1010DATA

Excel Reporting with 1010data

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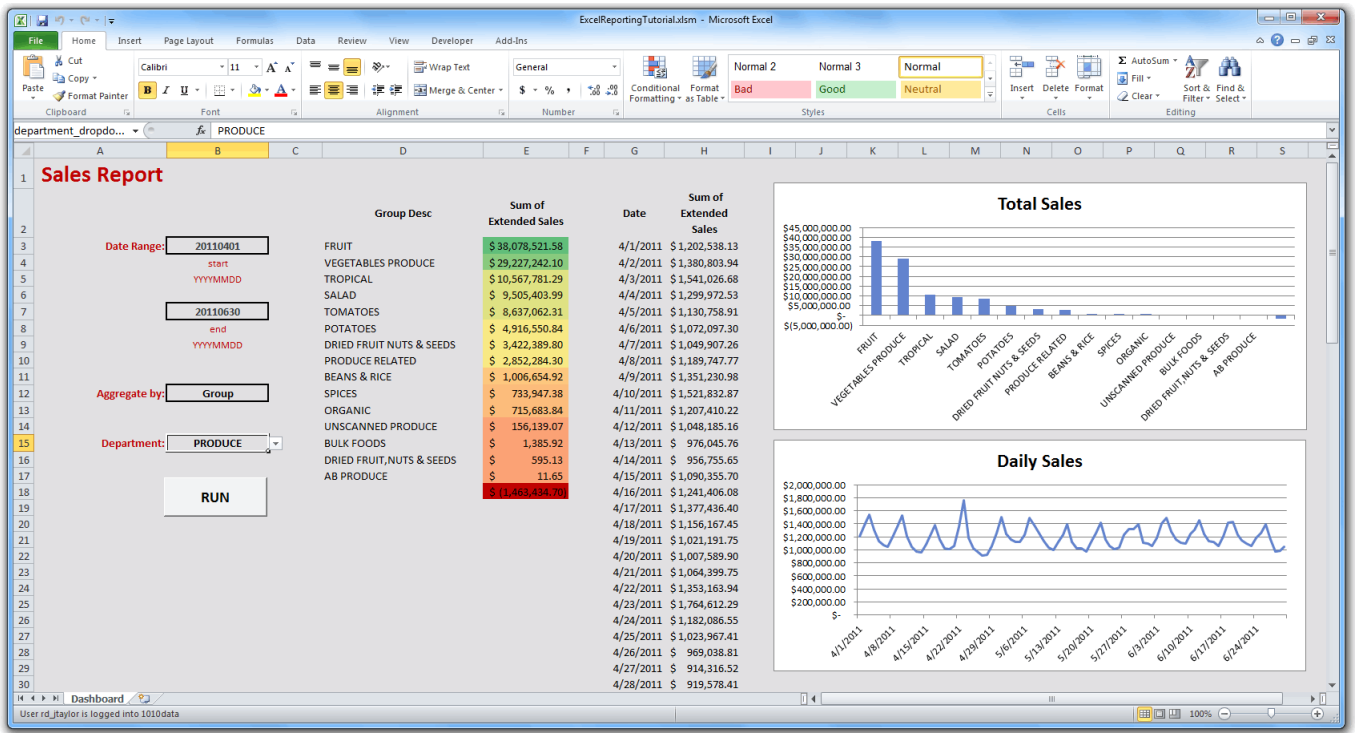
Overview

1010data gives its users the ability to manipulate and analyze large amounts of data using a familiar spreadsheet interface. It is for that very reason that the 1010data GUI is known as the Trillion Row Spreadsheet. Many of our users also like to use Microsoft Excel for its widely-known functionality and its ability to create user-interactive dashboards. Because of that, we've made it very easy to create dashboards in Excel that can leverage the power and speed of data analysis using the 1010data engine. In fact, it is fairly simple to incorporate user-specified parameters in a query that is run on 1010data and have the results displayed directly in an Excel dashboard with charts and conditional formatting.

Let's say we want to build a dashboard in Excel that displays the results of two 1010data queries. One simply aggregates total sales for a specified department and date range, while the other aggregates total sales by date for the same department. We want to give the user the ability to specify the start and end dates for the date range and to select the department for which they want to see total sales figures. In addition, we want to give the user the choice to aggregate either by group description or by brand. Finally, we want to see visualizations of the results in the dashboard using Excel's charting capabilities.

When we're finished with this tutorial, we want our dashboard to look something like the following:



Though this may look a little complex, it is created via a number of simple steps that this tutorial will guide you through:

- Start with a 1010data query that aggregates total sales for a specific department and date range
- Run the 1010data query from Excel using the 1010data Excel Add-in
- Add static inputs to the dashboard for the date range
- Target the results of the query to the dashboard
- Format the query results using basic and conditional formatting
- Add a simple chart to the dashboard
- Create a static drop-down to allow the user to select whether they want to aggregate on group description or brand
- Incorporate a dynamic drop-down to allow the user to select a particular department for the query
- Add another query that aggregates total sales by date for the same department

- Add a button to run both queries from the dashboard
- Chart the results of both queries dynamically on the dashboard
- Incorporate the use of 1010data libraries and blocks
- Hide the worksheets and lock the workbook

Let's build the dashboard one step at a time.

We'll use the 1010data Excel Add-in to run a 1010data query from Excel and download the results directly into an Excel worksheet. Let's start with a 1010data query.

Start with a 1010data query

Let's start off by building a query using 1010data's Trillion-Row Spreadsheet interface.

For our example, we'll use a **Sales Detail** table (`retaildemo.salesdetail`) that contains billions of rows of transactional data, and we'll incorporate information from a **Product Master** table (`retaildemo.products`) that contains detailed information about all of our products.

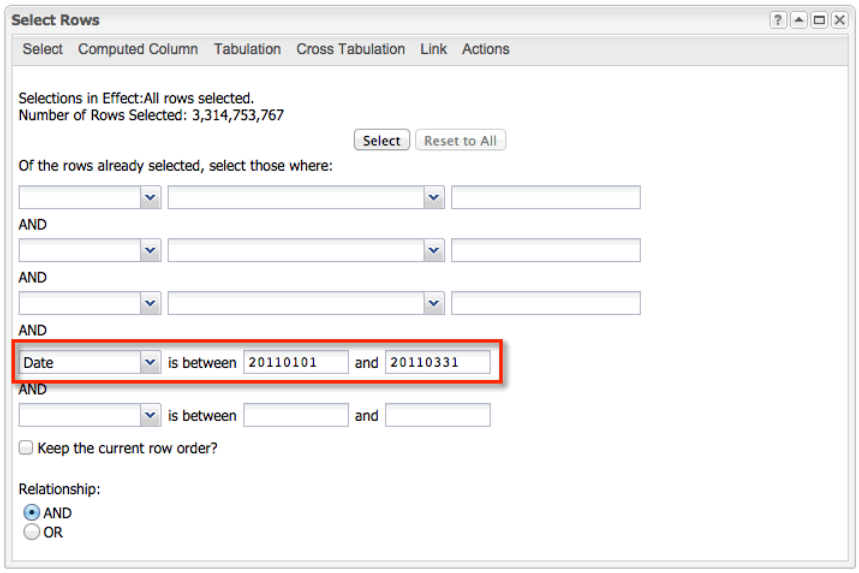
Let's say we want to calculate the total sales from 01/01/2011 to 03/31/2011 for items in department 19 and we want to group the results by the values in the **Group Desc** column of the **Product Master** table. So, our results would look something like:

Tabulation on Sales Detail
For: between(date;20110101;20110331)
Columns 1-2 of 2, Rows 1-7 of 7

Group Desc	Sum of Extended Sales
	32,297,595.61
SOFT DRINKS	19,981,237.31
SOFT DRINKS SINGLES	4,437,368.61
ENERGY DRINKS	2,869,443.74
NEW AGE BEVERAGE	2,516,073.37
SPARKLING/ENHANCED WATER	2,035,110.21
SODA MIXERS	443,330.15
UNSCANNED BEVERAGE	15,032.22

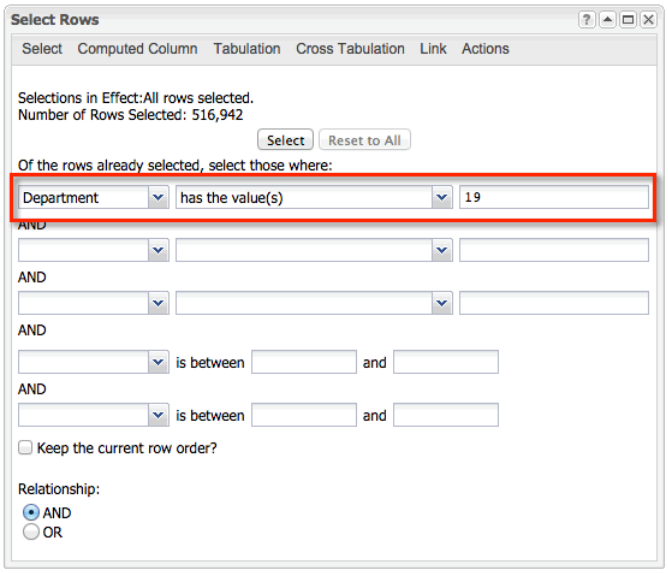
To do this in the 1010data web interface, it would take just a few simple steps.

We'll start by selecting those rows in the **Sales Detail** table whose values in the **Date** column fall between 01/01/2011 and 03/31/2011:

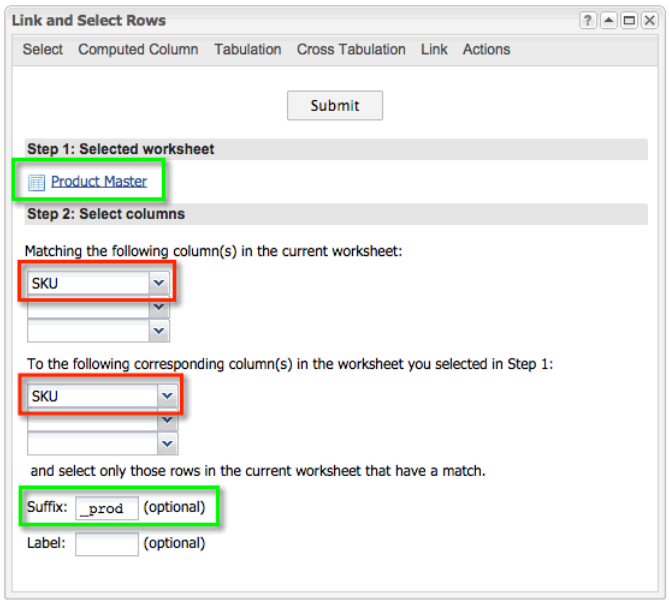


Note: We specify the date using *YYYYMMDD* format.

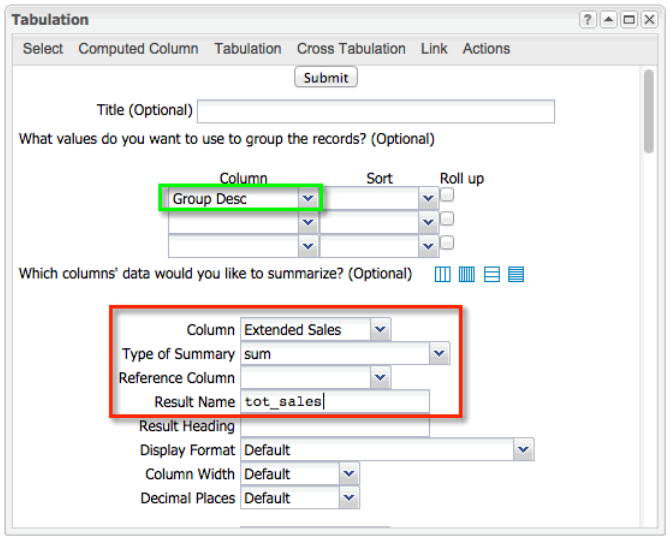
In the **Product Master** table, we'll select those rows whose **Department** is `19`.



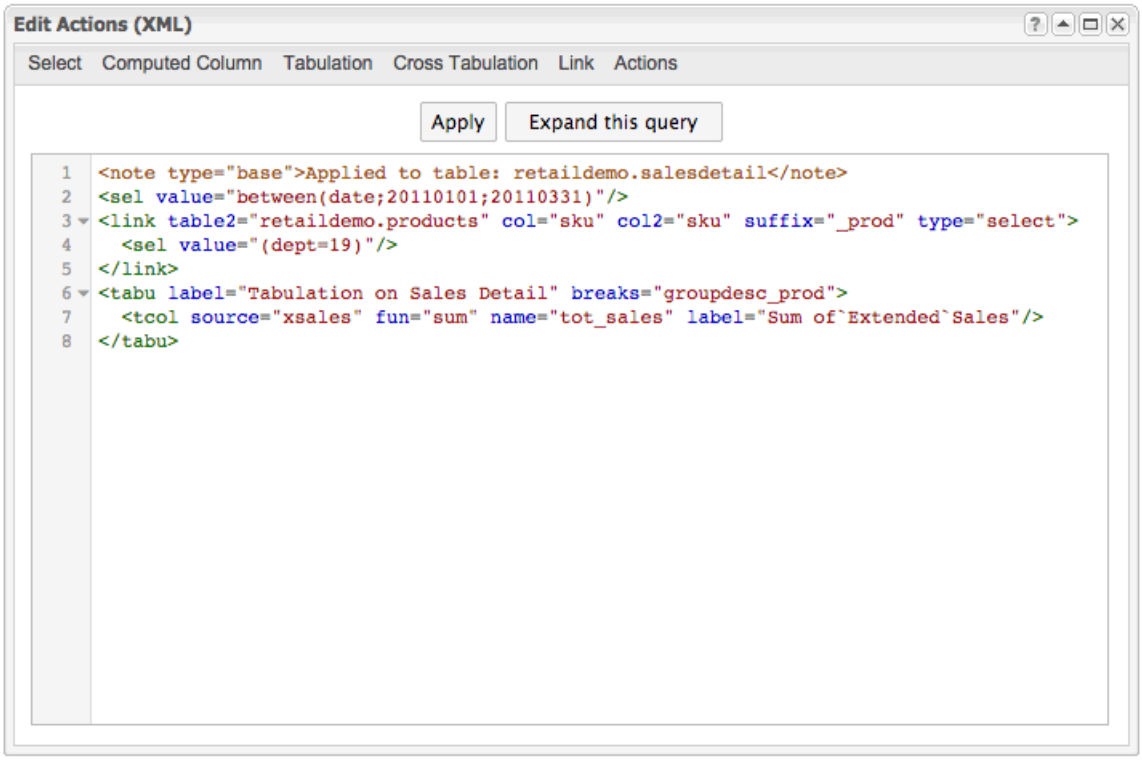
In the **Sales Detail** table, we can then use the **Link and Select** dialog to link in only those rows we just selected in the **Product Master**. We'll use the **SKU** column in each of the tables as the linking column, and we'll add the suffix `_prod` to those columns from the **Product Master** table:



Finally, in the **Sales Detail** table, we can use the **Tabulation** dialog to compute the sum of extended sales (`tot_sales`), grouping by the values in the **Group Desc** column:



Click **View** > **Edit Actions (XML)...** to see the Macro Language code for our query:



We can then copy and paste this Macro Language code directly into the 1010data Excel Add-in.

Running your query using the Excel Add-in

Using the 1010data Excel Add-in, we can run a query on 1010data from Excel and have the results directly downloaded into an Excel worksheet.

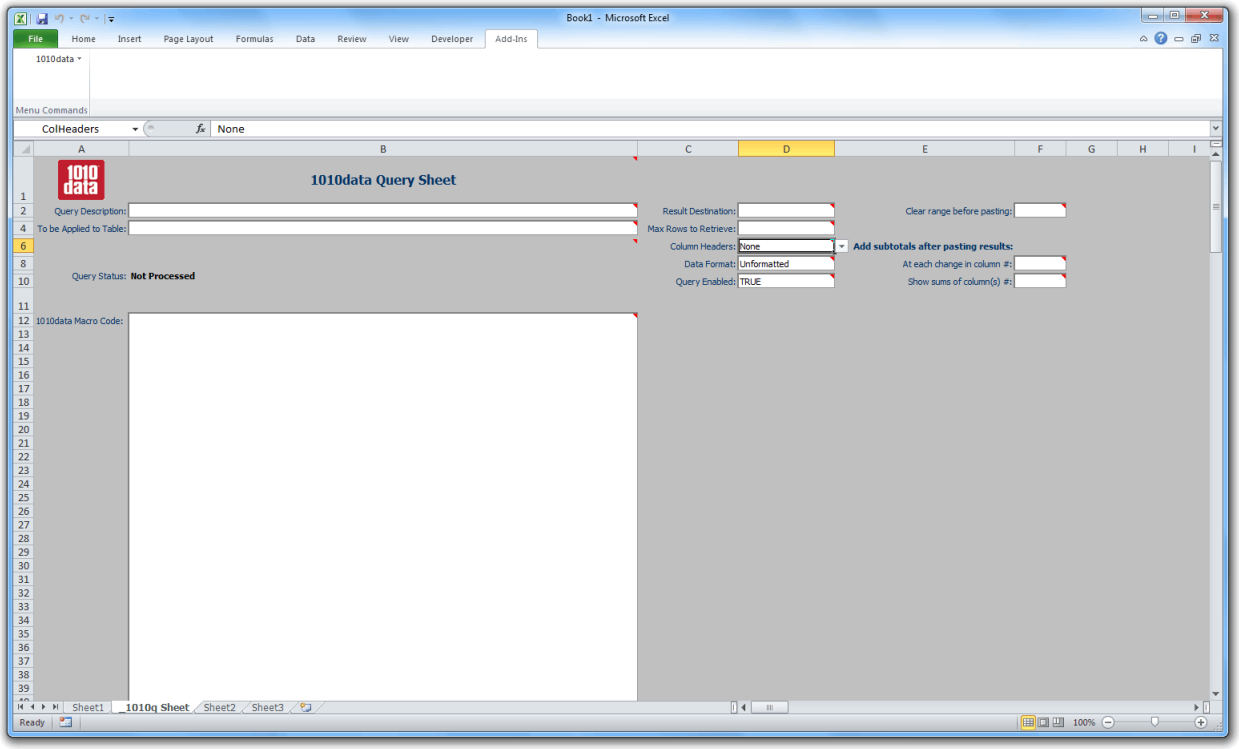
The Macro Language code for our example 1010data query is:

```
<note type="base">Applied to table: retaildemo.salesdetail</note>
<sel value="between(date;20110101;20110331)"/>
<link table2="retaildemo.products" col="sku" col2="sku" suffix="_prod" type="select">
  <sel value="(dept=19)"/>
</link>
<tabu label="Tabulation on Sales Detail" breaks="groupdesc_prod">
  <tcol source="xsales" fun="sum" name="tot_sales" label="Sum of`Extended Sales"/>
</tabu>
<sort col="tot_sales" dir="down"/>
```

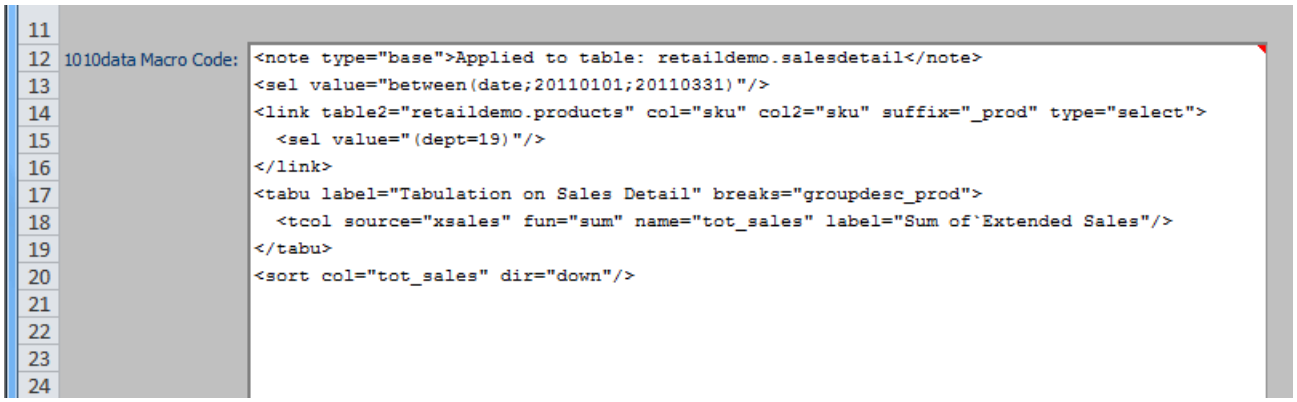
To run this query in an Excel workbook, we can use the 1010data Excel Add-in.

> **Note:** The 1010data Excel Add-in must be installed on your computer. (See *Installing the 1010data Excel Add-in* for more information.) Once installed, you want to make sure that you have *enabled the advanced features* of the 1010data Excel Add-in to perform the necessary steps in this tutorial.

In Microsoft Excel, from the **Add-Ins** menu, click **1010data** > **Add New Q-Sheet**. This will open a *q-sheet* in a new tab labeled **_1010q Sheet**, which is where we will specify the query we want to run on 1010data.



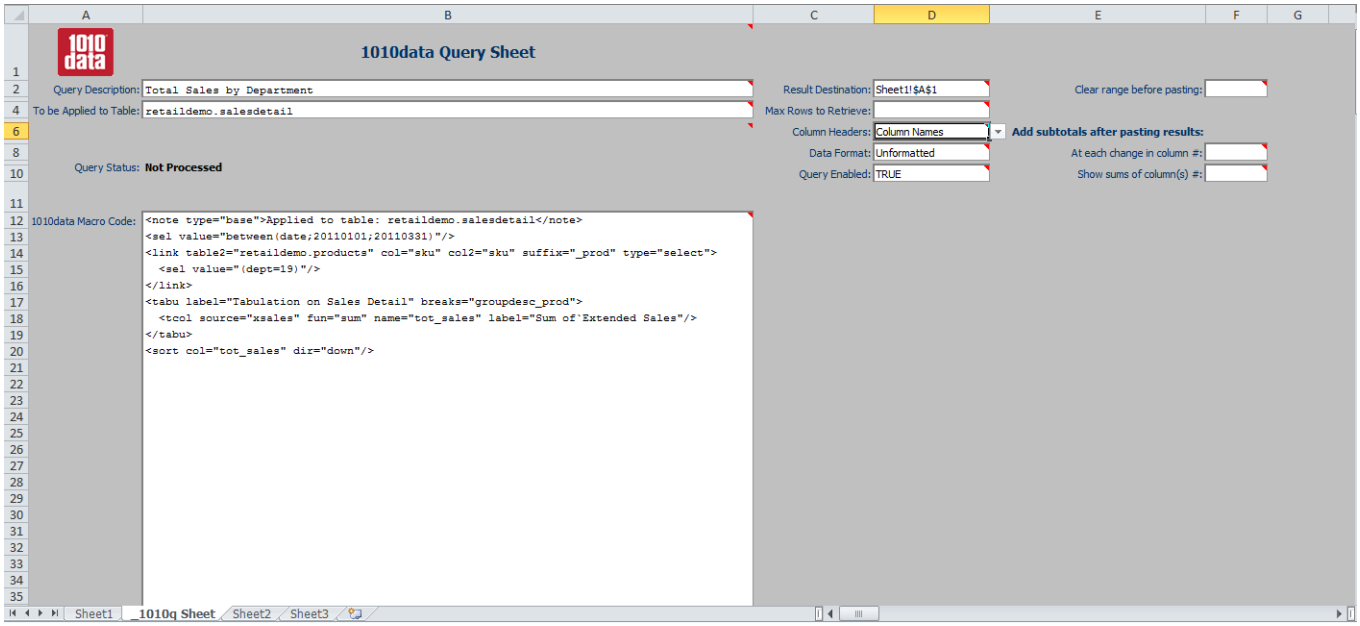
Copy the Macro Language code for the 1010data query and paste it into the section of the q-sheet labeled **1010data Macro Code**.



We need to enter some other information in the q-sheet:

- For the **Query Description**, enter "`Total Sales by Department`".
- In the **To be Applied to Table** field, we need to specify the full path to the table this query should be applied to. For this example, we'll enter `retaildemo.salesdetail`.
- In the **Result Destination** field, enter `Sheet1!$A$1` so that the results will be pasted in cell **A1** in the **Sheet1** worksheet.
- From the **Column Headers** drop-down, select "`Column Names`".

Our q-sheet should look similar to the following:



Let's run the query and see our results. From the **Add-Ins** menu, click **1010data** > **Run Queries** > **In Active Workbook** (or press Ctrl+Q).

> **Note:** If you have not logged into 1010data via the Excel Add-in, you will be presented with the following dialog:

Enter your 1010data credentials and click **Secure Login**.

As the query runs on 1010data, you'll see a **1010data Query Progress** dialog, which shows the percentage of total operations completed within the current query. When the query finishes running, you should see a dialog saying: `Query completed successfully`. Click **OK** to dismiss this dialog.

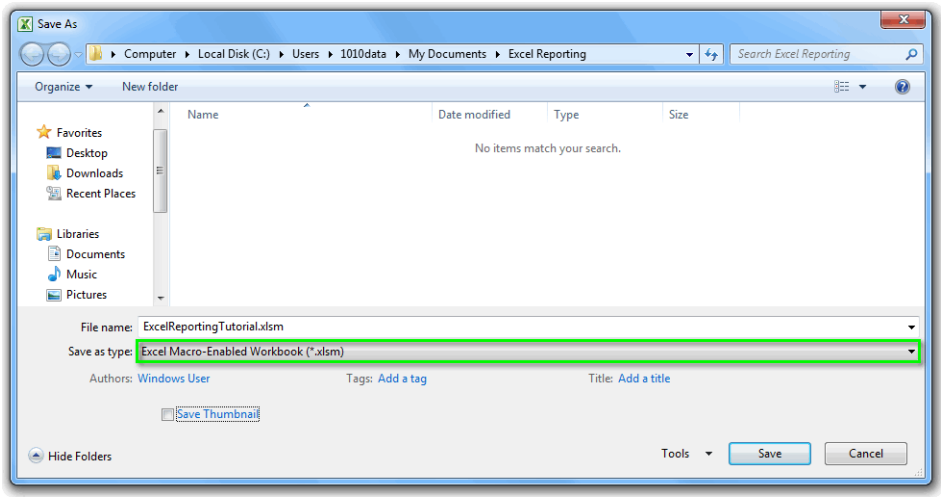
To see the results, click the **Sheet1** tab:

	A	B
1	groupdesc_prod	tot_sales
2	SOFT DRINKS	19981237.31
3	SOFT DRINKS SINGLES	4437368.61
4	ENERGY DRINKS	2869443.74
5	NEW AGE BEVERAGE	2516073.37
6	SPARKLING/ENHANCED WATER	2035110.21
7	SODA MIXERS	443330.15
8	UNSCANNED BEVERAGE	15032.22

Sheet1 _1010q Sheet Sheet2 Sheet3

You can see that the results of this query have been downloaded into Excel and are the same as what we got when we ran this query directly on 1010data.

> **Note:** It's a good idea to save your workbook as you progress though this tutorial. Click **File** > **Save As** and navigate to the folder where you want to save your work. Be sure to select **Excel Macro-Enabled Workbook (*.xlsm)** from the **Save as type** drop-down, as we will be incorporating VBA macros later in this tutorial.


Save As
Computer ▸ Local Disk (C:) ▸ Users ▸ 1010data ▸ My Documents ▸ Excel Reporting
Search Excel Reporting
Organize
New folder
Name
Date modified
Type
Size
No items match your search.
Favorites
Desktop
Downloads
Recent Places
Libraries
Documents
Music
Pictures
File name: ExcelReportingTutorial.xlsm
Save as type: Excel Macro-Enabled Workbook (*.xlsm)
Authors: Windows User
Tags: Add a tag
Title: Add a title
Save Thumbnail
Hide Folders
Tools
Save
Cancel

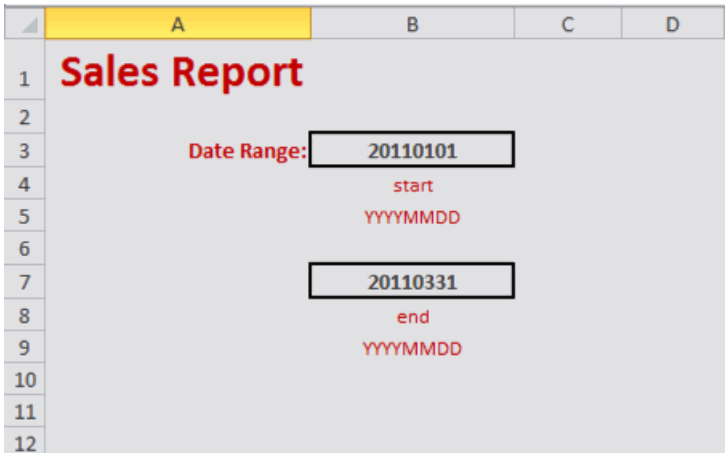
Adding a static input to a dashboard

Our original query had date values hard-coded for the row selection. Let's add a little more flexibility by allowing the user to enter a date range using static inputs.

We'll create a dashboard where the user can enter the start and end dates for the date range, and then we'll use those values in the query.

We can use **Sheet2** for our dashboard (or create a new worksheet, if necessary). Let's rename it "`Dashboard`" and change the background color to a light grey.

Enter text in the cells so that your dashboard looks similar to the following:



You can see in this example that we will allow the user to enter a start date in cell **B3** and an end date in cell **B7**. Below the inputs, we specify that we want the dates in the format *YYYYMMDD*, which is the date format used by 1010data.

> **Note:** There are no restrictions as to what the user can enter in these cells. These are simply cells in which the user can type in any values. Also, though we are specifying that we want the user to enter dates in the *YYYYMMDD* format for this example, you might want to allow the user to enter dates in a more recognizable format (e.g., *MM/DD/YYYY*). In this case, you would need to do some type of transformation on these input values to put them in the *YYYYMMDD* format. This date transformation could be done in Excel before the values are passed to the query, or within the 1010data query itself. (See *Date Transformations* for examples on how to do such a transformation within the 1010data query.)

Let's also name the cells that contain the start and end dates so that it will be easier to reference them in our q-sheet. We'll give the cell **B3** the name `startdate` and the cell **B7** the name `enddate`.

The q-sheet essentially sends whatever Macro Language code it contains to 1010data to process and return the results. Because of that, we can convert any row in the q-sheet that contains our macro code into an Excel formula that references the contents of other cells. Then, when the Excel Add-in sends that query to 1010data, it will contain the values in the referenced cells.

In our query, the date selection was done using the *`between(X;Y;Z)`* function:

```
<note type="base">Applied to table: retaildemo.salesdetail</note>
<sel value="between(date;20110101;20110331)"/>
<link table2="retaildemo.products" col="sku" col2="sku" suffix="_prod" type="select">
  <sel value="(dept=19)"/>
</link>
<tabu label="Tabulation on Sales Detail" breaks="groupdesc_prod">
  <tcol source="xsales" fun="sum" name="tot_sales" label="Sum of`Extended Sales"/>
</tabu>
<sort col="tot_sales" dir="down"/>
```

Let's go over to our q-sheet and change the hard-coded date values in our query to reference the new input values, `startdate` and `enddate`.

To reference input values from within the 1010data query, we will need to change the line in our macro code into a formula. We do this by:

- removing any blank spaces from the start of the line
- inserting an = at the beginning of the line
- enclosing the macro code in double quotes
- preceding any double quote within the macro code with another double quote so that Excel will not interpret any of them as the end of the formula
- replacing each hard-coded value with a reference to its corresponding input cell using the syntax: `"&[CELL_REFERENCE]&"` (e.g., `"&B3&"`)

Let's go through those steps for our example. There are no blank spaces at the start of the line, so we can move to the next step and add an = to the beginning:

```
=<sel value="between(date;20110101;20110331)"/>
```

Next, let's enclose the macro code in double quotes:

```
="<sel value="between(date;20110101;20110331)"/>"
```

Then, we'll precede each double quote within the macro code with another double quote so that Excel will not interpret any of them as the end of the formula:

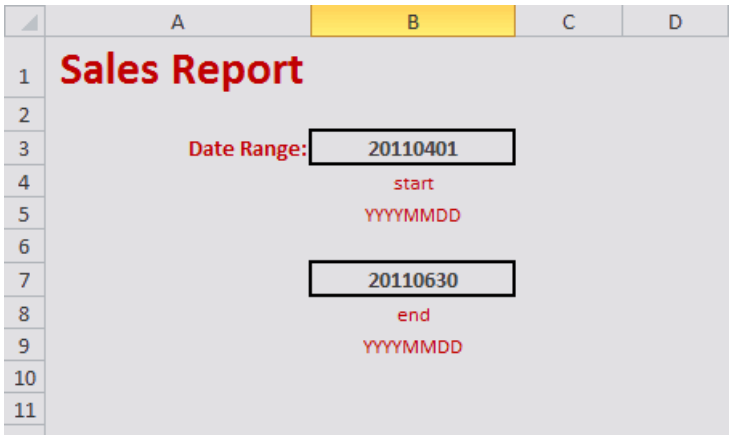
```
="<sel value=""between(date;20110101;20110331)""/>"
```

Our last step is to replace each hard-coded value with a reference to its corresponding input cell, so we'll change the start date value to a reference to the `startdate` cell and the end date to a reference to the `enddate` cell:

```
="<sel value=""between(date;"&startdate&";"&enddate&")""/>"
```

Now, let's test it out!

Change the date range values on the **Dashboard** worksheet so that the start date is 04/01/2011 and the end date is 06/30/2011. (Remember, we want these input values in the form *YYYYMMDD*.)



To run the query, click **1010data** > **Run Queries** > **In Active Workbook** (or press Ctrl+Q).

Then to see the results, click the **Sheet1** tab. The values displayed now show the total sales for each department for the new date range:

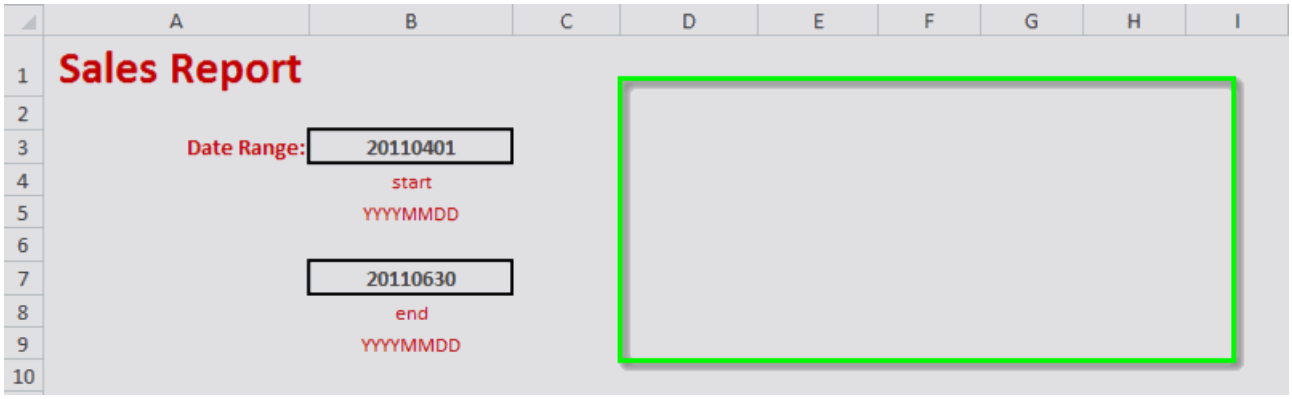
	A	B	C
1	groupdesc_prod	tot_sales	
2	SOFT DRINKS	22685213	
3	SOFT DRINKS SINGLES	5275938	
4	ENERGY DRINKS	3380641	
5	NEW AGE BEVERAGE	3266687	
6	SPARKLING/ENHANCED WATER	2305238	
7	SODA MIXERS	473634.9	
8	UNSCANNED BEVERAGE	18379.35	
9			
10			
11			

It's not very convenient to have to go to one worksheet to enter input values and a different one to view the results. It would be better if we could do everything from our dashboard. In the next step, we'll see how to target the results of our query to the dashboard itself.

Targeting the query results to the dashboard

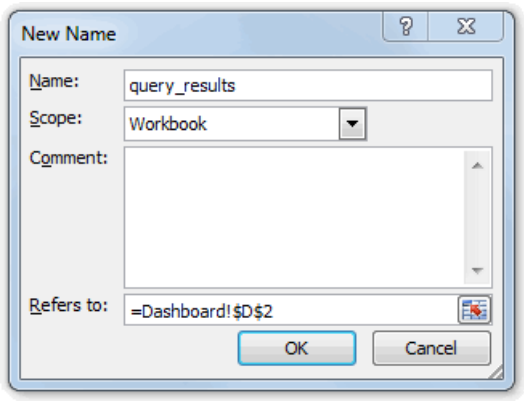
Let's set a result destination for our query results on the dashboard next to our input values.

Let's say we want our result values to be placed starting at cell **D2** on the **Dashboard** worksheet:



Click the **_1010q Sheet** tab to modify the q-sheet. The **Result Destination** is a reference to the top left cell of the range where the query results will be pasted. This can be an address or a defined name. Let's create a defined name for cell **D2** on the **Dashboard** worksheet.

On the **Formulas** tab, click **Define Name**. In the **New Name** dialog, enter `query_results` for the **Name** and enter the following for **Refers to**: `=Dashboard!$D$2`, then click **OK**.



> **Note:** If, for whatever reason, you need to modify a defined name that you have created, you can access it by clicking the **Name Manager** button on the **Formulas** tab and editing it within the **Name Manager** dialog. In addition to the names that you have defined, you will notice that there are other names that are needed by the Excel Add-in to work properly, which should not be altered in any way.

In the **Result Destination** field on the q-sheet, enter `query_results`.

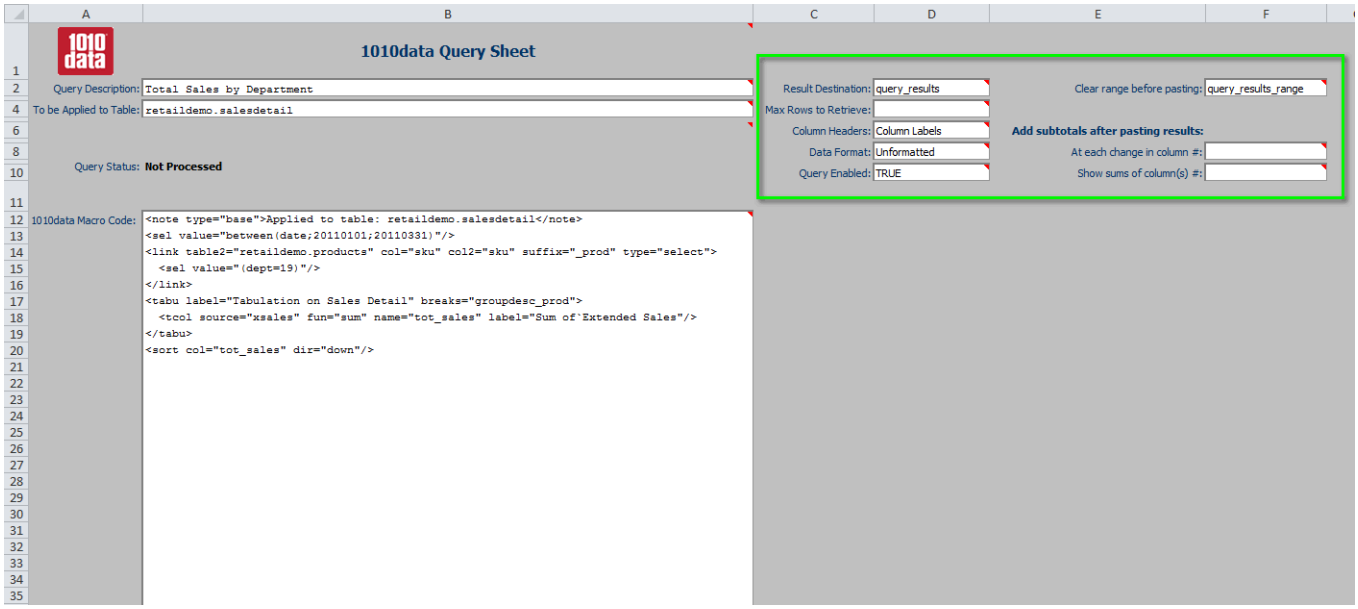
Since we will most likely run this query more than once, let's make sure that the contents from the results of any previous run of the query are cleared before we paste the results of the current query. To do this, click **Define Name**. In the **New Name** dialog, enter `query_results_range` for the **Name** and enter the following for **Refers to**: `Dashboard!$D$2:$E$500`, then click **OK**.

> **Note:** This assumes that our result data will be less than 500 rows, which is probably safe for this example; however, you would want to specify a range that makes sense for you.

In the **Clear range before pasting** field on the q-sheet, enter `query_results_range`.

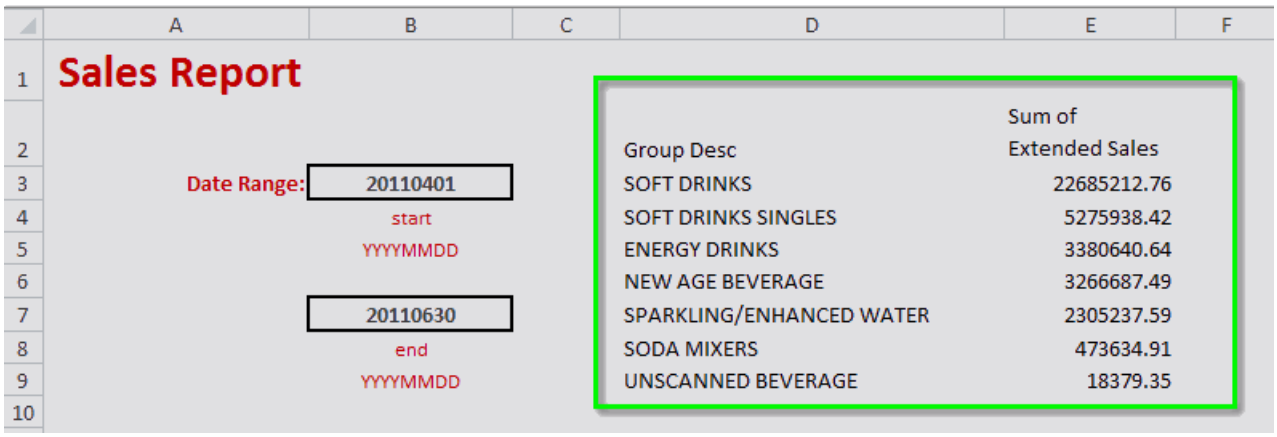
We would also like the column labels to be displayed at the top of the result columns instead of the column names, so let's select "`Column Labels`" from the **Column Headers** drop-down.

Our q-sheet should now look similar to the following:



Now, let's test it out. To run the query, press Ctrl+Q.

Then, click the **Dashboard** tab to see the results:



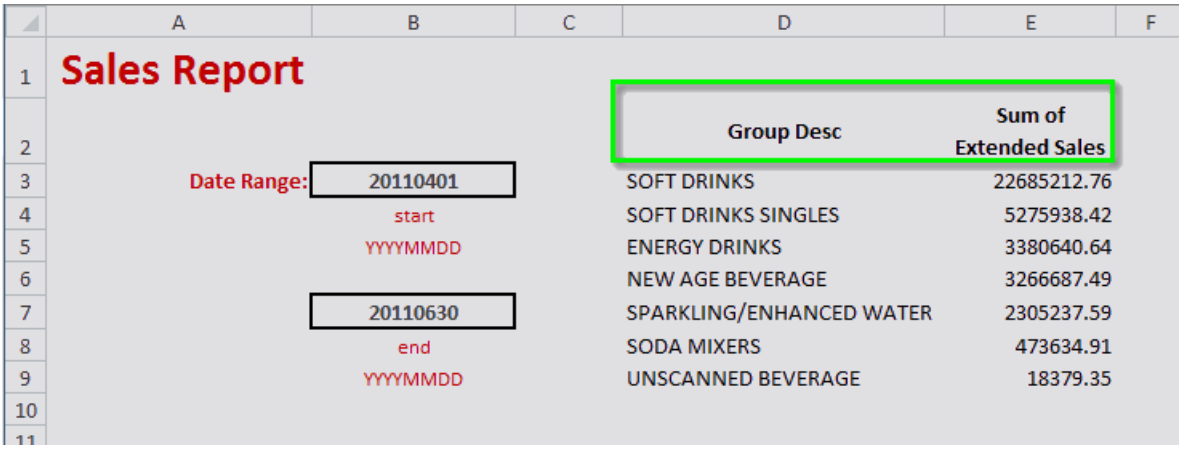
You can see that the results have been pasted in our dashboard right next to our input values. In the next section, we'll see how to apply basic and conditional formatting to these results.

Formatting the results on the dashboard

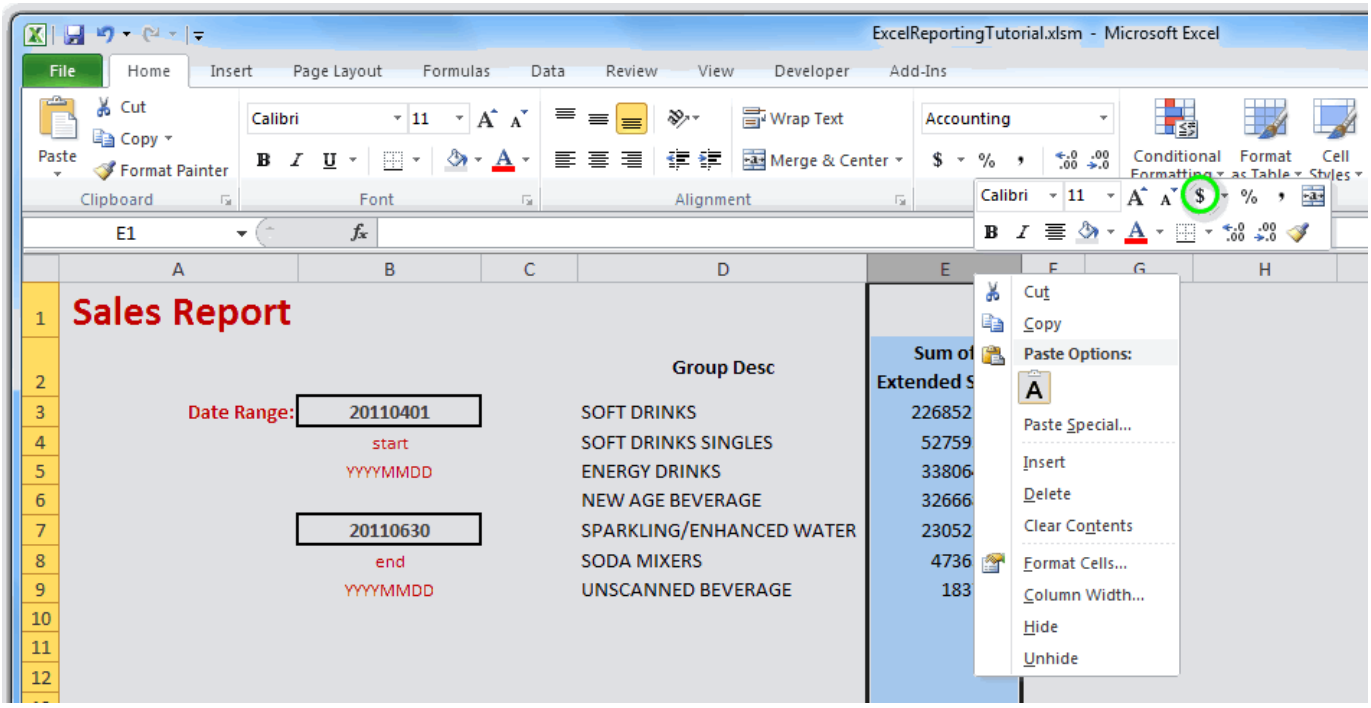
You can apply basic and conditional formatting in Excel on the results that you got from running your 1010data query.

Basic Formatting

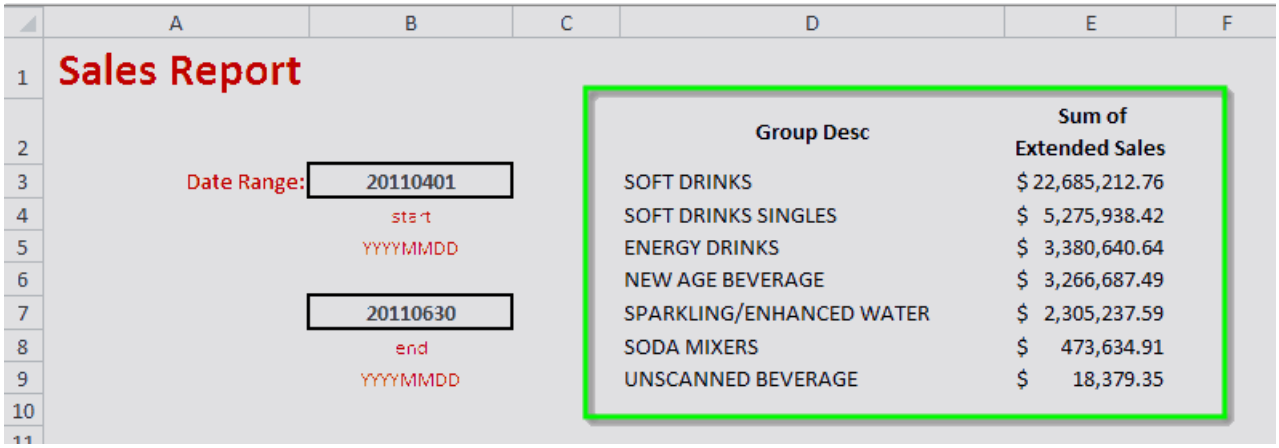
Since this is a dashboard, we can add a little formatting to make it more visually appealing. So, for our query results, let's change the cells containing the column headers to be bold, and let's center the text in those cells both horizontally and vertically.



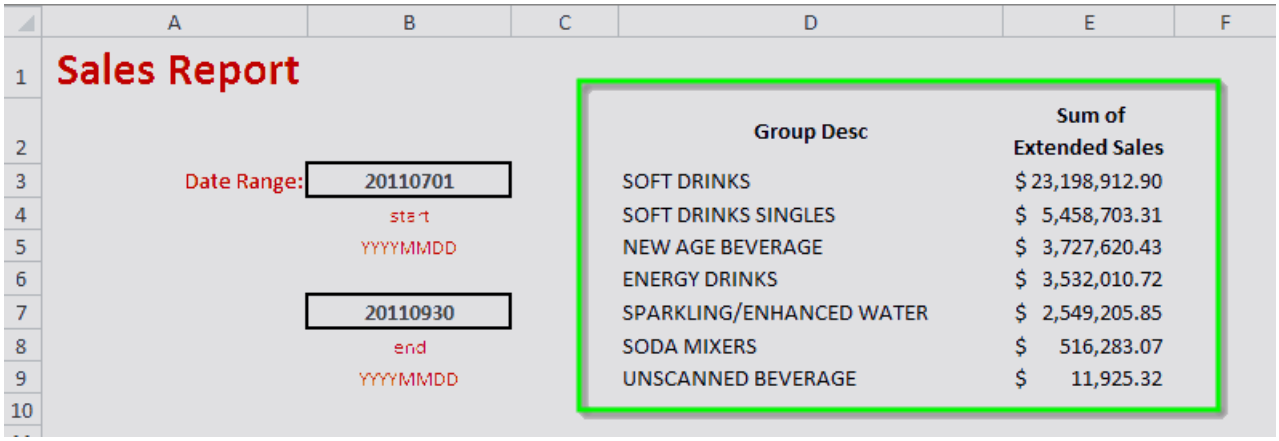
We'll also change the format of the **Sum of Extended Sales** column to appear as dollar amounts. Right-click the column heading in Excel and click the **$** from the context menu:



The values in that column will now be formatted correctly:



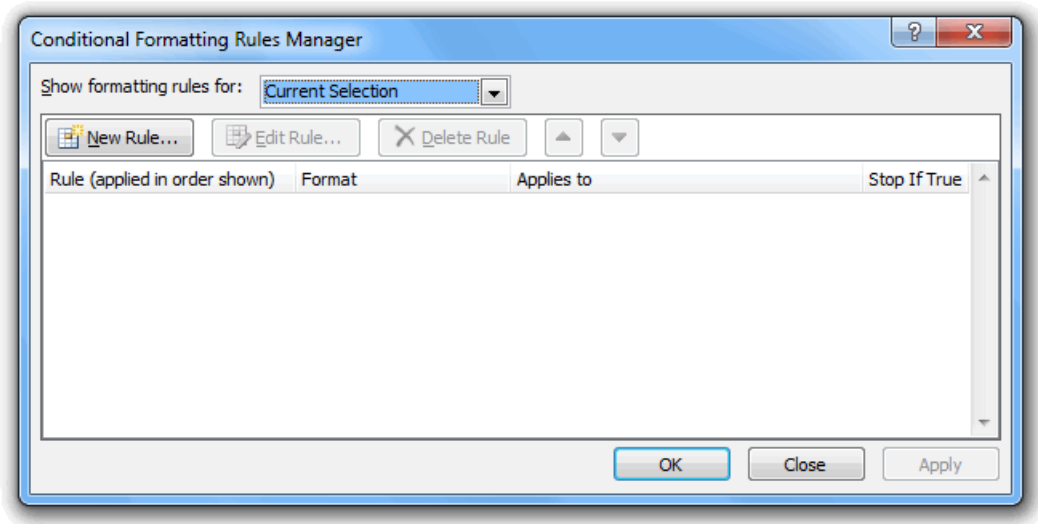
These formats will be retained every time the query is run. We can verify that by changing the dates and running the query again. Change the start date to `20110701` (07/01/2011) and the end date to `20110930` (09/30/2011). To run the query press Ctrl+Q (or click **1010data** > **Run Queries** > **In Active Workbook**). When the query finishes running, you should see the following results:



You can see that the values in the **Sum of Extended Sales** column have changed to reflect the new date range, and the formatting has been kept intact.

Conditional Formatting

We can also incorporate conditional formatting for the results from our 1010data query within our Excel workbook. Let's say we want the format the range of values in the **Sum of Extended Sales** column using a color scale. On the **Home** tab, click the **Conditional Formatting** button, and select **Manage Rules...** from the menu. The **Conditional Formatting Rules Manager** dialog is presented:



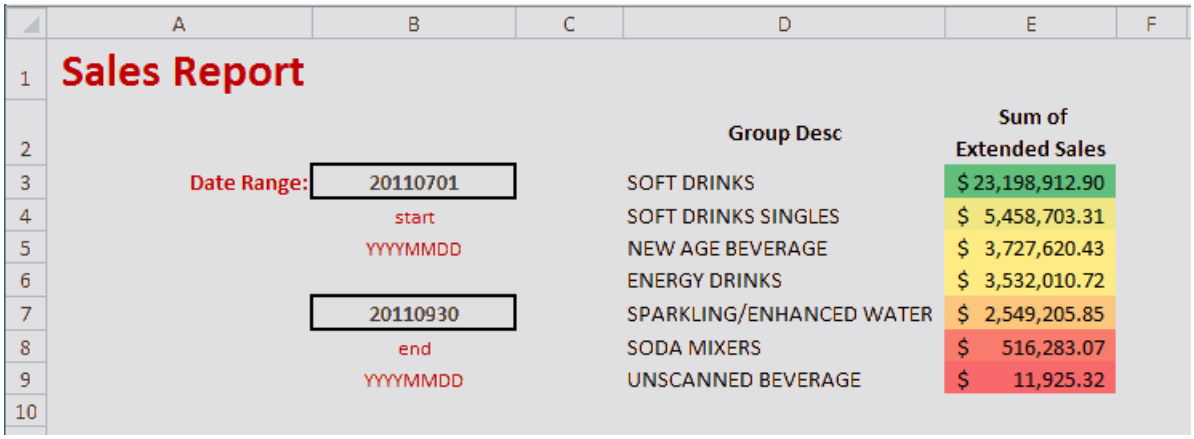
Let's create a rule to apply conditional formatting using a color scale:

1. Click the **New Rule...** button.
2. In the **New Formatting Rule** dialog, change the **Format Style** to `3-Color Scale`, then click **OK**.
3. In the **Applies to** field, enter `=query_results_range`, so that the rule will be applied to any of the values that appear within the range we defined for our results earlier.
4. Click **Apply** to create the new rule.

Let's also create a rule to show cells that have negative values with a red fill color:

1. Click the **New Rule...** button.
2. From the **Select a Rule Type** list, select **Format only cells that contain**.
3. Under **Edit the Rule Description**, make sure the first drop-down is `Cell Value`, change the second drop-down to `less than`, and enter `0` in the third drop-down.
4. Click the **Format** button.
5. In the **Format Cells** dialog, click the **Fill** tab.
6. Under **Background Color**, click the red box, then click **OK**.
7. In the **New Formatting Rule** dialog, click **OK** .
8. In the **Conditional Formatting Rules Manager** dialog, in the **Applies to** field, enter `=query_results_range`.
9. Click **OK** .

The results of our query are now formatted with a color scale:



Our dashboard now shows us the total sales in a certain department within a specified date range and groups those results by the values in the **Group Desc** column in the **Product Master** table. These results are also conditionally formatted using a color scale.

Let's add a simple chart to the dashboard to visually represent these results.

Adding a simple chart to the dashboard

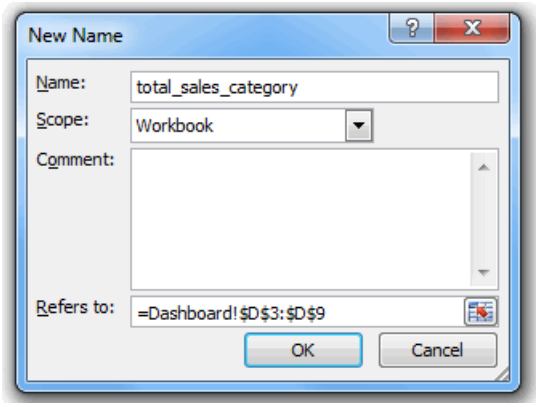
Leverage Excel's charting capabilities to visually represent the results from your query.

Let's combine Excel's easy-to-use charting functionality with the power and speed of running queries on 1010data. Let's create a simple bar chart that shows the total sales for each group returned by our query.

We'll start by creating variables that will represent the x-axis and y-axis values for the chart.

For the x-axis, we will specify the list of groups returned by our query. Go to the **Dashboard** worksheet, then on the **Formulas** tab, click **Define Name**. In the **New Name** dialog, enter `total_sales_category` for the **Name**. For the value of this variable, we'll specify the range of cells containing the groups returned by our query. For our example, in the **Refers to** field, we'll enter the following:

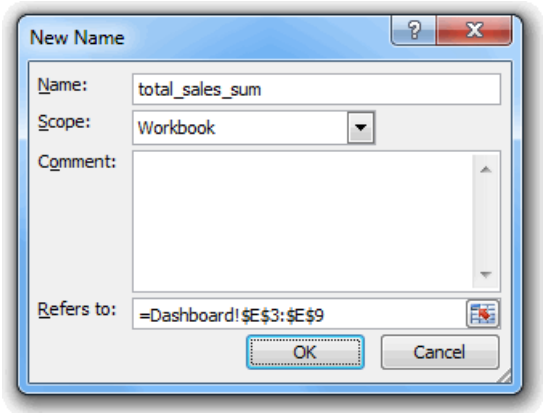
```
=Dashboard!$D$3:$D$9
```



Click **OK** to create the variable.

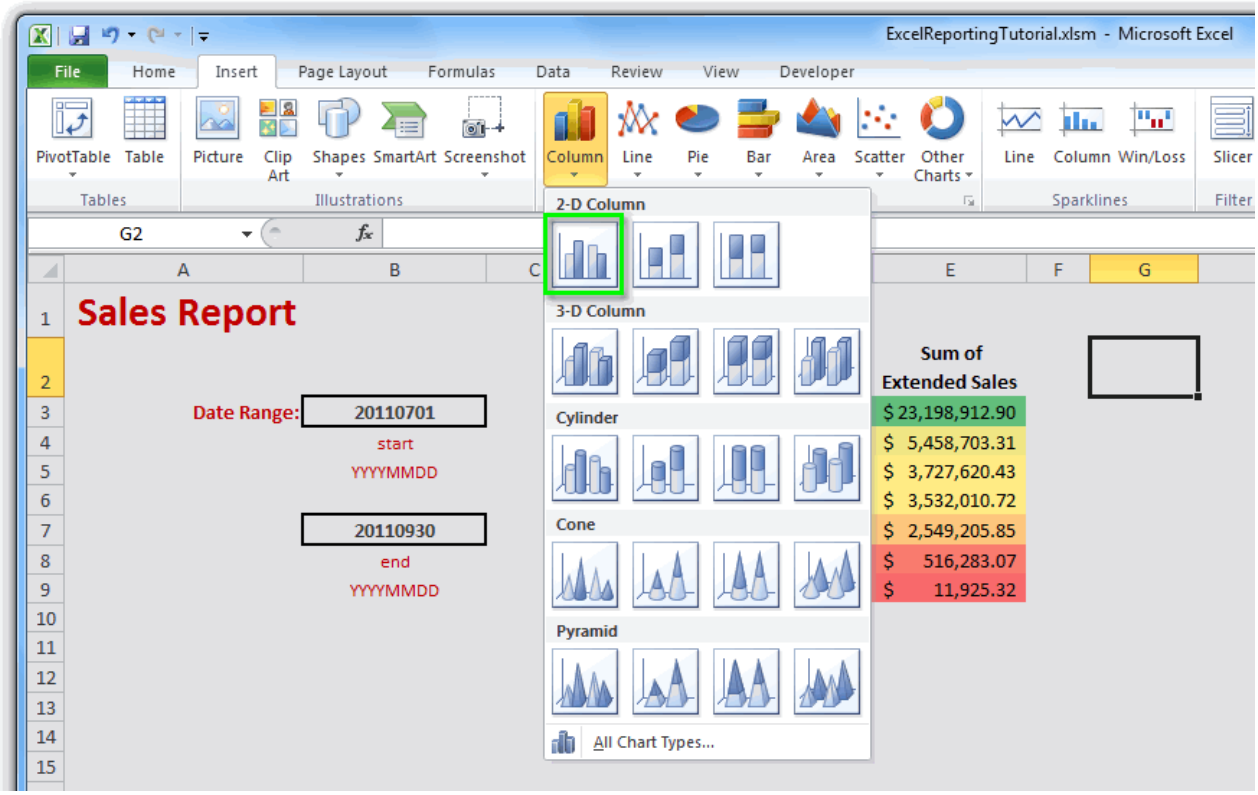
Now let's create a variable for the y-axis, which will correspond to the range of cells containing the summarization results for each group. Click **Define Name** and in the **New Name** dialog, enter `total_sales_sum` for the **Name**. In the **Refers to** field, we'll enter the following:

```
=Dashboard!$E$3:$E$9
```

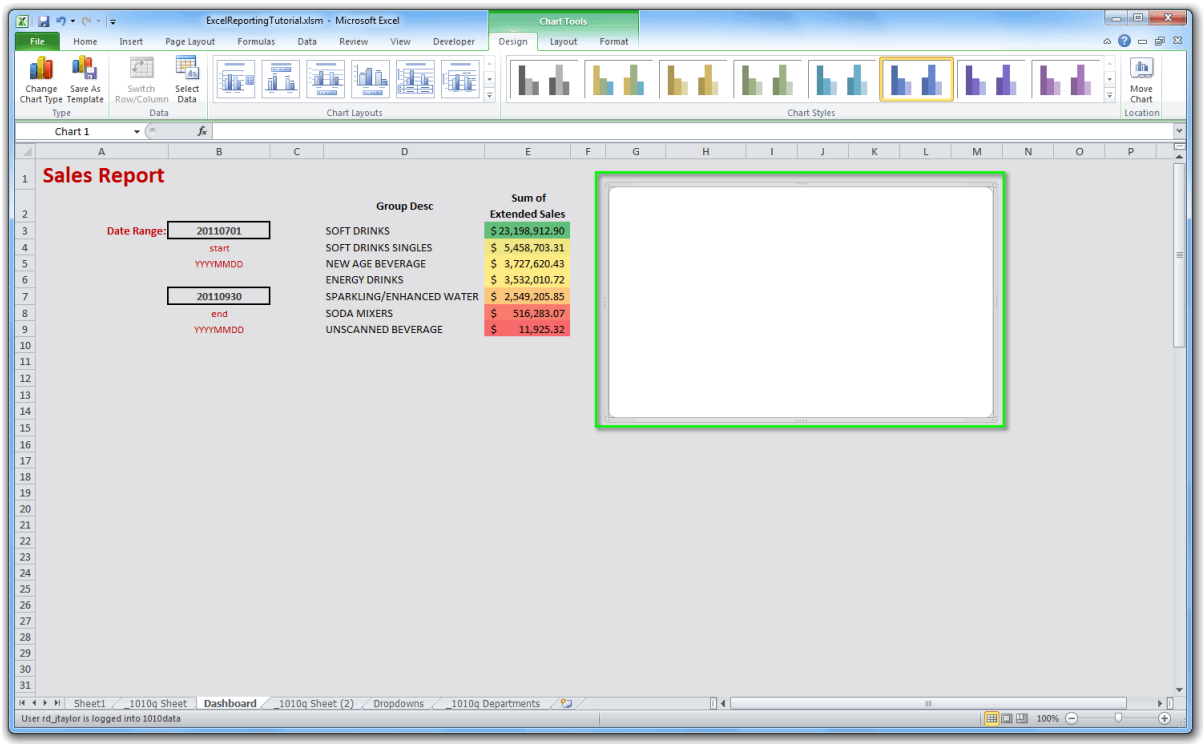


Click **OK** to create the variable.

Now that we've created our variables, we can create our chart. Click in any empty cell in the dashboard. Then, on the **Insert** tab, click **Column** and select the first **2-D Column** chart (**Clustered Column**):



Position the chart where you want it to appear in the dashboard and resize it as desired:



Now let's incorporate the x-axis and y-axis variables we created earlier.

Let's start with the y-axis:

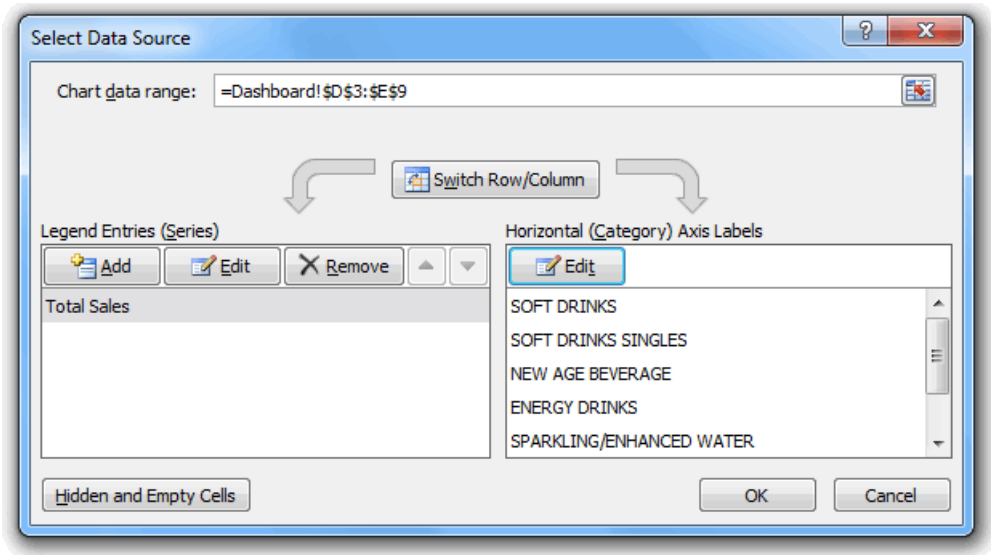
1. Right-click anywhere on the chart and click **Select Data...** from the context menu.
2. In the **Select Data Source** dialog, click the **Add** button under **Legend Entries (Series)**.

3. In the **Edit Series** dialog, enter `Total Sales` for the **Series name**.
4. In the **Series values** field, enter `Dashboard!total_sales_sum`, which is the name of the y-axis variable we created earlier.
5. Click **OK**.

And now, for the x-axis:

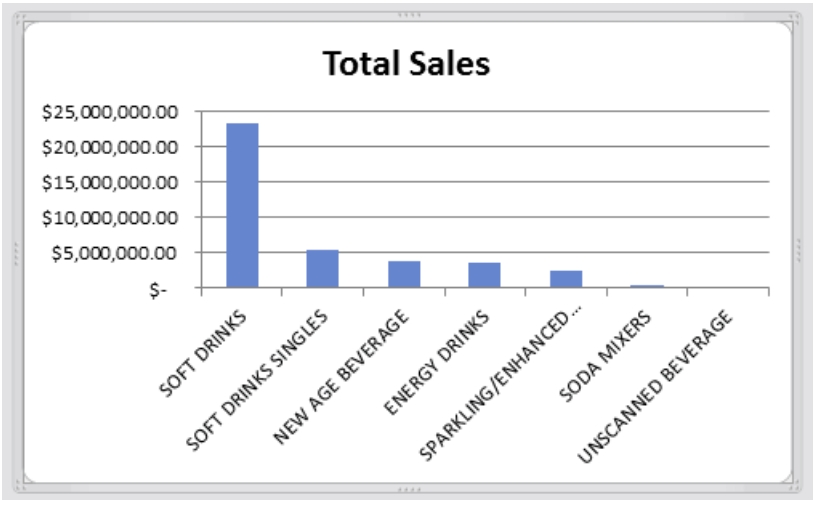
1. In the **Select Data Source** dialog, under **Horizontal (Category) Axis Labels**, click the **Edit** button.
2. In the **Axis Labels** dialog, enter `Dashboard!total_sales_category`, which is the name of the x-axis variable we created earlier.
3. Click **OK**.

The **Select Data Source** dialog should look similar to the following:

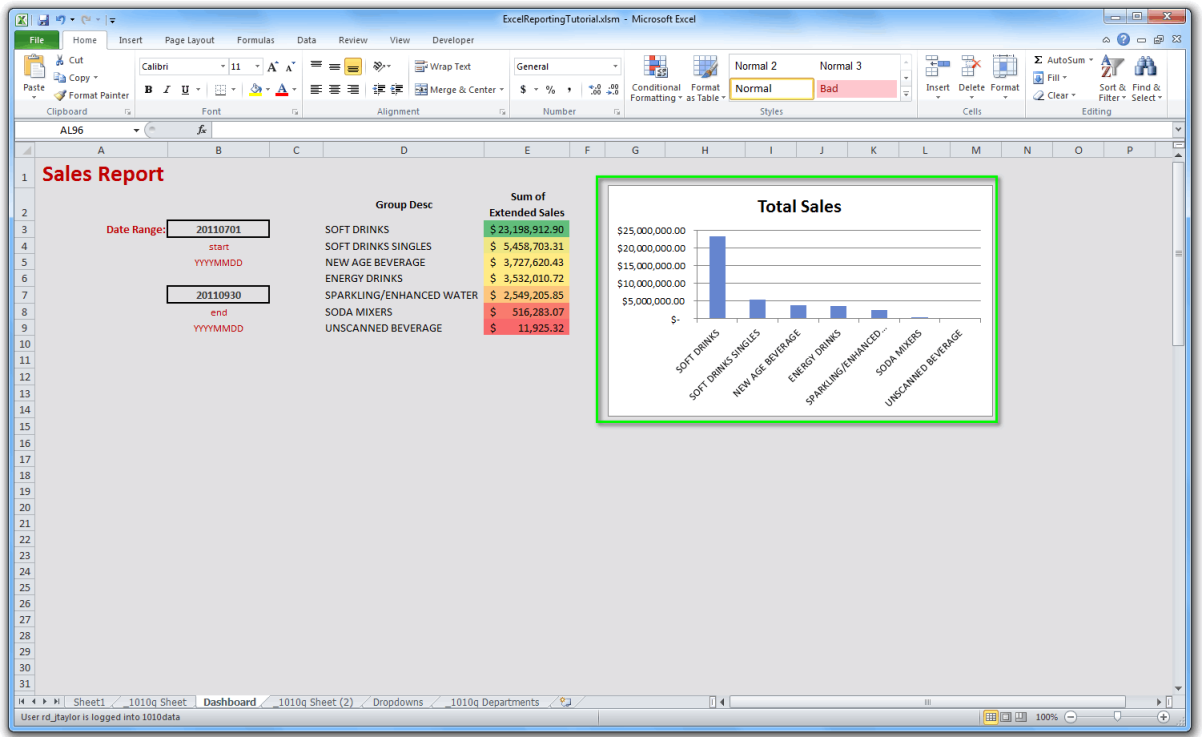


Click **OK**.

We now have a bar chart showing the total sales for each group:



which appears on our dashboard:



The chart will dynamically update when the query is run with different parameters. For instance, if we change the start date and the end date and then run the q-sheet, the dashboard (including the chart we just created) will update with the results.

> **Note:** When we created the x-axis and y-axis variables for our chart, we specified a set range of cells for each (e.g., `=Dashboard!$D$3:$D$9`), so that our chart displayed the extended sales for the seven groups in department 19. This is fine if we know the results of our query will always be the same number of rows, or if we know that we just want to chart the top seven items returned by our query. But what if our query returns more than seven values and we want our chart to display all of them? For example, in the next section, we're going to give the user the choice to summarize extended sales either by the group description or the brand. Since there are more than seven brands in our data set, not all of them will be displayed as our chart is currently defined. Later in this tutorial, we'll see how to modify this chart to be more dynamic so it can handle a varying number of rows returned by the query.

Creating a static drop-down in the dashboard

Let's create a drop-down to give the users of our dashboard the ability to select, from a static set of values, the column by which they want to group the results of the tabulation.

Currently, our query tabulates the sum of extended sales, grouping by the values in the **Group Desc** column in the **Product Master** table. Let's make it so that the user can select to group the results of the tabulation either by the group description or by the brand.

We're going to need a place to list the values that will populate the static drop-down. We can use **Sheet3** for our drop-down values (or create a new worksheet, if necessary). Let's rename it "`Dropdowns`".

In the **Dropdowns** worksheet, enter the following information:

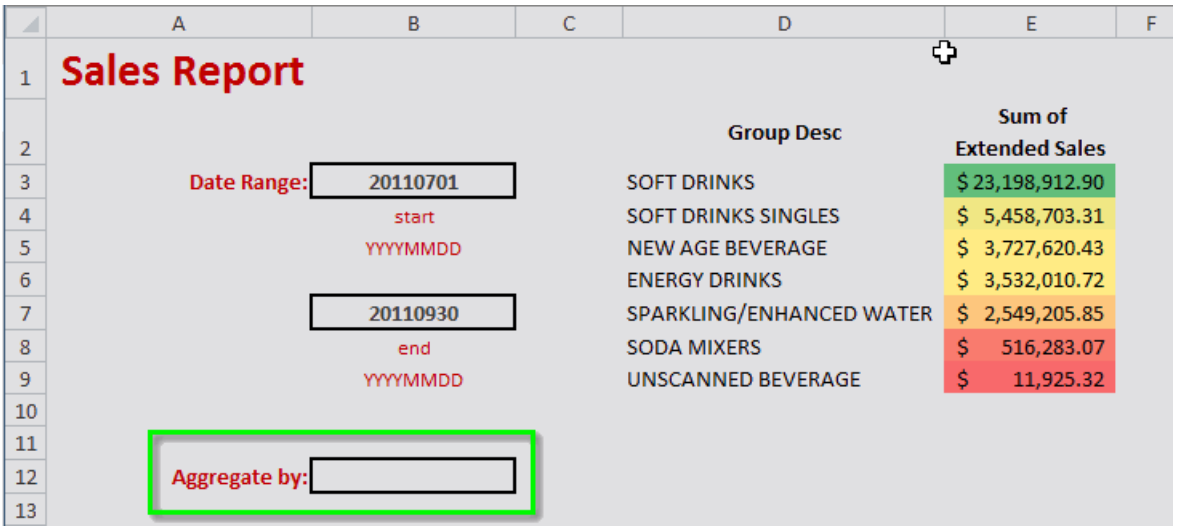
	A	B	C
1		Drop-down Values	
2			
3	Aggregate by Drop-down	Group	
4		Brand	
5			
6			
7			

Let's give this range of values a defined name. On the **Formulas** tab, click **Define Name**. In the **New Name** dialog, enter `aggregate_by_values` for the **Name** and enter the following for **Refers to**: `=Dropdowns!$B$3:$B$4`, then click **OK**.

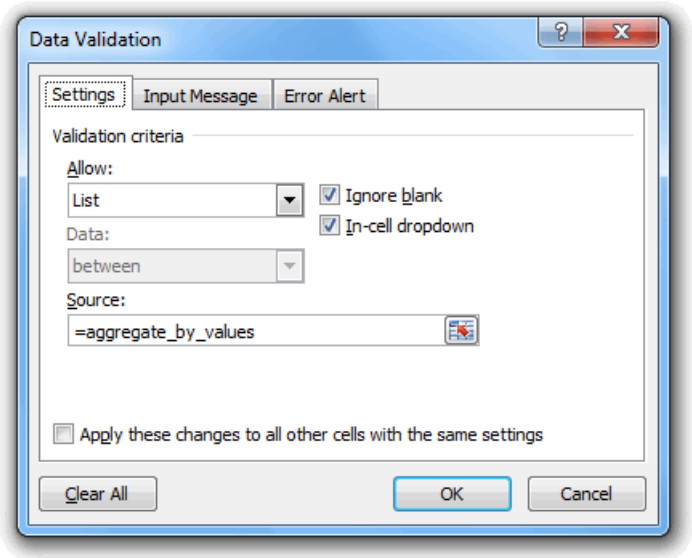
Now let's go back to the **Dashboard** tab and create the static drop-down.

In the **Dashboard** worksheet, add the label "`Aggregate by:`" next to where you want the drop-down to appear.

Click the cell that you want to contain the drop-down. In our example, that would be cell **B12**. Let's give that cell the defined name `aggregate_by_dropdown`.

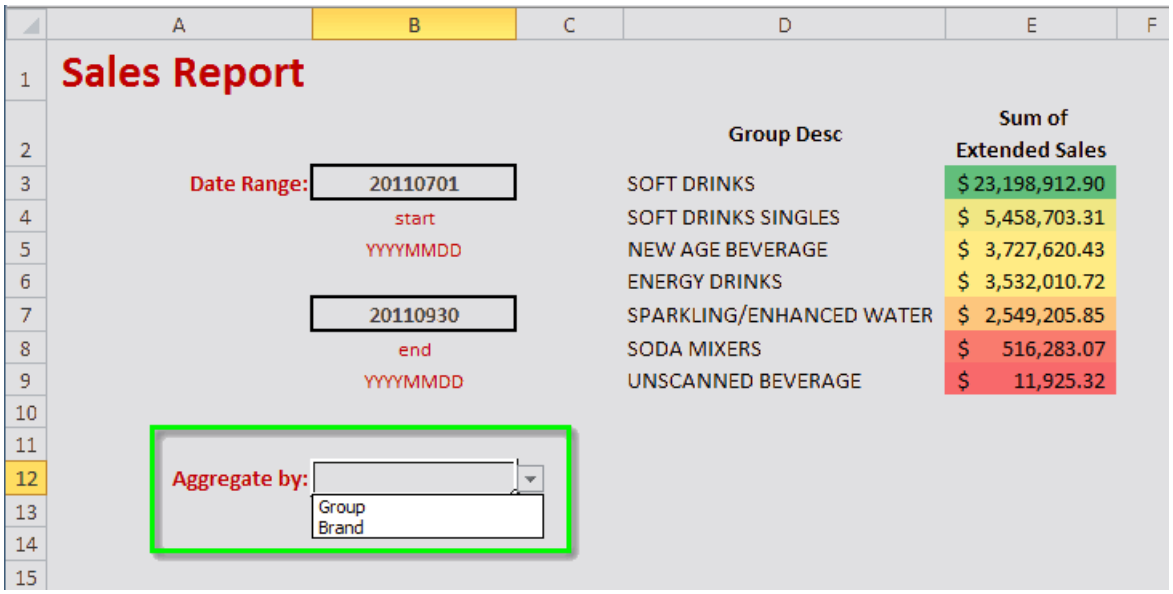


From the **Data** tab, click **Data Validation**. In the **Data Validation** dialog, select `List` from the **Allow** drop-down, and enter `=aggregate_by_values` in the **Source** field:



Then click **OK** in the **Data Validation** dialog to finish creating the drop-down.

Now, if you click the newly created drop-down, you should see the two values, `Group` and `Brand`, in the list:



Since we want the tabulation in our query to group by the item we select from the drop-down, we need to associate the choice in the drop-down with its corresponding column name. For instance, if someone chooses `Brand` from the drop-down, we want the query to specify the column `brand_prod` for the `breaks` attribute to the *<tabu>* operation. Right now, it's hard-coded to be `groupdesc_prod`:

```
<note type="base">Applied to table: retaildemo.salesdetail</note>
<sel value="between(date;20110101;20110331)"/>
<link table2="retaildemo.products" col="sku" col2="sku" suffix="_prod" type="select">
  <sel value="(dept=19)"/>
</link>
<tabu label="Tabulation on Sales Detail" breaks="groupdesc_prod">
  <tcol source="xsales" fun="sum" name="tot_sales" label="Sum of`Extended Sales"/>
</tabu>
<sort col="tot_sales" dir="down"/>
```

So let's go back to the **Dropdowns** worksheet and add another column that will associate the drop-down choices with their corresponding column names:

	A	B	C	D
1		Drop-down Values	Column Values	
2				
3	Aggregate by Drop-down	Group	groupdesc_prod	
4		Brand	brand_prod	
5				
6				

Since our query needs to reference a single cell (similar to what we did in *Adding a static input to a dashboard* on page 12), we also need somewhere to store the choice that the user makes from the drop-down. Let's add one more column to the **Dropdowns** worksheet with a cell that will hold that value:

	A	B	C	D	E
1		Drop-down Values	Column Values	Selected Value	
2					
3	Aggregate by Drop-down	Group	groupdesc_prod		
4		Brand	brand_prod		
5					
6					

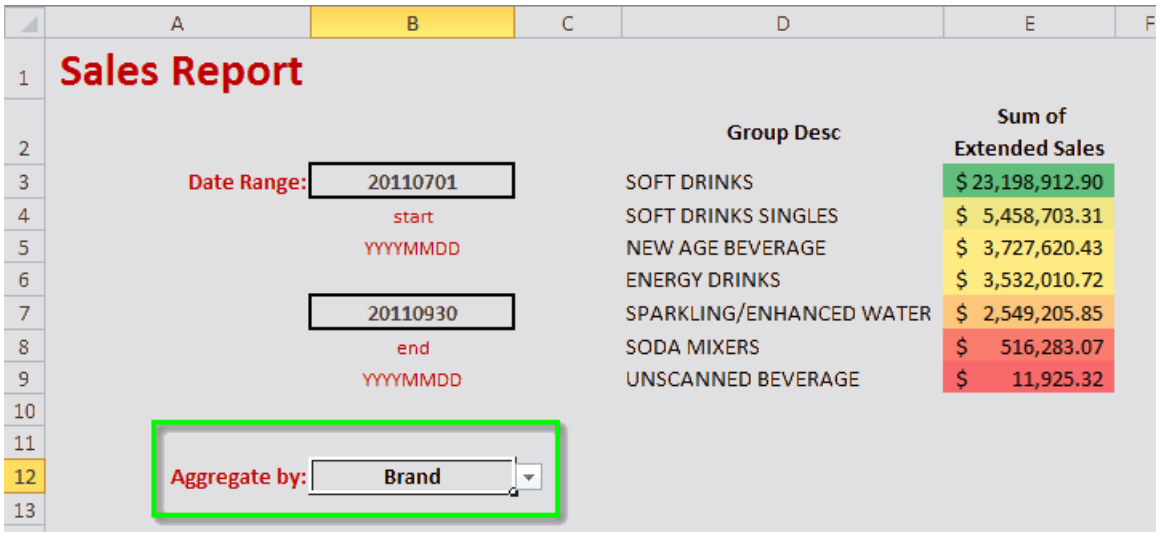
So, for our example, whatever choice the user selects from the drop-down will be stored in cell **D3**. Let's give that cell the defined name `aggregate_by_selected`

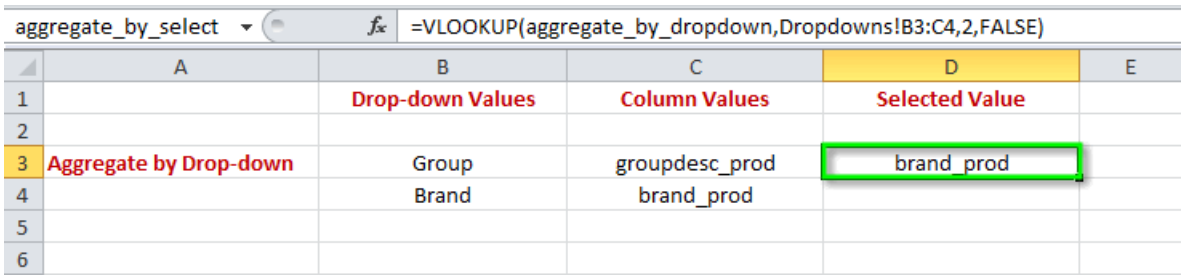
Let's add the functionality to populate that cell with the user's selection. We can use the Excel function *`VLOOKUP()`* to help us do that. Let's add the following formula to cell **D3**:

```
=VLOOKUP(aggregate_by_dropdown,'Dropdowns'!B3:C4,2,FALSE)
```

This says that for the value in the `aggregate_by_dropdown`, search the first column in the table defined by the range `'Dropdowns'!B3:C4`, and return the value in the second column (which we indicate by setting the third parameter to `2`), and only return if there is an exact match, which we specify by setting the last parameter to `FALSE` Keep in mind that there will always be an exact match since we only have a finite number of defined choices in the drop-down.

So, if the user selects `Brand` from the drop-down in the **Dashboard** worksheet, the `VLOOKUP` function will search the values in the **Drop-down Values** column on the **Dropdowns** worksheet and will return the value in the second column, which is `brand_prod`:





Now that we have the column name, we can insert it into our query, just like we did in *Adding a static input to a dashboard* on page 12.

The line that we need to change in our macro code is:

```
<note type="base">Applied to table: retaildemo.salesdetail</note>
<sel value="between(date;20110101;20110331)"/>
<link table2="retaildemo.products" col="sku" col2="sku" suffix="_prod" type="select">
  <sel value="(dept=19)"/>
</link>
<tabu label="Tabulation on Sales Detail" breaks="groupdesc_prod">
  <tcol source="xsales" fun="sum" name="tot_sales" label="Sum of`Extended Sales"/>
</tabu>
<sort col="tot_sales" dir="down"/>
```

To reference input values from within the 1010data query, we will need to change the line in our macro code into a formula. We do this by:

- removing any blank spaces from the start of the line
- inserting an = at the beginning of the line
- enclosing the macro code in double quotes
- preceding any double quote within the macro code with another double quote so that Excel will not interpret any of them as the end of the formula
- replacing each hard-coded value with a reference to its corresponding input cell using the syntax: `"&[CELL_REFERENCE]&"` (e.g., `"&B3&"`)

Let's go through those steps for our example. Click on the **_1010q Sheet** tab so that we can modify the macro code in our q-sheet.

Since there are no blank spaces at the start of the line, we can move to the next step and add an "=" to the beginning:

```
=<tabu label="Tabulation on Sales Detail" breaks="groupdesc_prod">
```

Next, let's enclose the macro code in double quotes:

```
="<tabu label="Tabulation on Sales Detail" breaks="groupdesc_prod">"
```

Then, we'll precede each double quote within the macro code with another double quote so that Excel will not interpret any of them as the end of the formula:

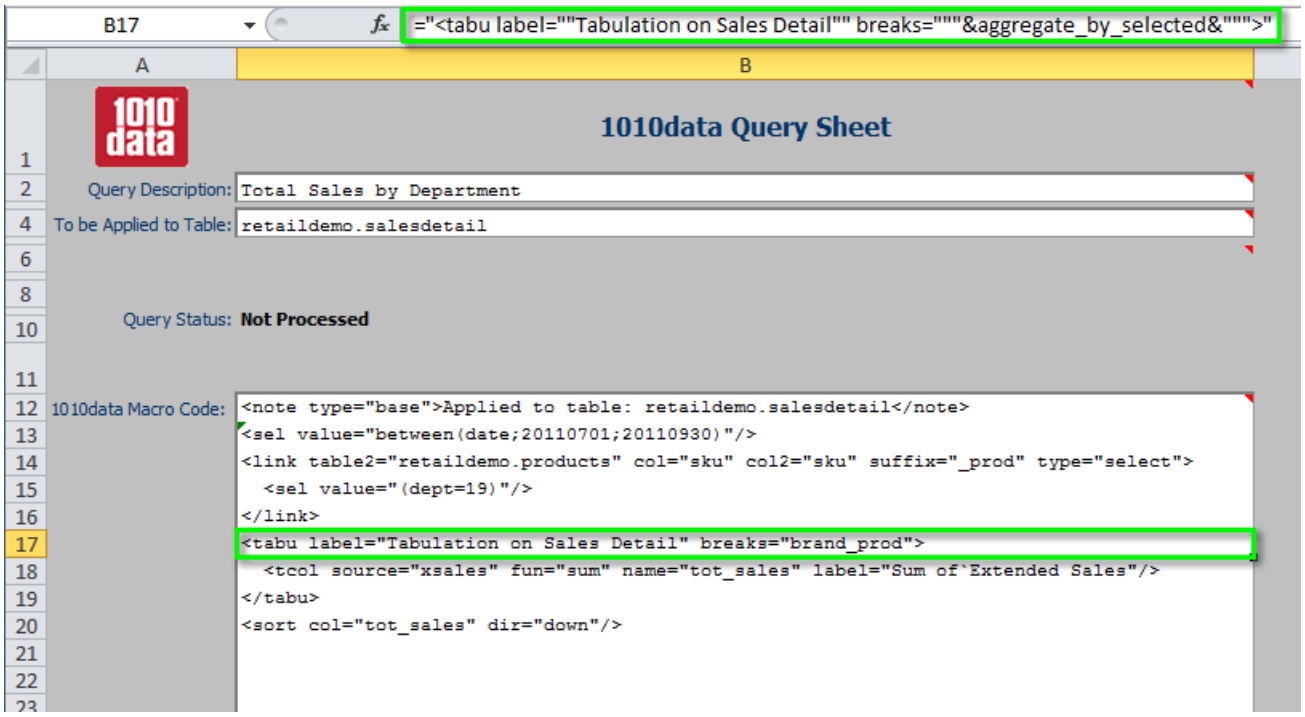
```
="<tabu label=""Tabulation on Sales Detail"" breaks=""groupdesc_prod"">"
```

Our last step is to replace the hard-coded `groupdesc_prod` value with a reference to the `aggregate_by_selected` cell, which contains the value the user selected from the drop-down:

```
="<tabu label=""Tabulation on Sales Detail""
 breaks="""&aggregate_by_selected&""">"
```

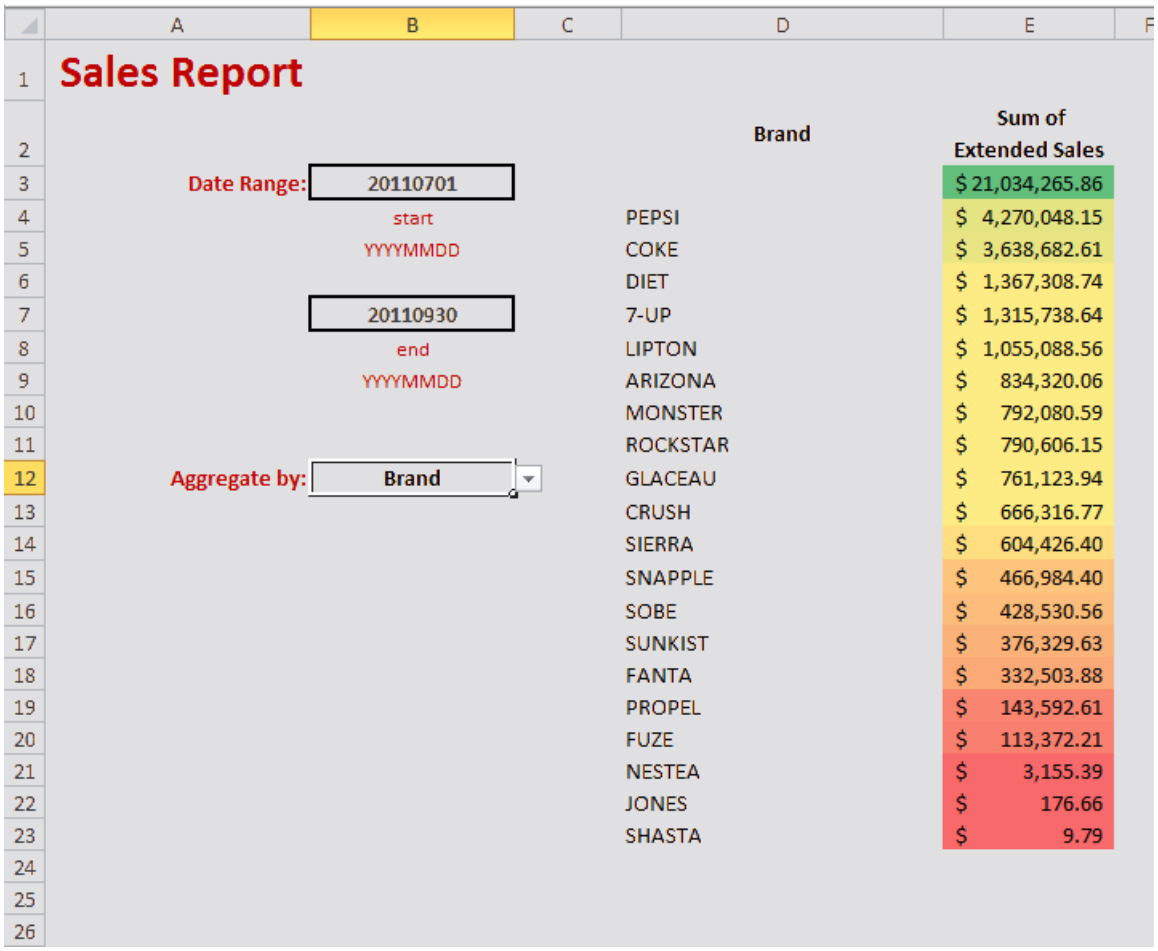
> **Note:** There are three sets of double quotes around `&aggregate_by_selected&`. Although this may look odd, it is correct syntax for this Excel formula to work properly.

We can see the line in our macro code now consists of the formula we just created and that it resolves to `brand_prod` within the **1010data Macro Code** section of the q-sheet:



Now let's test this out. Click **1010data** > **Run Queries** > **In Active Workbook** (or press Ctrl+Q).

When the query completes, click the **Dashboard** tab to see that the results show the sum of extended sales for each brand:



Sales Report

	Brand	Sum of Extended Sales
Date Range: 20110701 (start, YYYYMMDD)		$ 21,034,265.86
	PEPSI	$ 4,270,048.15
	COKE	$ 3,638,682.61
	DIET	$ 1,367,308.74
20110930 (end, YYYYMMDD)	7-UP	$ 1,315,738.64
	LIPTON	$ 1,055,088.56
	ARIZONA	$ 834,320.06
	MONSTER	$ 792,080.59
	ROCKSTAR	$ 790,606.15
Aggregate by: Brand	GLACEAU	$ 761,123.94
	CRUSH	$ 666,316.77
	SIERRA	$ 604,426.40
	SNAPPLE	$ 466,984.40
	SOBE	$ 428,530.56
	SUNKIST	$ 376,329.63
	FANTA	$ 332,503.88
	PROPEL	$ 143,592.61
	FUZE	$ 113,372.21
	NESTEA	$ 3,155.39
	JONES	$ 176.66
	SHASTA	$ 9.79

The results we see are for department 19 only, since that was the department that was hard-coded in our original query. The next step will show how to add a dynamic drop-down that allows the user to choose any department.

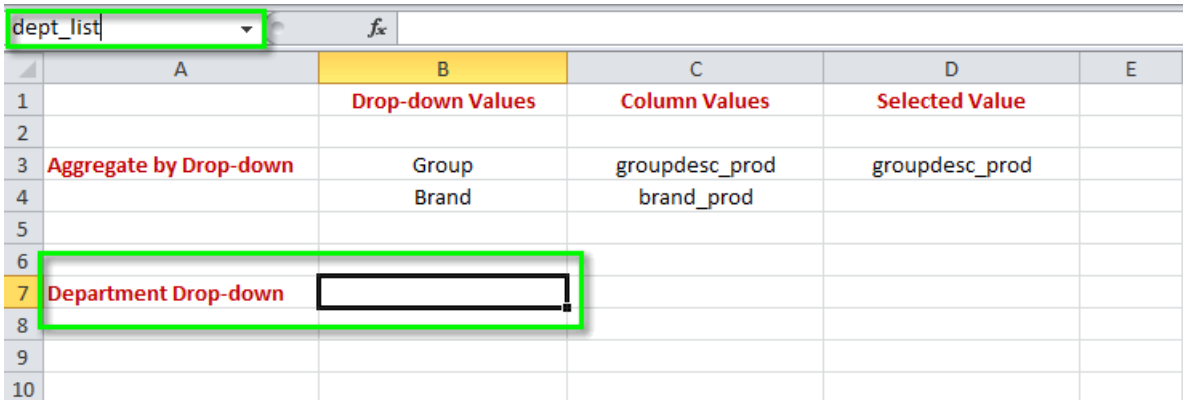
Incorporating a dynamic drop-down in the dashboard

The contents of dynamic drop-downs can change based on selections in the dashboard or the results of queries, which means your dashboard will always be up to date even as the data changes. This is historically something very hard to do in Excel-based reporting and a big differentiator with using 1010data and Excel.

Let's take a look at how to create a dynamic drop-down. Our original query calculated the sum of sales for one particular department, which was hard-coded into the query. Let's say we want to give the user of our dashboard the ability to select the department from a list of all the departments in our **Product Master** table. We could go through that table and list each department individually like we did in the previous step, *Creating a static drop-down in the dashboard* on page 25, but since our **Product Master** table has 59 different departments, that would be a bit time consuming and could introduce errors (for instance, if a department number was entered incorrectly). It would be easier (and less susceptible to error) if we ran a simple query on the **Product Master** table to find out the list of departments in the table and then used those results as the items in the drop-down. Let's create a dynamic drop-down to do just that.

We'll need to write a query that gives us a list of all the departments in the **Product Master** table, and we'll need to put the results of that query in a place that our dashboard can access. We'll also need to create the actual drop-down on the dashboard and populate it with the results of our department list query.

Since we already have a worksheet that we use for holding the values in our **Aggregate by** drop-down, let's use that same worksheet to hold the values for our dynamic drop-down. Click on the **Dropdowns** tab and enter a label similar to the one shown in cell A7 below. Then click in the cell where you want the results pasted, which in our example is **B7**, and give it a defined name. Let's call it `dept_list`.

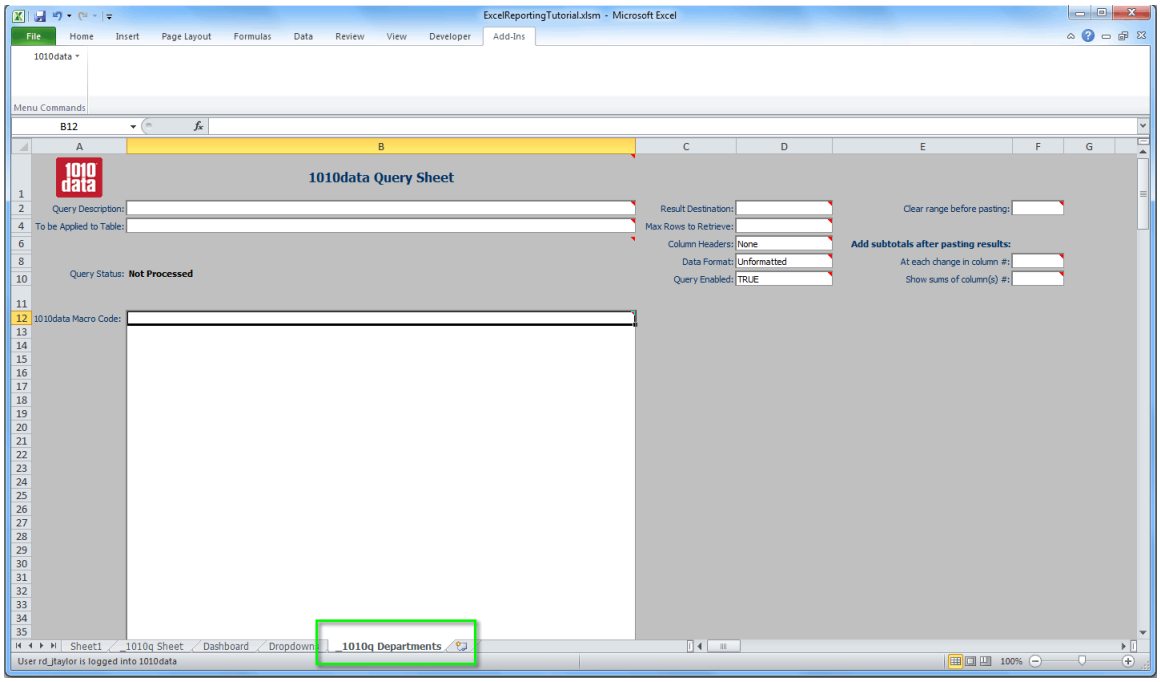


Now that we have a destination for the results of our query, let's create the query.

We'll need to create another q-sheet, since *each q-sheet can only contain one query*.

From the **Add-Ins** menu, click **1010data** > **Add New Q-Sheet**. This will open a q-sheet in a new tab labeled **_1010q Sheet (2)**. Let's rename this `_1010q Departments`, so it's a little more descriptive.

> **Note:** It is important that the worksheet begins with the prefix **_1010q**, which is used to identify it as a q-sheet to the Excel Add-in.



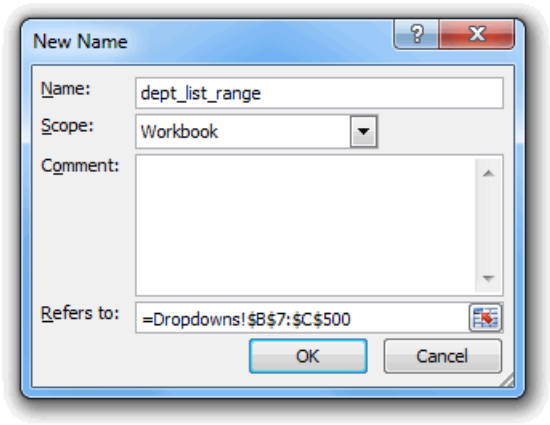
Let's paste the following query into the **1010data Macro Code** section, which will give us the list of departments from the **Product Master** table:

```
<note type="base">Applied to table: retaildemo.products</note>
<tabu label="Tabulation on Product Master" breaks="deptdesc,dept">
  <break col="deptdesc" sort="up"/>
  <tcol source="deptdesc" fun="cnt" label="Count"/>
</tabu>
<colord cols="deptdesc,dept"/>
```

We need to enter some other information in the q-sheet:

- For the **Query Description**, enter "`Department List`".
- In the **To be Applied to Table** field, we need to specify which table this query should be applied to. For this q-sheet, we'll enter `retaildemo.products`.
- In the **Result Destination** field, enter `dept_list` so that the results of our query will be pasted in the **Dropdowns** worksheet.
- From the **Column Headers** drop-down, select "`None`", which is the default. We don't need any column headers since the results of the query are going to be used to populate the drop-down.

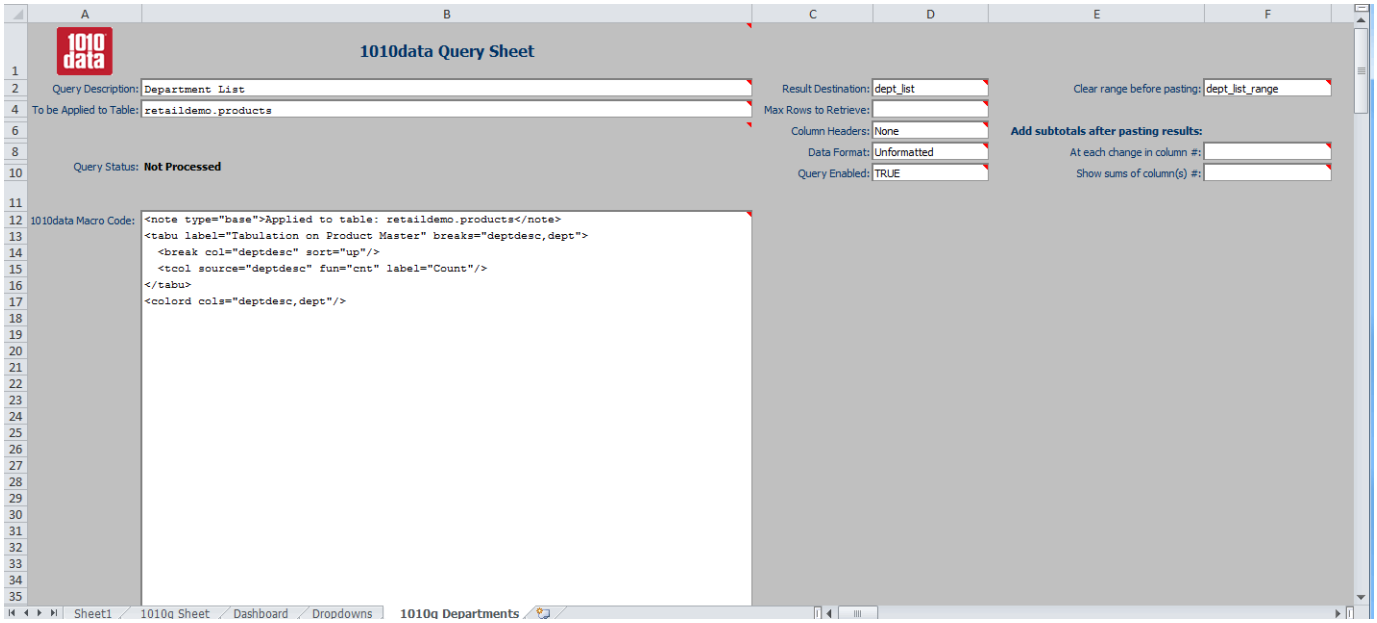
Finally, before we paste the results of the query, let's clear the contents from any previous run. Create a defined name for the range of cells where the results will be pasted. On the **Formulas** tab, click **Define Name**. In the **New Name** dialog, enter `dept_list_range` for the **Name** and enter the following for **Refers to**: `=Dropdowns!$B$7:$C$500`.



> **Note:** This assumes that our result data will be less than 500 rows, which is probably safe for this example; however, you would want to specify a range that makes sense for you.

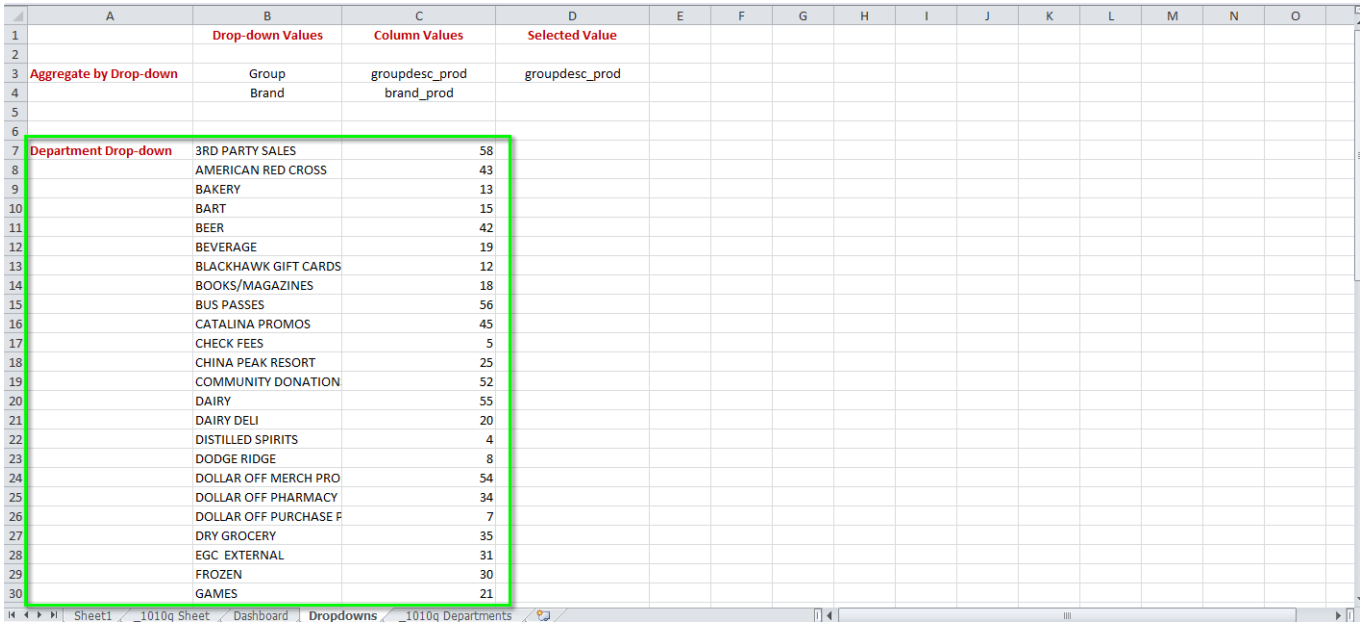
Then, in the **_1010q Departments** q-sheet, we can enter `dept_list_range` in the **Clear range before pasting** field.

Our q-sheet should look similar to the following:



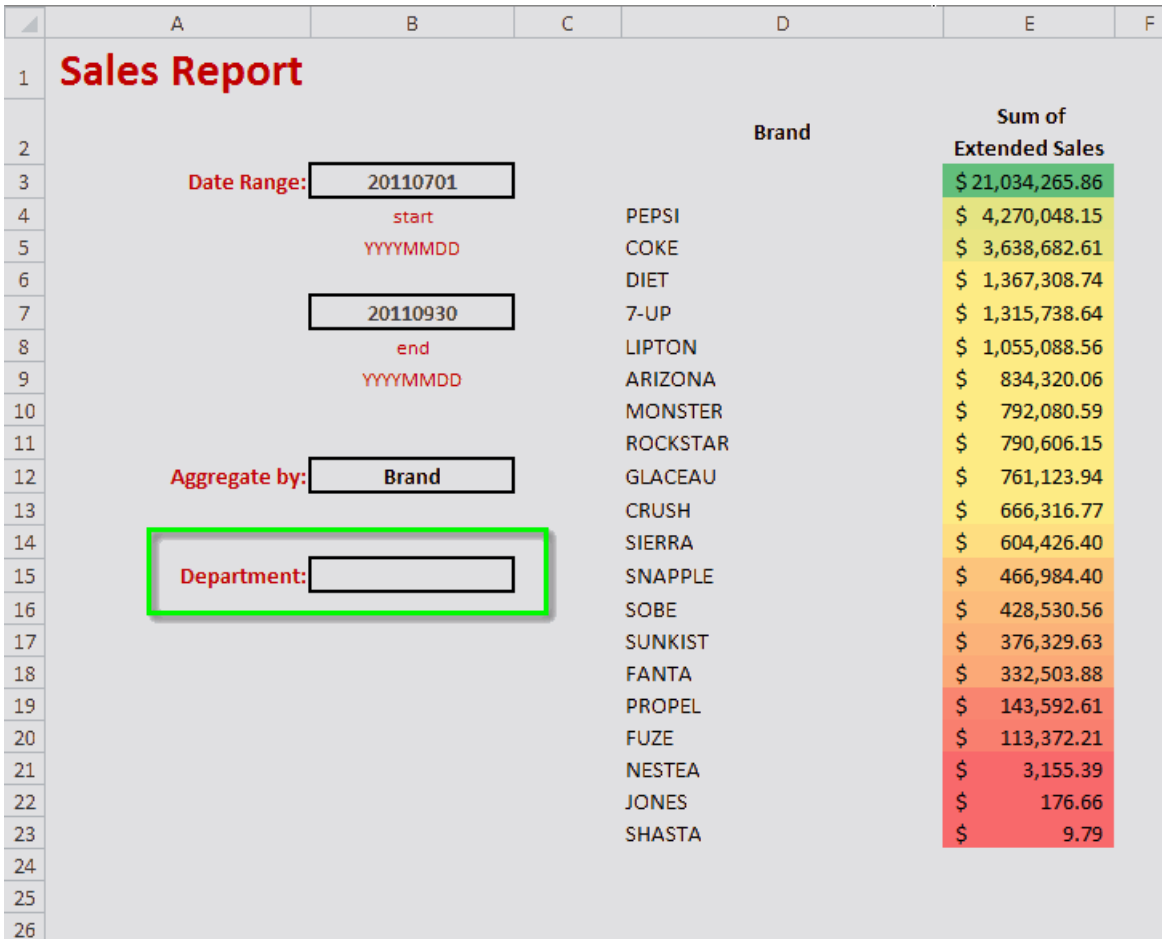
To run the q-sheet, click **1010data** > **Run Queries** > **In Active Workbook**, or press Ctrl+Q.

To see the results, click the **Dropdowns** tab. You can see that the results of the query have been pasted in the cells that we specified:



	Drop-down Values	Column Values	Selected Value
Aggregate by Drop-down	Group	groupdesc_prod	groupdesc_prod
	Brand	brand_prod	
Department Drop-down	3RD PARTY SALES	58	
	AMERICAN RED CROSS	43	
	BAKERY	13	
	BART	15	
	BEER	42	
	BEVERAGE	19	
	BLACKHAWK GIFT CARDS	12	
	BOOKS/MAGAZINES	18	
	BUS PASSES	56	
	CATALINA PROMOS	45	
	CHECK FEES	5	
	CHINA PEAK RESORT	25	
	COMMUNITY DONATION	52	
	DAIRY	55	
	DAIRY DELI	20	
	DISTILLED SPIRITS	4	
	DODGE RIDGE	8	
	DOLLAR OFF MERCH PRO	54	
	DOLLAR OFF PHARMACY	34	
	DOLLAR OFF PURCHASE P	7	
	DRY GROCERY	35	
	EGC EXTERNAL	31	
	FROZEN	30	
	GAMES	21	

Let's create the drop-down on our dashboard and use these values to populate it. Click on the **Dashboard** tab and add a label where you want the drop-down to appear:

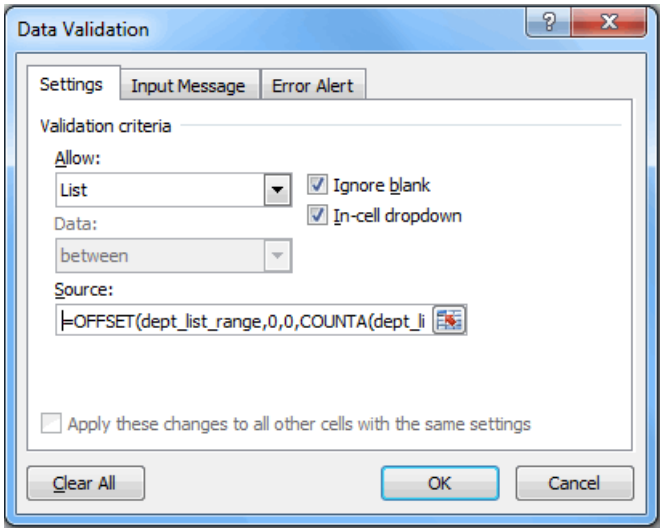


Click the cell that will contain the drop-down. In our example, that would be cell **B15**. Let's also give it the defined name: `department_dropdown`.

From the **Data** tab, click **Data Validation**. In the **Data Validation** dialog, select `List` from the **Allow** drop-down. For the **Source** field, you will need to use the following Excel *`OFFSET`* function:

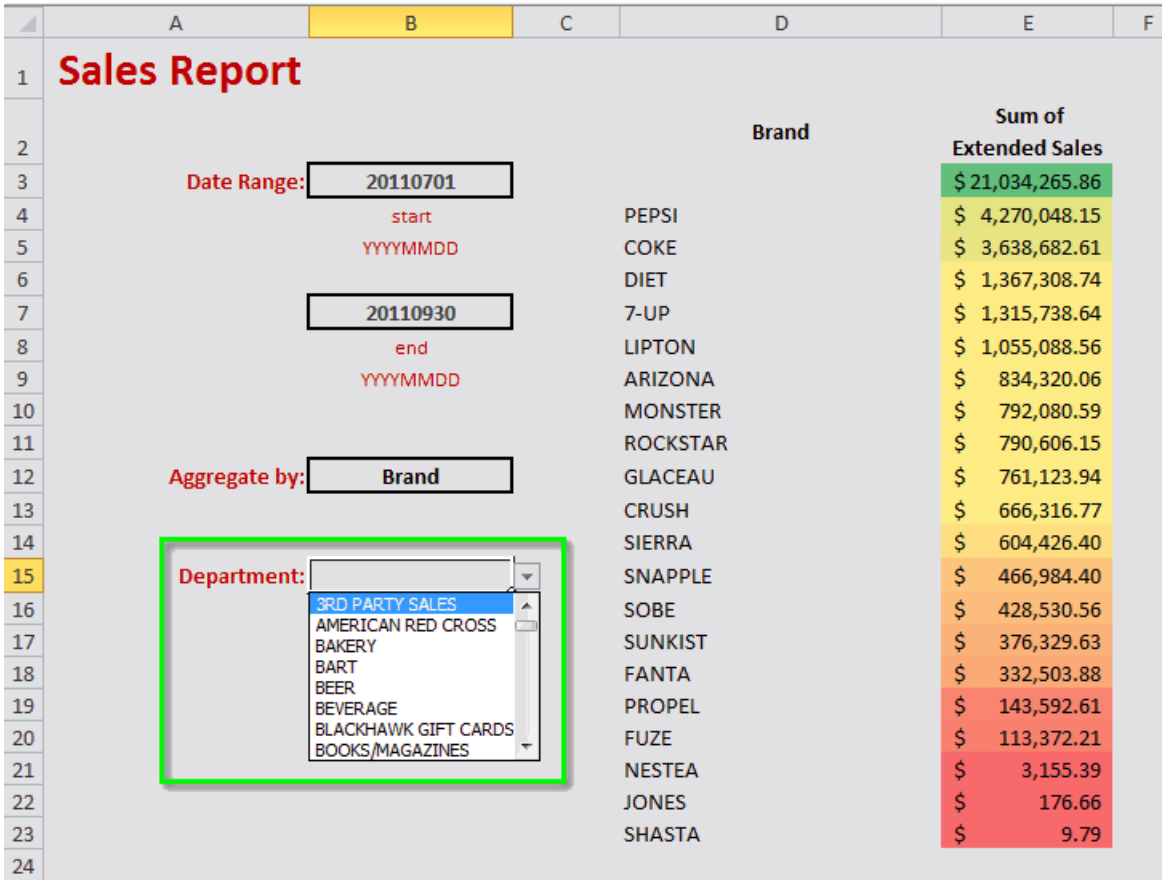
```
=OFFSET(dept_list_range,0,0,COUNTA(dept_list_range),1)
```

The first parameter specifies the range of cells corresponding to the values in your query-generated drop-down list (which we named `dept_list_range`), and the second and third parameters tell the `OFFSET` function to start the list with the top left value in that range. The fourth parameter uses the Excel *`COUNTA`* function to calculate the number of non-empty cells in the range, which in essence specifies the length of the list. The last parameter tells the `OFFSET` function that we just want one column of data from the results. Dynamic drop-downs require this `OFFSET` function in conjunction with the `COUNTA` function to automatically account for the varying length of the list returned from our query. So, our **Data Validation** dialog will look something like:



Click **OK** in the **Data Validation** dialog to finish creating the drop-down.

Now, if you click the newly created drop-down, you should see the list of all the departments returned by the query in the **_1010q Departments** q-sheet:



Since we want our main query to perform the row selection based on the item we select from the **Department** drop-down, we need to associate the choice in the drop-down with its corresponding department value. For instance, if someone chooses "`DAIRY DELI`" from the drop-down, we want the query to specify department `20` in the `value` attribute to the *`<sel>`* operation. Right now, it's hard-coded to be `19`:

```
<note type="base">Applied to table: retaildemo.salesdetail</note>
<sel value="between(date;20110101;20110331)"/>
<link table2="retaildemo.products" col="sku" col2="sku" suffix="_prod" type="select">
  <sel value="(dept=19)"/>
</link>
<tabu label="Tabulation on Sales Detail" breaks="groupdesc_prod">
  <tcol source="xsales" fun="sum" name="tot_sales" label="Sum of Extended Sales"/>
</tabu>
<sort col="tot_sales" dir="down"/>
```

So let's go back to the **Dropdowns** worksheet and choose a cell that will contain the department value associated with the selected item in the **Department** drop-down (similar to what we did in *Creating a static drop-down in the dashboard* on page 25). For our example, we'll use cell **D7**. Let's give that cell the defined name `department_selected`.

	A	B	C	D	E
1		Drop-down Values	Column Values	Selected Value	
2					
3	Aggregate by Drop-down	Group	groupdesc_prod	groupdesc_prod	
4		Brand	brand_prod		
5					
6					
7	Department Drop-down	3RD PARTY SALES	58		
8		AMERICAN RED CROSS	43		
9		BAKERY	13		
10		BART	15		
11		BEER	42		
12		BEVERAGE	19		

Let's add functionality to populate that cell with the department number that corresponds to the item the user selects from the **Department** drop-down. We can use the Excel function *VLOOKUP()* to help us do that. Let's add the following formula to cell **D7**:

```
=VLOOKUP(department_dropdown,dept_list_range,2,FALSE)
```

This says that for the value in the cell named `department_dropdown`, search the first column in the table defined by the range `dept_list_range`, and return the value in the second column, and only return if there is an exact match (which there will always be since we populated the drop-down from this list). So, if the user selects "`DAIRY DELI`" from the drop-down in the **Dashboard** worksheet, the `VLOOKUP` function will search the values in the **Drop-down Values** column on the **Dropdowns** worksheet until it finds a match, and then return the value in the **Column Values** column, which for our example is `20`:

	A	B	C	D	E	F
1	Sales Report					
2				Brand	Sum of Extended Sales	
3	Date Range:	20110701			$ 21,034,265.86	
4		start		PEPSI	$ 4,270,048.15	
5		YYYYMMDD		COKE	$ 3,638,682.61	
6				DIET	$ 1,367,308.74	
7		20110930		7-UP	$ 1,315,738.64	
8		end		LIPTON	$ 1,055,088.56	
9		YYYYMMDD		ARIZONA	$ 834,320.06	
10				MONSTER	$ 792,080.59	
11				ROCKSTAR	$ 790,606.15	
12	Aggregate by:	Brand		GLACEAU	$ 761,123.94	
13				CRUSH	$ 666,316.77	
14				SIERRA	$ 604,426.40	
15	Department:	DAIRY DELI		SNAPPLE	$ 466,984.40	
16				SOBE	$ 428,530.56	
17				SUNKIST	$ 376,329.63	
18				FANTA	$ 332,503.88	
19				PROPEL	$ 143,592.61	
20				FUZE	$ 113,372.21	
21				NESTEA	$ 3,155.39	
22				JONES	$ 176.66	
23				SHASTA	$ 9.79	
24						

D7 =VLOOKUP(department_dropdown,dept_list_range,2,FALSE)

	A	B	C	D	E
1		Drop-down Values	Column Values	Selected Value	
2					
3	Aggregate by Drop-down	Group	groupdesc_prod	brand_prod	
4		Brand	brand_prod		
5					
6					
7	Department Drop-down	3RD PARTY SALES	58	20	
8		AMERICAN RED CROSS	43		
9		BAKERY	13		
10		BART	15		
11		BEER	42		
12		BEVERAGE	19		
13		BLACKHAWK GIFT CARDS	12		
14		BOOKS/MAGAZINES	18		
15		BUS PASSES	56		
16		CATALINA PROMOS	45		
17		CHECK FEES	5		
18		CHINA PEAK RESORT	25		
19		COMMUNITY DONATION	52		
20		DAIRY	55		
21		DAIRY DELI	20		
22		DISTILLED SPIRITS	4		

The last step is to reference the selected value in our original query. This process is essentially the same as what we did in *Adding a static input to a dashboard* on page 12 and *Creating a static drop-down in the dashboard* on page 25.

The line that we need to change in our macro code is:

```
<note type="base">Applied to table: retaildemo.salesdetail</note>
<sel value="between(date;20110101;20110331)"/>
<link table2="retaildemo.products" col="sku" col2="sku" suffix="_prod" type="select">
  <sel value="(dept=19)"/>
</link>
<tabu label="Tabulation on Sales Detail" breaks="groupdesc_prod">
  <tcol source="xsales" fun="sum" name="tot_sales" label="Sum of`Extended Sales"/>
</tabu>
<sort col="tot_sales" dir="down"/>
```

To reference input values from within the 1010data query, we will need to change the line in our macro code into a formula. We do this by:

- removing any blank spaces from the start of the line
- inserting an = at the beginning of the line
- enclosing the macro code in double quotes
- preceding any double quote within the macro code with another double quote so that Excel will not interpret any of them as the end of the formula
- replacing each hard-coded value with a reference to its corresponding input cell using the syntax: `"&[CELL_REFERENCE]&"` (e.g., `"&B3&"`)

Let's go through those steps for our example. Click on the **_1010q Sheet** tab so that we can modify the macro code in our q-sheet.

First, remove any blank spaces from the start of the line:

```
<sel value="(dept=19)"/>
```

Then, add an "=" to the beginning of the line:

```
=<sel value="(dept=19)"/>
```

Next, let's enclose the macro code in double quotes:

```
="<sel value="(dept=19)"/>"
```

Then, we'll precede each double quote within the macro code with another double quote so that Excel will not interpret any of them as the end of the formula:

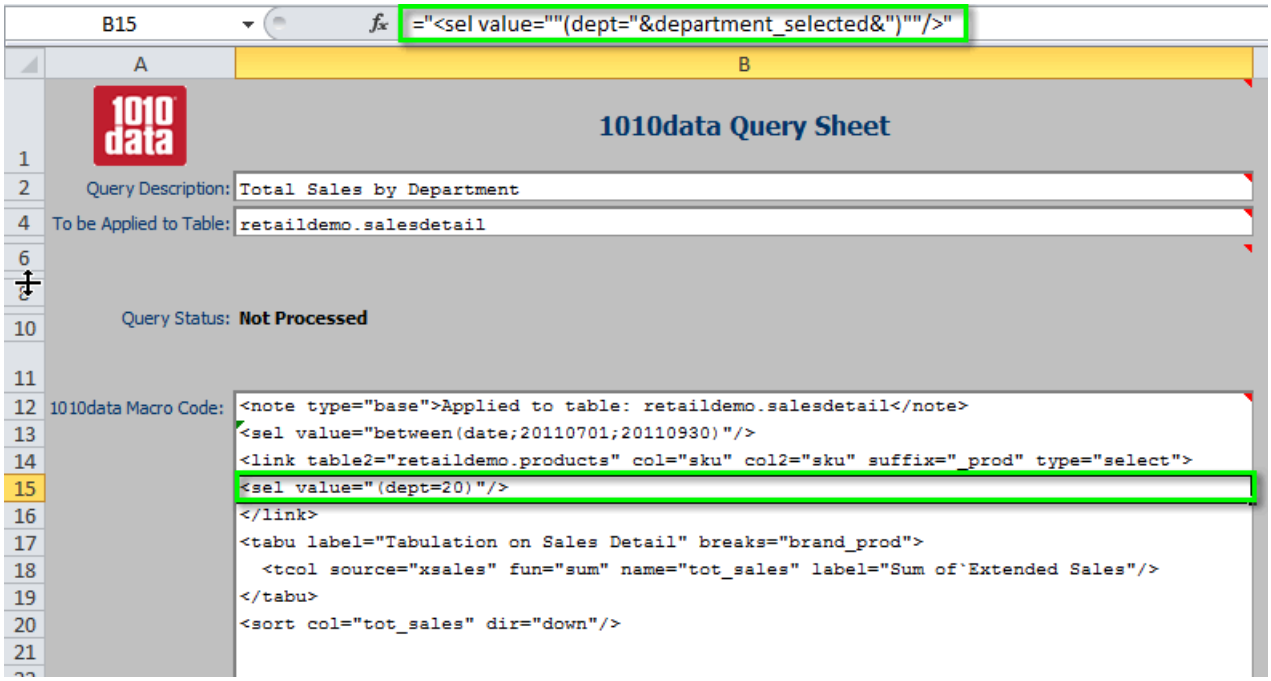
```
="<sel value=""(dept=19)""/>"
```

Our last step is to replace the hard-coded department `19` value with a reference to the `department_selected` cell, which contains the value the user selected from the drop-down:

```
="<sel value=""(dept="&department_selected&")""/>"
```

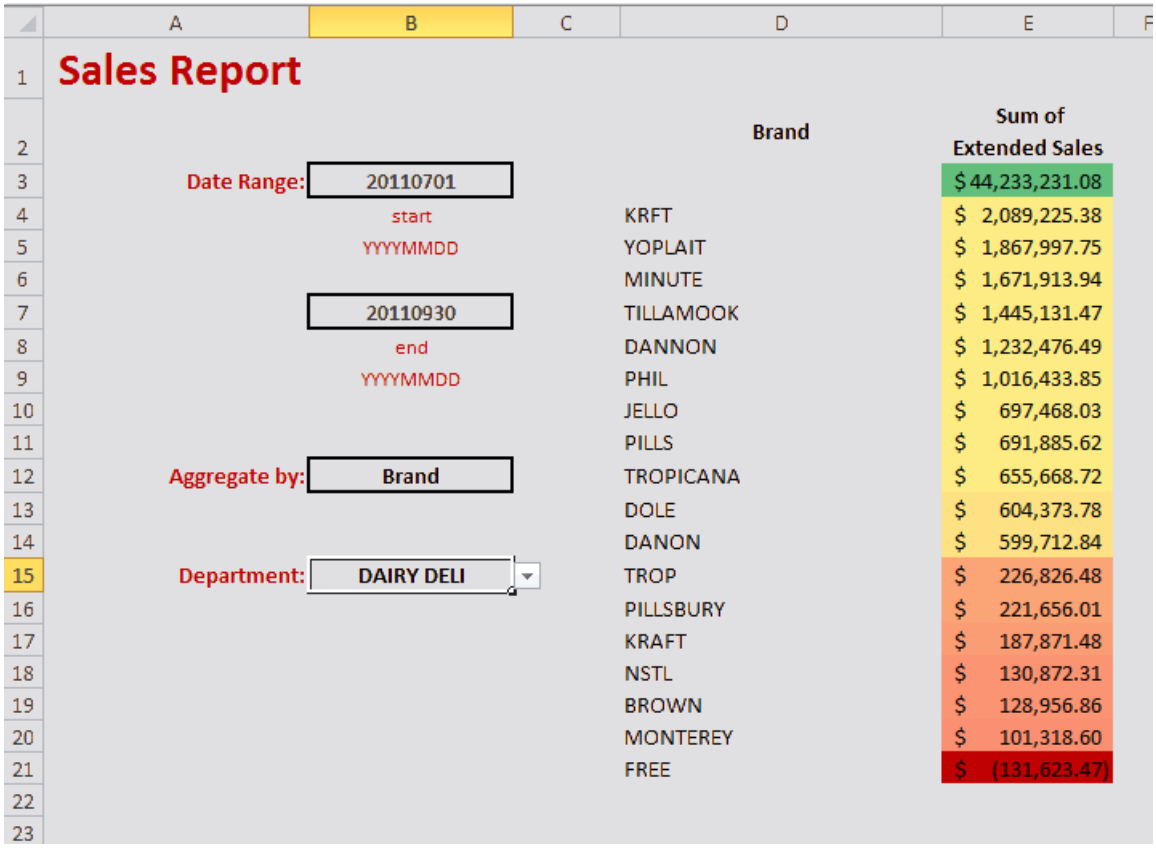
> **Note:** You must include the set of double quotes around `&department_selected&` for this Excel formula to work properly.

Now we can see the line in our macro code consists of the formula we just created and that it resolves to `20` within the **1010data Macro Code** section of the q-sheet:



Now let's test this out. Click **1010data** > **Run Queries** > **In Active Workbook** (or press Ctrl+Q).

When the query completes, you can see that the results show the sum of extended sales for each brand in department 20:



	A	B	C	D	E
1	**Sales Report**				
2				Brand	Sum of Extended Sales
3	Date Range:	20110701			$ 44,233,231.08
4		start		KRFT	$ 2,089,225.38
5		YYYYMMDD		YOPLAIT	$ 1,867,997.75
6				MINUTE	$ 1,671,913.94
7		20110930		TILLAMOOK	$ 1,445,131.47
8		end		DANNON	$ 1,232,476.49
9		YYYYMMDD		PHIL	$ 1,016,433.85
10				JELLO	$ 697,468.03
11				PILLS	$ 691,885.62
12	Aggregate by:	Brand		TROPICANA	$ 655,668.72
13				DOLE	$ 604,373.78
14				DANON	$ 599,712.84
15	Department:	DAIRY DELI		TROP	$ 226,826.48
16				PILLSBURY	$ 221,656.01
17				KRAFT	$ 187,871.48
18				NSTL	$ 130,872.31
19				BROWN	$ 128,956.86
20				MONTEREY	$ 101,318.60
21				FREE	$ (131,623.47)
22					
23					

You can also see that the cell for the last item in the list, which contains a negative value, appears with a dark red fill color, which we specified in *Conditional Formatting* on page 18.

Adding another query to the dashboard

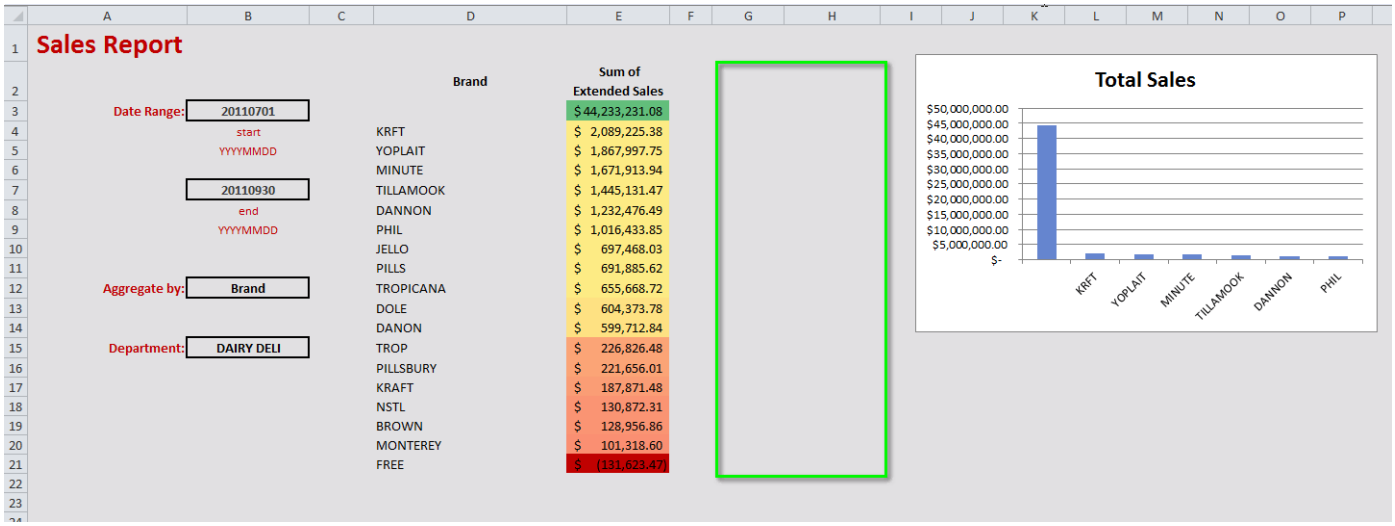
In addition to aggregating total sales by either group description or brand for a specified department and date range, we would also like to aggregate the total sales by date for the same department and date range and display those results in our dashboard.

We have already created the framework to easily add this new query to our dashboard. Basically, we need to perform the following steps:

- Determine where on the dashboard we want our results to go
- Create a new q-sheet for our new query and target the results to the dashboard

Determine the result destination on the dashboard

First let's figure out where we want our results to go. If we look at our dashboard, we can put our results right next to the other aggregation if we move our chart over to the right a bit:



> **Note:** Since the first query will return results of varying length, it makes more sense to place the results of the second query next to, not beneath, the first query in the dashboard.

Let's create a defined name for where the results of our query will be placed. On the **Formulas** tab, click **Define Name**. In the **New Name** dialog, enter `query_2_results` for the **Name** and enter the following for **Refers to**: `=Dashboard!$G$2`, then click **OK**.

Let's also create a defined name for the range to be cleared before pasting the results from a subsequent query: Click **Define Name**. In the **New Name** dialog, enter `query_2_results_range` for the **Name** and enter the following for **Refers to**: `=Dashboard!$G$2:$H$500`, then click **OK**.

> **Note:** This assumes that our result data will be less than 500 rows, which is probably safe for this example; however, you would want to specify a range that makes sense for you.

Create a new q-sheet

Now let's create a new q-sheet for the query we want to run on 1010data. From the **Add-Ins** menu, click **1010data** > **Add New Q-Sheet**. This will open a q-sheet in a new tab labeled **_1010q Sheet (2)**.

We need to enter some other information in the q-sheet:

- For the **Query Description**, enter "`Total Sales by Date`".
- In the **To be Applied to Table** field, enter `retaildemo.salesdetail`, since we want this query to be applied to the same table as our first query.

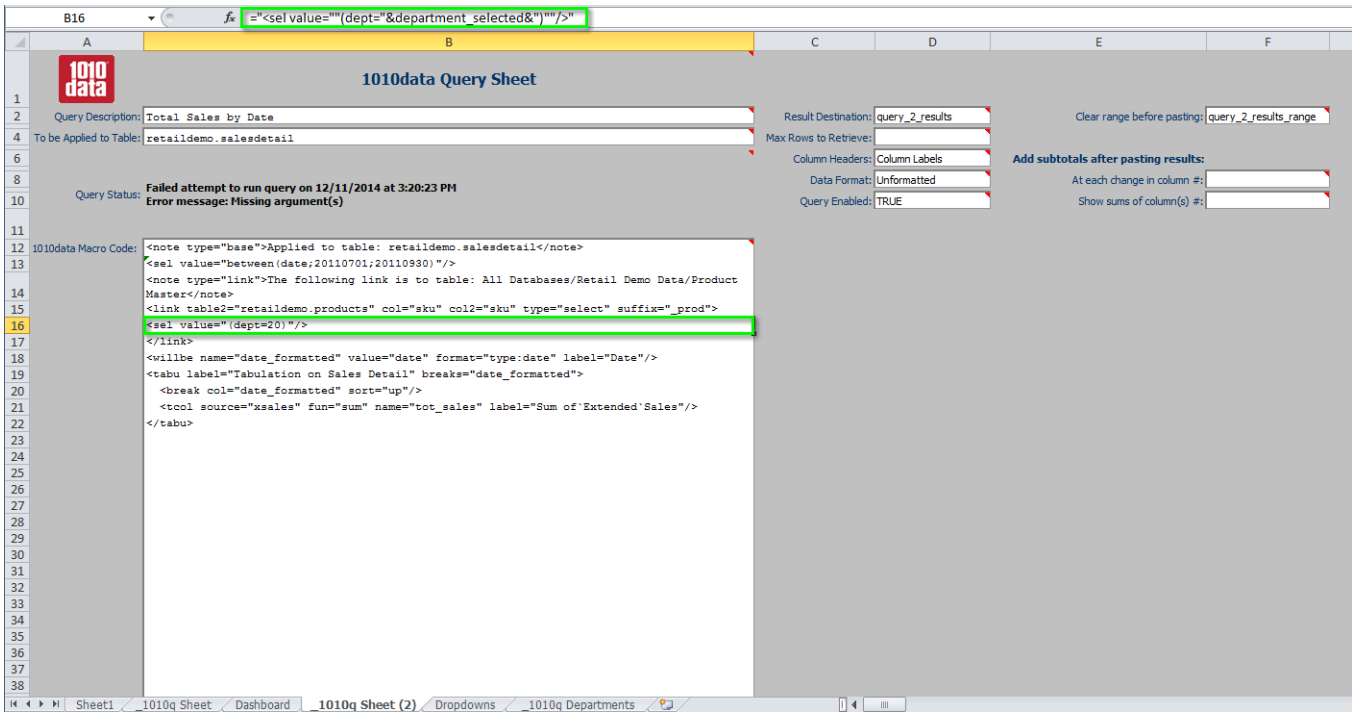
- In the **Result Destination** field, enter `query_2_results` so that the results will be placed where we decided on our dashboard.
- From the **Column Headers** drop-down, select "`Column Labels`".
- In the **Clear range before pasting** field, we'll enter: `query_2_results_range`.

In the **1010data Macro Code** box, enter the following Macro Language code:

```
<note type="base">Applied to table: retaildemo.salesdetail</note>
="<sel value=""between(date;"&startdate&";"&enddate&")""/>"
<note type="link">The following link is to table: All Databases/Retail Demo Data/
Product Master</note>
<link table2="retaildemo.products" col="sku" col2="sku" type="select" suffix="_prod">
="<sel value=""(dept="&department_selected&")""/>"
</link>
<willbe name="date_formatted" value="date" format="type:date" label="Date"/>
<tabu label="Tabulation on Sales Detail" breaks="date_formatted">
  <break col="date_formatted" sort="up"/>
  <tcol source="xsales" fun="sum" name="tot_sales" label="Sum of`Extended`Sales"/>
</tabu>
```

> **Note:** The lines in bold are Excel formulas that reference the start and end dates (`startdate` and `enddate`) as well as the department number (`department_selected`) that the user provides on the dashboard. (See *Adding a static input to a dashboard* on page 12 and *Creating a static drop-down in the dashboard* on page 25 for more details on how to reference input values within 1010data Macro Language code.)

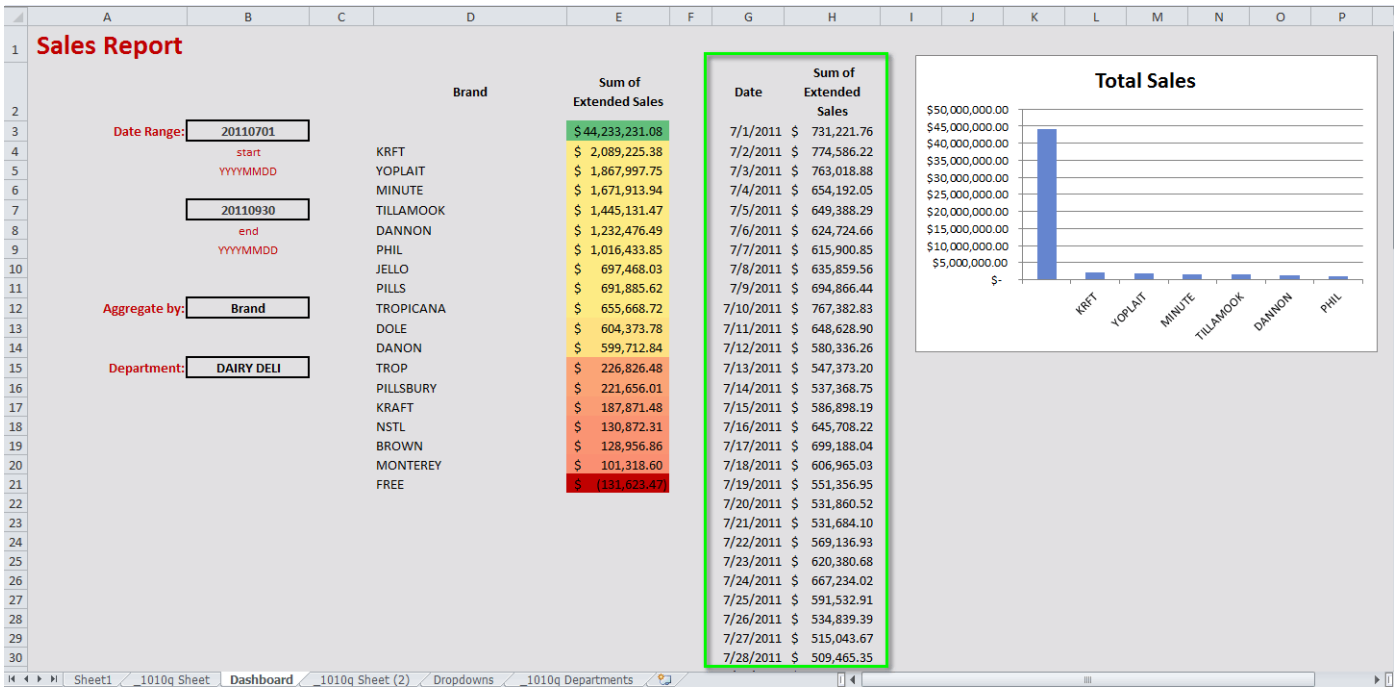
Our new q-sheet should look similar to the following:



> **Note:** The lines containing the Excel formulas display the values of the cells that they are referencing. For example, department number `20` appears for the reference to `department_selected` in cell **B16** within the **1010data Macro Code** section.

Now let's test this out. Click **1010data** > **Run Queries** > **In Active Workbook** (or press Ctrl+Q).

You can see the results from both queries next to one another in the dashboard:



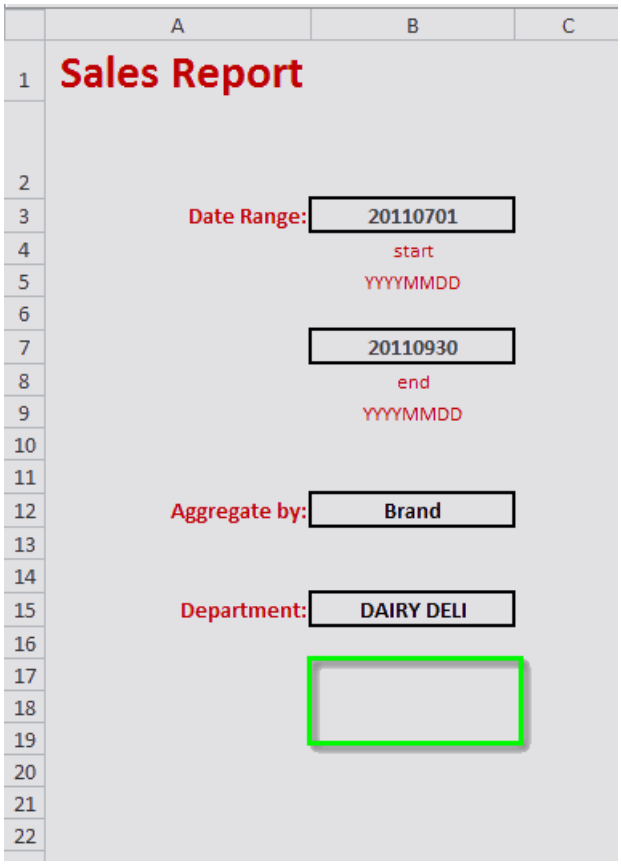
Note: You can format the column headings and the dollar amounts, which appear in the new **Sum of Extended Sales** column, so that the look across the dashboard is consistent. (See *Basic Formatting* on page 17 for details.)

It would be even more convenient if we could run the queries directly from our dashboard. The next step will show how to add a button to the dashboard that will allow you to do just that.

Adding a button to run the queries

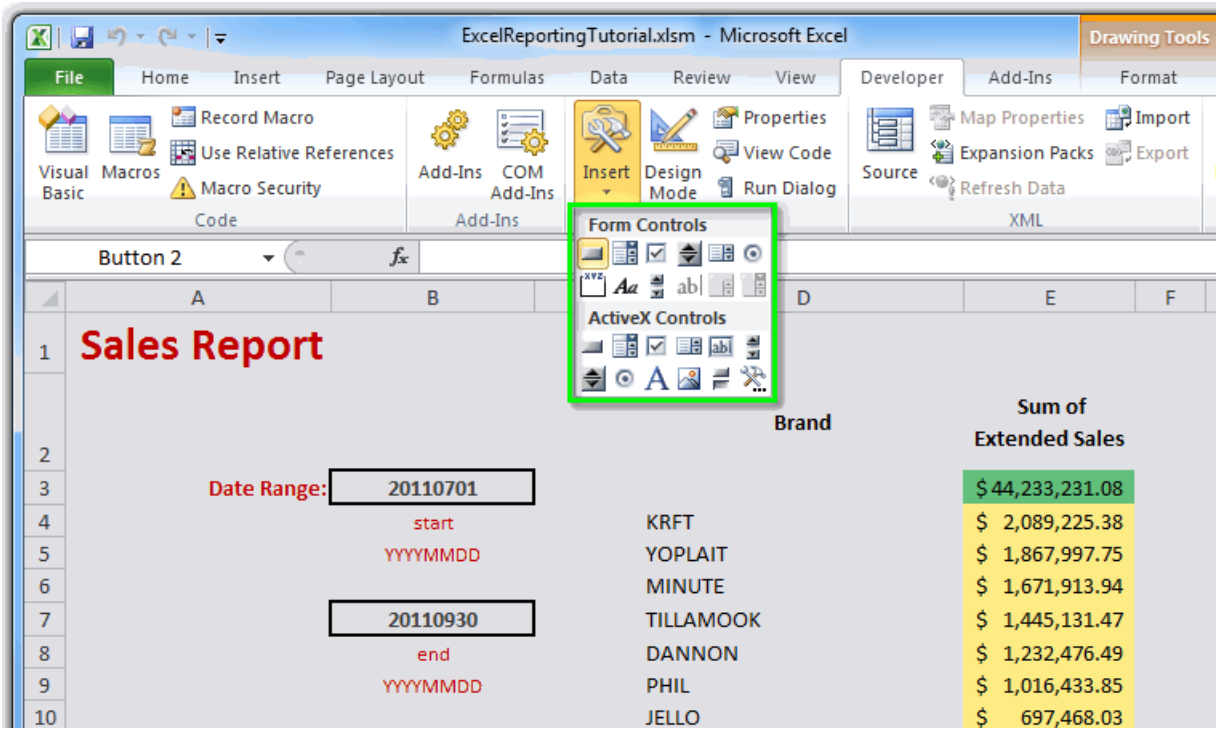
We want to be able to run our queries by simply clicking a button on the dashboard.

Click on the **Dashboard** tab. Let's add the button somewhere around cell **B18** on that worksheet:



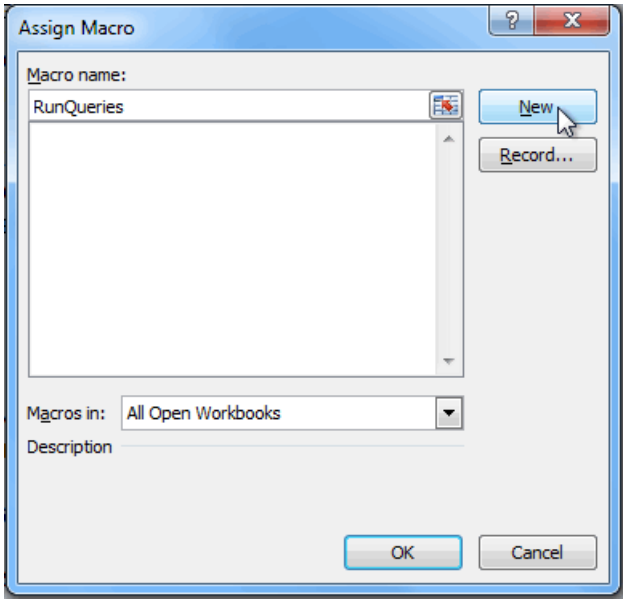
On the **Developer** tab, click the **Insert** button to bring up the **Form Controls** and then click the icon in the top left corner, which corresponds to the **Button (Form Control)**.

> **Note:** If the **Developer** tab does not appear in your ribbon, click **File** > **Options** > **Customize Ribbon**. Under the **Customize the Ribbon** list on the right side of the dialog, select **Developer** and then click **OK**. The **Developer** tab should now appear in the ribbon.



On the dashboard, drag across the area where you want the button to appear.

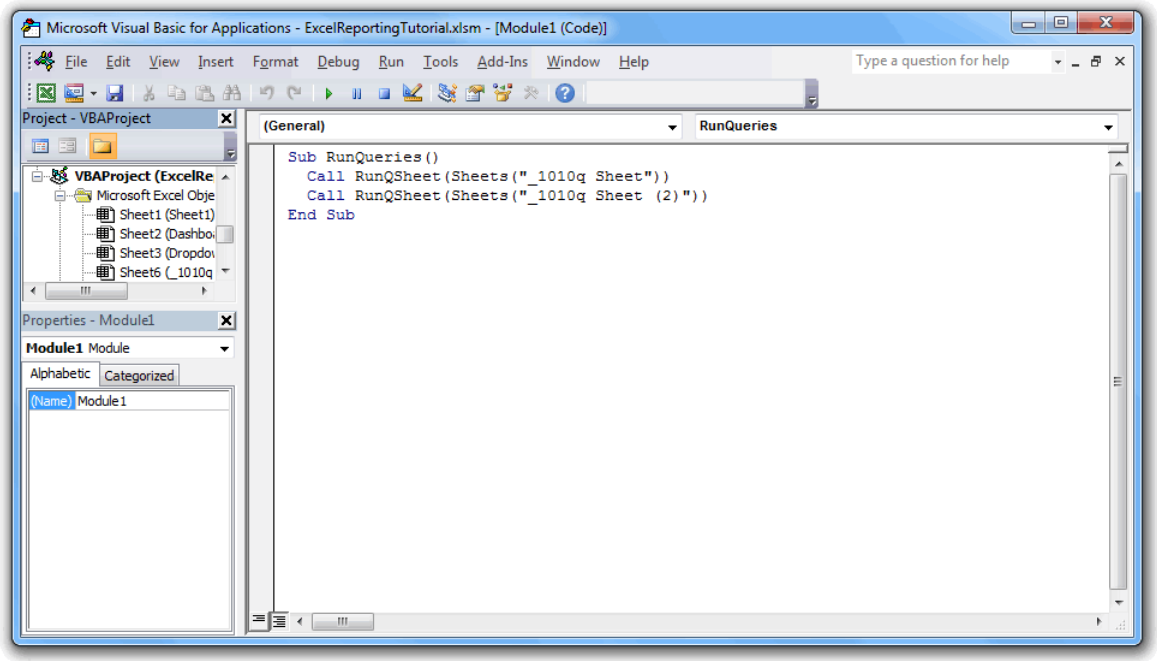
In the **Assign Macro** dialog, enter "`RunQueries`" for the **Macro name** and then click the **New** button:



This will bring up the **Microsoft Visual Basic for Applications** window, which will allow us to execute the `RunQueries` macro when our new button is clicked. Enter the following code:

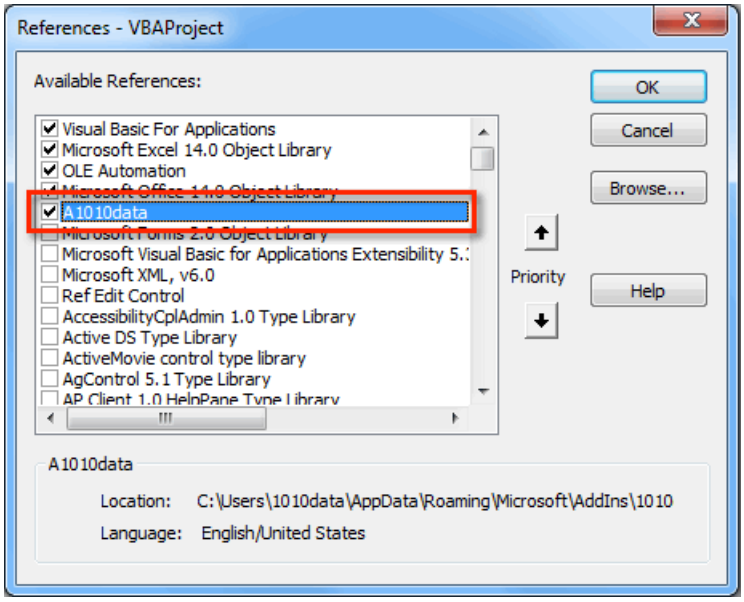
```
Sub RunQueries()
  Call RunQSheet (Sheets("_1010q Sheet"))
  Call RunQSheet (Sheets("_1010q Sheet (2)"))
End Sub
```

The 1010data Excel Add-in VBA function *`RunQSheet`* validates and runs the two specified q-sheets, `Sheets("_1010q Sheet")` and `Sheets("_1010q Sheet (2)")`.



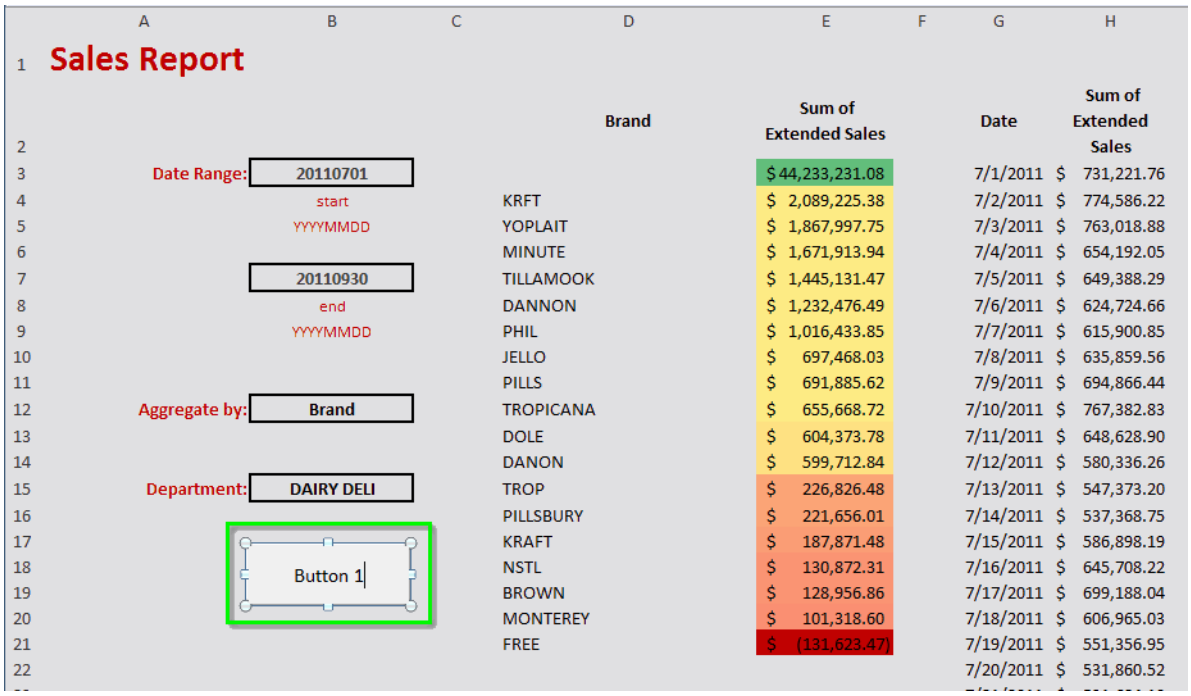
Note: If you don't want the status bar to appear while queries are being run, or if you are running several q-sheets and don't want to click **OK** after each one completes, you can add the parameter `Quiet:=True` to the `RunQSheet` function calls. For example, `Call RunQSheet (Sheets("_1010q Sheet"), Quiet:=True)`

Let's make sure our VBA project has a reference to the 1010data Excel Add-in VBA library. In the **Microsoft Visual Basic for Applications** window, click **Tools** > **References** and select `A1010data` from the list of **Available References**, if it is not already selected.



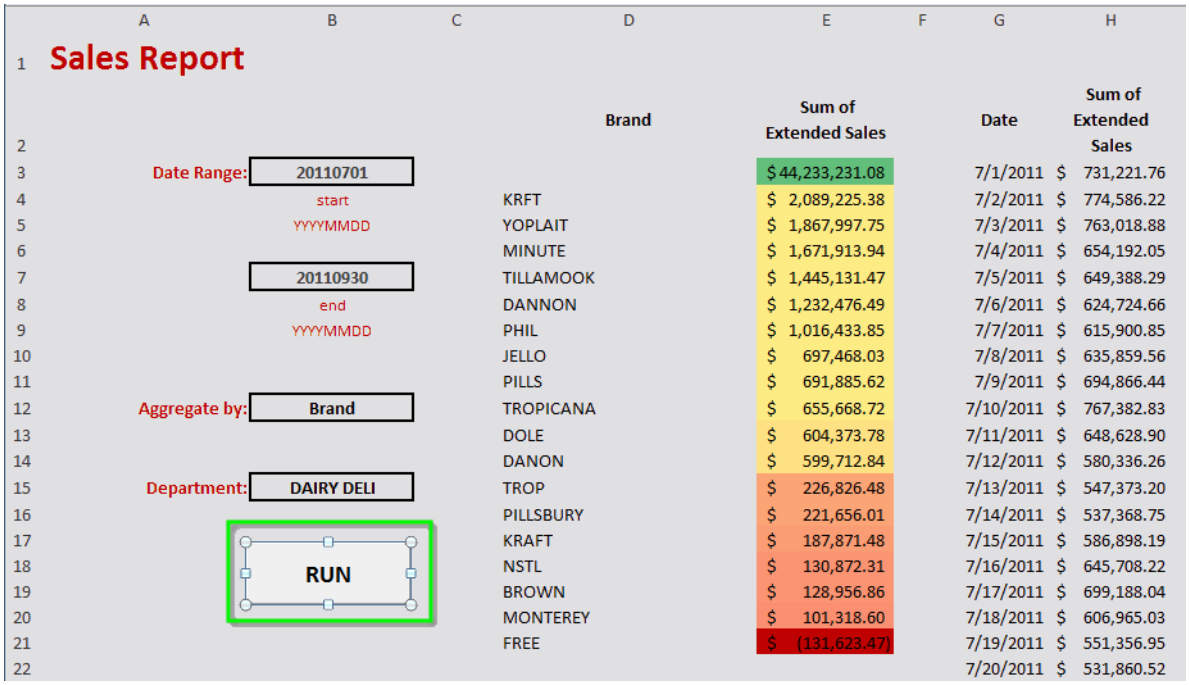
Click **OK**, then save the macro by pressing Ctrl+S.

After you close the **Microsoft Visual Basic for Applications** window, you should see the new button on the dashboard:



Brand	Sum of Extended Sales	Date	Sum of Extended Sales
	$ 44,233,231.08	7/1/2011	$ 731,221.76
KRFT	$ 2,089,225.38	7/2/2011	$ 774,586.22
YOPLAIT	$ 1,867,997.75	7/3/2011	$ 763,018.88
MINUTE	$ 1,671,913.94	7/4/2011	$ 654,192.05
TILLAMOOK	$ 1,445,131.47	7/5/2011	$ 649,388.29
DANNON	$ 1,232,476.49	7/6/2011	$ 624,724.66
PHIL	$ 1,016,433.85	7/7/2011	$ 615,900.85
JELLO	$ 697,468.03	7/8/2011	$ 635,859.56
PILLS	$ 691,885.62	7/9/2011	$ 694,866.44
TROPICANA	$ 655,668.72	7/10/2011	$ 767,382.83
DOLE	$ 604,373.78	7/11/2011	$ 648,628.90
DANON	$ 599,712.84	7/12/2011	$ 580,336.26
TROP	$ 226,826.48	7/13/2011	$ 547,373.20
PILLSBURY	$ 221,656.01	7/14/2011	$ 537,368.75
KRAFT	$ 187,871.48	7/15/2011	$ 586,898.19
NSTL	$ 130,872.31	7/16/2011	$ 645,708.22
BROWN	$ 128,956.86	7/17/2011	$ 699,188.04
MONTEREY	$ 101,318.60	7/18/2011	$ 606,965.03
FREE	$ (131,623.47)	7/19/2011	$ 551,356.95
		7/20/2011	$ 531,860.52

Change the text of the button to "`RUN`" and change the font size and style as you like. When you're done, right-click the new button and click **Exit Edit Text** from the context menu.

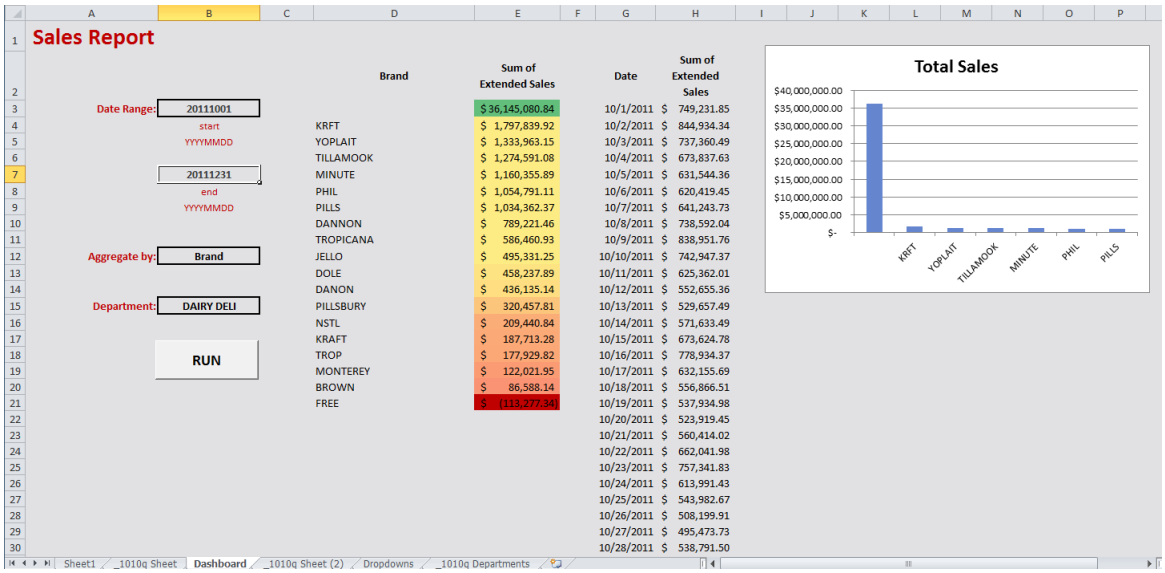


Brand	Sum of Extended Sales	Date	Sum of Extended Sales
	$ 44,233,231.08	7/1/2011	$ 731,221.76
KRFT	$ 2,089,225.38	7/2/2011	$ 774,586.22
YOPLAIT	$ 1,867,997.75	7/3/2011	$ 763,018.88
MINUTE	$ 1,671,913.94	7/4/2011	$ 654,192.05
TILLAMOOK	$ 1,445,131.47	7/5/2011	$ 649,388.29
DANNON	$ 1,232,476.49	7/6/2011	$ 624,724.66
PHIL	$ 1,016,433.85	7/7/2011	$ 615,900.85
JELLO	$ 697,468.03	7/8/2011	$ 635,859.56
PILLS	$ 691,885.62	7/9/2011	$ 694,866.44
TROPICANA	$ 655,668.72	7/10/2011	$ 767,382.83
DOLE	$ 604,373.78	7/11/2011	$ 648,628.90
DANON	$ 599,712.84	7/12/2011	$ 580,336.26
TROP	$ 226,826.48	7/13/2011	$ 547,373.20
PILLSBURY	$ 221,656.01	7/14/2011	$ 537,368.75
KRAFT	$ 187,871.48	7/15/2011	$ 586,898.19
NSTL	$ 130,872.31	7/16/2011	$ 645,708.22
BROWN	$ 128,956.86	7/17/2011	$ 699,188.04
MONTEREY	$ 101,318.60	7/18/2011	$ 606,965.03
FREE	$ (131,623.47)	7/19/2011	$ 551,356.95
		7/20/2011	$ 531,860.52

Now we're ready to test out our new button. Let's modify the date range once again so that we can see if the sales totals update. Let's change the start date to `20111001` and the end date to `20111231`. Then click the **RUN** button.

> **Note:** After each query completes, you will be presented with a dialog that you must dismiss before the next query runs.

When the queries complete, we can see the results on the dashboard.

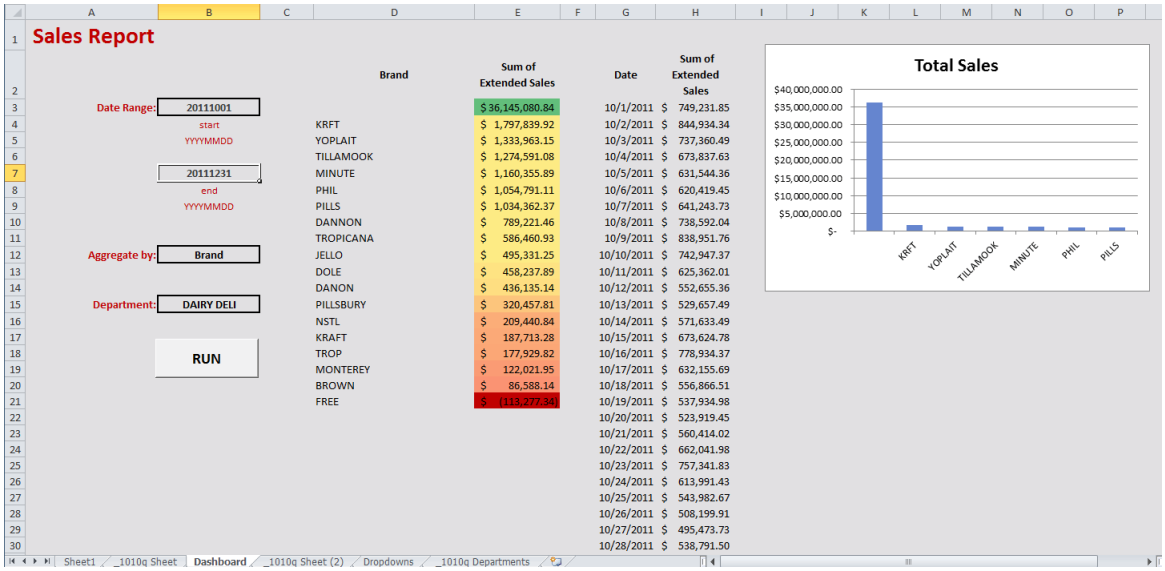


You will notice that the chart has also been updated. However, it only shows the top seven items returned from our first query. Let's modify the chart so that it will dynamically include all of the items returned from the first query. We'll also add a second chart that shows the results of the query that aggregates total sales by date.

Charting the results dynamically on the dashboard

Utilize more advanced charting techniques in Excel to show the details in the results returned by our 1010data queries.

Here's what our dashboard looks like up to this point:



Our chart only shows the top seven items returned from our first query. Let's modify the chart so that it will dynamically include all of the items returned from the first query. We'll also add a line chart for the results of the second query to show the total sales by date for the same department.

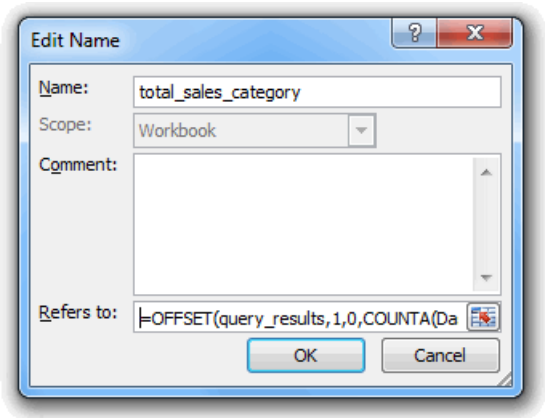
Making the bar chart more dynamic

Our first query returns the total sales for each group or brand in a specific department. The bar chart we created earlier only shows the top seven items returned by the query, because we hard-coded a range of values for the x-axis and y-axis variables. Let's modify those variables, so that our chart will dynamically display all of the items returned by the query.

On the **Formulas** tab, click the **Name Manager** button. In the **Name Manager** dialog, click the `total_sales_category` item in the list, and then click the **Edit...** button. For the value of this variable, we're going to use the Excel *OFFSET* function. In the **Refers to** field in the **Edit Name** dialog, we'll enter the following:

```
=OFFSET(query_results,1,0,COUNTA(Dashboard!$D:$D),1)
```

The first parameter specifies the cell from which you want to base the offset, so we'll specify `query_results` for that parameter. The list of groups or brands returned from our first query begins at one row below in the same column as the cell named `query_results`, so we'll specify `1` for the second parameter to indicate one row below, and we'll specify `0` for the third parameter to indicate the same column. The fourth parameter uses the Excel *COUNTA* function to calculate the number of non-empty cells in column **D**, because all information charted has to correspond to a value along the x-axis, and those values are in column **D**. The last parameter tells the `OFFSET` function that we just want one column of data from the results.

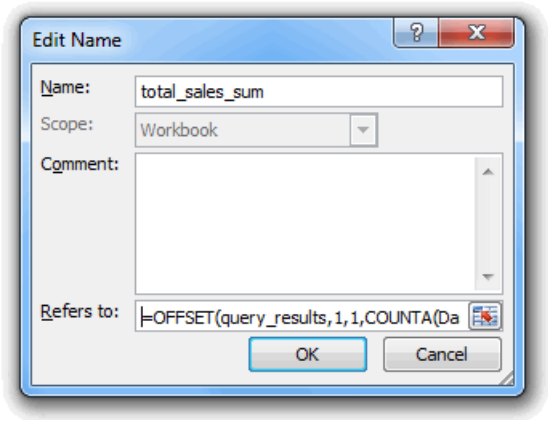


Click **OK** to modify the variable.

Now let's modify the y-axis variable. In the **Name Manager** dialog, click the `total_sales_sum` item in the list, and then click the **Edit...** button. In the **Refers to** field in the **Edit Name** dialog, we'll enter the following:

```
=OFFSET(query_results,1,1,COUNTA(Dashboard!$D:$D),1)
```

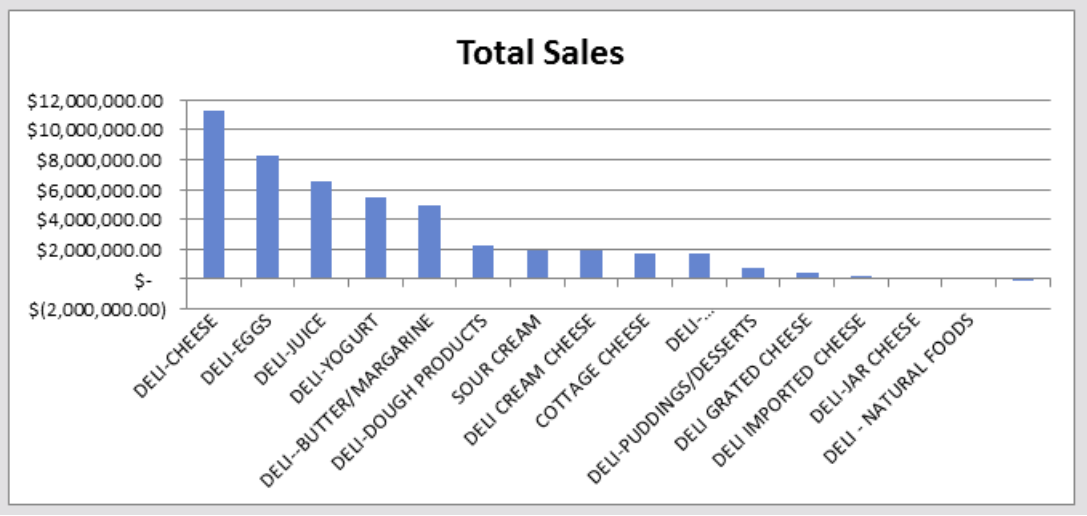
For the first parameter, we specify `query_results` like we did for the x-axis variable. The list of total sales returned from our first query begins at one row below and one column to the right of the cell named `query_results`, so we'll specify `1` for the second parameter to indicate one row below, and we'll specify `1` for the third parameter to indicate one column to the right. For the fourth parameter, we'll use the Excel *`COUNTA`* function again to calculate the number of non-empty cells in column **D**, because all information charted has to correspond to a value along the x-axis, and those values are in column **D**. The last parameter tells the `OFFSET` function that we just want one column of data from the results.



Click **OK** to modify the variable.

In the **Name Manager** dialog, click **Close**.

The chart will automatically update to show all of the items returned from our query:



Note: You may want to resize the chart to accommodate the additional items along the x-axis.

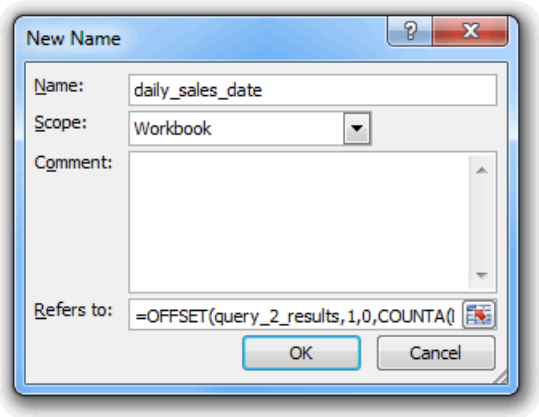
Creating a line chart

We can also create a line chart that shows the results from our second query, so that we can see total sales by date for the department we have selected.

Once again, we need to create variables that will represent the x-axis and y-axis values for the chart. For the x-axis, we will specify the list of dates returned by our query. The determination of their values follows the same logic as the variables we created for the bar chart in the previous section, so we won't go into as detailed an explanation here.

On the **Formulas** tab, click **Define Name**. In the **New Name** dialog, enter `daily_sales_date` for the **Name**. In the **Refers to** field, we'll enter the following:

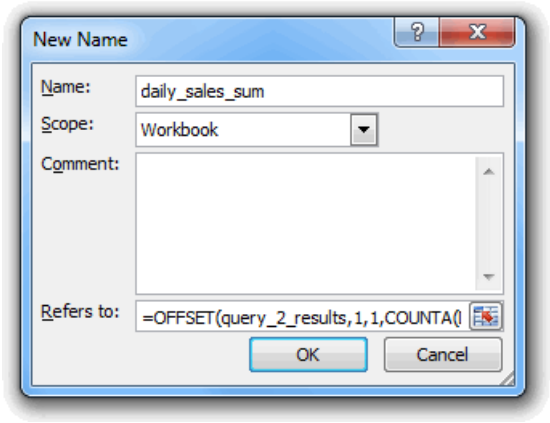
```
=OFFSET(query_2_results,1,0,COUNTA(Dashboard!$G:$G),1)
```



Click **OK** to create the variable.

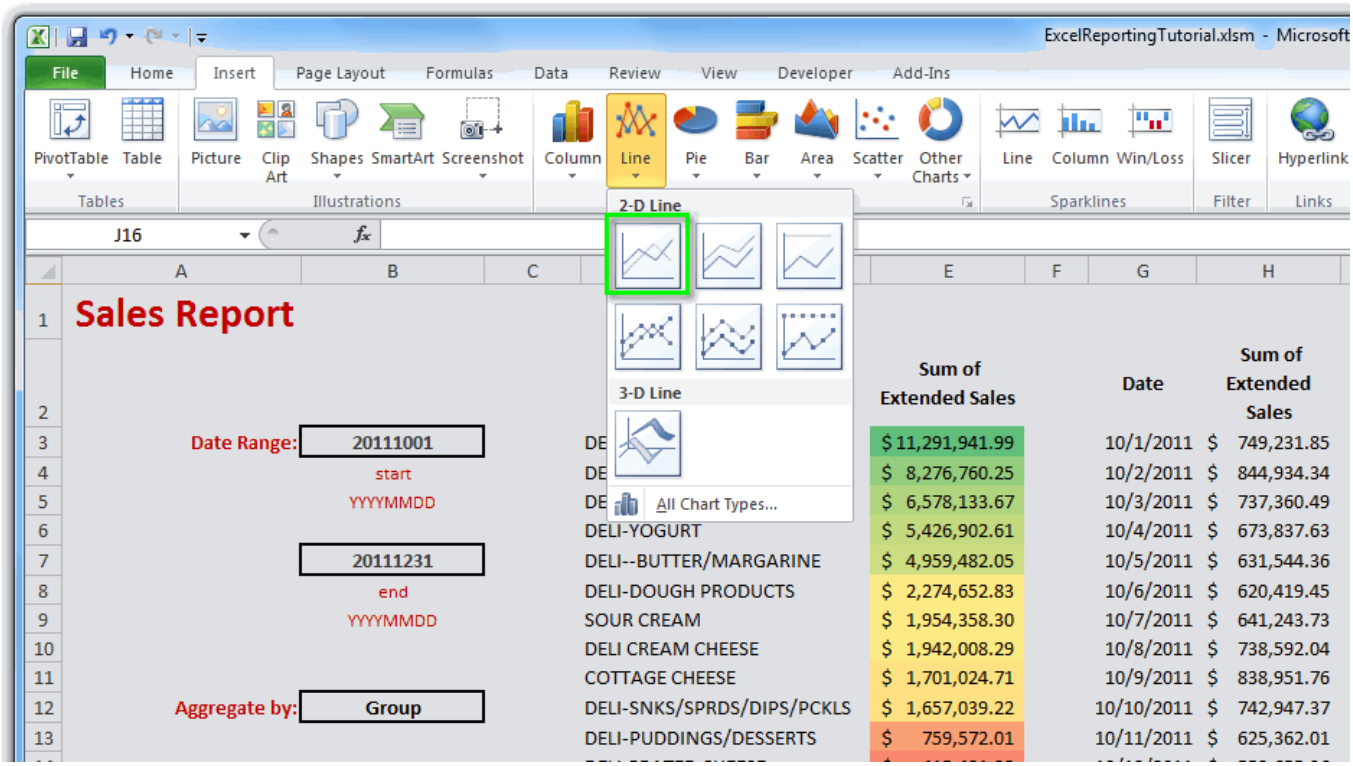
Now let's create a variable for the y-axis. Click **Define Name** and in the **New Name** dialog, enter `daily_sales_sum` for the **Name**. In the **Refers to** field, enter the following:

```
=OFFSET(query_2_results,1,1,COUNTA(Dashboard!$G:$G),1)
```

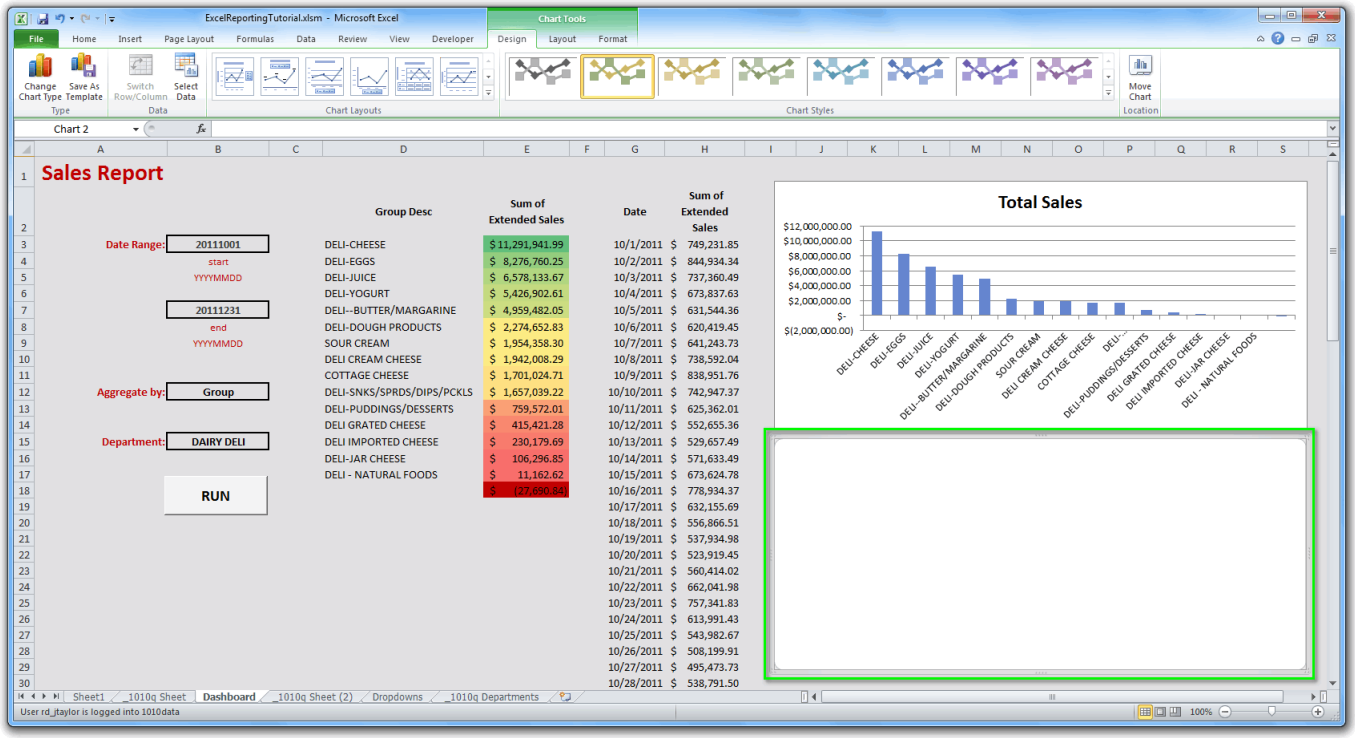


Click **OK** to create the variable.

Now that we've created our variables, we can create our chart. Click in any empty cell in the dashboard. Then, on the **Insert** tab, click **Line** and select the first **2-D Line** chart (**Line**):



Position the chart where you want it to appear in the dashboard and resize it as desired:



Now let's incorporate the x-axis and y-axis variables we created earlier.

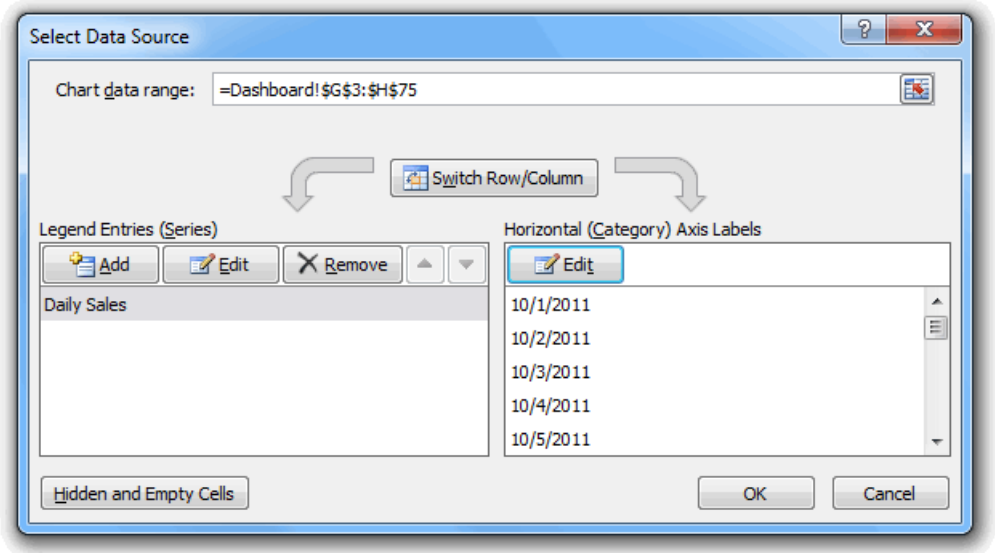
Let's start with the y-axis.

1. Right-click anywhere on the new line chart and click **Select Data...** from the context menu.
2. In the **Select Data Source** dialog, click the **Add** button under **Legend Entries (Series)**.
3. In the **Edit Series** dialog, enter `Daily Sales` for the **Series name**.
4. In the **Series values** field, enter `Dashboard!daily_sales_sum`, which is the name of the y-axis variable we just created.
5. Click **OK**.

And now, for the x-axis:

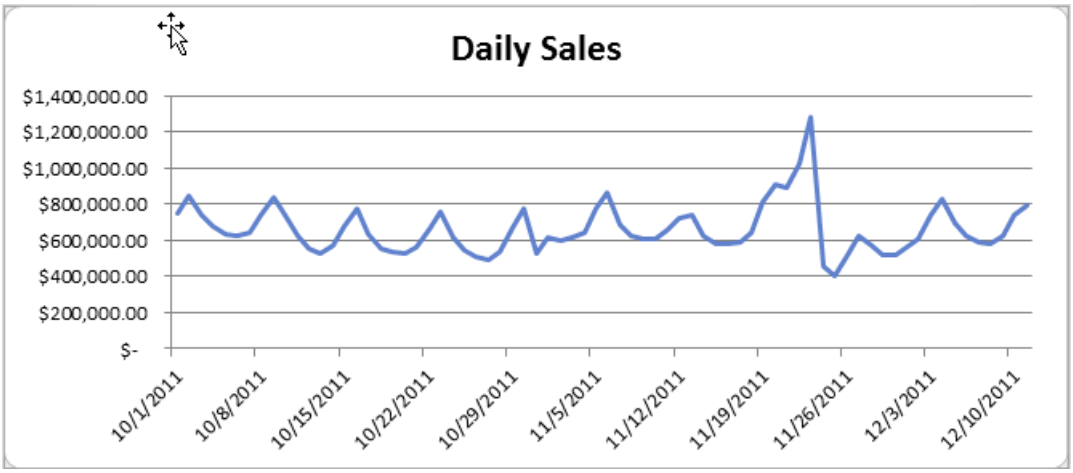
1. In the **Select Data Source** dialog, click the **Edit** button under **Horizontal (Category) Axis Labels**.
2. In the **Axis Labels** dialog, enter `Dashboard!daily_sales_date`, which is the name of the x-axis variable we just created.
3. Click **OK**.

The **Select Data Source** dialog should look similar to the following:

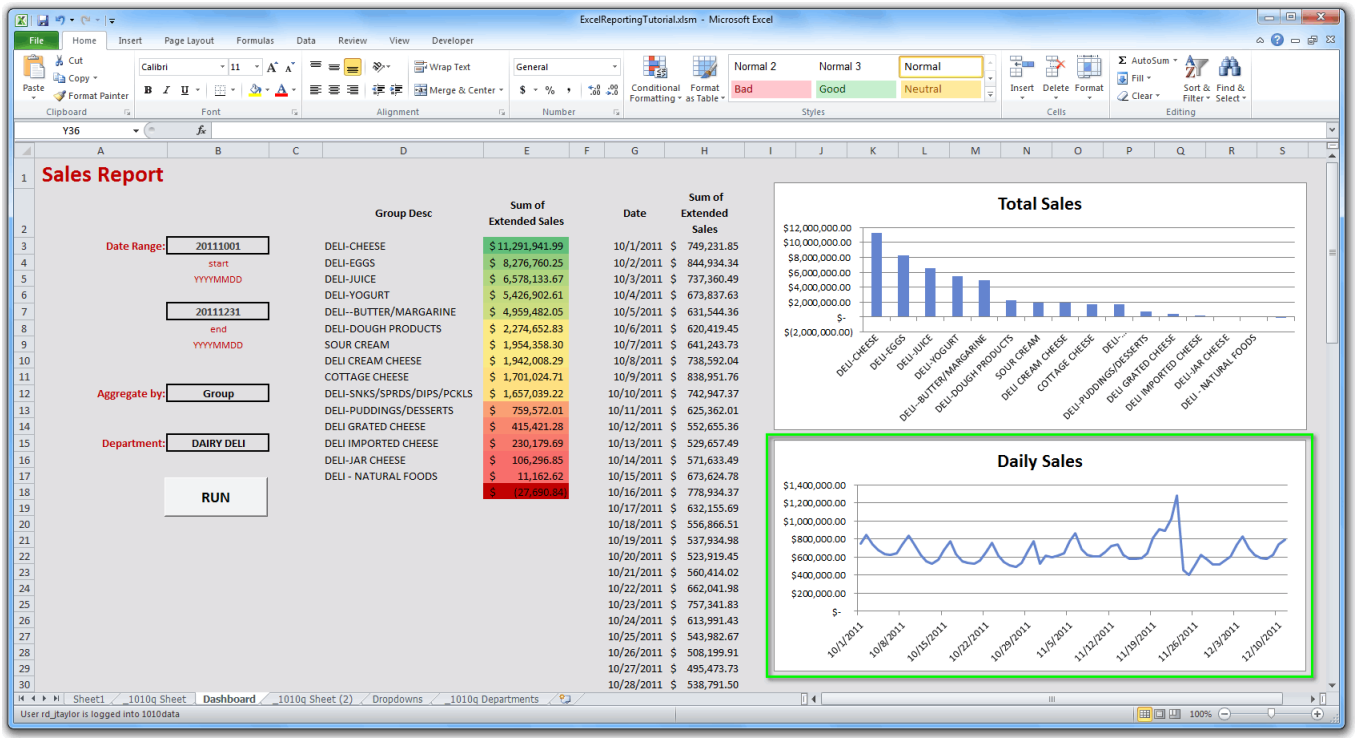


Click **OK**.

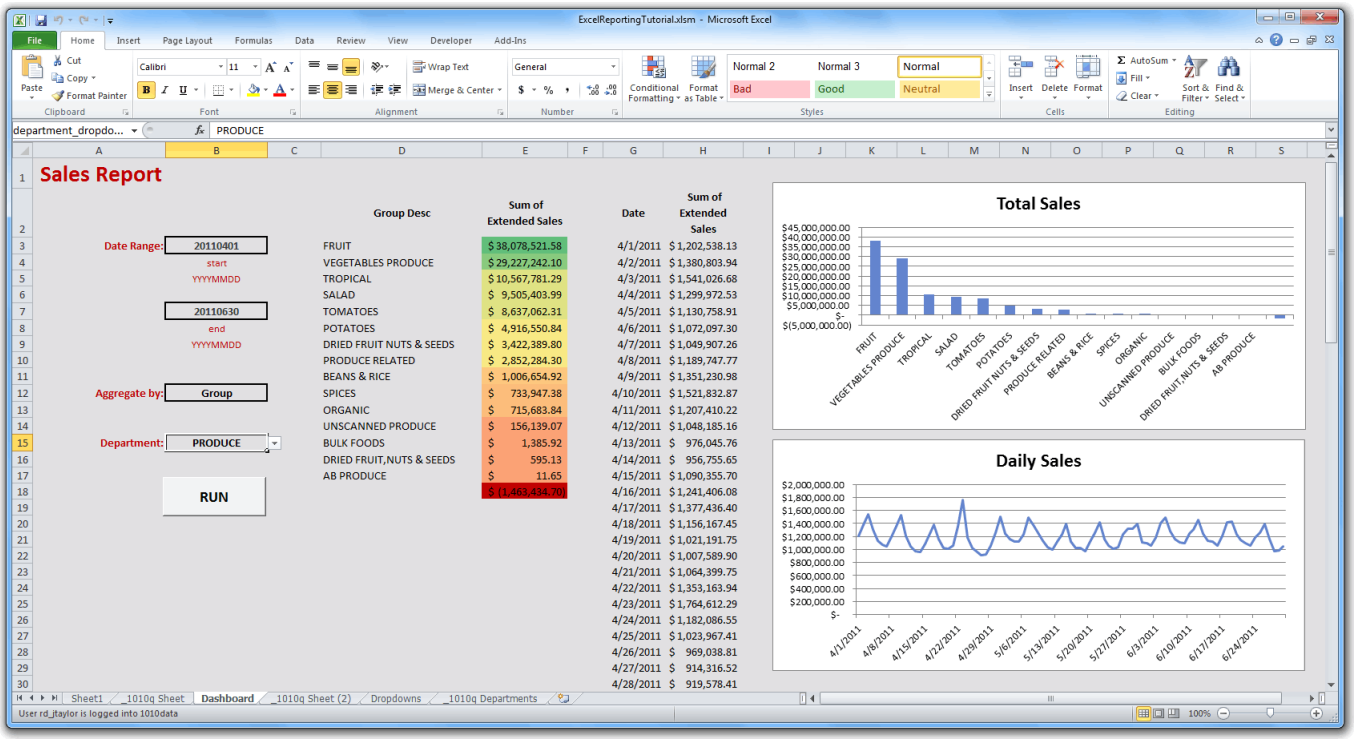
We now have a line chart showing the total sales by date for the department we've selected:



which appears on our dashboard:



The chart will dynamically update when the query is run with different parameters. For instance if we enter `20110401` for the start date and `20110630` for the end date, and we select `Group` from the **Aggregate by** drop-down and `PRODUCE` from the **Department** drop-down, and then click **RUN**, the dashboard will update with the results, including the chart we just created:



Using 1010data libraries and blocks

You can make the Excel Add-in even more dynamic by accessing query code in libraries and blocks on 1010data.

One of the most powerful features of 1010data is the use of libraries and blocks to encapsulate Macro Language code. Libraries consist of one or more blocks, each of which contains Macro Language code that can be inserted within other queries. This allows you to keep your query code in a central location and give multiple users access to it. If you need to change the code for any reason (e.g., one of the calculations needs to change), you can simply change the block. Whenever anybody inserts the block into their query, they will get the most up-to-date code.

To see how this works, we'll log into the 1010data web interface to create a library. The library will consist of one block that contains the code for *the second query* on our dashboard. As you'll recall, this query calculates the total sales by date for a given department.

> **Note:** If you are not already logged into the 1010data web interface, when you attempt to log in, you will see a message prompting you to either re-enter or end your existing session. You must select **End existing session**, which will log you out of your Excel Add-in session. Consequently, you will need to log in via the Excel Add-in again before you can run your q-sheets.

Our *<library>*, which consists of a *<block>* named `sales_by_date`, would look something like the following:

```
<note type="base">Applied to table: retaildemo.salesdetail</note>
<library>
  <block name="sales_by_date" start="20110101" end="20110331" department="19">
    <sel value="between(date;{@start};{@end})"/>
    <note type="link">The following link is to table: All Databases/Retail
 Demo Data/Product Master</note>
    <link table2="retaildemo.products" col="sku" col2="sku" type="select"
 suffix="_prod">
      <sel value="(dept={@department})"/>
    </link>
    <willbe name="date_formatted" value="date" format="type:date"
 label="Date"/>
    <tabu label="Tabulation on Sales Detail" breaks="date_formatted">
      <break col="date_formatted" sort="up"/>
      <tcol source="xsales" fun="sum" name="tot_sales" label="Sum
 of`Extended`Sales"/>
    </tabu>
  </block>
</library>
```

You'll notice that the code within the `<block>` is almost identical to the code that we used in *Adding another query to the dashboard* on page 41.

You'll also notice that the `<block>` takes three parameters: `start`, `end`, and `department`. The parameters are then referenced in the query using the `{@PARAM_NAME}` syntax (e.g., `{@start}`).

> **Note:** We specify default values for these parameters in the `<block>` definition (e.g., `start="20110101"`).

The library is then saved as a Quick Query in a folder on 1010data.

> **Note:** Users who want to use any of the blocks in the library must be given the appropriate permissions to the requisite folders and tables. See *How to Share Quick Queries and Folders* in the Quick Start Guide for more information.

For this example, let's say that the path to the Quick Query containing this library is: `uploads.t632564076_rd_jtaylor`.

We can then go to the **_1010q Sheet (2)** tab, where the q-sheet containing our second query is located, and replace all of the query code in the **1010data Macro Code** section with a call to our block:

```
<import path="uploads.t632564076_rd_jtaylor"/>
<insert block="sales_by_date" start="20110101" end="20110331" department="19"/
>
```

We use the *<import>* operation to make the `<library>` available to our current query, and then we use the *<insert>* operation to insert the `sales_by_date` block code in our query.

Note that in the `<insert>` statement, we have provided hard-coded values for the `start`, `end`, and `department` parameters, but since we want our block to be called with the input values from the dashboard, we need to change the hard-coded values to references to the appropriate cells in the Excel workbook.

To reference input values from within the 1010data query, we will need to change the line in our macro code into a formula. We do this by:

- removing any blank spaces from the start of the line
- inserting an = at the beginning of the line
- enclosing the macro code in double quotes
- preceding any double quote within the macro code with another double quote so that Excel will not interpret any of them as the end of the formula
- replacing each hard-coded value with a reference to its corresponding input cell using the syntax: `"&[CELL_REFERENCE]&"` (e.g., `"&B3&"`)

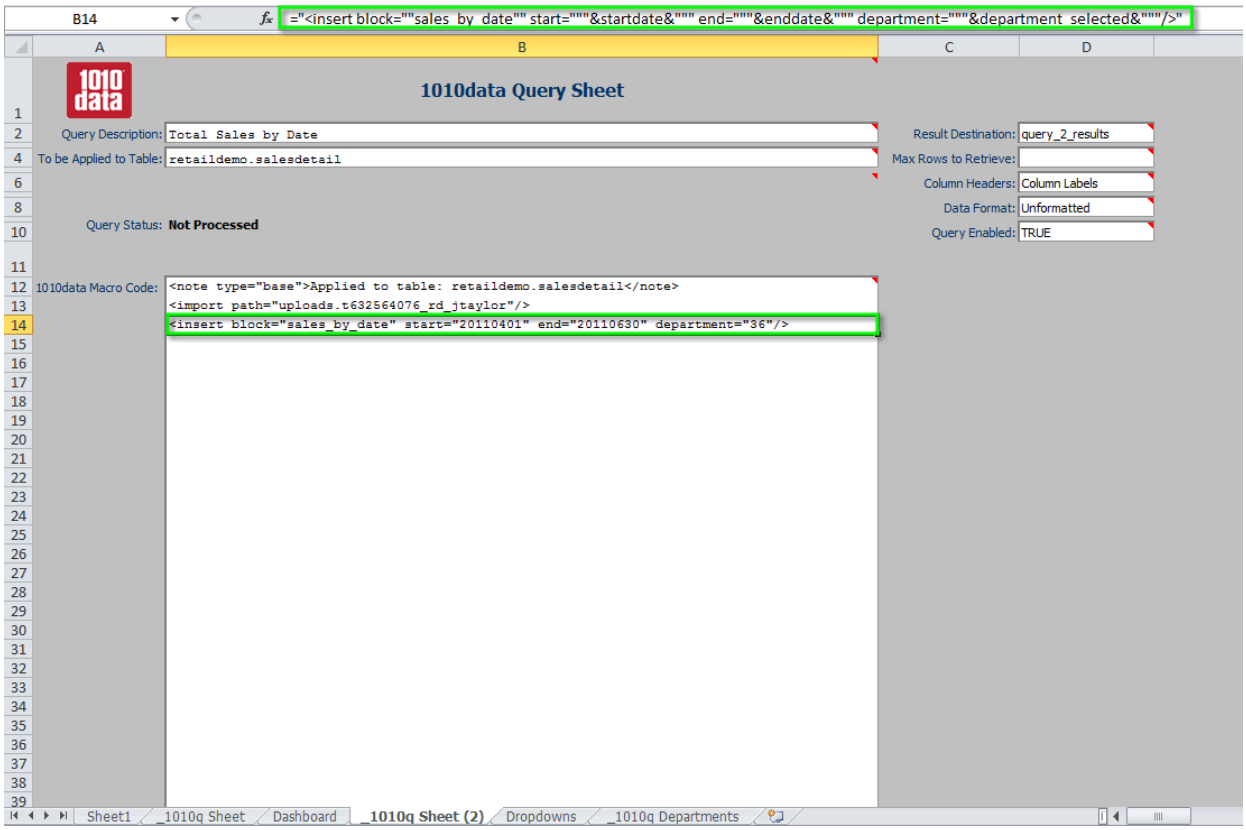
So, the line containing the `<insert>` command would change to:

```
="<insert block=""sales_by_date"" start="""&startdate&""" end="""&enddate&"""
 department="""&department_selected&"""/>"
```

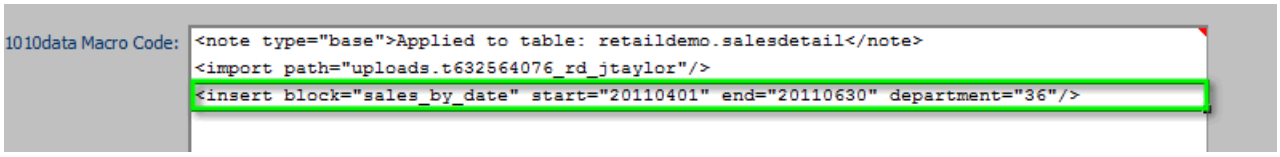
> **Note:** There are three sets of double quotes around each of the variables (e.g., `"""&startdate&"""`). Although this may look odd, it is correct syntax for this Excel formula to work properly.

To see step-by-step examples of how to do this, see the sections *Creating a static drop-down in the dashboard* on page 25 and *Incorporating a dynamic drop-down in the dashboard* on page 31.

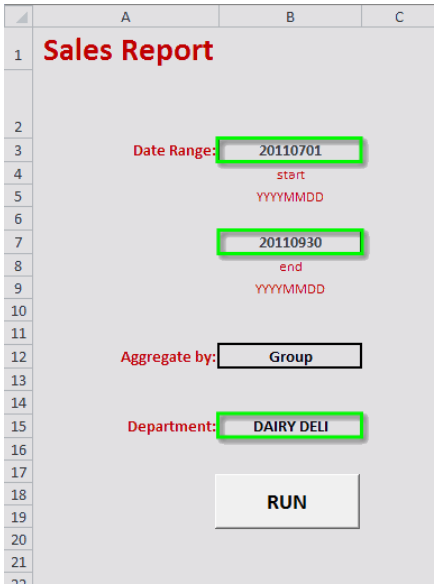
Our q-sheet would look similar to the following:



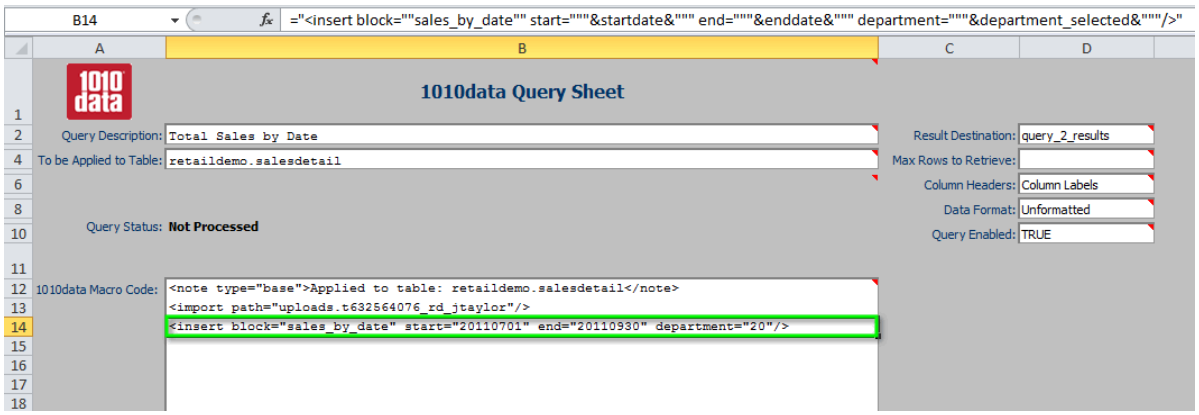
You can see in the **1010data Macro Code** section that the actual values corresponding to the `start`, `end`, and `department_selected` inputs on our dashboard appear in the code:



If we change the values on the dashboard:

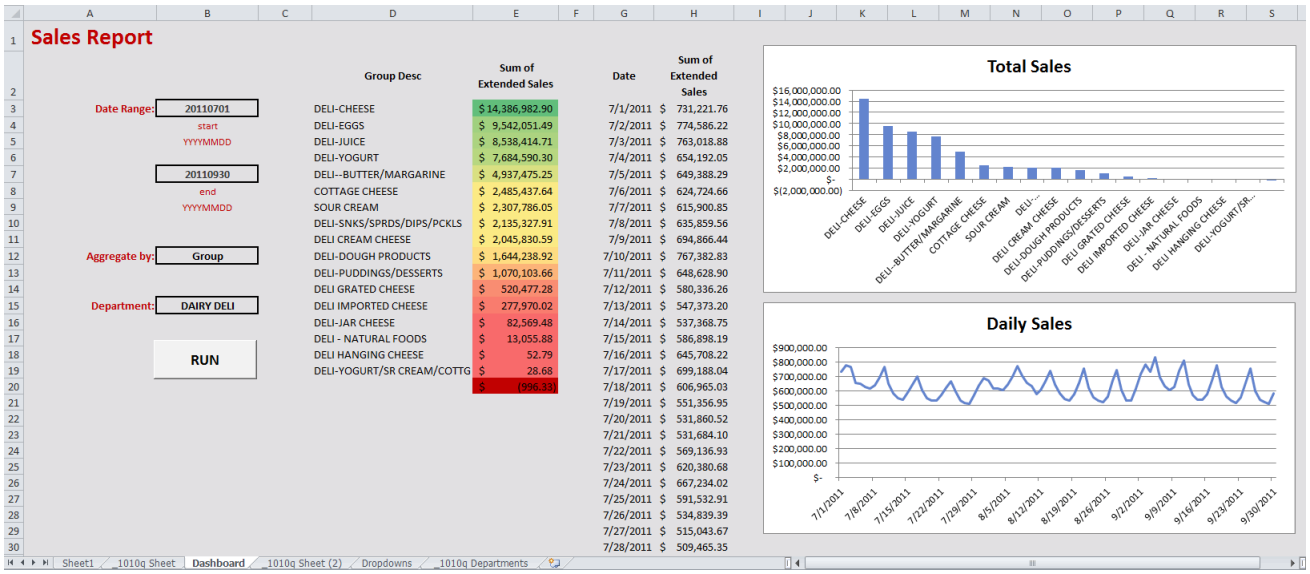


The values in our `<insert>` call in the q-sheet will change as well:



Note: Before you run the q-sheets, you may have to log in once again. From the **Add-Ins** tab, click **1010data** > **1010data Login...**, enter your credentials, and then click **Secure Login**.

Now, if we go to the dashboard and click the **RUN** button, the second query will run the code from our `<block>`, and the dashboard will update accordingly:



Libraries and blocks give you flexibility in providing your users with the most up-to-date query code. In this way, you can provide templates to your business users and change metric calculations without needing to update or send new Excel templates. If something within the block changes, the Excel Add-in will automatically leverage the new definition going forward.

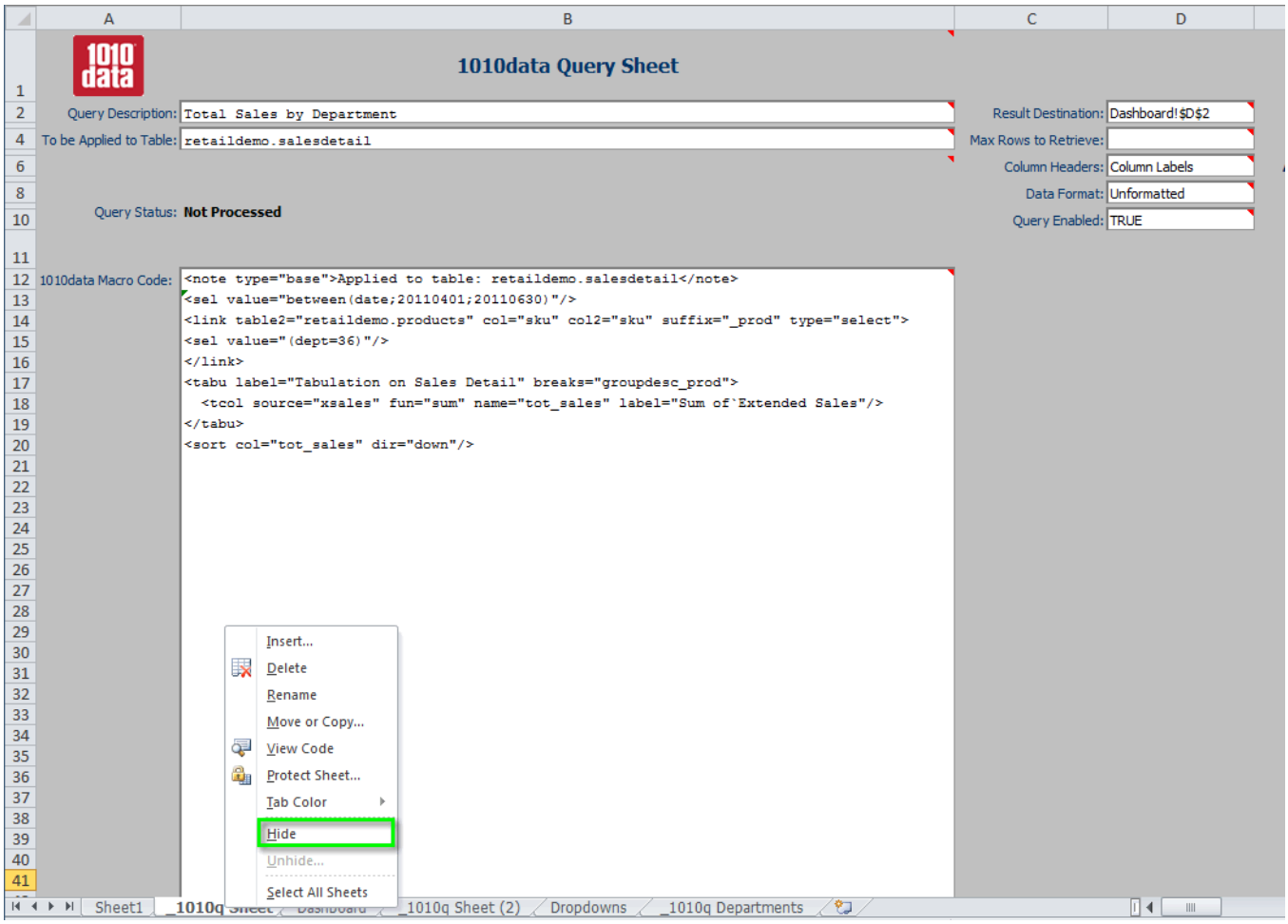
Hiding worksheets and locking the workbook

If you are planning to share your workbook with other users, you may want to hide all q-sheets and lock the workbook to prevent accidental edits to your query code.

Hiding worksheets

Because our dashboard is self-contained, there is no need for users to see or access the q-sheets or, for that matter, the **Dropdowns** worksheet we used to hold the values for the drop-downs in our dashboard. It is also a good idea to hide q-sheets to prevent the user from changing the query code.

You can hide a worksheet by right-clicking its tab and then selecting **Hide** from the context menu:

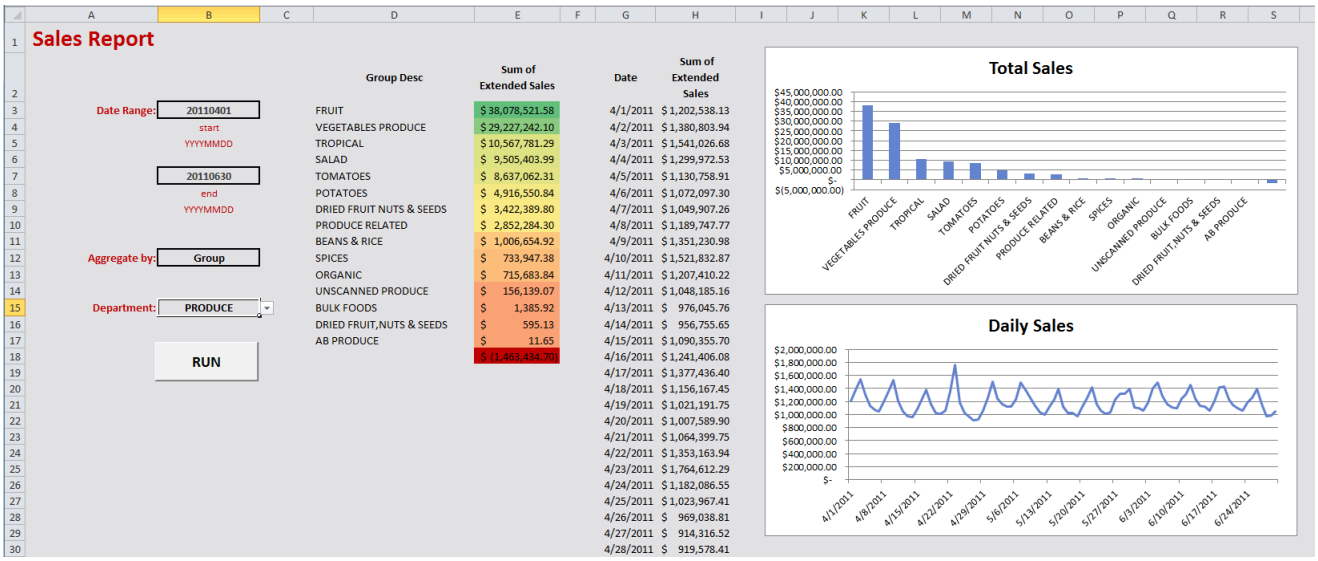


For our example, we would hide the following worksheets:

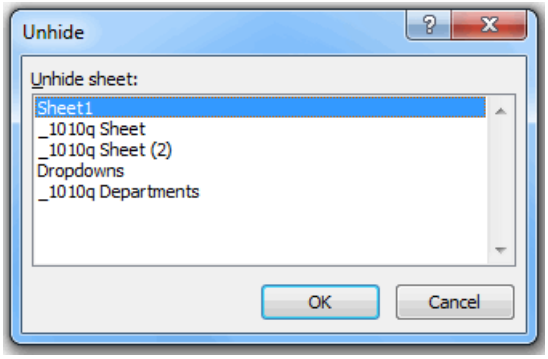
- **_1010q Sheet**
- **_1010q Sheet (2)**
- **_1010q Departments**
- **Dropdowns**
- **Sheet1**

> **Note:** In fact, you could delete **Sheet1** since it is no longer needed.

Once those worksheets are hidden, our workbook looks like:

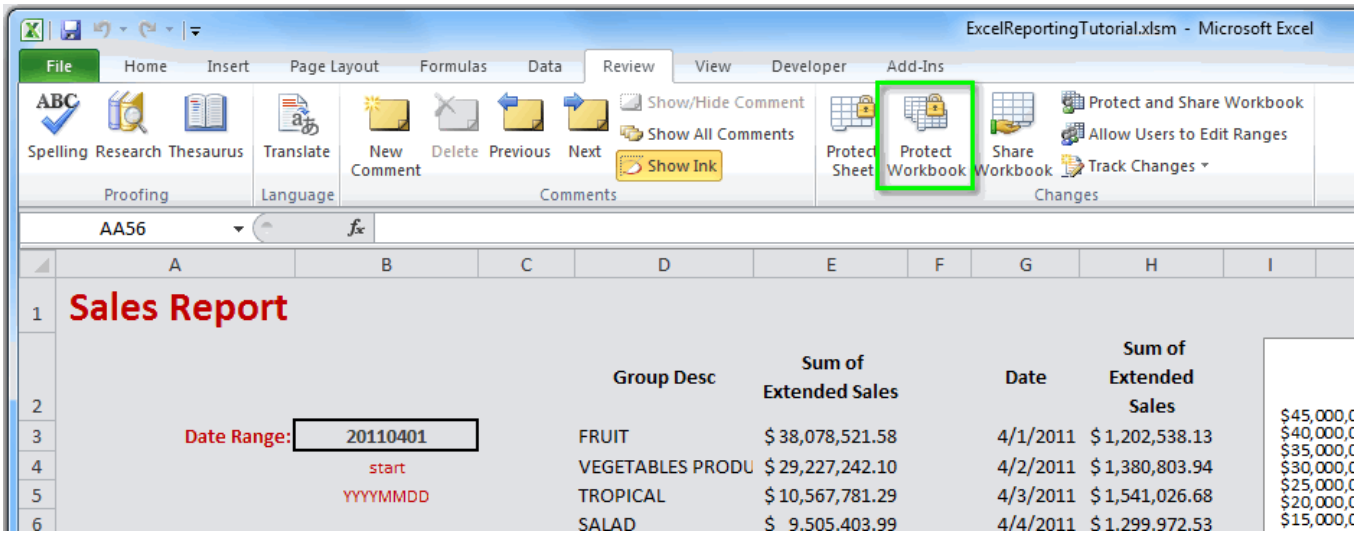


To unhide worksheets you have previously hidden, right-click anywhere along your worksheets pane at the bottom of your workbook and click **Unhide**. From the **Unhide** dialog, you can select which worksheets you would like to be visible again:

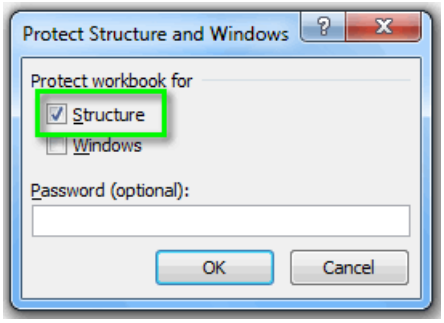


Locking the workbook

To prevent users from unhiding worksheets, you can lock the workbook. On the **Review** tab, click **Protect Workbook**:



In the **Protect Structure and Windows** dialog, make sure that **Structure** is selected:



If you want to require the user to provide a password to unhide worksheets, enter a password in the **Password (optional)** field.

Click **OK** for the changes to take effect.

> **Note:** Once the workbook has been locked, you need to click **Protect Workbook** on the **Review** tab to be able to make changes to the workbook. If a password is required, you must enter the password in the **Unprotect Workbook** dialog and click **OK**

Now your dashboard is ready to send out to others!