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Crystal Reports 2013 Designer 2 Workshop

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This course covers Crystal Reports® 2013

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Introduction

Introduction Objectives

This manual is written to give you a step-by-step guide for your classroom training and a handy reference for your daily work. In this Introduction, you will learn how to use this training guide effectively. This section covers the following topics:

- An introduction to the Crystal Reports application
- Pre-Qualification Exercise
- Class objectives
- Help with using this training guide
- Information on how to start the program

About Crystal Reports

In today's information intensive environment, every business has a database of some sort. After all, business today is all about information and databases give you a handle on the massive amounts of information you must deal with. Therefore, your business has a database and from that database, you need reports. The problem is, most reporting capabilities that come with database programs are limited. They only report on data from that program. Many users need to report on data from multiple sources, even databases such as Oracle, Microsoft SQL Server, DB2 or Sybase.

Crystal Reports is one of the most powerful reporting programs available with the ability to pull data from all types of data sources. You can use Crystal Reports to generate reports from any of the standard PC database programs; Access, Paradox, or FoxPro, as well as from a mainframe or server database. Crystal also has a powerful web-reporting server that allows you to distribute your reports over the web.

Crystal Reports is bundled with more than 160 other programs including Visual Basic, some medical applications, many accounting packages and several ERP solutions. It makes report generation easy without requiring you to be a programmer or a database expert. If you know how to work in a Windows environment and are familiar with the data you want to use, you can create a Crystal Report that looks professional and makes sense.

Training Philosophy

Studies show that people retain 10% of information they see, 20% of information they hear, 50% of what they see and hear, and 80% of what they see, hear and do. In line with this concept, the class utilizes a hands-on method of training. You will see the effects of new procedures on the screen, hear the instructor explain how and why to use features, and perform the actions yourself as you learn.

In addition, this class focuses on your ability to perform tasks using the most productive techniques. The manual may contain several methods of accomplishing a certain task. However, class time does not allow for practice of all methods for each task. Your instructor will guide you in the most effective method of performing a task, but inform you of other methods that are available.

Questions are encouraged. While we give our best effort to explain new concepts in understandable terms, you may need to hear the concept again or have it explained more thoroughly. Please let the instructor know when you need more information!

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Pre-Qualification Exercise for the Designer 2 Workshop

Why Should You Pre-qualify Yourself for the Designer 2 Workshop?

The Crystal Reports 2013 Designer 2 Workshop is designed for the experienced Crystal Reports user. It covers the more complex and powerful features of the program. The class discusses very technical issues and includes several fast-paced, comprehensive exercises. Our instructors have years of experience helping students to get the most out of their training. However, it is not always possible in a high level workshop to assist students with basic tasks.

In order to maximize the benefit you receive from the Crystal Reports 2013 Designer 2 Workshop, you should come into the training with a certain skill level. We assume all students who sign up for this workshop have a comfortable level of understanding in regards to relational databases. Students should also be able to perform the following tasks in Crystal Reports:

- Create a new report, insert fields, save the report and refresh the data.
- Add multiple tables to the report using the Data Explorer.
- Use the select expert to pull only the data needed from the database.
- Insert groups and summarize fields within the group.
- Perform formatting tasks.
- Create, save and use formulas in the report.

If you would like to evaluate for yourself whether this is the correct level course, take our self-evaluation exercise. The exercise consists of writing a report in Crystal Reports. When you are finished, compare your report to the one our experts have done to see how well you understand the basic features of Crystal Reports. You can obtain the exercise and the results report from the Designer 1 Workshop class files.

If you have trouble creating the report or getting the correct results, or if you cannot perform some of the above-mentioned tasks, then we strongly recommend that you take the Crystal Reports 2013 Designer 1 Workshop before attending the Designer 2 Workshop. By assuring you are well prepared for the Designer 2 Workshop, you maximize the benefits you receive from this in-depth look at advanced report writing.

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Pre-qualification Exercise

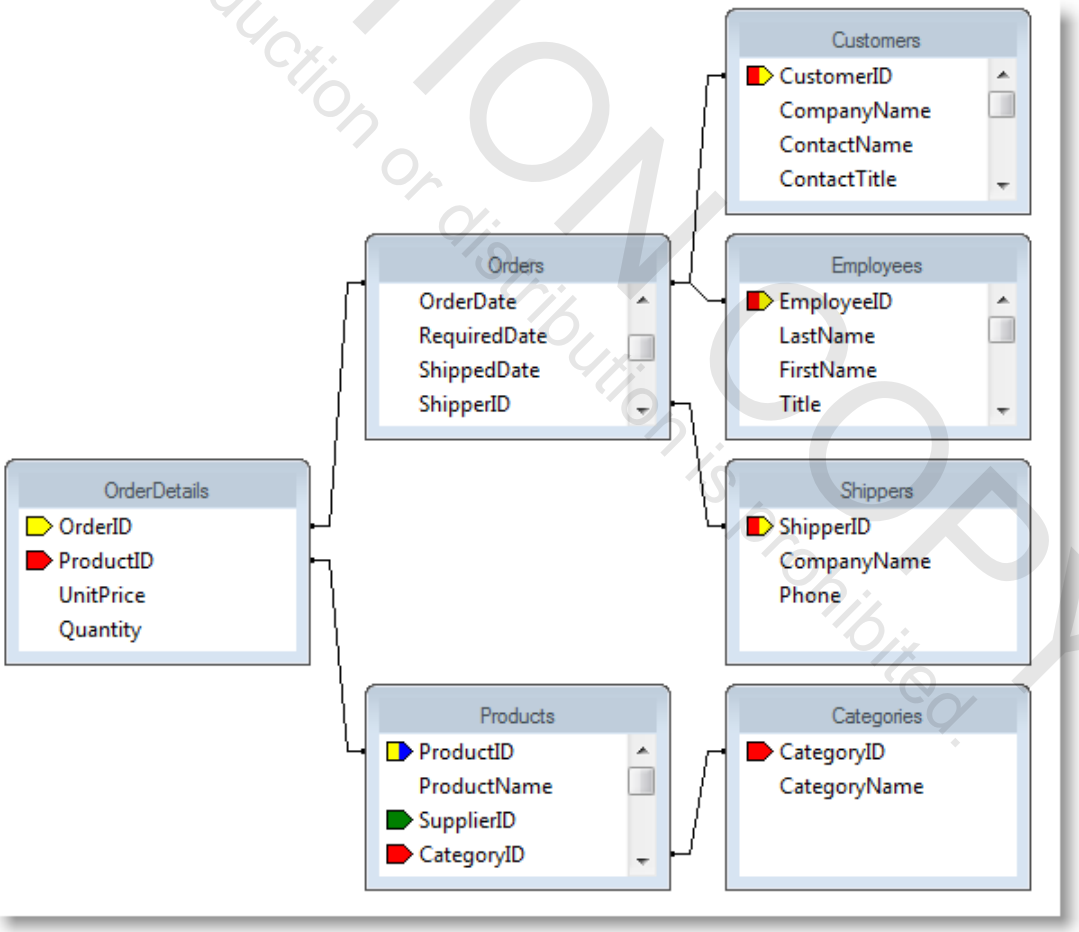
Using the Northwind 2008 database available included with the class files, create a report invoicing customers for each order. The report needs to show the customer billing address, the Invoice#, the sales person, the order date, the requested date, the ship date and the company shipping the order. The Details section should list the product ID, the product name, product category, the unit price, the quantity, and the line item total.

Select only those orders with an ship date between January 1, 2008 and March 31, 2008. Group on the CustomerID, then on the OrderID. Display each order on its own page. Sum the line item total amount for each OrderID. Calculate the sales tax for the order at 6% and total the subtotal and sales tax.

You will need to pull data from the following tables:

Customers
Orders
Employees
Shippers
Products
OrderDetails
Categories

The tables joins should look like the example below, but Smart Linking might link incorectly, so double check.



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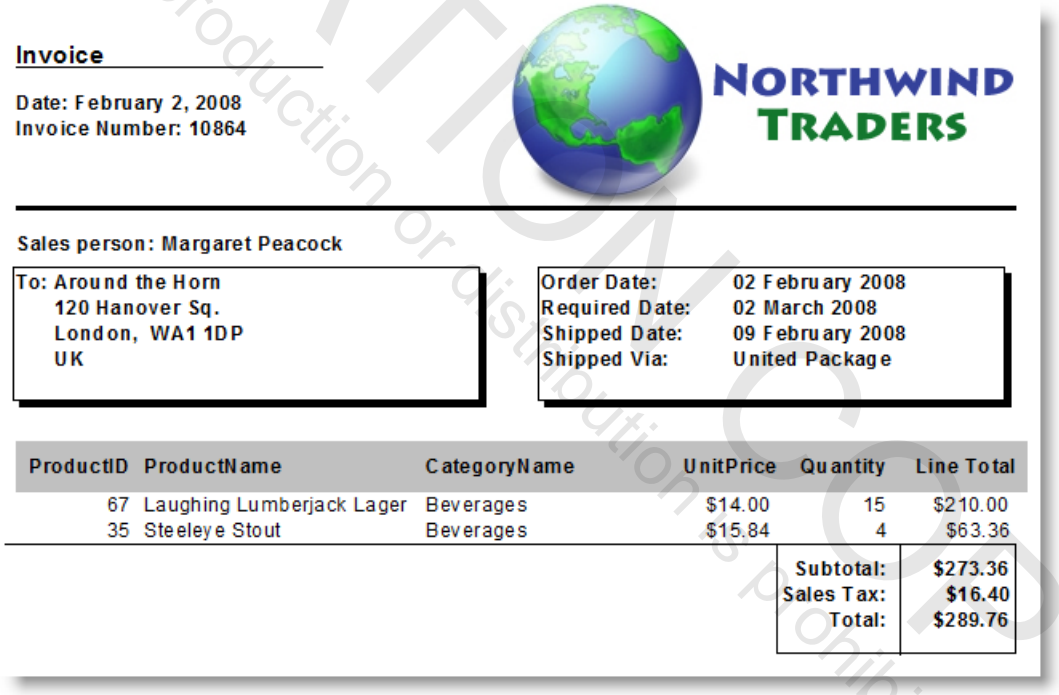
You will need to create the following formulas:

- ❖ Line Item Total that multiplies the unit price times the quantity for each product ordered
- ❖ Sales Tax that multiplies the sum of each line item total times 6%
- ❖ Order Total that adds the sum of each line item total and the sales tax
- ❖ You will need to create the following text boxes:
  - A An address box with the text **To:** then the company name, the address, the city, region, postal code and country
  - A An employee box with the employee first name, a space, then the last name
  - A An invoce box with invoice date
  - A An order information box containg the order date, required date, shpped date and shipped via fields

Format the report to look like the following:



Invoice

Date: February 2, 2008
Invoice Number: 10864

NORTHWIND TRADERS

Sales person: Margaret Peacock

To: Around the Horn
120 Hanover Sq.
London, WA1 1DP
UK

Order Date: 02 February 2008
Required Date: 02 March 2008
Shipped Date: 09 February 2008
Shipped Via: United Package

ProductID	ProductName	CategoryName	UnitPrice	Quantity	Line Total
67	Laughing Lumberjack Lager	Beverages	$14.00	15	$210.00
35	Steeleye Stout	Beverages	$15.84	4	$63.36

Subtotal: $273.36
Sales Tax: $16.40
Total: $289.76

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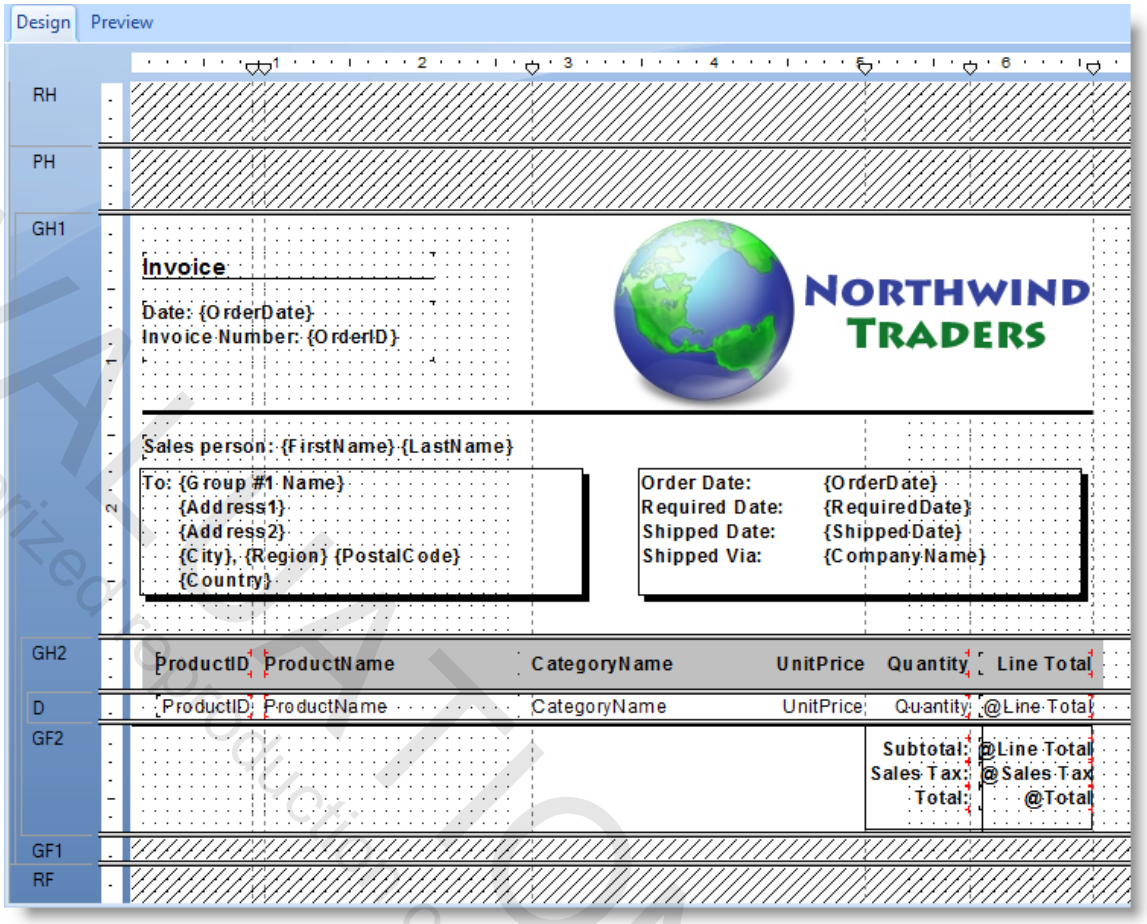
The Design view should look similar to the following example:



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Class Objectives

This class is a performance based instructional system. It is geared to provide you with the tools you need to build and distribute reports the quickest, most efficient way. After completing this course, you will be able to perform the following tasks:

- Review Designer 1 with the Refresher Exercise
- Use multiple sections in reports for advanced formatting techniques
- Underlay graphics and charts to print beside data
- Calculate running totals in reports
- Develop parameter fields to prompt users for information
- Limit user entry into parameter fields
- Understand Crystal Reports data handling and Evaluation Time functions
- Comfortably make use of variables in formulas
- Work with arrays and control structures in formulas for more flexible decision making
- Use additional reports within a main report as subreports
- Create linked subreports to tie data from another report to the current report
- Format subreports to display on demand only
- Customize groups in the report with formulas and custom names and create hierarchical groups
- Perform group selection based on summary field values
- Create and format Cross-Tab reports and create charts from Cross-Tabs
- Work with Report Alerts
- Create and use Report Templates
- Solve table linking problems with advanced linking techniques

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About This Manual

Each section of this manual contains objectives to provide you with the overall goals for the lesson. Lessons have descriptions of features and concepts followed by systematic directions for completing a specific task. Each section ends with a challenge exercise to help you practice the skills you learned in the lesson. Challenge exercises provide you with tasks to accomplish. Try to complete these exercises on your own.

As you work in this Training Guide, certain conventions are used to identify specific procedures. Use the following table as a guide:

Training Guide Conventions	
Item	**Illustrated As**
Menu Commands	Underlined letters for accessing menu commands are shown: Example: File/Open
Command Buttons	Command Buttons in dialog boxes are shown as buttons: Example: Finish
Categories, Radio Buttons, Text Boxes, Check Boxes	All options within dialog boxes are listed in italicized text: Example: the *Keep Group Together* check box the *Other* radio button
Keystrokes	Keyboard keys are indicated by uppercase text: Example: press ENTER Keyboard combinations are shown in uppercase text with a plus sign (+) between the keys that need to be pressed simultaneously. Example: press CTRL + S to save
Toolbar Buttons	Toolbar buttons are indicated by the button name and a graphic image of the button: Example: click the Print Preview button
Typing or File Selections	Text to be typed or file names to be selected are printed in bold letters: Example: type **Henry** select **grouping.rpt**
Exercises	Step-by-Step exercises in the text are indicated by bold text and the ❖ symbol. For example: ❖ **Exercise - Format Objects**

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Lesson 2
Power Formatting with Multiple Sections

Lesson Objectives

After completing this lesson, you will be able to:

- **Create multiple sections**
  Expand your formatting power by learning how to add sections to the report
- **Underlay a section**
  Display a graphic or chart beside the data it represents by utilizing the underlay feature
- **Use multiple sections for conditional formatting**
  Add additional sections that only display under certain conditions

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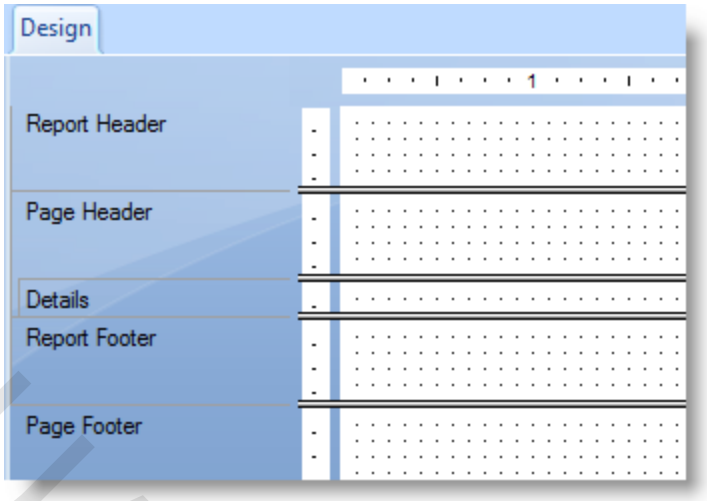
Using Multiple Sections in Reports

By default, Crystal Reports gives you five design areas to use when building your report: Report Header, Page Header, Details, Report Footer, and Page Footer.



Each area contains only a single section when you first begin your report. There are certain reporting tasks you can perform most efficiently by creating multiple sections within an area, such as:

- Putting conditional messages to appear under certain conditions
- Formatting objects/sections differently based on field values
- Alternating background colors on a row-by-row basis
- Adding blank lines under specific conditions, such as every fifth row
- Managing the Underlay feature when some objects should not underlay

When you understand the power of multiple sections, you discover many ways you can use them to produce the report effects you want. The following are some ideas for using multiple sections:

- Suppose you want to display current order amounts in the Details section. If the customer has outstanding amounts you want to display them as well. You add an additional Details section (b) and conditionally format it to display only if there are outstanding order amounts.
- You are printing an employee listing grouped by Employee Name. You have information on each employee, including address, telephone, start date and sales for the last month. You also have a field displaying the employee's picture you want shown beside the printed data. You cannot put it in the Employee Name group header because it prints above the rest of the data and takes up too much space. So, you create a second group header section, put the picture there, and then turn on "Underlay Following Sections". The picture will then print beside each employee's data.

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- You need a single page summary report of the top twenty customers. Included in the report, you need a graph showing each region's percent of total sales. There is not enough room to print the graph above or below the customer listing. You can put the graph in a Report Header b section and underlay the section, causing the graph to print along side the data.

- Your report prints customer invoices and a list of the orders in the last month. You want to include a nice letter to thank paid up customers for keeping their account current. For overdue customers, you want a more forceful letter asking them for payment. You can create two Group Header sections and conditionally suppress each one depending on the condition of the account. The Detail section would show all orders currently not paid, along with their due dates.

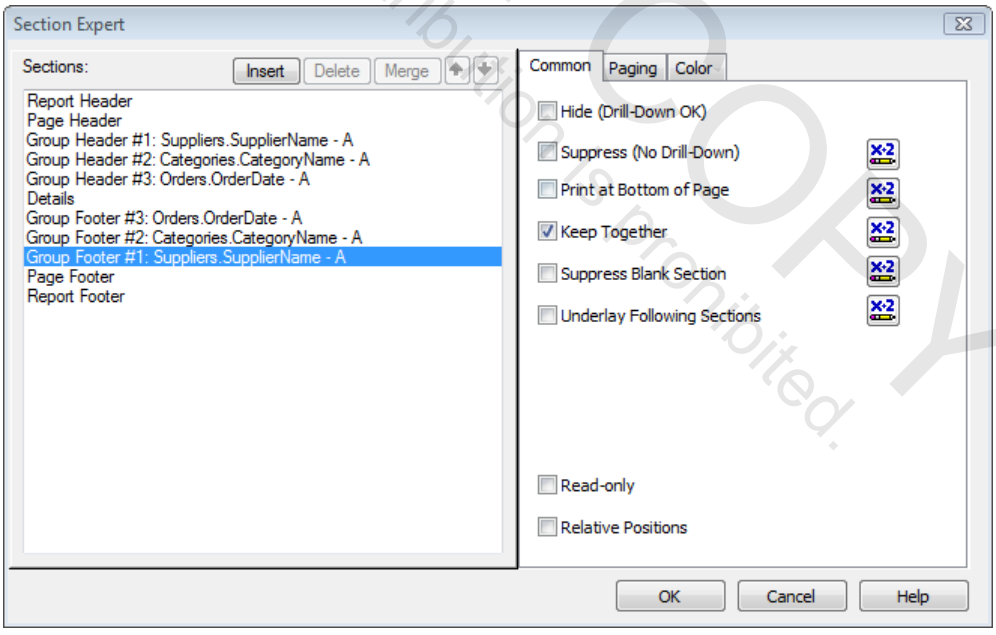
These are only some ideas for using multiple sections. You are going to try some of these ideas in following exercises.

Using the Section Expert to Work with Sections

In the Section Expert, you can easily insert, merge and delete sections. You can also move sections within an area and conditionally format sections. Remember, you can open the Section Expert in three ways:

- Choose Report|Section Expert…
- Click the Section Expert button on the Experts toolbar
- RIGHT click the section name you want to format, then choose Section Expert from the shortcut menu

In the Section Expert, you can select the section you want to work with in the *Sections:* list, and then use the Insert, Delete, or Merge buttons to manipulate additional sections. The arrow buttons allow you to move sections within an area.



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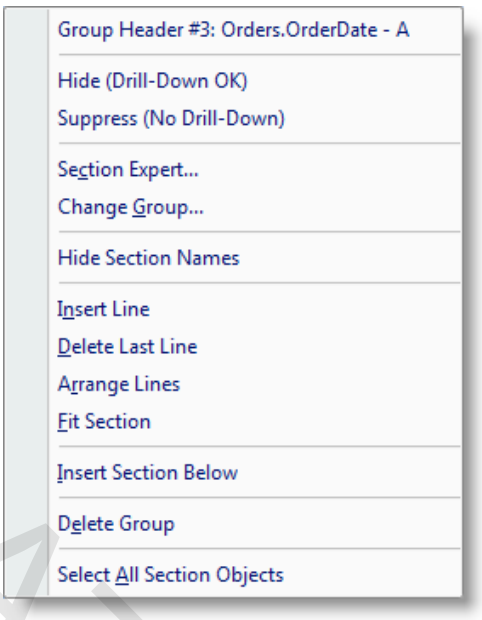
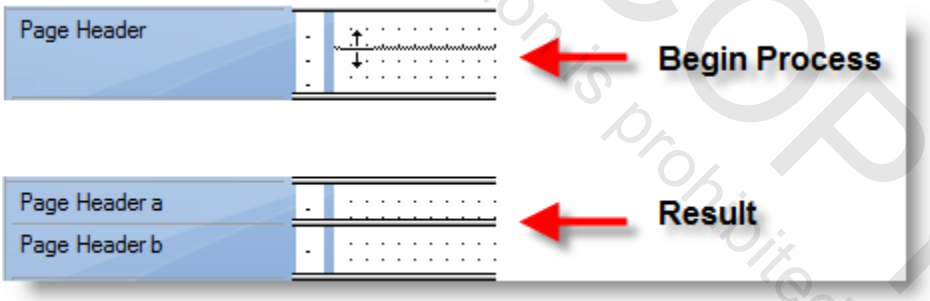
You can also perform all these section procedures from the Section shortcut menu. RIGHT click on the left side of the screen where you see the section name of the section you wish to change. The shortcut menu contains commands for inserting, merging and deleting sections.



WARNING: If there is currently only one section in an area, the Merge, Move and Delete commands do not display. You only see the Merge command if you RIGHT click on a section that has another section of the same type below it.

Crystal Reports has a true shortcut for inserting a section below an existing section. Left click on the vertical separator bar in the section you wish to add. Hold down the mouse button until the mouse pointer changes to a double-headed arrow with a single line horizontally separating the arrows. Drag the line up or down and release. This method of inserting a new section keeps all the formatting from the section above.



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❖ Exercise 2.0 – Insert an Additional Group Header Section

1. Create an **Employee Sales** report using the **Employees** and **Orders** tables in the **Northwind 2008** database

2. Group by the **LastName** field from the **Employee** table. Check on the *Keep Group Together* option in the **Group Options** tab

3. Insert the **OrderID**, **OrderDate** and **OrderAmount** fields from the **Orders** table. Format the **OrderDate** field to display only the date

4. Summarize the **OrderAmount** field for all levels including grand total

5. Resize the **Group Header #1** section to approx. **.5"** tall. Move the field title headers down to the **Group Header #1** section

6. Create a **Record Selection Formula** filter to limit records to only orders in 2008. The formula should look similar to the following:

   {Orders.OrderDate} >= Date(2008,1,1)

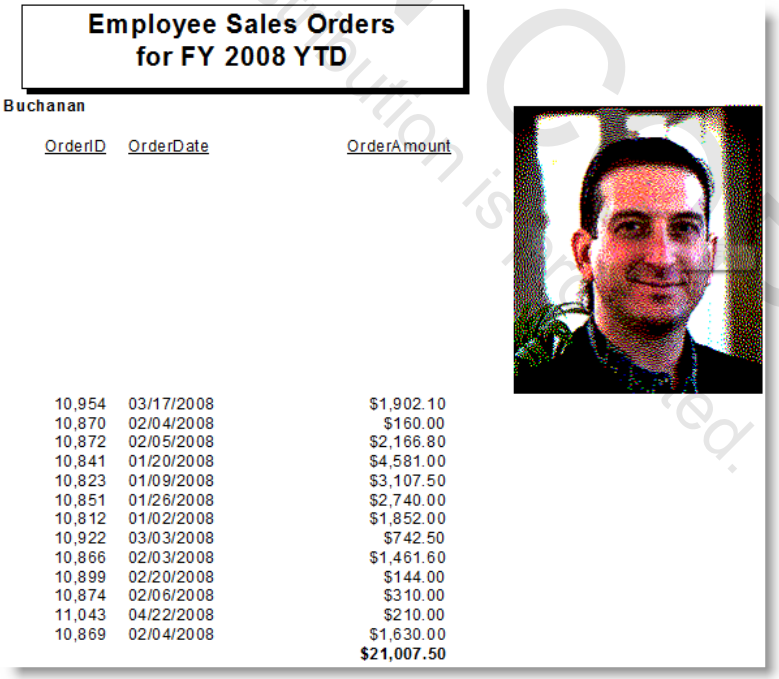
7. Place a text object into the **Page Header** section with the title **Employee Sales Orders for FY 2008 YTD**. Format the title like the illustration later in this exercise

8. Suppress the **Report Header** section

9. Add the **Photo** field from the **Employees** table into the **Group Header #1** section. Be sure to place the field to the right of the field headers

10. Save the report as **Employee Sales Orders for 2008.rpt** and preview the report

The report should be similar to the following illustration:



Employee Sales Orders for FY 2008 YTD

Buchanan

OrderID	OrderDate	OrderAmount
10,954	03/17/2008	$1,902.10
10,870	02/04/2008	$160.00
10,872	02/05/2008	$2,166.80
10,841	01/20/2008	$4,581.00
10,823	01/09/2008	$3,107.50
10,851	01/26/2008	$2,740.00
10,812	01/02/2008	$1,852.00
10,922	03/03/2008	$742.50
10,866	02/03/2008	$1,461.60
10,899	02/20/2008	$144.00
10,874	02/06/2008	$310.00
11,043	04/22/2008	$210.00
10,869	02/04/2008	$1,630.00
		$21,007.50

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The report would look better if the photo displayed beside the records. You can underlay the Group Header #1 to accomplish this. However, if you underlay the entire Page Header the Group Name field and field headers will also display over the order information. We need to place the photo in a separate section below the Group Name field and field titles and then underlay Group Header #1b.

11. Return to **Design** view.

12. Insert a section below the **Group Header #1** by right clicking the words **Group Header #1** and choosing *Insert Section Below*. Move the photo into **Group Header #1b**. Right click in **Group Header #1a** and choose *Fit Section*

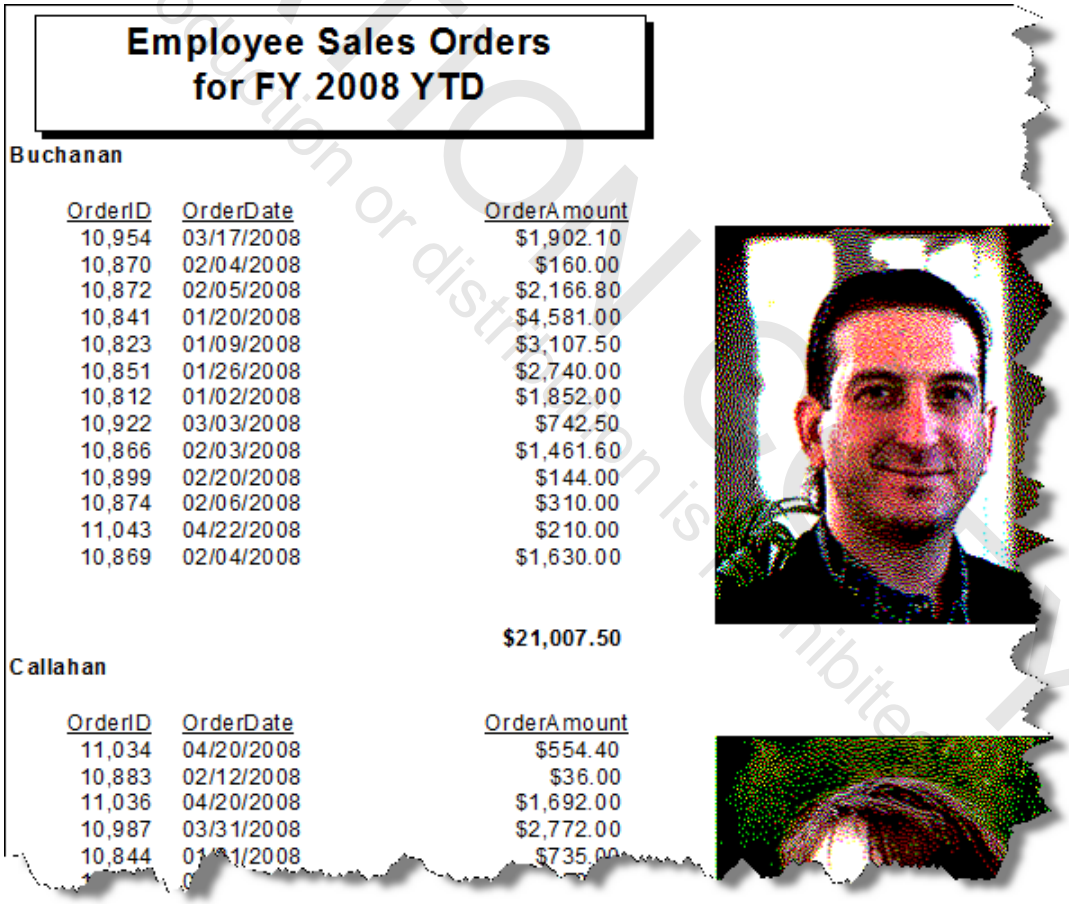
13. RIGHT click the section name for **Group Header #1b**, then choose *Section Expert...* *Notice the Section Expert now displays both Report Header sections.*

❖ Exercise 2.1 – Underlay a Section

1. Click the *Underlay Following Sections* check box in the **Common** tab, and then click **OK**.

2. Save (**Employee Sales Orders for 2008**) and preview the report.

The report should look like the following illustration:



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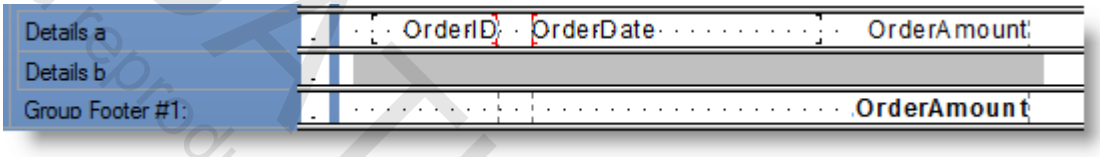
Conditionally Formatting Multiple Sections

Now that you have a nice looking employee sales report, suppose you wish to add a background color to ever other record. This is a common request in many reports and is fairly easy to achieve in Crystal Reports.

To achieve the desired goal, we need to add an additional Details section, add a formatted line box to the new section , turn on underlay and finally conditionally suppress the new section every other record.

❖ Exercise 2.2 – Conditionally Format Multiple Sections

1. Return to **Design** view
2. RIGHT click the **Details** section name, and then choose *Insert Section Below*
3. Draw a box to fit **Details b** in height and make it slightly wider than the data fields in the **Details a** section. Your Details sections should look similar to the following:



4. If we preview, we see the **Details b** appears with every record. We now need to suppress it every other record. RIGHT-click the **Details b** section name from **Design** and choose *Section Expert*
5. Click on the X+2 button next to the Suppress (No-Drill-Down) option. The Format For mula Editor opens. Enter the following formula:

RecordNumber Mod 2 = 0

NOTE: The* RecordNumber *function found in the Print State function category returns a number corresponding with the position of the record being displayed. The record number does not represent the order in which the records were returned by the database, but by the order in which they are printed (displayed) in the report. The* Mod *operator is found in the Arithmetic operators list. The Mod operator returns the remainder of a division between a numerator and denominator. In this case, the even number records return 0 remainder and odd number records return 1. Our formula returns a True value on even number records and will suppress those records.

6. Save and close the formula, but do not close the **Section Expert**
7. In the *Sections:* list, select the **Details a** section and in the **Common** tab check on the *Underlay Following Sections* option and click **OK**
8. Save (**Employee Sales Orders for 2008**) and preview the report

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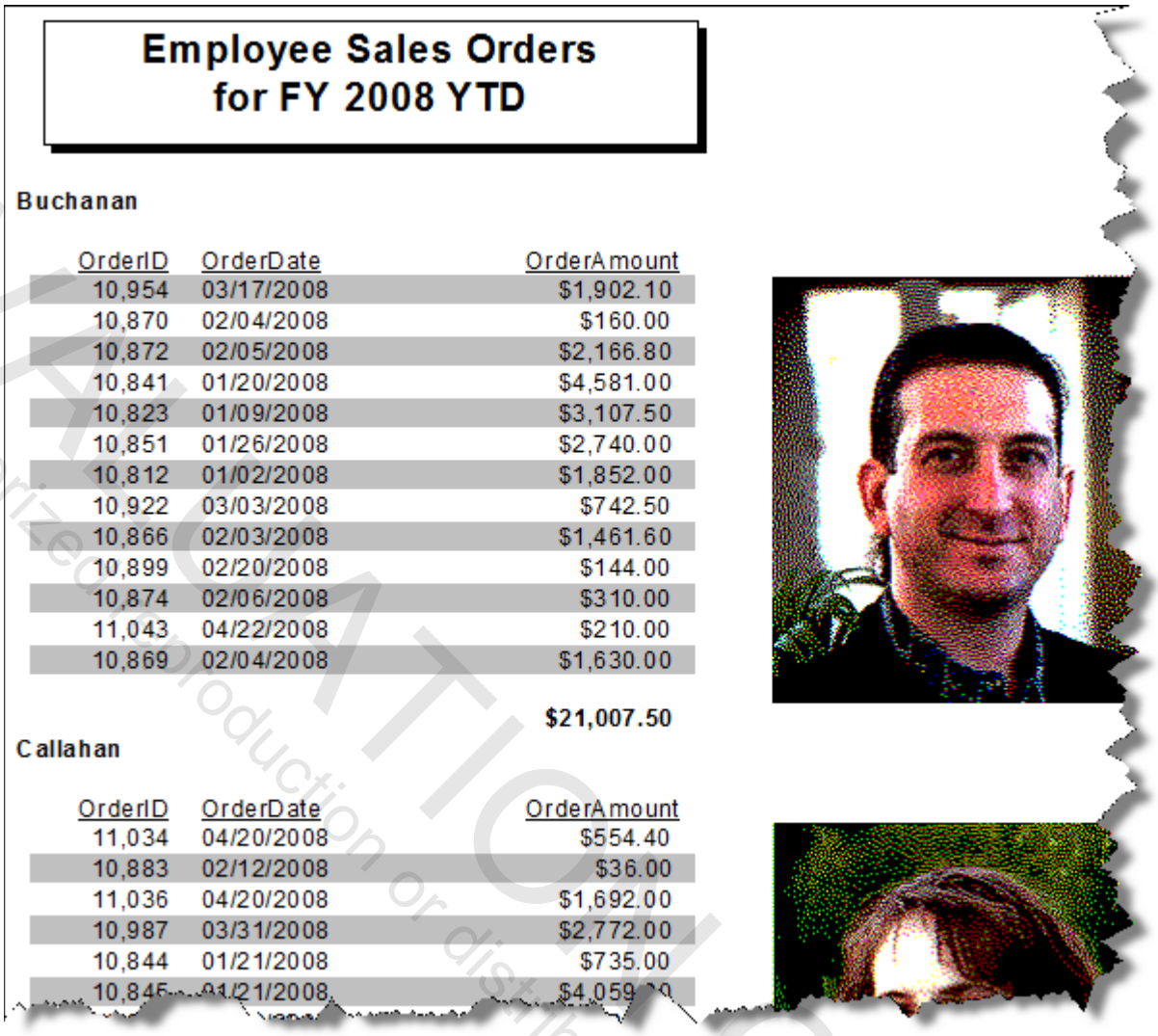
The report should look similar to the following example:



Employee Sales Orders for FY 2008 YTD

Buchanan

OrderID	OrderDate	OrderAmount
10,954	03/17/2008	$1,902.10
10,870	02/04/2008	$160.00
10,872	02/05/2008	$2,166.80
10,841	01/20/2008	$4,581.00
10,823	01/09/2008	$3,107.50
10,851	01/26/2008	$2,740.00
10,812	01/02/2008	$1,852.00
10,922	03/03/2008	$742.50
10,866	02/03/2008	$1,461.60
10,899	02/20/2008	$144.00
10,874	02/06/2008	$310.00
11,043	04/22/2008	$210.00
10,869	02/04/2008	$1,630.00
		$21,007.50

Callahan

OrderID	OrderDate	OrderAmount
11,034	04/20/2008	$554.40
10,883	02/12/2008	$36.00
11,036	04/20/2008	$1,692.00
10,987	03/31/2008	$2,772.00
10,844	01/21/2008	$735.00
10,845	01/21/2008	$4,059.20

Note: The alternate row color example in the previous lesson can be improved on in a few ways, such as making sure the first record in each group has a colored background. We will achieve this through the use of Running Total fields covered in the next lesson.

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Challenge Exercise – Formatting with Multiple Sections

Suppose you need to create a Quarterly Sales report showing the sales for last year (2007). This will be a summary report including a graph of the sales for each quarter and the sales totals for each employee. The finished report needs to look like the following illustrations.

1. Start by creating a new report based on the **Northwind 2008** database. Add the **Employees** and **Orders** tables

2. Use the **Group Expert** to insert a group on the **OrderDate** field. Choose to print the group once for each quarter. Insert another group on the **LastName** field

3. Select only records in **2007** using the *is between* option in the **Select Expert**

4. Put the **OrderDate** field and the **OrderAmount** field into the **Details** section at the RIGHT side of the report. Put the field headings into **Group Header #2**

5. Summarize the **OrderAmount** field by **OrderDate** group (Group #1) and by **LastName** group (Group #2)

6. Move the **Group #1 Name** field into the **Group Footer #1** and position it close to the summary field. You may need to resize it. Do the same for the **Group #2 Name** field (into Group Footer #2). Reformat the **Group #1 Name** field to look like the following: **January 2004**

7. Add the title and the print date to the **Report Header** section. Format both objects similar to the example at the end of the exercise. Add the **Northwind Traders** logo. Add a subtitle "**Quarterly Sales**" as shown in the example
HINT: For the 2007 Sales Report text box, add a bottom border to have a separator line.

8. Suppress the **Page Header** and hide the **Group Header #2** section, the **Group Footer #2** section and **Details** section

9. Now you are ready for the extra sections. The report needs to have a graph of the sales by quarter displayed beside the summary values using the underlay feature. Since the graph appears once on the report, you need to put it in the **Report Header**. To accomplish this we need an additional **Report Header** section. Right click on the **Report Header** section name, and then choose *Insert Section Below*

10. Insert a chart into **Report Header b**. Use the **Chart Expert** to ensure that it is a pie chart graphing the **Sum of Order Amount by Order Date**. On the **Options** tab, display the values and format them to look like currency with no decimals ($1). Turn off the **Legend**. Turn off all the **Auto-Text** entries on the **Text** tab and delete any text. Click **OK** when finished

11. Ensure the chart is in the left side of **Report Header b** section and resize to be only **4"** wide.

12. Turn on the *Underlay Following Sections* command for **Report Header b** but not for **Report Header a**

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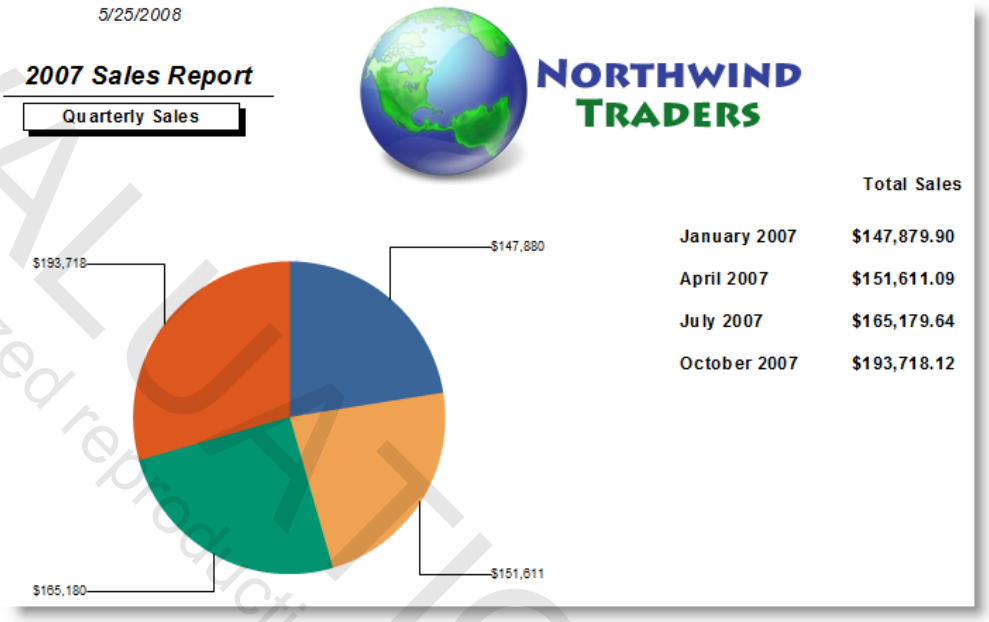
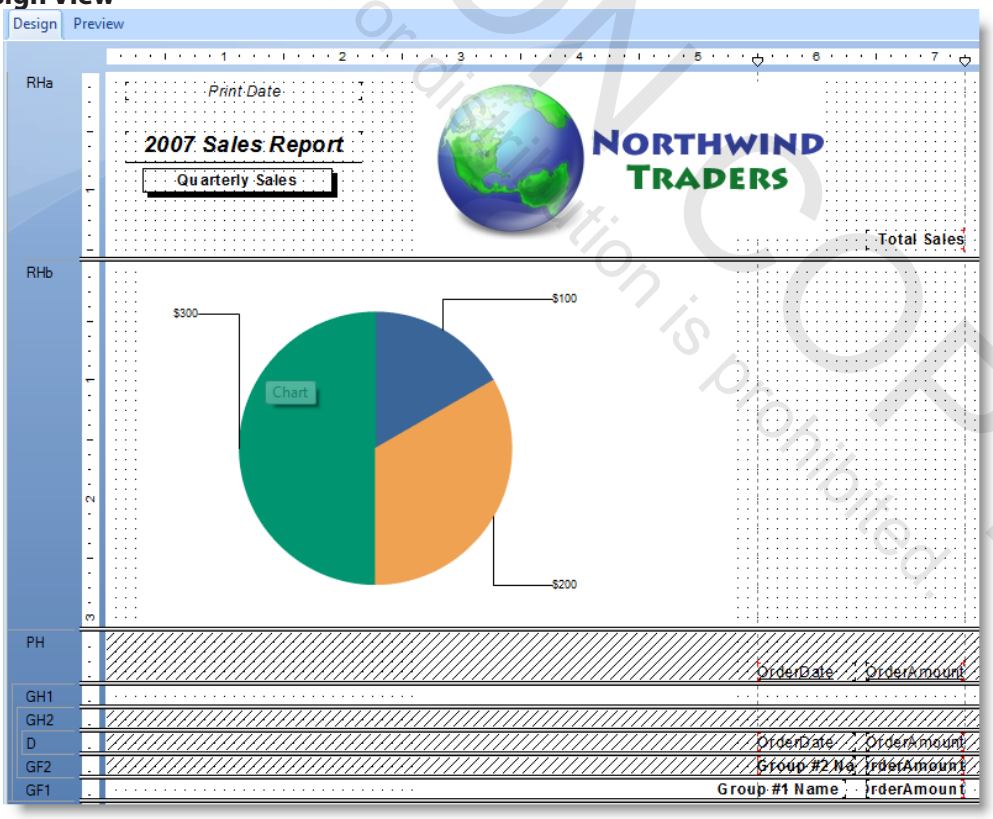
13. Finally you want to add a title for the quarterly sales figures. Add a text object to **Report Header a** that lines up with the **OrderAmount** summary fields. Type **Total Sales**. Format the box to be bold with a bottom single border

14. Save this report and name it **Quarterly Sales Report.rpt**. Preview the report

Preview View



Design View



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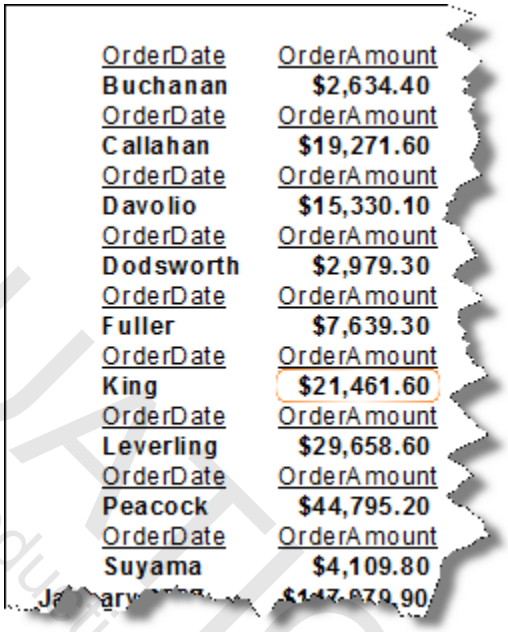
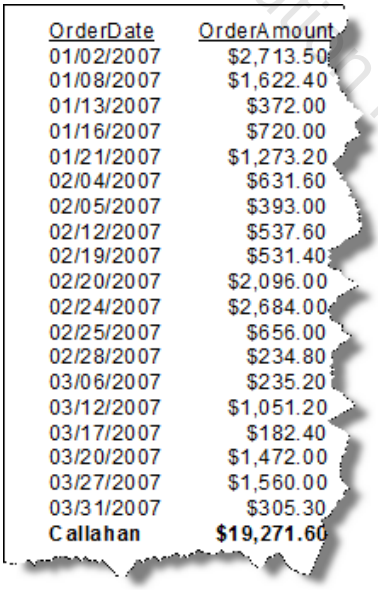
Challenge Exercise – Conditionally Formatting Using DrillDownGroupLevel

The Quarterly Sales report displays summary level information. However, when you created this report, you included the detailed information. The information in the Group #2 sections and the Details section was hidden in the previous exercise. If you drill down into the report by selecting the summary information for January 2004, you will notice the report will display column headings for the first drill down. The drill down will look similar to the following example:



OrderDate	OrderAmount
Buchanan	**$2,634.40**
OrderDate	OrderAmount
Callahan	**$19,271.60**
OrderDate	OrderAmount
Davolio	**$15,330.10**
OrderDate	OrderAmount
Dodsworth	**$2,979.30**
OrderDate	OrderAmount
Fuller	**$7,639.30**
OrderDate	OrderAmount
King	**$21,461.60**
OrderDate	OrderAmount
Leverling	**$29,658.60**
OrderDate	OrderAmount
Peacock	**$44,795.20**
OrderDate	OrderAmount
Suyama	**$4,109.80**

Obviously we do not want the column headings to appear at this level of detail. However, we do not want to delete them, because they will serve a useful purpose when you drill down to the order details for each employee. In order to prevent the column headings from appearing at the first drill down, we use a formatting option called DrillDownGroupLevel. By using this function in conjunction with conditional suppression of a section, the column headings will display at the order detail level, but not at the employee summary level.



OrderDate	OrderAmount
01/02/2007	$2,713.50
01/08/2007	$1,622.40
01/13/2007	$372.00
01/16/2007	$720.00
01/21/2007	$1,273.20
02/04/2007	$631.60
02/05/2007	$393.00
02/12/2007	$537.60
02/19/2007	$531.40
02/20/2007	$2,096.00
02/24/2007	$2,684.00
02/25/2007	$656.00
02/28/2007	$234.80
03/06/2007	$235.20
03/12/2007	$1,051.20
03/17/2007	$182.40
03/20/2007	$1,472.00
03/27/2007	$1,560.00
03/31/2007	$305.30
Callahan	**$19,271.60**

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In this exercise, you will format the report to only display the column headings at the order detail level.

1. Return to the **Design** view. Right click on the **Group Header #2** section and select the *Section Expert...*
2. Locate the **X+2** button beside the *Suppress (No Drill-Down)* option
3. The **DrillDownGroupLevel** function is found in the **Print State** functions list. The formula for preventing the **Group Header #2** from displaying at level 1 is:

   DrillDownGroupLevel = 1

4. Save and close the **Format Formula Editor**
5. Close the **Section Expert**
6. Save (**Quarterly Sales Report**) and preview the report
7. From the **Preview** tab, double click the value for **January 2007**
   Notice the information for January 2007 now displays the employees and their summary information. The column headings no longer appear at this level of detail.
8. Drill down to view the detail orders for **Davolio**. Notice the column headings appear above the **OrderDate** and **OrderAmount** columns.
9. Save the report (**Quarterly Sales Report**) and close.

Tip: If you are unsure what the DrillDownGroupLevel value is for the group you are working with, create a formula with the DrillDownGroupLevel value in it and place it into the header. You will then see the value as you drill down. Once you know the value, simply place it into the Section Expert as shown above to prevent the heading from displaying on drill down. Another way of knowing the level is to assume Preview = Level 0, Group 1 = Level 1, Group 2 = Level 2 and so on.

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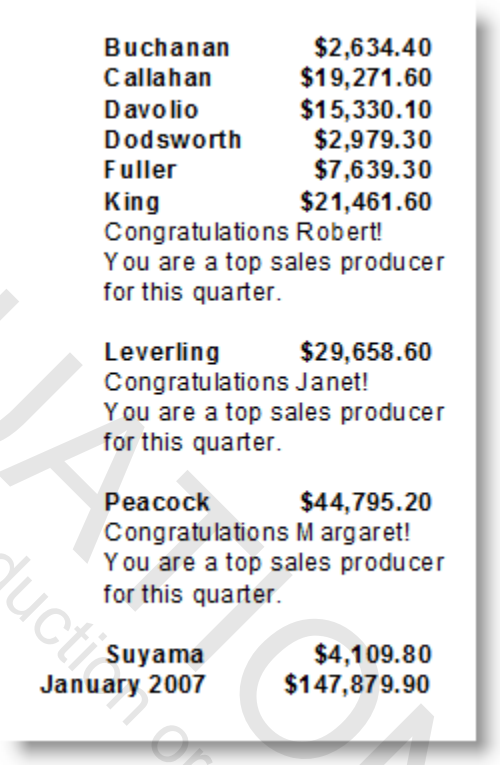
Challenge Exercise – Conditionally Formatting Multiple Sections

Suppose you also want to include a message in the report congratulating all the sales reps with sales over $20,000 in any quarter. The message only displays when the sales person drills down on the quarter to see employee sales for that quarter. You only want the message to appear under the employee names meeting the top sales goals for that quarter. The results should look like this:



Since the sales for each employee is a summary field, there is no way to compare it with summaries from other groups. So, you need to add the message and suppress it based on a combination of which quarter it is and the employee name.

1. Return to **Design** view.
2. RIGHT click the **Group Footer #2** section name at the left of the screen, and then choose *Insert Section Below*
3. Add a text box to the **Group Footer #2b** section. Type **Congratulations**, and insert the **{Employees.First Name}** field. Then type **! You are one of the top sales producers for this quarter.**
4. Resize the text object so it looks good to you and move it to the right side of the section, directly under the summary information for **Group Footer #2a**
5. Now you are ready to conditionally suppress the **Group Footer #2b** section. RIGHT click the **Group Footer #2b** section name, and choose *Section Expert...*
6. Click the **X+2** button after the *Suppress (No Drill Down)* check box.

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7. Enter the following formula:

   Sum ({Orders.OrderAmount}, {Employees.LastName}) < 20000

8. Save and close the formula. Close the **Section Expert**. Save and preview the report. Double click on the **January 2007** sales to see if the formula worked

9. Save (**Quarterly Sales Report**)

The drill-down pages of the report should look similar to the example at the beginning of this challenge exercise.

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Lesson 3
Using the Running Totals Feature

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Lesson Objectives

After completing this lesson, you will be able to:

- **Understand how to use Running Totals fields**
  Learn to create accumulated totals and to reset them automatically
- **Create totals conditionally**
  Define a running total to only accumulate or increment under certain conditions
- **Create totals independent of groups in the report**
  Now you have the control to make totals for any breaking point in the report or for all the records in the report

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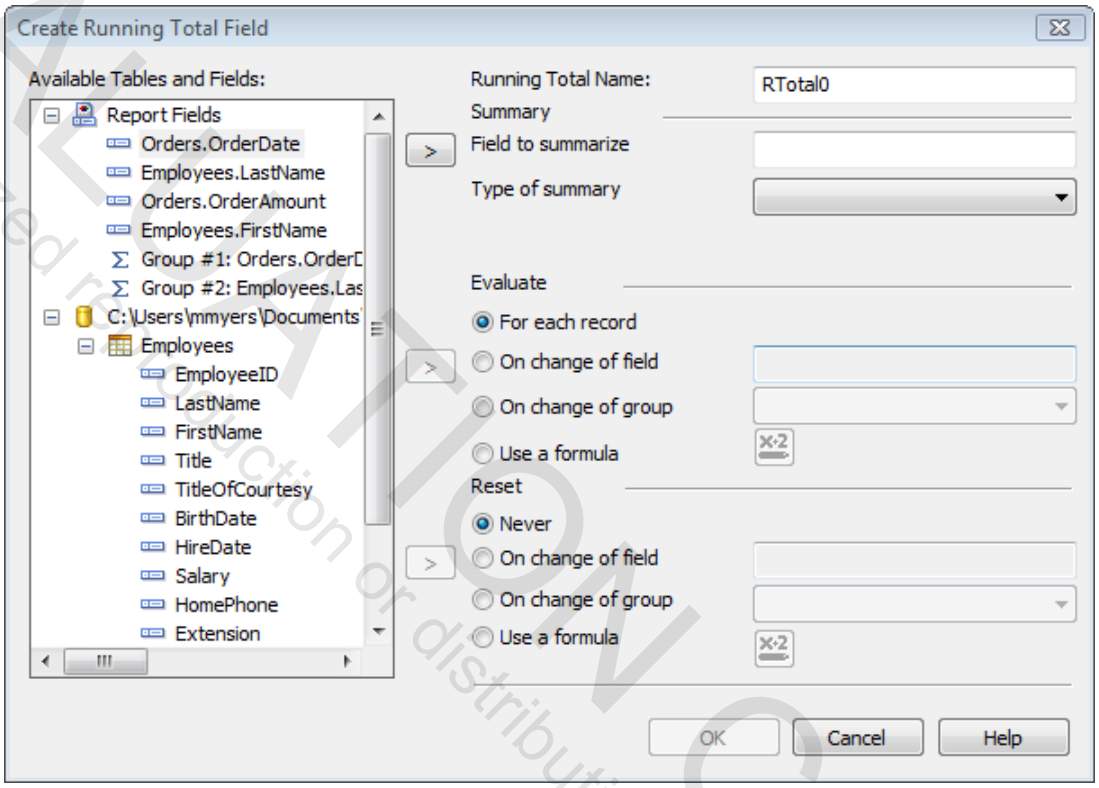
Understanding Running Totals

To make working with totals easier, Crystal Reports has the Running Total field, an automatic field that calculates totals record by record, rather than just summarizing fields at the end of groups. Running total fields work similar to formula fields. You create the running total from the Field Explorer dialog box, and then insert it into the report just like any other field. Running Total fields perform functions similar to summary fields, but provide more control over how the total is calculated and when the value is reset.

You create running total fields from the Field Explorer dialog box. With the *Running Total Fields:* highlighted, selecting the New button will open the Running Total Dialog box.



In this dialog box, you can name the Running Total field, pick a field to summarize and a type of calculation, determine when to evaluate the field, and define when to reset the field. You can even use the Formula Editor to specify conditions on which to evaluate or reset.

Once you have created a Running Total field you can use it in the report or reference it in formulas. The performance of the total is not dependent upon where you put the field in the report. It performs its calculations based upon the settings you define in the Create Running Total Field dialog box. However, proper placement of the running total within the report is suggested so the calculation makes sense when the report is reviewed.

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Creating Running Totals for a List of Numbers

Running totals perform calculations on a record-by-record basis. That is, they evaluate for each record read in the report. For example, if you have a list of values and perform a running total that sums them, the running total adds each value to the sum of all the previous values.

Values	Running Total
2	0 + 2 = 2
4	2 + 4 = 6
10	6 + 10 = 16

The most basic type of running total is one calculating a list of numbers. You tell Crystal Reports which field to calculate and what type of calculation to perform (count, standard deviation, sum, etc.). If the report is grouped, you can also instruct Crystal to restart the calculations at each new group.

In the next exercise, you are going to sum a list of Last Year's Sales amounts for customers. The report is grouped by Region. The report also shows the Top 3 regions. Remember the grand total shows the total for all selected records. We shall use the Running Total to show a grand total for the top 3 regions. In this case we do not need to reset the running total.

❖ Exercise 3.0 – Create a Running Total for a Top N or Bottom N report

1. Begin a new report, as a blank report, based on the **Northwind 2008** database and the **Customers** and **Orders** tables

2. Select only orders placed in 2008
   Hint: Use the Record Selection Formula Editor to create the filter. The filter should look like: ***{Orders.OrderDate} >= Date (2008,1,1)***

3. Add the **OrderID**, the **OrderDate** and **OrderAmount** fields to the **Details** section. Format **OrderID** to not display a thousands separator and the **OrderDate** to display the date only

4. Insert a group based on the **CompanyName** field

5. Resize the **Group Header #1** to be **.5"** tall and move the field headers from the **Page Header** section to the **Group Header #1**, below the **Group Name** field

6. Summarize the **OrderAmount** by **Group #1** and **Grand Total**.

7. Sort the group using the **Group Sort Expert** to be a **Top 3** report exclude others from the report.

8. Add a title in the **Report Header** section and suppress the **Page Header** section. The title should display the text "**Customer Sales Orders 2008 YTD**" and be formatted with a border, drop shadow and 16pt font

9. Save the report as **Customer Sales Orders 2008 YTD.rpt** and preview

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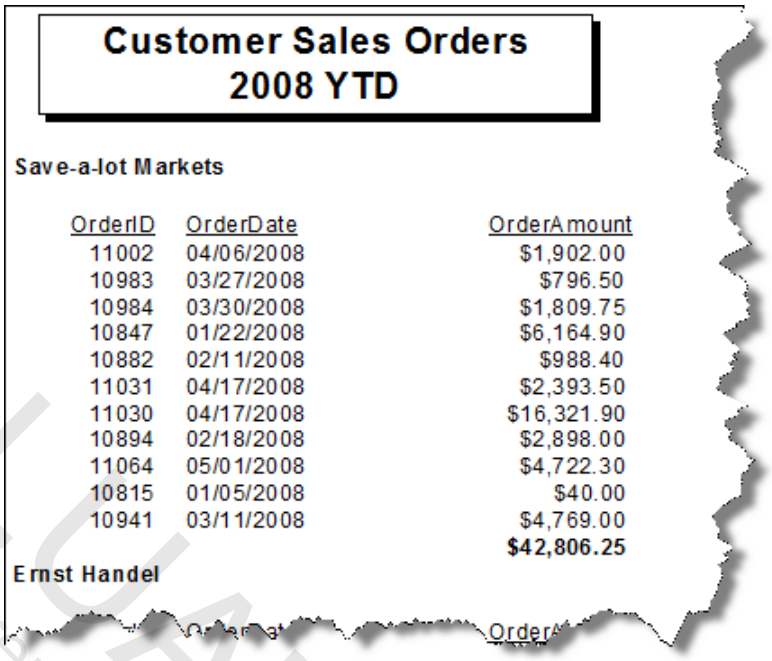
The report should look similar the following example:



Customer Sales Orders
2008 YTD

Save-a-lot Markets

OrderID	OrderDate	OrderAmount
11002	04/06/2008	$1,902.00
10983	03/27/2008	$796.50
10984	03/30/2008	$1,809.75
10847	01/22/2008	$6,164.90
10882	02/11/2008	$988.40
11031	04/17/2008	$2,393.50
11030	04/17/2008	$16,321.90
10894	02/18/2008	$2,898.00
11064	05/01/2008	$4,722.30
10815	01/05/2008	$40.00
10941	03/11/2008	$4,769.00
		$42,806.25

Ernst Handel

10. Now you are ready to create the running total. Select the **Running Total Field** item in the **Field Explorer**, and then click the New button.

11. Name the Running Total field **RT_Sales Total**.

12. Select the **OrderAmount** field, and then click the > button in the **Summary** section.

13. The field is added to the *Summary* section. The sum function is the default selected in the *Type of summary* list.

14. You want the field to be calculated for every record in the report, so make sure the *For each record* radio option is selected in the *Evaluate* section.

15. You do not want to reset the running total. Your running total dialog should look as follows:

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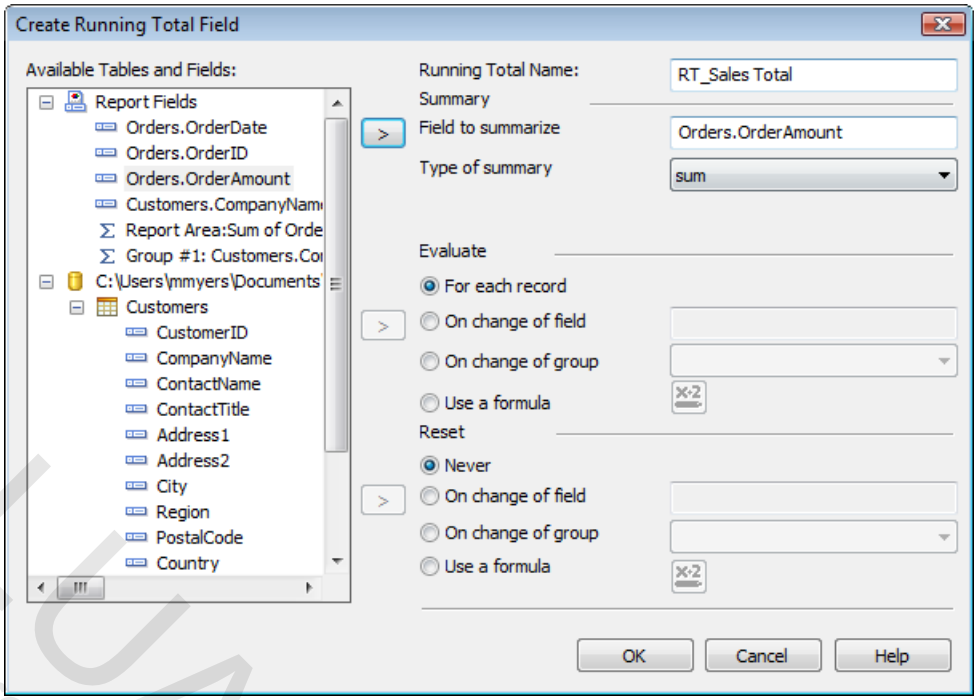

16. Click OK to save the **RT_Sales Total** field and return to the **Field Explorer**.

17. Insert the **RT_Sales Total** field into the Details section of the report after the **OrderAmount** field.

18. Insert the running total into the **Group Footer #1** and the **Report Footer** as well.

19. Save (**Customer Sales Orders 2008 YTD**) the report and preview it.

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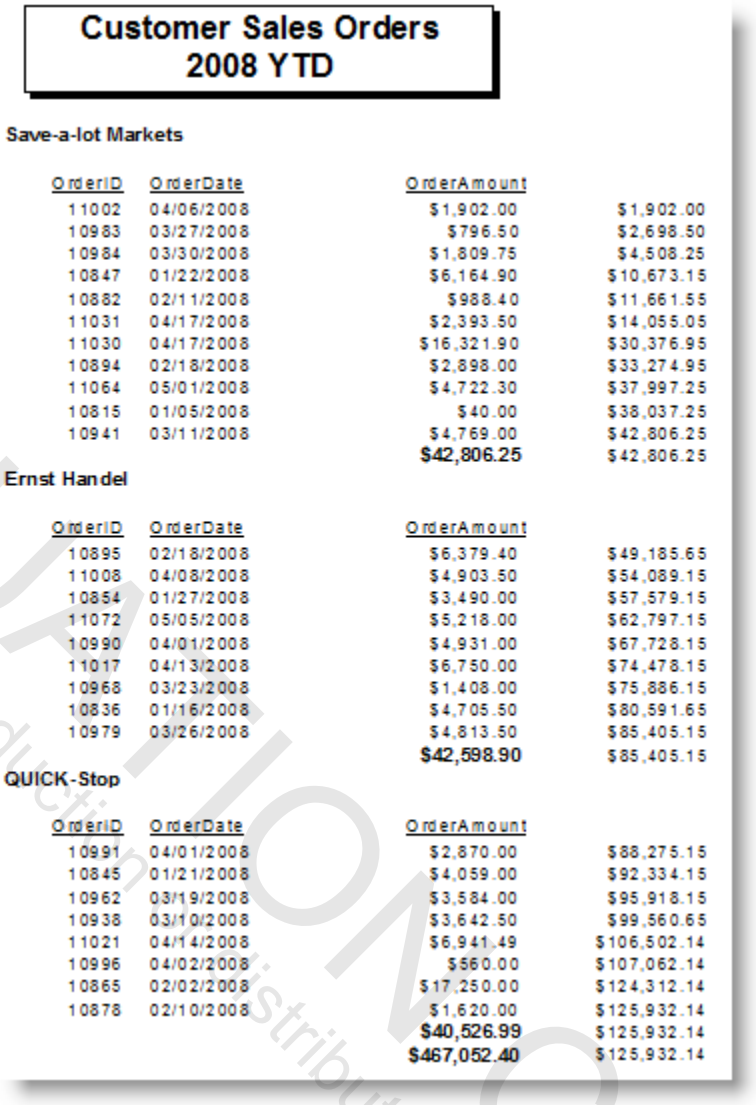
The report should be similar to the following illustration:



Customer Sales Orders
2008 YTD

Save-a-lot Markets

OrderID	OrderDate	OrderAmount	
11002	04/06/2008	$1,902.00	$1,902.00
10983	03/27/2008	$796.50	$2,698.50
10984	03/30/2008	$1,809.75	$4,508.25
10847	01/22/2008	$6,164.90	$10,673.15
10882	02/11/2008	$988.40	$11,661.55
11031	04/17/2008	$2,393.50	$14,055.05
11030	04/17/2008	$16,321.90	$30,376.95
10894	02/18/2008	$2,898.00	$33,274.95
11064	05/01/2008	$4,722.30	$37,997.25
10815	01/05/2008	$40.00	$38,037.25
10941	03/11/2008	$4,769.00	$42,806.25
		$42,806.25	$42,806.25

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OrderID	OrderDate	OrderAmount	
10895	02/18/2008	$6,379.40	$49,185.65
11008	04/08/2008	$4,903.50	$54,089.15
10854	01/27/2008	$3,490.00	$57,579.15
11072	05/05/2008	$5,218.00	$62,797.15
10990	04/01/2008	$4,931.00	$67,728.15
11017	04/13/2008	$6,750.00	$74,478.15
10968	03/23/2008	$1,408.00	$75,886.15
10836	01/16/2008	$4,705.50	$80,591.65
10979	03/26/2008	$4,813.50	$85,405.15
		$42,598.90	$85,405.15

QUICK-Stop

OrderID	OrderDate	OrderAmount	
10991	04/01/2008	$2,870.00	$88,275.15
10845	01/21/2008	$4,059.00	$92,334.15
10962	03/19/2008	$3,584.00	$95,918.15
10938	03/10/2008	$3,642.50	$99,560.65
11021	04/14/2008	$6,941.49	$106,502.14
10996	04/02/2008	$560.00	$107,062.14
10865	02/02/2008	$17,250.00	$124,312.14
10878	02/10/2008	$1,620.00	$125,932.14
		$40,526.99	$125,932.14
		$467,052.40	$125,932.14

Note: The Grand Total for the report is $467,052.40. However, by using running totals we can get a grand total for the actual records displayed on the report, which in this case is $125,932.14. The reason for this discrepancy is due to the order in which Crystal Reports processes certain items. In the first process (pass of data) Crystal Reports calculates subtotal and grand totals as well as creates groupings. In the second process (pass of data) Crystal Reports applies TopN and Running Total fields. The way Crystal Reports processes data is covered in detail in the Using Advanced Formula Feature lesson.

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Conditional Running Totals

There may be times when you want running total values to calculate only under certain conditions. For example, in the current report, you might want to have a count of the number of customers with sales orders higher than $5,000. You might also want to calculate the total sales for those specific orders only. In cases like these, you must enter a formula that specifies the conditions under which the running calculation should be processed.

Since there are only two situations involved, to perform the calculation or not, you do not have to type an if…then…else… statement in the Formula Editor. All you have to do is specify the test for the condition. If the test evaluates to true, The running total calculates the record. If not, it does not. To create a conditional running total, just specify the Use a formula option in the Evaluate section, then enter a test for the condition.

TIP: You can also use a condition to define when the running total is reset. Choose Use a formula in the Reset section.

❖ Exercise 3.1 – Create a Conditional Running Total

1. Return to **Design** view and make sure the **Field Explorer** is open
2. Change the **Top N** sort to **All** (Descending) using the **Group Sort Expert**
3. Start a new running total and name it **RT_Count 5K**
4. Select **CompanyName** in the *Available Tables and Fields* list, then click the button to add it to the *Fields to summarize* box. Drop-down the *Type of summary* list and choose **Count**
5. In the **Evaluate** section, choose the *Use a formula* radio button. Click the button
6. Enter the following formula, then save and close the **Formula Workshop**:

   {Orders.OrderAmount} > 5000

7. Set the running total field to reset on the *Change of group*, **Group #1: Customers. CompanyName - A**. Then click **OK**
8. Create another running total named **RT_Orders 5K**. Select the **Orders.OrderAmount** field and set the *Type of summary* to **sum**. Use the same formula seen in step 6 for the evaluation and reset on change of the **ComapnyName** group. Click **OK**
9. Expand the height of **Group Footer #1** to **1"**. Delete the **RT_Sales Total** field in **Group Footer #1** and the **Details** section. Add a text object to the **Group Footer #1**
10. Type **There were** plus a space in the text box and then select from the **Field Explorer** box the **RT_Count 5K** running total field and place it into the text box. Continue to type **orders over $5,000 for a total of** plus a space
11. Add the **RT_Orders 5K** running total into the text object and then add a period (.)
12. Format the text object to have a single line border with a drop shadow

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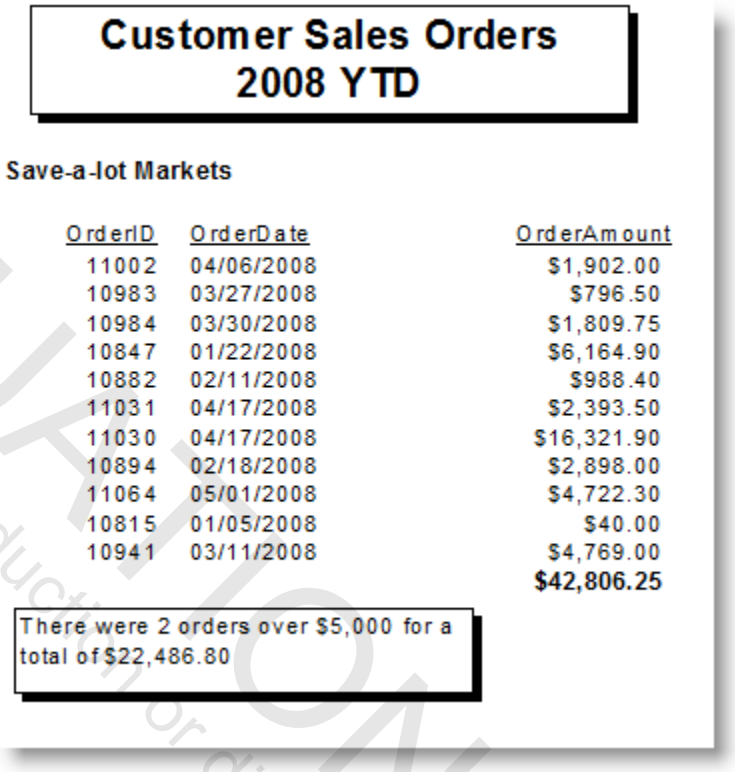
13. Finally, conditionally suppress the **Group Footer #1** section if the **{RT_#Count 5K}** running total field equals zero.
If a customer does not have any order over $5,000, you do not want to see the group footer.

14. Save the report (**Customer Sales Orders 2008 YTD**) and preview

The report should look like the following illustration.



Customer Sales Orders 2008 YTD

Save-a-lot Markets

OrderID	OrderDate	OrderAmount
11002	04/06/2008	$1,902.00
10983	03/27/2008	$796.50
10984	03/30/2008	$1,809.75
10847	01/22/2008	$6,164.90
10882	02/11/2008	$988.40
11031	04/17/2008	$2,393.50
11030	04/17/2008	$16,321.90
10894	02/18/2008	$2,898.00
11064	05/01/2008	$4,722.30
10815	01/05/2008	$40.00
10941	03/11/2008	$4,769.00
		$42,806.25

There were 2 orders over $5,000 for a total of $22,486.80

15. To see another advantage to running totals, add a formula that calculates the **RT_Sales Total** as a percentage of the **OrderAmount** summary. Create a formula named **LargeOrdersPct** and add the following formula:

{#RT_Orders 5K} % Sum ({Orders.OrderAmount}, {Customers.CompanyName})

16. In the **Group Footer #1** text box, add the following text: **Large orders represent** plus a space. Add the **LargeOrdersPct** formula followed with a percent symbol (%)

17. Add the remaining text: **of total sales revenue.** The final text box should look similar to the following example:

There were 2 orders over $5,000 for a total of $22,486.80 Large orders represent 52.53% of total sales revenue.

18. Save (**Customer Sales Orders 2008 YTD**) the report and close it

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❖ Exercise 3.2 – Using Running Totals as a Line Counter

1. Create a new report that only shows the last ten order transactions for each employee. This report uses the **Employees** and **Orders** tables from the **Northwind 2008** database

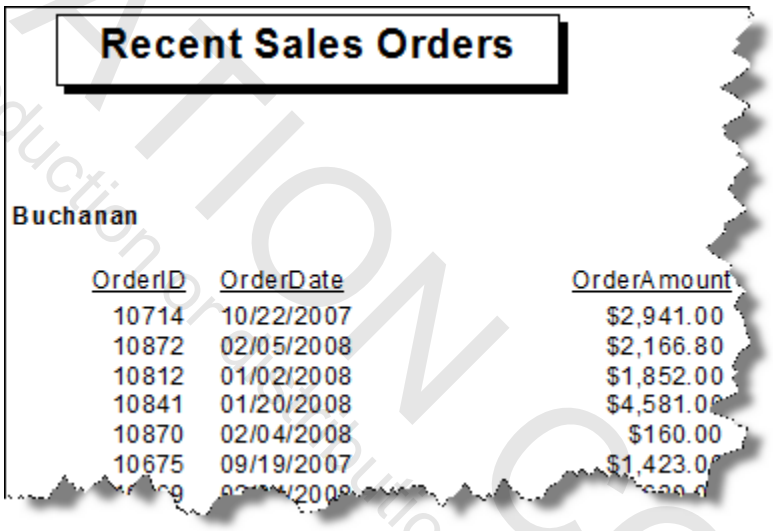
2. Group on the Employees **LastName** field

3. Insert the **OrderID**, **OrderDate** and **OrderAmount** fields in the **Details** section. Format **OrderDate** to show as a date without time and the **OrderID** field to display without a thousands separator

4. Place a text object in the **Report Header** section with the title **Recent Sales Orders**. Format the title as shown below

5. Move the field headers from the **Page Header** section to the **Group Header** section under the **Group #1 Name** field. Resize the Group Header #1 as needed

6. Save the report and name it **Recent Orders.rpt**. Preview the report. The report should look like the following example:



To view only the most recent ten transactions by date, you must sort the OrderDate field in *descending* order. Then you need to create a running total that counts the orders and conditionally suppresses the Detail section if the order count is greater than ten.

7. Using the **Record Sort Expert**, sort the **OrderDate** field in *descending* order.

8. Create the running total and name it **RT_Line Count**. Select the **OrderID** field. Set the summary to **count**, evaluate it for every record, and reset it at the change of the **LastName** group.

9. Place the **RT_Line Count** running total field in the Details section after the **OrderAmount** field. Delete the field header created for the running total

10. Preview the report and check to be sure that it restarts numbering at a new group. Save (**Recent Orders**) the report

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In order to show the last ten transactions per customer, you are going to conditionally suppress the Details section.

11. Open the **Section Expert** dialog box. Make sure the **Details** section is selected in the *Sections:* list.

12. Click the button beside the *Suppress (No Drill-Down)* check box.

13. Create the following formula: **{#RT_Line Count} > 10**

14. Save (**Recent Orders**) and preview the report. When finished, close the report

The report should look like the following illustration:

Recent Sales Orders

Buchanan

OrderID	OrderDate	OrderAmount	
11043	04/22/2008	$210.00	1
10954	03/17/2008	$1,902.10	2
10922	03/03/2008	$742.50	3
10899	02/20/2008	$144.00	4
10874	02/06/2008	$310.00	5
10872	02/05/2008	$2,166.80	6
10870	02/04/2008	$160.00	7
10869	02/04/2008	$1,630.00	8
10866	02/03/2008	$1,461.60	9
10851	01/26/2008	$2,740.00	10

Callahan

OrderID	OrderDate	OrderAmount	
11075	05/06/2008	$586.00	1
11068	05/04/2008	$2,384.80	2
11065	05/01/2008	$252.56	3
11056	04/28/2008	$3,740.00	4
11054	04/28/2008	$305.00	5
11050	04/27/2008	$900.00	6
11046	04/23/2008	$1,564.00	7
11036	04/20/2008	$1,692.00	8
11034	04/20/2008	$554.40	9
11007	04/08/2008	$2,633.90	10

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Challenge Exercise – Creating a Conditional Running Total

Suppose you need to create a list of customers in Canada and the USA. You do not want to group the report, but you do need to see sales totals for each of the countries. You can use a conditional running total for the sales figures.

1. Start a new report based on the **Northwind 2008** database and the **Customers** table
2. Add the **CompanyName** and **LastYearsSales** fields to the **Details** section
3. Select only those records with a country of **Canada** or **USA**. Use the '*is one of*' option from the **Select Expert** or manually create the filter in the **Record Selection Formula Editor** with the following formula:

   {Customers.Country} in ["Canada","USA"]

4. Sort the records alphabetically on **CompanyName**
5. Create a running total field called **Canada Total**. Select the **LastYearsSales** field and a **sum** operation. Select *Never* in the *Reset* section
6. In the *Evaluate* section, choose *Use a formula*. Then create the following formula:

   {Customers.Country} = "Canada"

7. Create a running total field called **USA Total**. Use the same settings and a formula that sets the Country = "USA"
8. Create a text object in the **Report Footer**. Type **Total for Canada:**
   Create another text object below the first one and Type **Total for USA:**
   Insert the two running totals to the right of the appropriate text objects.
9. Format the text objects to be bold. Format the running totals to be bold with a fixed currency symbol. It should look like the following:

   Total for Canada: **{#Canada Total}**
   Total for USA: **{ #USA Total}**

   NOTE: Running totals are indicated in Crystal Reports by the # sign.

10. Save the report and name it **USA Canada Sales.rpt**. Preview the report, and then close it

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The USA Canada Sales report should look like the following illustration:

CompanyName	LastYearsSales
Bottom-Dollar Markets	$8,547.50
Great Lakes Food Market	$9,148.55
Hungry Coyote Import Store	$2,283.20
Laughing Bacchus Wine Cell	$335.50
Lazy K Kountry Store	$357.00
Let's Stop N Shop	$2,039.42
Lonesome Pine Restaurant	$1,837.20
Mère Paillarde	$26,087.10
Old World Delicatessen	$5,896.00
Rattlesnake Canyon Grocery	$19,658.70
Save-a-lot Markets	$60,672.64
Split Rail Beer & Ale	$2,972.50
The Big Cheese	$2,955.40
The Cracker Box	$1,621.24
Trail's Head Gourmet Provisi	$1,333.30
White Clover Markets	$10,262.55
Total for Canada:	**$34,970.10**
Total for USA:	**$121,037.70**

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