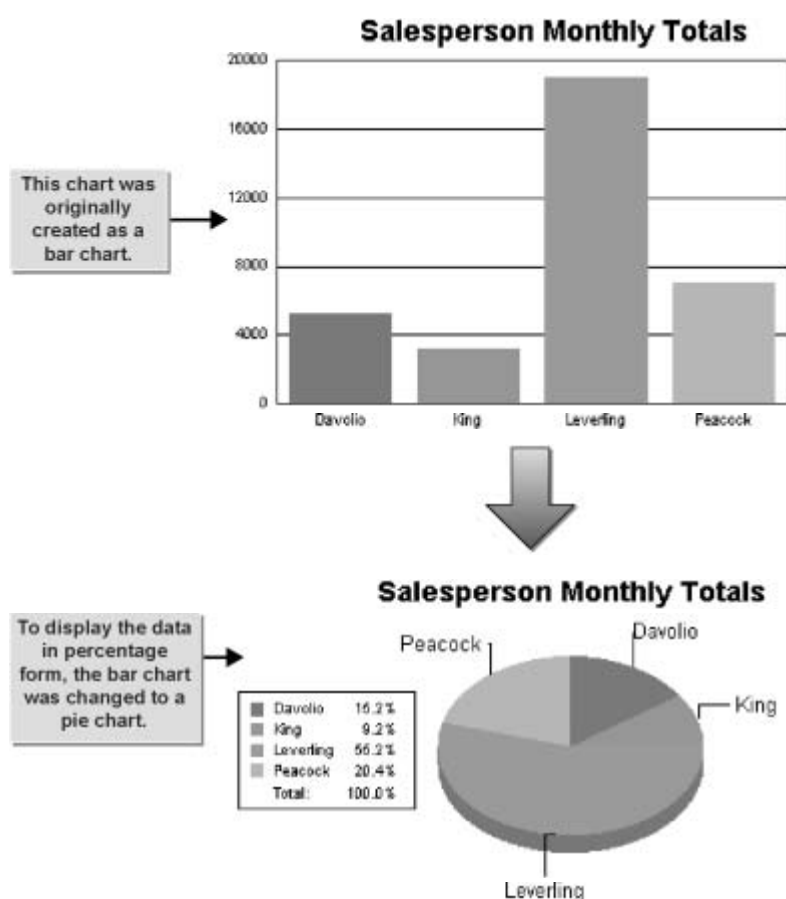


Figure 6-2: You can modify many aspects of a chart, including the chart type.

How to Modify a Chart

Procedure Reference:

To modify a chart:

Options will vary depending on what you need modified.

1. Display the Chart Expert dialog box by right-clicking the chart and choosing Chart Expert, or by selecting the chart, and choosing Format→Chart Expert.
 - On the Type tab, you can change the type of chart.
 - On the Data tab, you can change the placement of the chart and how often the chart will appear on the report.
 - On the Options tab, you can change the type of labels that will appear (data points), the legend placement, and the bar size.
 - On the Text tab, you can select and enter the titles, footnotes, and axis titles for the chart.
2. Click OK to close the Chart Expert dialog box.
3. If you want to modify a specific component of a chart, select that component so that it is individually selected, then right-click it and select the appropriate command.

ACTIVITY 6-2

Modifying a Chart

Setup:

Glove-Helmet Sales.rpt is open in preview.

Scenario:

You have a chart that shows one set of data (helmet sales). You have been asked to add the glove sales data to the same chart. When you're finished, your chart should look like Figure 6-3.

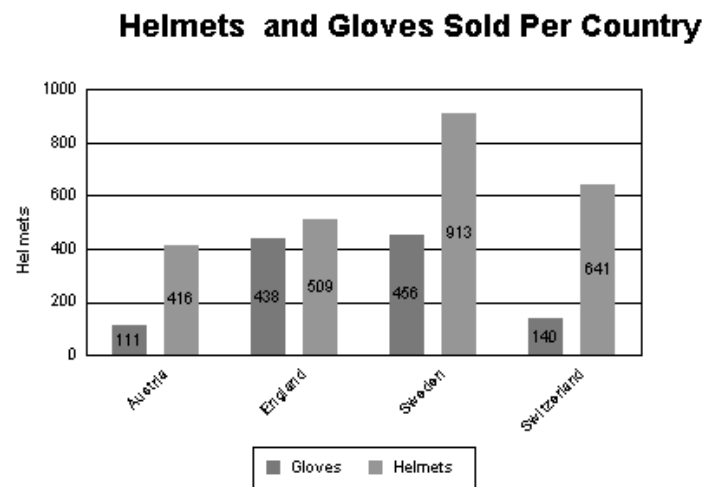


Figure 6-3: The chart after modifying.

What You Do	How You Do It
1. In the Chart Expert, display the Data tab.	a. Right-click the chart and choose Chart Expert. b. Select the Data tab.
2. Change the chart to display total gloves and total helmets sold by country.	a. In the Layout box, select Advanced. b. In the Available Fields list box, select Customer.Country and click the Add button next to the On Change Of list. c. In the Available Fields list box, select Gloves and click the Add button next to the Show Value(s) box. d. In the Available Fields list box, select Helmets and click the Add button next to the Show Value(s) box.

3. Remove the title for data points and move the chart legend to the bottom.
 - a. On the Options tab, in the Data Points box, verify that the Show Label check box is unchecked.
 - b. In the Placement drop-down list, select **Bottom**.

4. Make the change to the title to add the words "and Gloves."

Titles

Auto-Text

Title: ☐ Helmets and Gloves Sold Per Country

- a. On the Text tab, change the title to add the words *and Gloves*
- b. If necessary, remove any text specified for the Data title.
- c. Click OK.

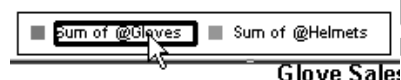
5. Preview the chart. How has the chart changed?

The chart now displays multiple data series: helmets and gloves.

LESSON 6

6. Change the Legend headings to read *Gloves* and *Helmets*

- a. In the Legend, click the Sum of @Gloves label so that a selection border appears around it.



- b. Right-click the selected label, and select Edit Axis Label.

- c. In the Displayed Label field, type *Gloves*



- d. Click OK.

- e. Change the other Legend label to *Helmets*

- f. Save and close the report.

TOPIC C

Create a Top N Chart

When creating a chart to graphically display data, you may sometimes want the chart to only represent a portion of data. In this topic, you'll create a Top N chart to display only a subset of the available data.

At times you might want to show only the “top” or “bottom” producers in a chart. For example, you could show the fastest selling product lines, the least productive sales regions, or the states that generate the most orders.

A Top N Chart

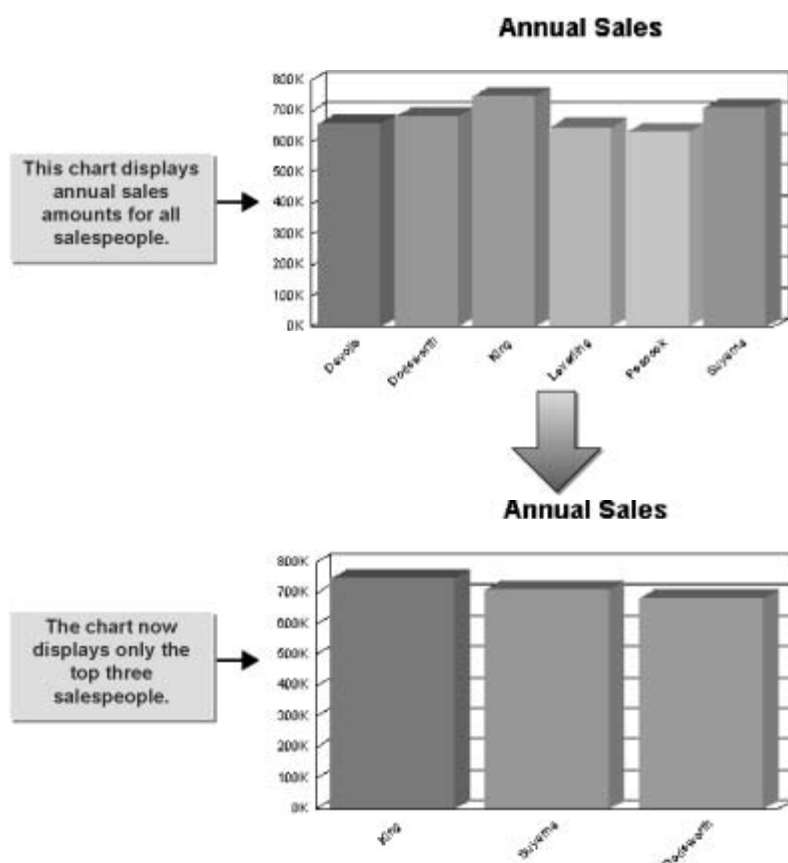


Figure 6-4: A Top N was used to display only the top three salespeople.

How to Create a Top N Chart

Procedure Reference:

To create a Top N chart:

1. Display the Chart Expert.
2. On the Data tab, select the field you want and click the TopN button to display the Group Sort Expert dialog box.
3. In the For This Group Sort list box, select TopN.
4. Select the summary field that the chart will be based on.
5. Enter the number that you want to represent as N (where N is the number of values).
6. Click OK to return to the Chart Expert.
7. Click OK to close the Chart Expert and create the TopN chart.

ACTIVITY 6-3

Creating a Top N Chart

Data Files:

- Sales by Country.rpt

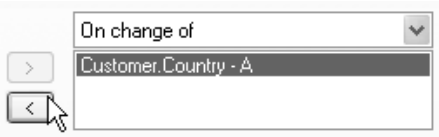
Setup:

There are no files open.

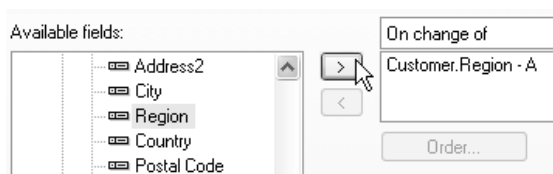
Scenario:

You have a bar chart that displays sales of helmets in five countries: Australia, Canada, England, Germany, and the USA. You want to see the top three regions within each country. You also want to display the data as currency.

What You Do	How You Do It
1. In Sales by Country.rpt, copy the bar chart from the report header into the country group footer.	<div>a. In Sales by Country.rpt, in Design view, right-click the chart in the report header and choose Copy.</div> <div>b. Right-click in the Group Footer section and choose Paste.</div> <div>c. The mouse pointer is holding the chart. In the upper-left corner of the Group Footer, click the mouse button to position the chart.</div>
2. On the chart located in the Group Footer, change the data series to group by region rather than by country.	<div>a. Right-click the chart in the Group Footer and choose Chart Expert.</div> <div>b. On the Data tab, below the On Change Of drop-down list, select Customer.Country-A and click the Remove button.</div>



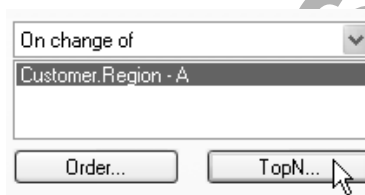
- c. In the Available Fields list box, select **Customer.Region** and click the **Add** button.



3. Display the top three customers in each region.

- a. Below the On Change Of field, select **Customer.Region-A**.

- b. Click the **TopN** button.



- c. From the For This Group Sort drop-down list, select **Top N**.
- d. From the Based On drop-down list, if necessary, select **Sum of Customer.Last Year's Sales**.
- e. In the Where N Is box, type **3**
- f. Verify that the **Include Others, With The Name** option is unchecked.
- g. Click **OK**.

4. Display the data points as dollars.

- a. On the Options tab, in the Data Points box, select **Show Value**.

b. Set the Number format to \$1.00.

Data points

☐ Show label

☒ Show value

Number format:

\$1.00

5. Change the title to *Top Three Regions*

a. On the Text tab, select the title text and type *Top Three Regions*

b. Click OK.

6. Preview the chart. How has the chart changed?

There are five charts showing the top three regions in each country.

Save and close the report.

TOPIC D

Format a Chart

Once you’ve created and modified a chart, you might want to change its appearance. In this topic, you’ll change a chart’s formatting.

Charts are great at displaying complicated data graphically, which makes interpreting data quick and easy. However, if the data labels are illegible, or the default color selections are incompatible, you have a problem. To solve this problem and make your charts more visually appealing, you can format individual chart components. Chart formatting options enable you to change colors, sizes, presentation view, grid options, axis scales, and more.

A Chart with Modified Formatting

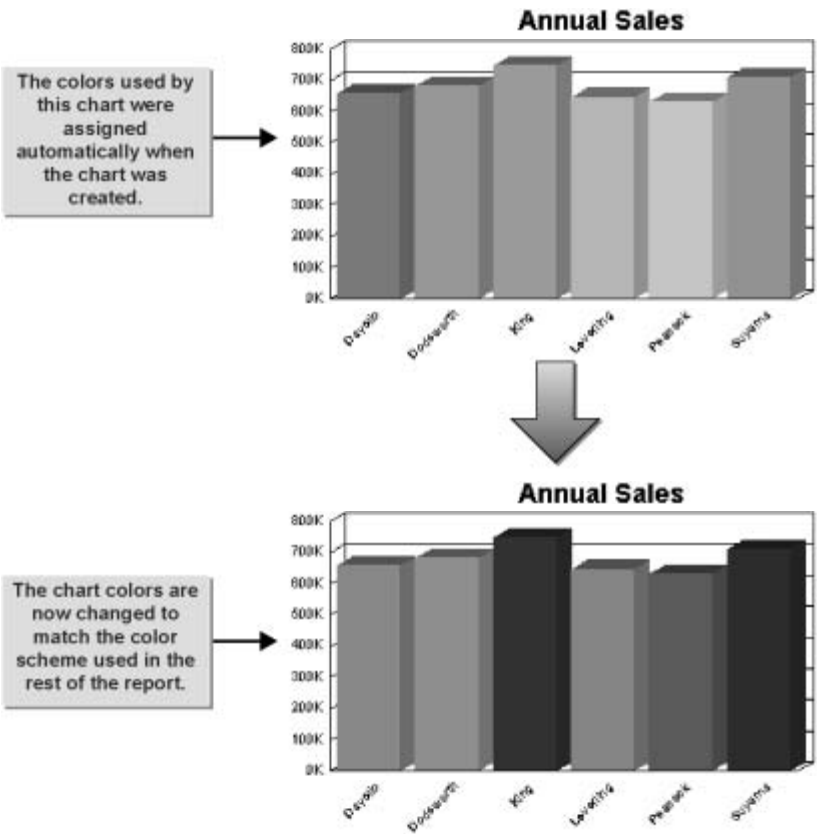


Figure 6-5: One way to adjust a chart’s formatting is to change its colors.

Chart Formatting Options

The following table identifies the format options that are available in the Chart Options submenu:

Chart Format Option	Description
Template	Displays the Choose A Chart Type dialog box to enable you to select a chart template from the Gallery tab or create your own custom chart template from the Custom tab.
General	Displays the Chart Options dialog box to enable you to change the General, Layout, Data Labels, Numbers, Look, and Display Status options.
Titles	Displays the Titles dialog box to enable you to change the Title, Subtitle, Footnote, Group Title, and Data Axis titles.
Grid	Displays the Numeric Axis Grids & Scales dialog box to enable you to change the General, Scales, Labels, Numbers, and Grids options on the Data Axis tab and change the General, Labels, and Grids options on the Group Axis tab.
Selected Item	Provides formatting options specific to the selected chart item.

 Chart Formatting Options

How to Format a Chart

Procedure Reference:

To format a chart:

1. Right-click the chart and choose Chart Options, or select the chart and choose Chart→Chart Options, to display the Chart Options submenu.
 - Choose Template to display the Choose A Chart Type dialog box to apply or customize a template.
 - Choose General to display the Chart Options dialog box to change the General, Layout, Data Labels, Numbers, Look, and Display Status options.
 - Choose Titles to display the Titles dialog box to change the Title, Subtitle, Footnote, Group Title, and Data Axis Title.
 - Choose Grid to display the Numeric Axis Grids & Scales dialog box to change the Data Axis and Group Axis options.
2. Click OK to close the dialog box and apply the changes to the chart.
3. If a chart repeats throughout a report to display data for each set of grouped data, and you want to format one of the charts without impacting the others, then modify it on the Preview tab.
4. If you want to update all charts based on formatting changes you made to a single chart, then right-click the formatted chart and select Apply Changes To All Charts.

ACTIVITY 6-4

Formatting a Chart

Data Files:

- Regional Sales.rpt

Setup:

There are no files open.

Scenario:

You're getting ready to hand in your report but find that it doesn't look the way you want it to. You decide that the data labels would look better if they were placed at the base of the chart and that the blue data series should be purple because that color looks better when transferred to overheads that will be included in each report. When you're finished, your chart should look like Figure 6-6.

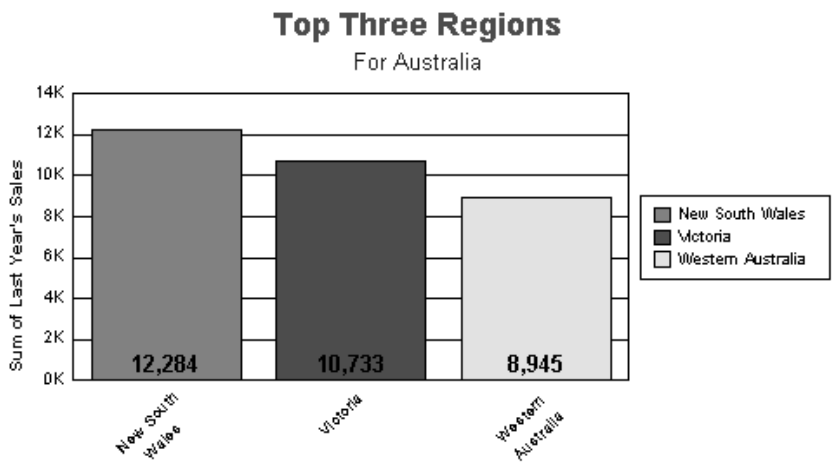


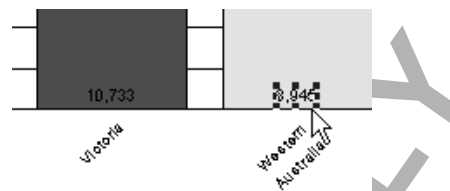
Figure 6-6: The chart after you make changes to the chart options.

What You Do	How You Do It
1. In Regional Sales.rpt, move the data labels for the Region chart to the base of the chart.	<div>a. In Regional Sales.rpt, in Preview, right-click one of the Top Three Regions charts and choose Chart Options→General.</div> <div>b. Select the Data Labels tab and, from the Labels Location drop-down list, select Base Of Chart.</div> <div>c. Verify that Label Format is set to Value.</div> <div>d. Click OK.</div>

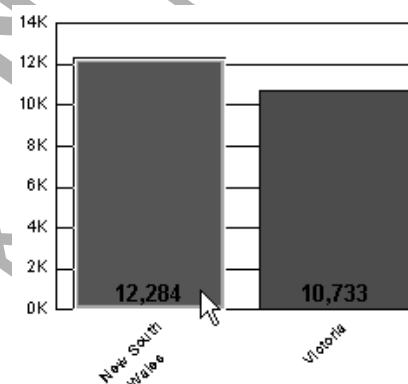
LESSON 6

2. Make the data labels bold and change the blue data series to purple.

- a. On the Region chart, select a data label and right-click the data label.

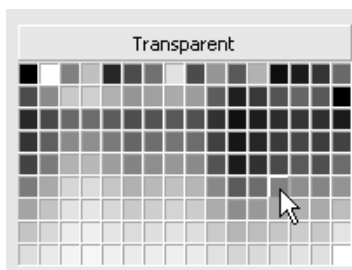


- b. Choose Chart Options→Selected Item.
- c. In the Style drop-down list, select Bold.
- d. In the Size drop-down list, select 10.
- e. Click OK.
- f. Click the blue data series to select it.



- g. Right-click the blue data series to display the shortcut menu and choose Chart Options→Selected Item to display the Formatting dialog box.

- h. Select purple (R6, C13) and click OK to change the blue series to purple.



3. Preview the charts. How have the charts changed?

The changes were only made to the one chart.

4. Apply the changes to all charts and preview the charts.

- Right-click the chart and choose Apply Changes To All Charts.
- In Preview View, scroll to view all the charts.
- Notice that all of the region charts are updated to purple.
- Save and close the report.

TOPIC E

Create a Chart Template

Once you've formatted a chart, you may want to then create a template based on that chart. In this topic, you'll save a chart format as a template.

Let's say that you've created and formatted several beautiful charts and distributed them to your client. The client is so happy about the charts that she has given you some more work to do and wants the charts to look just like the ones you created earlier. You could probably duplicate the appearance of the charts but it's going to take some time. Imagine the time you could save if the chart settings were saved as a template.



A Chart Formatted Based on a Template

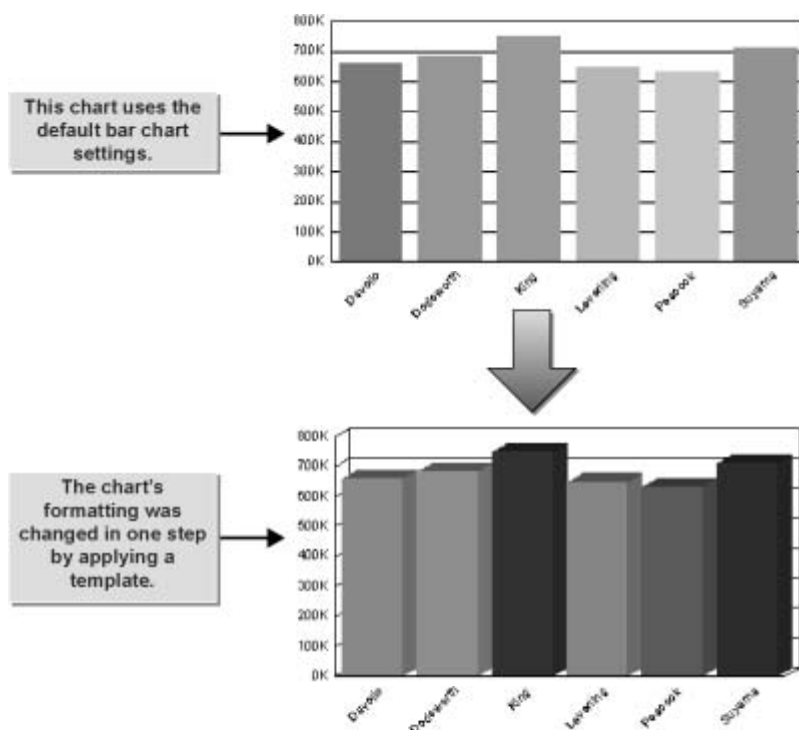


Figure 6-7: You can quickly apply a set of desired chart formatting options using a template.

Template

Definition:

A *template* is a set of chart formatting options that can be used as the starting point for formatting a new chart, or applied to an existing chart. If you have a specific set of chart settings you would like to use again and again, you can save them as a chart template. You can then apply the chart settings to a chart that you create or edit.

Example:

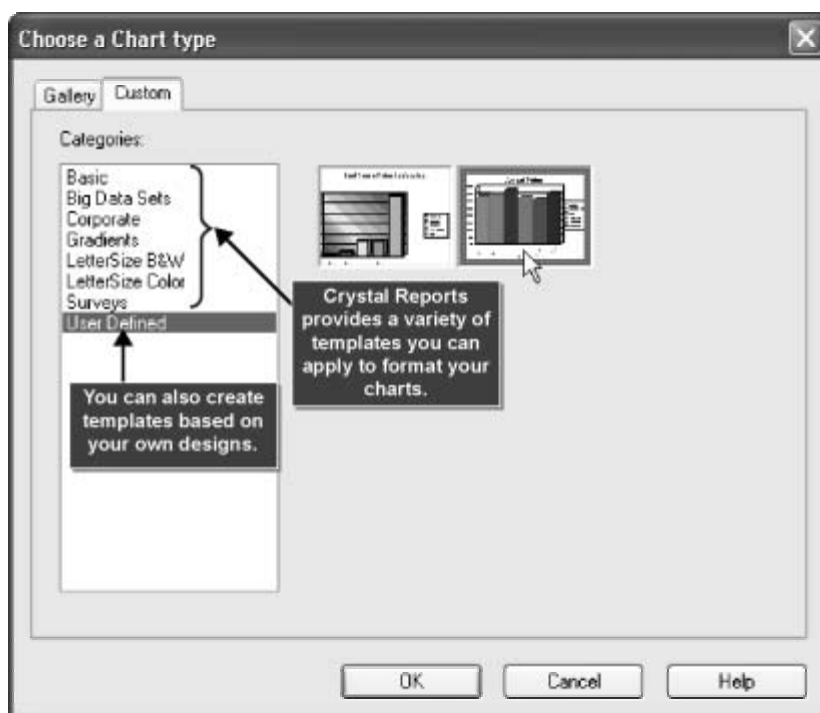


Figure 6-8: You can apply existing templates to your charts, or create your own templates.



Templates are Accessible in the Choose A Chart Type Dialog Box

How to Create a Chart Template

Procedure Reference: Create a Chart Template

To save an existing chart as a template:

1. Make the changes to the chart that you want to save.
2. Right-click the chart and choose Save As Template, or select the chart and choose Chart→Save As Template.
3. Type a name for your chart template and click Save. The template has been saved under User Defined in the Templates dialog box. User Defined chart templates are saved in the user defined template folder. By default, this folder is located at \Program Files\Common Files\Crystal Decisions\2.5\ChartSupport\Templates\User Defined. The only way to delete a user defined template is through Windows Explorer.

Procedure Reference: Apply a Chart Template

To apply a chart template to another chart:

1. Right-click the unformatted chart, and select Chart Options→Template.
2. Select the Custom tab, and in the Categories box, select User Defined.
3. Select the template, then click OK.

ACTIVITY 6-5

Creating a Chart Template

Data Files:

- Sales Report by Region.rpt

Setup:

No files are open.

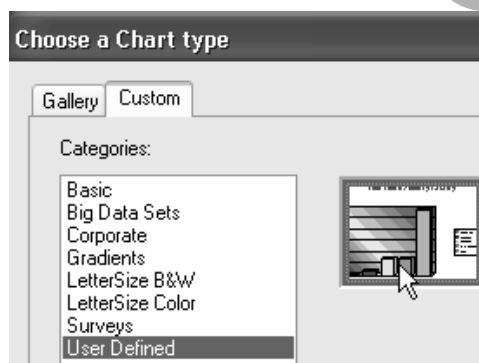
Scenario:

You have spent considerable time with a co-worker determining the format options for a chart. You want to incorporate the same formatting on all future financial reports.

What You Do	How You Do It
1. In Sales Report by Region.rpt, save the formatting from the Last Years Sales by Country chart as a template.	a. In Sales Report by Region.rpt, on the Last Years Sales by Country chart, right-click the chart and select Save As Template. b. Name the template <i>Financial Charts</i> and click Save.

2. Apply the new template to the chart in the Group Footer.

- a. On the Design tab, view the chart in the group footer.
- b. In the chart in the group footer, **right-click and choose Chart Options→Template.**
- c. On the Custom tab, in the Categories box, **select User Defined.**
- d. If necessary, **select the template, then click OK.**



- e. Preview the report.

3. What happened to the rest of the charts?

They were automatically updated.

Save and close the report.

Be sure that your students are in Design view when they apply the template. If they apply the template to a chart on the Preview tab, it will apply only to that instance of the chart, rather than to the chart for each set of grouped data.

Lesson 6 Follow-up

You've worked with charting data to create both single and multiple data charts. The ability to create charts allows you to display data in a graphical format, making it easier to review and make sense of your data at a glance.

1. What do you think are some advantages to using charts?

Answers will vary.

2. Will you use charts in your reports? How?

Answers will vary.

FOR EVALUATION USE ONLY
(C) 2004 Element K Content LLC
DO NOT DUPLICATE

LESSON 7

Reporting on Excel Data

Lesson Time

1 hour(s) to 1 hour(s),
30 minutes

Lesson Objectives:

In this lesson, you will report from Excel data.

You will:

- Create a report based on Excel data.
- Modify a report.
- Update the report.

Introduction

You already know that Crystal Reports can generate reports based on data from many different database sources. But what if you had Excel data that needed to be imported? In this lesson, you'll learn how to use data in your Excel spreadsheet to create a report while you are working directly within Excel.

Imagine you're working along in your Excel spreadsheet that contains hundreds of rows and columns and you think to yourself that this information would make more sense if it were displayed in a Crystal Reports report. The last thing you want to do is convert data. Fortunately, you don't have to. You can highlight a range of cells in the Excel spreadsheet and launch a Crystal Report Wizard.

TOPIC A

Create a Report Based on Excel Data

At some point, you might have access to data in an Excel database that you think would be useful in a Crystal Reports report. Crystal Reports makes it possible to use your Excel spreadsheet as your data source. In this topic, you'll build a report based on an Excel spreadsheet.

You're probably familiar with pulling data from several different types of databases. One source you might have overlooked is Excel. The ability to create reports based on your existing Excel files saves you time, because you don't have to re-enter data, and you can generate your report while you're working in the Excel application.

 A Report Based on Excel Data

	A	B	C	D
1	First	Last	Month	Sales
2	Bobbie	Dempsey	January	\$52,480
3	Brent	Duncan	January	\$32,000
4	Jean	Duncan	January	\$78,020
5	Nancy	Hawkins	January	\$47,800
6	Bobbie	Dempsey	February	\$62,320
7	Brent	Duncan	February	\$41,250
8	Jean	Duncan	February	\$67,500
9	Nancy	Hawkins	February	\$50,650
10	Bobbie	Dempsey	March	\$55,530
11	Brent	Duncan	March	\$39,350
12	Jean	Duncan	March	\$82,680
13	Nancy	Hawkins	March	\$46,950

This Excel spreadsheet stores data for first quarter sales amounts for several salespeople.

January

Bobbie	Dempsey	January	\$52,480.00
Brent	Duncan	January	\$32,000.00
Jean	Duncan	January	\$78,020.00
Nancy	Hawkins	January	\$47,800.00
		January	\$210,380.00

February

Bobbie	Dempsey	February	\$62,320.00
Brent	Duncan	February	\$41,250.00
Jean	Duncan	February	\$67,500.00
Nancy	Hawkins	February	\$50,650.00
		February	\$221,720.00

March

Bobbie	Dempsey	March	\$55,530.00
Brent	Duncan	March	\$39,350.00
Jean	Duncan	March	\$82,680.00
Nancy	Hawkins	March	\$46,950.00
		March	\$224,510.00

This report was generated directly from the Excel spreadsheet.


Figure 7-1: You can convert an Excel spreadsheet directly to a Crystal Reports report.

Set Up the Data Source

Before you use your Excel data for your Crystal Reports report, you need to make sure the data is entered properly in the spreadsheet so that it can be used flawlessly in Crystal Reports. Use the following list as a means of checking the data in the spreadsheet before you use it in Crystal Reports.

Before you use Excel as the data source, make sure:


- The data is in simple column/field format.
- There is one row for column headings and all subsequent rows show field data only.
- There are no merged cells.
- There are no subtotals.
- There are no entirely blank rows or columns in the data.

 A limitation of the Excel Crystal Add-on tool is that the Excel data file cannot be moved. If the file is moved, the report will not be usable. The "set location" feature does not work reliably with Excel data files.

How to Create a Report Based on Excel Data

Procedure Reference:

To create a report based on Excel data:

 When you create a file from Excel data, the title you assign to your report will get stored in the Summary Information property box. If the file name is later changed, the original title will appear in the upper-left corner of the screen rather than the file name. This can be changed by removing the information stored in the File→Summary Information menu option.

1. In Excel, click the Crystal Reports Wizard button to open the Crystal Reports Wizard.
2. Select the range of data including column headings.
 - Drag to select the range of data to include.
 - Click any cell within the data range, then click the Expand button to select the entire range.
3. Click the Create Crystal Report button to open the Crystal Reports Wizard.
4. Add the fields to the Fields To Display list box, then click Next.
5. If desired, add any fields you want to group in the Group By list, then click Next.
6. If desired, add the fields you want to total in the Summarized Fields list, then click Next.
7. If desired, set the selection criteria, then click Next.
8. If desired, select a style and enter a title and location for your report, then click Next.
9. Specify how you want to save and view the report.
10. Click Finish to preview the report.

ACTIVITY 7-1

Creating a Report Based on Excel Data

Data Files:

- Personnel.xls

Scenario:

You have some employee information stored in an Excel spreadsheet that you want to display as a report. The spreadsheet is named Personnel.xls. When you're finished, your report should look like Figure 7-2.

6/11/2004

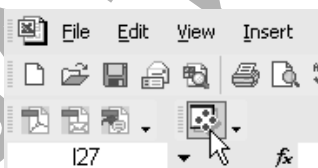
Emp ID	Last name	First Name	City	State	Phone
EN1-10	Cole	Daniel	Walworth	NY	(315) 898-5931
EN1-12	Anderson	Jacqueline	Adams Basin	NY	(315) 855-0037
EN1-15	Rubenstein	Sarah	Holley	NY	(716) 855-8265
EN1-16	Gordon	Anne	Hulberton	NY	(315) 852-4703
EN1-19	Majid	Indera	Leicester	NY	(716) 898-3966
EN1-20	MacKenzie	Lauren	Shortsville	NY	(315) 898-5664
EN1-22	Hernandez	Natalie	Knowlesville	NY	(315) 821-7474
EN1-23	Osborne	William	South Byron	NY	(315) 855-0856
EN1-25	Chu	Laurie	Perkinsville	NY	(315) 876-4367
EN1-26	O'Brien	Sean	Pultneyville	NY	(315) 887-2208
EN1-27	Osborne	Suzanne	South Byron	NY	(315) 855-0856
EN1-28	Miller	Anthony	Lakeville	NY	(315) 887-6975
EN1-30	Micelli	Thomas	Gorham	NY	(315) 821-3730
EN1-33	Guya	Amy	Rose	NY	(315) 813-5574
EN1-35	Baranco	Steven	Oaks Corners	NY	(315) 887-3956
EN1-36	Roslyn	Elizabeth	Wyoming	NY	(315) 821-3782
EN1-38	Schaaf	Carol	Gorham	NY	(315) 813-3397
EN1-39	Meyer	Edward	Wayland	NY	(315) 898-2944
EN1-40	Wing	Alexandra	Holley	NY	(315) 887-2985
EN1-41	McDermott	Lucas	Dresden	NY	(315) 813-6488
EN1-43	Oowski	Robert	Retsof	NY	(716) 855-2209
EN1-45	DiPaolo	Evelyn	Leicester	NY	(716) 821-2978
EN1-48	Williams	Gayle	Hall	NY	(315) 813-4833
EN1-50	Eisenberg	Carolyn	Pultneyville	NY	(315) 876-2124
EN1-53	Higgins	Paul	Ionia	NY	(716) 898-2012

Figure 7-2: The report after it's generated from Excel.

What You Do**How You Do It**

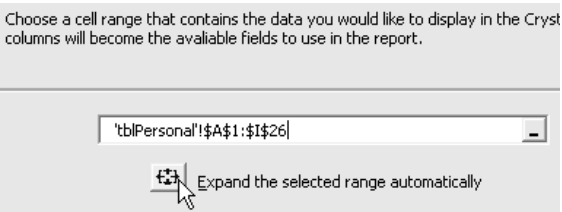
1. In Personnel.xls, start the Crystal Reports Wizard and select the entire worksheet data.

- a. Start Excel and open Personnel.xls.
- b. Click the Crystal Reports Wizard button.



- c. Click any cell in the range that contains the data you would like to display in the report.

- d. Click the Expand button to expand the selected range automatically.



- e. Click the Create Crystal Report button to open the Crystal Reports Wizard to choose the information to display on the report.

- | | |
|--|---|
| <p>2. Add the Emp ID, Last Name, First Name, City, State, Phone, and Hire Date fields to the report.</p> | <ul style="list-style-type: none">a. In the Available Fields list box, double-click Emp ID to add it to the Fields To Display list box.b. Double-click Last Name, First Name, City, State, Phone, and Hire Date to add them to the Fields To Display list box. |
| <p>3. Continue through the wizard naming the report <i>Benefit Enrollment.rpt</i>.</p> | <ul style="list-style-type: none">a. Click Next four times to reach the Save panel of the wizard.b. Browse to locate the 085516Data folder.c. In the File Name text box, type <i>Benefit Enrollment</i> and click Save.d. Click Finish. |
| <p>4. In the maximized Preview window, view the completed report at 100% zoom.</p> | <ul style="list-style-type: none">a. Maximize the Preview window.b. If necessary, in the Preview window, change the zoom to 100%. |
| <p>5. <u>False</u> True or False? You can adjust the size and position of fields in this Preview window.</p> | |
| <p>6. Close the Preview window, exit Excel, and open the file from within Crystal Reports.</p> | <ul style="list-style-type: none">a. Close the Preview window and exit Excel.b. If necessary, start Crystal Reports and open <i>Benefit Enrollment.rpt</i>. |

7. Preview the report and increase the Zoom to 100%.
 - a. Preview the report.
 - b. Change the Zoom Control to 100%.
8. What needs to be fixed in the report?

The size and position of some fields are too small or too large, the Hire Date field is set to date/time format, and the names are in no particular order.

TOPIC B

Modify a Report Generated from Excel Data

After you create a report based on Excel data, you're ready to make some changes to the report. In this topic, you'll use Crystal Reports to modify a report based on Excel data.

When you need to make changes to the report that is based on Excel data, do you modify the Crystal Reports report? What about keeping your data in Excel current? If you need to modify the Excel data to add, delete, or edit, information, you make your changes in Excel and then update your report in Crystal Reports. In this case, you only have to change a data source once which is a helpful timesaver.

This report generated from Excel data includes far too much white space, but can be modified to fix the problem within Crystal Reports.

Bobbie	Dempsey	January	
Brent	Duncan	January	\$52,480.00
Jean	Duncan	January	\$32,000.00
Nancy	Hawkins	January	\$78,020.00
		January	\$47,800.00
		January	\$210,300.00
Bobbie	Dempsey	February	
Brent	Duncan	February	\$62,320.00
Jean	Duncan	February	\$41,250.00
Nancy	Hawkins	February	\$67,500.00
		February	\$50,650.00
		February	\$221,720.00
Bobbie	Dempsey	March	
Brent	Duncan	March	\$55,530.00
Jean	Duncan	March	\$39,350.00
Nancy	Hawkins	March	\$82,680.00
		March	\$46,950.00




A Report Based on Excel Data that Contains too Much White Space

Figure 7-3: You may need to modify a report generated from Excel data.

How to Modify a Report Generated from Excel Data

Procedure Reference:

To modify a report based on Excel data:

-  Options will vary depending upon the report needs.
- 1. In Crystal Reports, resize and reposition fields so the data is visible.
- 2. If necessary, change the format of any date fields.
- 3. Sort the report data as desired.
- 4. Save the report.

ACTIVITY 7-2

Modifying a Report Based on Excel Data

Setup:

Benefit Enrollment.rpt is open.

Scenario:

Your report needs some changes. It's not in alphabetical order, some of the fields are too large, and not all of the data is visible. When you're finished, it should look like Figure 7-4.

5/12/2004						
Emp ID	Last name	First Name	City	State	Phone	Hire Date
EN1-12	Anderson	Jacqueline	Adams Basin	NY	(315) 855-0037	1/30/90
EN1-35	Baranco	Steven	Oaks Corners	NY	(315) 887-3956	1/24/89
EN1-25	Chu	Laurie	Perkinsville	NY	(315) 876-4367	8/20/97
EN1-10	Cole	Daniel	Walworth	NY	(315) 898-5931	11/13/89
EN1-45	DiPaolo	Evelyn	Leicester	NY	(716) 821-2978	7/10/91
EN1-50	Eisenberg	Carolyn	Pultneyville	NY	(315) 876-2124	8/20/92
EN1-16	Gordon	Anne	Hulberton	NY	(315) 852-4703	8/31/94
EN1-33	Guya	Amy	Rose	NY	(315) 813-5574	3/27/92
EN1-22	Hernandez	Natalie	Knowlesville	NY	(315) 821-7474	8/2/88
EN1-53	Higgins	Paul	Ionia	NY	(716) 898-2012	1/10/94
EN1-20	MacKenzie	Lauren	Shortsville	NY	(315) 898-5664	4/20/93
EN1-19	Majid	Indera	Leicester	NY	(716) 898-3966	9/16/93
EN1-41	McDermott	Lucas	Dresden	NY	(315) 813-6488	8/25/89
EN1-39	Meyer	Edward	Wayland	NY	(315) 898-2944	5/25/88
EN1-30	Micelli	Thomas	Gorham	NY	(315) 821-3730	12/14/92
EN1-28	Miller	Anthony	Lakeville	NY	(315) 887-6975	2/21/88
EN1-26	O'Brien	Sean	Pultneyville	NY	(315) 887-2208	11/12/94
EN1-27	Osborne	Suzanne	South Byron	NY	(315) 855-0856	3/3/90
EN1-23	Osborne	William	South Byron	NY	(315) 855-0856	6/4/85
EN1-43	Oowski	Robert	Retsof	NY	(716) 855-2209	11/11/89
EN1-36	Roslyn	Elizabeth	Wyoming	NY	(315) 821-3782	2/15/95
EN1-15	Rubenstein	Sarah	Holley	NY	(716) 855-8265	6/4/82
EN1-38	Schaaf	Carol	Gorham	NY	(315) 813-3397	8/21/95
EN1-48	Williams	Gayle	Hall	NY	(315) 813-4833	9/24/93
EN1-40	Wing	Alexandra	Holley	NY	(315) 887-2985	3/11/88

Figure 7-4: The report after it's modified.

What You Do

How You Do It

1. What is wrong with the size and position of the fields and the hire date field?

The hire date field is cut off. Most of the fields can be made smaller and moved to the left to accommodate the hire date field.

2. How can you efficiently resize the fields so that each one is just large enough to display its contents?

Resize the fields on the Preview tab so you can see the data as you resize the fields.

3. Resize and reposition fields so that all the fields and all the data are visible.

- a. On the Preview tab, resize the Emp ID, Last Name, First Name, City, State, and Phone fields so that each field is just large enough to display its contents.

Emp ID	Last Name	First Name	City	State	Phone	Hire Date
EN1-10	Care	Daniel	Albany	NY	(515) 898-9991	11/11/1999 12:00:00AM
EN1-12	Anderson	Jacqueline	Albany	NY	(515) 895-9121	12/01/1999 12:00:00AM
EN1-15	Robertson	Sarah	Haley	NY	(718) 955-8265	04/01/992 12:00:00AM
EN1-16	O'connor	Aimee	Hazlet	NY	(515) 852-4703	05/01/1994 12:00:00AM
EN1-19	Mull	Isidore	Lakewood	NY	(718) 999-2066	01/01/1993 12:00:00AM
EN1-20	McKenzie	Lauren	Shoreville	NY	(515) 898-8664	02/01/1993 12:00:00AM
EN1-22	Hernandez	Natalie	Knowltonville	NY	(515) 821-7474	02/01/1998 12:00:00AM
EN1-23	O'Sullivan	William	South Byron	NY	(515) 855-8956	04/01/1995 12:00:00AM
EN1-25	Che	Laure	Perkinsville	NY	(515) 876-4367	02/01/1997 12:00:00AM
EN1-26	O'Brien	Sean	Pulneyville	NY	(515) 887-2259	11/01/1994 12:00:00AM
EN1-27	O'Sullivan	Suzanne	South Byron	NY	(515) 855-8956	03/01/1993 12:00:00AM
EN1-29	Miler	Anthony	Lakewood	NY	(515) 887-6075	02/01/1998 12:00:00AM
EN1-30	McCall	Thomas	O'Connell	NY	(515) 821-3730	12/01/1992 12:00:00AM
EN1-32	O'neal	Amy	Rose	NY	(515) 813-5574	02/01/1992 12:00:00AM
EN1-35	Sacento	Steven	Oak Corners	NY	(515) 887-1968	10/01/1999 12:00:00AM
EN1-36	Ridley	Elizabeth	Wyoming	NY	(515) 821-3782	01/01/1995 12:00:00AM
EN1-39	Schwarz	Carol	Gotham	NY	(515) 813-2367	02/01/1995 12:00:00AM
EN1-39	Meyer	Edward	Wayland	NY	(515) 898-2944	02/01/1999 12:00:00AM
EN1-40	Wing	Alexandra	Haley	NY	(515) 887-2985	01/01/1998 12:00:00AM
EN1-41	McDermott	Lucas	Oswego	NY	(515) 813-8489	03/01/1999 12:00:00AM
EN1-43	O'Connell	Robert	Palmer	NY	(718) 955-2209	11/01/1999 12:00:00AM
EN1-45	O'Connell	Evlyn	Lakewood	NY	(718) 821-2978	01/01/1991 12:00:00AM
EN1-48	Williams	Gayle	Hall	NY	(515) 813-4823	02/01/1993 12:00:00AM
EN1-50	Steinberg	Cashlyn	Pulneyville	NY	(515) 876-2124	02/01/1992 12:00:00AM
EN1-53	Higgins	Paul	Tona	NY	(718) 898-2012	11/01/1994 12:00:00AM

4. What is wrong with the format of the Hire Date field?

It includes a date and time format.

5. Change the Hire Date format from date/time to mm/dd/yy and then decrease the size of the Hire Date field.

- a. Right-click the Hire Date field and choose Format Field.
- b. On the Date and Time tab, in the Style list, choose 3/1/99 and click OK.
- c. Adjust the Hire Date field size as necessary.

6. Sort the list by last name then first name, in ascending order.

a. Click the Record Sort Expert button.

b. Add the Last Name and First Name fields to the Sort Fields list box.

c. Verify that Sort Direction is set to Ascending.

d. Click OK.

e. Preview the report.
7. Apply bold formatting to the field labels.

a. In Design view, right-click the gray area of the Page Header section, and choose Select All Section Objects.

b. In the Formatting toolbar, click the Bold button.

c. Preview the report.

d. Save the report.

TOPIC C

Update Data in a Report Based on Excel Data

After you have created a report from Excel data and then made changes to the appearance of the report in Crystal Reports, you may need to update the spreadsheet data. In this topic, you'll make changes to the report in Excel and then update the report in Crystal Reports.

At times, the Excel data upon which a report is based may change. This is especially true when you're working with employee information. New employees will be added and employees' names or addresses will change. You don't want to have to update this information in two places. Instead, you would like to make the modifications to your Excel data and then update the report in Crystal Reports.

Updating a Report when the Excel Data on Which it is Based has Changed

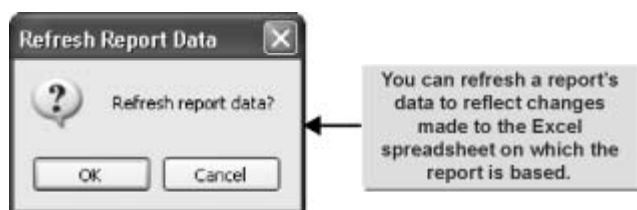


Figure 7-5: You can update the data in a report that is based on an Excel spreadsheet.

How to Update Data in a Report Based on Excel Data

Procedure Reference:

To update the report data:

1. Exit Crystal Reports.
2. Start Excel and open the spreadsheet.
3. Make changes to the data in the spreadsheet (as necessary).
 - Add rows or columns of new data
 - Modify existing data (replace text)
 - Delete rows or columns of data
4. Save the spreadsheet and Exit Excel.
5. In Crystal Reports, open the report and choose Report→Refresh Report Data (or press F5) and click OK to refresh the report.

ACTIVITY 7-3

Updating the Report in Crystal Reports

Setup:

Benefit Enrollment is open.

Scenario:

Two new employees have joined the company, and another employee was married. You need to modify the file in Excel and then update the report in Crystal Reports. When you're finished, your report should look like Figure 7-6.

6/11/2004

Emp ID	Last Name	First Name	City	State	Phone	Hire Date
EN1-35	Baranco	Steven	Oaks Corners	NY	(315) 887-3956	1/24/89
EN1-25	Chu	Laurie	Perkinsville	NY	(315) 876-4367	8/20/97
EN1-10	Cole	Daniel	Walworth	NY	(315) 898-5931	11/13/89
EN1-29	Davis	Jane	Victor	NY	(315) 555-9898	2/16/98
EN1-45	DiPaolo	Evelyn	Leicester	NY	(716) 821-2978	7/10/91
EN1-50	Eisenberg	Carolyn	Pultneyville	NY	(315) 876-2124	8/20/92
EN1-16	Gordon	Anne	Hulberton	NY	(315) 852-4703	8/31/94
EN1-33	Guya	Amy	Rose	NY	(315) 813-5574	3/27/92
EN1-22	Hernandez	Natalie	Knowlesville	NY	(315) 821-7474	8/2/88
EN1-53	Higgins	Paul	Ionia	NY	(716) 898-2012	1/10/94
EN1-20	MacKenzie	Lauren	Shortsville	NY	(315) 898-5664	4/20/93
EN1-19	Majid	Indera	Leicester	NY	(716) 898-3966	9/16/93
EN1-41	McDermott	Lucas	Dresden	NY	(315) 813-6488	8/25/89
EN1-39	Meyer	Edward	Wayland	NY	(315) 898-2944	5/25/88
EN1-30	Micelli	Thomas	Gorham	NY	(315) 821-3730	12/14/92
EN1-28	Miller	Anthony	Lakeville	NY	(315) 887-6975	2/21/88
EN1-26	O'Brien	Sean	Pultneyville	NY	(315) 887-2208	11/12/94
EN1-27	Osborne	Suzanne	South Byron	NY	(315) 855-0856	3/3/90
EN1-23	Osborne	William	South Byron	NY	(315) 855-0856	6/4/85
EN1-43	Osowski	Robert	Retsof	NY	(716) 855-2209	11/11/89
EN1-36	Roslyn	Elizabeth	Wyoming	NY	(315) 821-3782	2/15/95
EN1-15	Rubenstein	Sarah	Holley	NY	(716) 855-8265	6/4/82
EN1-38	Schaaf	Carol	Gorham	NY	(315) 813-3397	8/21/95
EN1-12	Smith	Jacqueline	Adams Basin	NY	(315) 855-0037	1/30/90
EN1-48	Williams	Gayle	Hall	NY	(315) 813-4833	9/24/93
EN1-40	Wing	Alexandra	Holley	NY	(315) 887-2985	3/11/88

Figure 7-6: The report after it's been updated in Excel.

What You Do

How You Do It

- Exit Crystal Reports, and display Personnel.xls.
 - In Crystal Reports, close the report.
 - Exit Crystal Reports.
 - Start Excel and open Personnel.xls.
- Change Jacqueline Anderson's last name to *Smith*.
 - Click the cell that contains the last name Anderson.
 - On the Formula bar, place the insertion point at the end of the word Anderson.
 - Backspace to erase the word Anderson.
 - Type *Smith*

3. Add the following employee to the end of the spreadsheet:

EN1-45 Donahue John 5 Main Street Victor NY 14514-3309 (315) 555-3422 3/2/99

- Click the last row and type *EN1-55* and press Tab.
- Enter the last name *Donahue*
- Enter the first name *John*
- Enter the address *5 Main Street*
- Enter the city *Victor*
- Enter the state *NY*
- Enter the ZIP Code *14514-3309*
- Enter the phone number *(315) 555-3422*
- Enter the hire date *3/2/99*

4. Add the following employee to the middle of the spreadsheet:

EN1-29 Davis Jane 4 Main Street Victor NY 14514-3309 (315) 555-9898 2/16/98

- Place the insertion point in the middle of the spreadsheet and choose Insert→Rows.
- Click the first cell in the blank row, and type *EN1-29* and press Tab.
- Enter the last name *Davis*
- Enter the first name *Jane*
- Enter the address *4 Main Street*
- Enter the city *Victor*
- Enter the state *NY*
- Enter the ZIP Code *14514-3309*
- Enter the phone number *(315) 555-9898*
- Enter the hire date *2/16/98*

5. Save the spreadsheet and exit Excel.

- Choose File→Save.
- Choose File→Exit.

LESSON 7

6. Reopen the Benefit Enrollment report in Crystal Reports and refresh the data.
 - a. Start Crystal Reports and open Benefit Enrollment.
 - b. Choose Report→Refresh Report Data.
 - c. Click OK.
-

7. How has the updated data changed?

Jacqueline Smith's name has been changed. The range being reported was expanded to include the employee Jane Davis inserted into the middle of the report. However, the employee John Donahue, who was added to the end of the report, outside the original range, was not included.

Save and close the report.

Lesson 7 Follow-up

You now know how to create, modify, and update Crystal Reports from right inside your Excel spreadsheet. Not only will this skill save you time doing your job, it will also give you another source for data and information processing.

1. What kinds of reports do you think you'll create with your Excel spreadsheet data?

Answers will vary.

2. What do you like about using Excel data to build reports? What do you dislike?

Answers will vary.

Follow-up

You now know how to create complex reports and data sources using Crystal Reports' tools so that you can tap into the power of your company's information.

1. **Of the tools covered in this course, which one(s) will you use the most? Which one(s) will you use the least?**

Answers will vary.

2. **What do you feel is the biggest advantage of using Crystal Reports? Why? What is the biggest disadvantage? Why?**

Answers will vary.

3. **Of the tools covered in this course, which one did you like the most? Why? Which one did you like the least? Why?**

Answers will vary.

What's Next?

This course is the last in the series. If you're not working with direct PC database connections, you might want to take courses related to Fundamentals of Querying, Advanced Querying, and Relational Database Design.

FOLLOW-UP

FOR EVALUATION USE ONLY
(C) 2004 Element K Content LLC
DO NOT DUPLICATE

APPENDIX A

Inserting a Geographic Map

Lesson Time

1 hour(s) to 1 hour(s),
30 minutes

Objectives:

In this lesson, you will insert a geographic map.

You will:

- Insert a geographic map into a report.

Introduction

At times, you'll find that the report information you want to present is most effective when presented graphically. You know this is true based on your experience with creating and modifying charts. In this Appendix, you'll learn how to use geographic maps to enhance the data in your report.

Imagine that you had some complex geographical data and needed a simple way to present it. For example, let's say you wanted to show the highest sales by region. Currently this information is displayed in a chart. To have even greater impact, you could present the information as a map, highlighting or color coding the countries with the highest sales. This makes interpreting large amounts of data quick and easy.

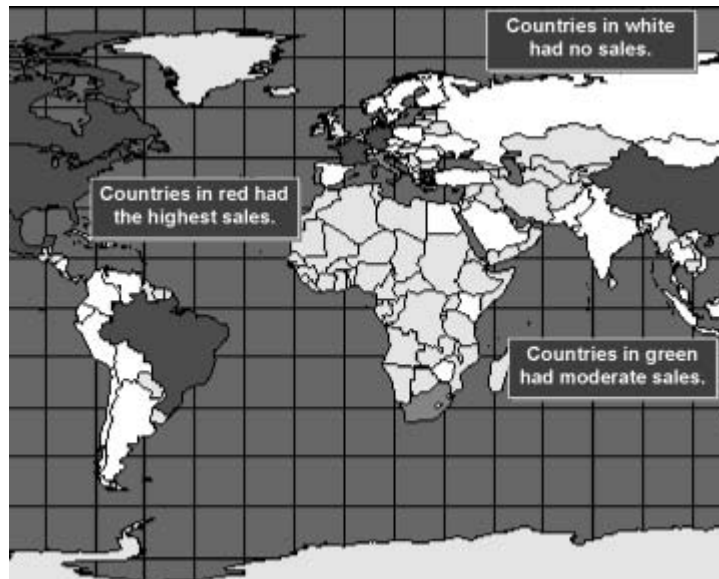


Figure A-1: This map indicates the level of sales from each country.

TOPIC A

Insert a Map

You've already learned how to use a pie and bar chart to help present your data. What if you had data that represented a particular region or country? Wouldn't a map make more sense to the viewers of the report? In this Appendix, you'll insert a geographic map into your report.

Let's say you have a long report showing sales data regarding several products from different regions. Trying to interpret all this data could be confusing and time consuming. If you displayed the products as colors on a map of the regions, you could analyze the information more quickly and easily.

A Geographic Map Based on
Report Data

How to Insert a Map

Procedure Reference:

To create a map:

1. Choose Insert→Map to display the Map Expert dialog box.
2. On the Data tab, in the Layout section, select the layout of the map depending on the data you wish to map.
 - Select the Advanced option view when you have multiple map values. You determine which fields are used such as the On change of value, and the map value. You can also set summary options.
 - Select the Group option view if you have at least one group and at least one summary field in your report.
 - Select the Cross-tab layout button when mapping on a cross-tab object.
 - Select the OLAP view option to map to an OLAP object.
3. On the Type tab, specify the type of map, as well as color and interval options to apply to the mapped data.
4. On the Text tab, specify a map title and legend options.

ACTIVITY A-1

Inserting a Geographic Map

Scenario:

Xtreme Bicycle sells products internationally, and you have been asked to create a geographic map that shows the customer density by country. You decide to use six different colors showing the number of customers in the countries (with white being the lowest and red being the highest.) The darker the color, the more customers in that country. Figure A-2 shows an example of the completed map.

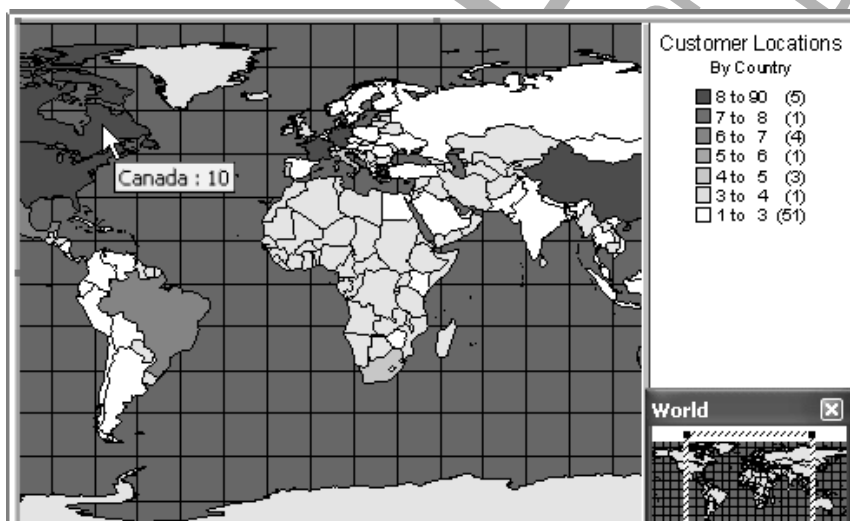


Figure A-2: The completed map with the Tooltip displaying the number of customers.

What You Do

How You Do It

1. Create a new report based on xtreme.mdb using the Customer table.

a. Click the New button and choose As A Blank Report and click OK.

b. In the Available Data Sources list, expand the Current Connections folder and expand the C:\085516Data\xtreme.mdb folder.

If this Appendix is not keyed on the same day as the rest of the course, then you will expand the History folder in step 1b, instead of the Current Connections folder.

c. Expand Tables and add the Customer table.

d. Click OK.

2. You want the countries in the map to change colors based on customer counts within each country. Insert a map based on the selections from the Data tab shown in the following graphic.

a. Choose Insert→Map.

b. On the Data tab, verify that Place Map is set to Once Per Report.

c. In the Geographic Field text box, add the Customer.Country field.

d. In the Map Values field, add Customer.Customer Name.

e. Notice that the default summary value will change to "Count" since this is a text field.



Map values:
Count of Customer.Customer Name

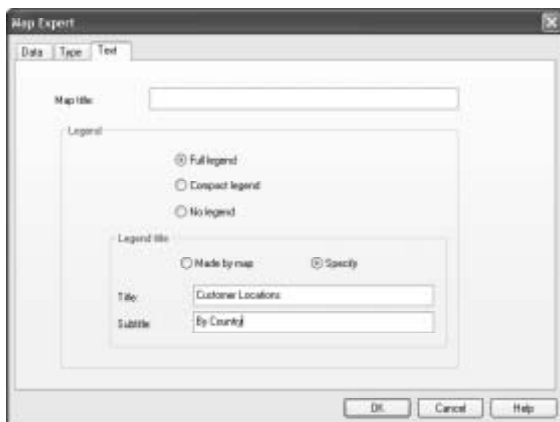
Students might get a message to install the map DLL files. You should have your installation CD handy just in case they run into this problem.

3. On the Type tab, make the selections shown in the following graphic.



- Select the Type tab and verify that Ranged is selected.
- Change Number Of Intervals to 7
- Verify that Distribution Method is set to Equal Count.
- From the Color Of Highest Interval drop-down list, select Red.
- From the Color Of Lowest Interval drop-down list, select White.

4. On the Text tab, set the following options.



- Select the Text tab, and if necessary, delete the text in the Map Title text box.
- In the Legend section, verify that Full Legend is selected.
- In the Legend Title section, select Specify.
- In the Title text box, type *Customer Locations*
- In the Subtitle text box, type *By Country*

5. Exit the Map Expert dialog box to apply the settings and preview the report.

- Click OK.
- Preview the report.
- With the map object selected, position the mouse over the colored sections of the map to display a ToolTip.

6. What country has the most customers?
The United States.

7. Save and close the report.

a. Save the report as *Customer Locations.rpt*

b. Close the report.

FOR EVALUATION USE ONLY
(C) 2004 Element K Content LLC
DO NOT DUPLICATE

LESSON LABS

Due to classroom setup constraints, some labs cannot be keyed in sequence immediately following their associated lesson. Your instructor will tell you whether your labs can be practiced immediately following the lesson or whether they require separate setup from the main lesson content.

LESSON 1 LAB 1

Creating Running Totals

Data Files:

- ShippingInfo.rpt

Scenario:

You work for a company that sells bicycles and equipment. As manager of the shipping department, you keep a report called ShippingInfo.rpt to track orders. You have been asked how many orders were shipped via UPS and Federal Express as of May 1, 2002. Create a running total showing UPS and FedEx shipments. When you're finished, your report will look like Figure 1-A. You can also compare your report to the solution file ShippingInfoComplete.rpt.

2002 Orders

Order	Ship	Ship Via	UPS Shipments	Fed Ex Shipments
12/30/01	01/01/02	Loomis	0	0
12/28/01	01/01/02	Purolator	0	0
12/30/01	01/03/02	UPS	1	0
12/30/01	01/03/02	UPS	2	0
12/30/01	01/03/02	Loomis	2	0
12/30/01	01/03/02	FedEx	2	1
12/31/01	01/03/02	Loomis	2	1
01/01/02	01/03/02	UPS	3	1
01/02/02	01/03/02	FedEx	3	2
01/03/02	01/03/02	FedEx	3	3
01/04/02	01/04/02	FedEx	3	4
01/04/02	01/04/02	Loomis	3	4
01/04/02	01/04/02	FedEx	3	5
01/04/02	01/04/02	Purolator	3	5
01/03/02	01/04/02	Loomis	3	5
01/01/02	01/04/02	Parcel Post	3	5
01/05/02	01/05/02	Loomis	3	5
01/04/02	01/05/02	UPS	4	5
01/02/02	01/05/02	UPS	5	5
01/04/02	01/05/02	Parcel Post	5	5
01/04/02	01/06/02	Parcel Post	5	5
01/04/02	01/06/02	Loomis	5	5

Figure 1-A: The completed *Shipping Info.rpt* report.

1. In *ShippingInfo.rpt*, create a running total called **UPS** that summarizes the **Ship Via** field using the evaluation formula `{Orders.Ship Via}="UPS"`. You will need to select **Ship Via** as the field to summarize using the Count function, and evaluate using the formula `{Orders.Ship Via}="UPS"`.
2. Create a running total called **FedEx** to create a running total for all FedEx shipments.
3. Add the **FedEx** and **UPS** running total fields to the report, under their respective headings. (Note: Page Header labels have already been placed in the report for the running totals. Remove the extra field labels as needed.)
4. Preview the report.
As of May 1, there were 58 orders shipped via UPS and 85 orders shipped via Federal Express.
5. Save and close the file.

LESSON 2 LAB 1

LESSON LABS

Building Cross-tabs in Your Report

Scenario:

You work for a company that sells bicycles and equipment. You have been asked to provide a total count of orders by year, by shipment type, in grid format. Your viewers are particularly interested in the FedEx and UPS totals, so you have been asked to show those two shipment carriers first in your grid. When you're finished, you can compare your report to the Crosstab Complete.rpt solution file or Figure 2-A.

	FedEx-UPS	Loomis	Parcel Post	Pickup	Purolator
2000	37	39	38	29	27
2001	527	278	276	241	245
2002	151	76	64	83	81
Total	715	393	378	353	353

Figure 2-A: The completed cross-tab.

1. Create a new blank report using the Orders table from the xtreme.mdb file.
2. Create a cross-tab and insert a row heading on the Ship Date field, grouped by year.
3. Insert a column heading using the Ship Via field.
4. Change the grouping options for the Ship Via field to In Specified Order, presenting FedEx and UPS first, and then all others "in their own groups."
5. Insert a summary field counting the Order IDs.
6. Place the cross-tab in the report header.
7. If necessary, customize the row headings so that a four-digit year appears.
8. Suppress the row grand totals.
9. Format your cross-tab as desired.
10. Save your report as 2000-02 Shipping.rpt and close it.

LESSON 3 LAB 1

Adding Subreports

Data Files:

- Orders.rpt
- Credits.rpt

Scenario:

You work for a company that sells bicycles and equipment. You have a report that shows total customer orders (Orders.rpt) and a separate report that shows total customer credits (Credits.rpt). You have been asked to display that information in one report, with order totals and credit totals appearing for each customer side by side. Compare your completed report to Figure 3-A or the Subreport Comp.rpt solution file.

Customer	Sales	Credits
7 Bikes For 7 Brothers Customer No: 132)	\$53.90	
Against The Wind Bikes Customer No: 133)	\$479.85	
AIC Childrens Customer No: 231)	\$101.70	
Alley Cat Cycles Customer No: 14)	\$54,565.39	(\$1,346.29)
Ankara Bicycle Company Customer No: 190)	\$959.70	
Arsenault et Maurier Customer No: 100)	\$1,739.85	
Aruba Sport Customer No: 157)	\$5,879.70	
Athens Bicycle Co. Customer No: 175)	\$8,819.55	
Auvergne Bicross Customer No: 101)	\$41.90	
Backpedal Cycle Shop Customer No: 46)	\$64,680.98	(\$7,991.29)
Bangkok Sports Customer No: 195)	\$329.85	

Figure 3-A: The subreport linked by Customer ID.

1. Open the Orders.rpt file, and increase the size of the Group Header #1 section, to make room for the subreport.
2. In the Orders.rpt file, insert the Credits.rpt file as a subreport, linked by Customer ID.
3. Modify the Credits.rpt subreport by doing the following:
 - Delete Report Header B.
 - Delete the group name field.
 - Move the remaining fields to the left margin (credit total and detail amount).

4. Preview the Orders.rpt report. Notice the borders around the subreport's information and the spacing problems.
5. Remove the border around the subreport using formatting options.
6. Verify that the Re-import When Opening option is not checked.
7. Edit the subreport to correct spacing problems. (Hint: Remove extra report sections and suppress remaining sections.)
8. Resize and reposition the subreport so that the credit data appears to the right of the sales data, and below the Credits heading.
9. Save and close the report.

LESSON 4 LAB 1

Creating a Drill-down

Data Files:

- Employee Salaries.rpt

Scenario:

You work for an engineering firm. You're creating a report to display the total salary expenses for each department. Although you don't need the report to prominently display the salaries for each employee in each department, you want that data to be accessible from within the report. The report is named Employee Salaries.rpt.

1. Open the Employee Salaries.rpt file.
2. Group the report by department, so that the department name and total department salaries appears for each group. Format the salaries to appear as currency.
3. Hide the Details section so that its contents are only visible via drill-down.

Engineering	\$633,555.00
Office Support	\$149,930.00
Publishing	\$274,258.00
Sales	\$344,620.00

- In the Details section, add the First, Last, and Salary fields.

- Specify that the First, Last, and Salary field labels only display with the drill-down data.

- In the Page Header section, add the label *Departmental Salary Expenses*

Departmental Salary Expenses

Engineering	\$633,555.00
-------------	--------------

Office Support	\$149,930.00
----------------	--------------

Publishing	\$274,258.00
------------	--------------

Sales	\$344,620.00
-------	--------------

- Preview the drill-down data.

Engineering		\$633,555.00
<u>First</u>	<u>Last</u>	<u>Salary</u>
Jayce	Potts	\$51,260.00
Suzanne	Jarr	\$75,250.00
Morgan	Pearson	\$70,000.00
Leonard	Wimmer	\$62,820.00
Brent	Duncan	\$91,325.00
Michelle	Miller	\$53,650.00
Nate	Maher	\$45,000.00
Alonso	Cabrera	\$49,500.00
Madison	Webb	\$48,250.00
Chuck	Stevens	\$42,250.00
Sy	Davis	\$44,250.00

- Save and close the report.

LESSON 5 LAB 1

Enhancing Report Processing Using SQL

Scenario:

You work for a company that distributes bicycles and equipment to bike shops around the world. You want to specify an SQL query to create a report that lists all customers alphabetically, and includes the largest order amount from each customer. The Customer Name field is in the Customer table, and the Order Amount field is in the Orders table. Both tables include a Customer ID field.

1. Create a new, blank report, opening the Add Command option for the `xtreme.mdb` database file.
2. Write an SQL statement that will generate the desired report.
3. Move the generated fields onto the report layout, and adjust the formatting as desired.
4. Save the report as `Largest Orders.rpt`.
5. Close the report.

LESSON 5 LAB 2

Creating SQL Expression Fields

Data Files:

- `Canada Sales.rpt`

Scenario:

You want to ensure that the `Canada Sales.rpt` report data filtering is done on the network server. You will replace the `Orders.Order Date` formula with an SQL Expression field.

1. Open the `Canada Sales.rpt` report.
2. Build an SQL expression called *YearFilter* that will represent the year of the order date field enabling filtering to be done at the server level.
3. In the Select Expert, delete the `Orders.Order Date` formula.

4. Replace the %YearFilter formula on a new tab that is equal to 2002.
5. Save and close the report.

LESSON 6 LAB 1

Creating Multiple Data Series Charts

Data Files:

- Qtr 1 Canada Sales-Done.rpt
- Qtr 1 Canada Sales.rpt

Scenario:

You work for a company that sells bicycles and equipment. You are meeting with your sales team to congratulate them on an increase in first quarter sales compared to the previous year. The sales reps tried some innovative marketing solutions with two customers (Crazy Wheels and Pedal Pusher Bikes, Inc). You have created a report (Qtr 1 Canada Sales.rpt) that shows the totals. You know the other sales reps will be more impressed if they can graphically see the increase in sales for those two customers. When you're finished, your report should look like Figure 6-A, or you can compare your work to the Qtr 1 Canada Sales-Done.rpt completion file. Note: Results will vary depending upon the formatting options selected in step 15.

First Quarter Sales

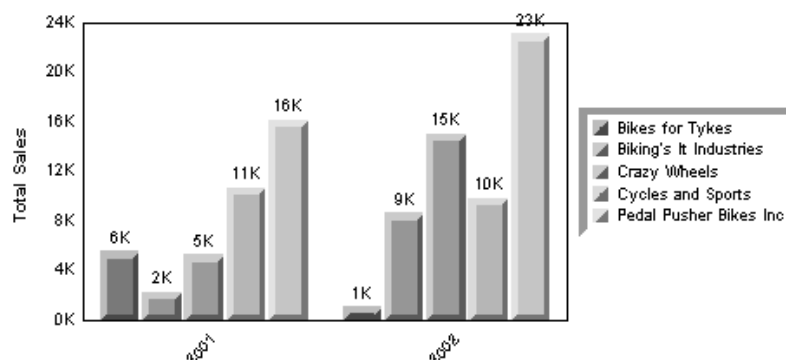


Figure 6-A: The completed chart in Qtr 1 Canada Sales.rpt.

1. In Qtr 1 Canada Sales.rpt, insert a new report header section to place your chart.
2. Using the Chart Expert, specify a vertical bar chart.

3. On the (Advanced) Data tab, move the Order Date and the Customer Name field to the On Change Of section. Be sure the Order Date field appears above the Customer Name field so that the first graphing sort will be done by date.
4. Highlight the Order Date field and confirm the Order settings by clicking the Order button. Confirm that the order date is grouped by year.
5. Move the Order Amount field to the Show Value(s) section.
6. On the Options tab, in the Data Points section, select Show Value and change the format to 1K.
7. On the Text tab, change the title to *First Quarter Sales*.
8. Change the data title to *Total Sales*.
9. Remove the group title text.
10. Preview your chart.
11. In the Chart Options dialog box, specify that the data labels appear outside the markers.
12. Change the legend box style to a reverse beveled frame.
13. Change the riser shapes to beveled boxes.
14. Remove gridlines, if desired. Try other formatting changes as desired.
15. Save and close the report.

LESSON 7 LAB 1

Reporting on Excel Data

Scenario:

You sell books part-time on the side, tracking your sales in an Excel spreadsheet (sales.xls). You would like to create a summary report showing customer names and total sales with the ability to double-click the customer name and obtain detail data. When you're finished, your report will look like Figure 7-A or you can compare your results to the Customer Book Sales Practice.rpt completion file.

Customer Book Sales	
6/11/2004	
<hr/>	
Anchor's Away	\$2,245.50
Barney's Books	\$14,161.50
Café Books	\$2,990.00
Computer Nook	\$1,260.00
Gardner's Delight	\$497.50

Figure 7-A: The completed Customer Book Sales Practice.rpt report.

1. Open Sales.xls in Excel and activate the Crystal Report Wizard.
2. Set the report area to be A1 through F31.
3. Create the Crystal Reports report, using all fields, grouped by customer name.
4. Advance through the wizard, not selecting any other options in the tabs presented until you reach the Add Style To The Report page. Name your report *Customer Book Sales*. Select the Executive, Leading Break style.



You would like a total field for each customer, but the report wizard will then force a sort by the total field. You will therefore not select the title field here, choosing instead to add it to our Crystal Reports report later.

5. Finish the Expert, preview the report, then exit Excel and open it in Crystal Reports.
6. Your Customer Book Sales Practice.rpt file will now be open in Crystal Reports. Remove the field, the line, and the vertical guide indicator from the Group Footer #1 section. (Tip: Vertical guidelines prohibit you from resizing a section. Removing the guide indicator will allow us to make the GF1 smaller after you have created the total.)
7. Right-click the Total field and insert a summary on Group 1.
8. Move the summary field to the Group header to the 3-inch margin position.
9. Suppress the Details section, allowing drill down.
10. Preview your report and format your report as desired to correct any problems. Steps taken might include:
 - Add Details section B.
 - Swap Details sections A and B.
 - Move page labels into Details section A.
 - Suppress each of the page label fields if they are duplicated.
 - Set the Suppress Blank Section option on the Details section A.
 - Format the sales date format.
 - Remove the customer name from the Details section.

FOR EVALUATION USE ONLY
(C) 2004 Element K Content LLC
DO NOT DUPLICATE

GLOSSARY

alias

An alternative name assigned to a database or formula.

cross-tab

A report presented in a column and row format that summarizes and presents data making it easy to identify trends and compare data.

DefaultAttribute

A constant used by Crystal Basic formula syntax.

join

A specification that links two or more tables together so that data from all the linked tables can be used within a single report.

multi-pass reporting

The process Crystal Reports uses each time data is read and manipulated.

null

No value within a database field for a given record.

on-demand subreport

A subreport that is accessible from the main report via a link.

running total

A total that is displayed on a record-by-record basis that totals all records in the report or group, up to and including the current record.

server-side processing

Sorting, filtering, grouping, and or totaling report data on the remote server containing the database, rather than on the client computer accessing the data remotely.

shared variable

Used to pass data around the main report, back and forth between the main report and subreports, and from subreport to subreport.

specified order

An order determined by the user.

SQL

Structured Query Language, which is the standard query language by which people access and manipulate relational database data that is stored on a computer network.

SQL aggregate function

A function that produces a single summary value for a group of values in a specified field.

SQL clauses

The components of an SQL statement that you use to indicate the task you want the database to perform.

SQL expression field

A formula written in SQL rather than in the Crystal Reports formula language, which you can use to sort, group, and select data.

SQL statement

A request written using SQL clauses that is sent to a server containing an SQL database, and directs the server to perform specific database tasks.

subquery

A query that is nested inside an outer query.

subreport

A report within a report.

GLOSSARY

summarized field

A field that represents a summary such as a sum, count, or average of multiple values.

template

A set of chart formatting options that can be used as the starting point for formatting a new chart.

variable

A value that can change, which is used as part of a formula.

variable scope

Determines how long and where a variable keeps its value.

FOR EVALUATION USE ONLY
(C) 2004 Element K Content LLC
DO NOT DUPLICATE

INDEX

A

aggregate functions
 SQL, 115
 alias, 54
 aligning objects, 5

B

bar charts, 141

C

charts
 creating, 141, 149
 formatting, 153, 154
 modifying, 145
 saving as a template, 159
 conditional formulas
 suppressing sections, 96
 Count function, 77
 cross-tabs
 creating, 39
 creating a specified order, 43
 defining, 38
 defining a specified order, 43
 defining an alias, 54
 defining summarized fields, 38
 filtering by group, 47
 formatting, 51, 54
 identifying common formatting options, 50
 keeping groups together, 59
 planning, 36
 using special functions, 55
 Crystal Reports Wizard, 165

D

data sources
 checking the data, 165
 creating a report based on Excel data, 165
 modifying a report in Excel, 170
 updating an Excel file in Crystal Reports, 173

DefaultAttribute, 55
 drill-down
 creating, 90
 creating separate headings, 96
 drill-down level numbering, 96

E

empty sections, 79
 Evaluation Time function, 22
 Excel
 creating a report based on, 165
 modifying the report, 170
 updating reports, 173
 using as a data source, 165

F

formatting options
 changing a chart, 153, 154
 changing a cross-tab, 51, 54
 changing a subreport, 74, 75
 identifying, 50
 formulas
 entering, 9
 sharing between main reports and subreports, 78

G

groups
 keeping together, 59

J

join types, 120
 specifying, 122
 joins, 119
 specifying with SQL, 121
 SQL join types, 120

K

Keep Group Together option, 59

M

- manual running totals
 - creating on detail data, 18
 - creating on summary data, 24
- maps
 - creating, 181
 - inserting, 181
- multi-pass reporting, 21, 22

N

- null values, 77

O

- on-demand subreports
 - creating, 82
 - defining, 82

P

- PrintDate function, 82

R

- Re-import When Opening option, 74, 75
- reports
 - creating using SQL, 111
- running total fields
 - creating, 4, 18, 24
 - defining, 3
 - modifying, 8, 9
- running totals, 3, 18, 24

S

- sections, 79
- selecting objects, 5
- server-side processing, 104, 132
 - enabling, 132
- shared variables, 78
- specified order
 - creating, 43
 - defining, 43
- SQL, 105
 - benefits, 106
 - subqueries, 128
- SQL aggregate functions, 115
 - summarizing report data, 116
- SQL clauses, 107
- SQL commands
 - creating, 111
 - modifying, 111
- SQL conventions, 109
- SQL expression fields, 131

- creating, 132
 - selecting records, 132
- SQL join types, 120
- SQL queries
 - creating a report, 111
 - viewing in Crystal Reports, 112
- SQL rules, 108
- SQL statements, 107
- subqueries, 128
 - creating, 128
- subreports
 - creating, 82
 - defining, 82
 - editing, 71
 - formatting, 74, 75
 - inserting, 65
 - linking to data in a primary report, 68
 - planning, 65
 - sharing formulas, 78
 - summarized fields, 38
 - summary operations, 9
 - suppressing, 79
 - suppressing sections, 96
- T
 - templates
 - defining, 158
 - saving a chart as, 159
 - Top N charts, 149
- V
 - variable scopes, 78
 - variables, 17

REVALUATION USE ONLY
© 2004 Element K Content LLC
DO NOT DUPLICATE

085516 IE rev 1.0

ISBN 0-7580-8040-9



9 780758 080400