

Assignment No.: 06

Title: Use Business intelligence and analytics tools to recommend the combination of share purchases and sales for maximizing the profit.

Aim: Use Business intelligence and analytics tools to recommend the combination of share purchases and sales for maximizing the profit. Use Business intelligence and analytics tools to recommend the combination of share purchases and sales for maximizing the profit.

Objectives:

- To study the Business intelligence.
- To study the analytics tools.

Theory:

Go to the Fact Orders sheet of the Northwind Traders data workbook. Individually select all values in the columns OrderDate, RequiredDate and ShippedDate and paste them in one single column in a new sheet. The below 2

snapshots will assist you in doing the same.

OrderID	CustomerSK	EmployeeSK	OrderDate	RequiredDate	ShippedDate	ShipperSK	Freight	ShipName	ShipAddress
1940	10999	42	6	4/3/1998 0:00	5/1/1998 0:00	4/10/1998 0:00	2	96.35 Ottillies Käseladen	Mehrheimerstr. 369
1941	10999	42	6	4/3/1998 0:00	5/1/1998 0:00	4/10/1998 0:00	2	96.35 Ottillies Käseladen	Mehrheimerstr. 369
1942	11000	79	2	4/6/1998 0:00	5/4/1998 0:00	4/14/1998 0:00	3	55.12 Rattlesnake Canyon Grocery	2817 Milton Dr.
1943	11000	79	2	4/6/1998 0:00	5/4/1998 0:00	4/14/1998 0:00	3	55.12 Rattlesnake Canyon Grocery	2817 Milton Dr.
1944	11000	79	2	4/6/1998 0:00	5/4/1998 0:00	4/14/1998 0:00	3	55.12 Rattlesnake Canyon Grocery	2817 Milton Dr.
1945	11001	38	2	4/6/1998 0:00	5/4/1998 0:00	4/14/1998 0:00	2	197.3 Folk och fa HB	Åkergatan 24
1946	11001	38	2	4/6/1998 0:00	5/4/1998 0:00	4/14/1998 0:00	2	197.3 Folk och fa HB	Åkergatan 24
1947	11001	38	2	4/6/1998 0:00	5/4/1998 0:00	4/14/1998 0:00	2	197.3 Folk och fa HB	Åkergatan 24
1948	11001	38	2	4/6/1998 0:00	5/4/1998 0:00	4/14/1998 0:00	2	197.3 Folk och fa HB	Åkergatan 24
1949	11002	83	4	4/6/1998 0:00	5/4/1998 0:00	4/16/1998 0:00	1	141.16 Save-a-lot Markets	187 Suffolk Ln.
1950	11002	83	4	4/6/1998 0:00	5/4/1998 0:00	4/16/1998 0:00	1	141.16 Save-a-lot Markets	187 Suffolk Ln.
1951	11002	83	4	4/6/1998 0:00	5/4/1998 0:00	4/16/1998 0:00	1	141.16 Save-a-lot Markets	187 Suffolk Ln.
1952	11002	83	4	4/6/1998 0:00	5/4/1998 0:00	4/16/1998 0:00	1	141.16 Save-a-lot Markets	187 Suffolk Ln.
1953	11003	29	3	4/6/1998 0:00	5/4/1998 0:00	4/8/1998 0:00	3	14.91 The Cracker Box	55 Grizzly Peak Rd.
1954	11003	29	3	4/6/1998 0:00	5/4/1998 0:00	4/8/1998 0:00	3	14.91 The Cracker Box	55 Grizzly Peak Rd.
1955	11003	29	3	4/6/1998 0:00	5/4/1998 0:00	4/8/1998 0:00	3	14.91 The Cracker Box	55 Grizzly Peak Rd.
1956	11004	71	3	4/7/1998 0:00	5/5/1998 0:00	4/20/1998 0:00	1	44.84 Maison Dewey	Rue Joseph-Bens 532
1957	11004	71	3	4/7/1998 0:00	5/5/1998 0:00	4/20/1998 0:00	1	44.84 Maison Dewey	Rue Joseph-Bens 532
1958	11005	31	2	4/7/1998 0:00	5/5/1998 0:00	4/10/1998 0:00	1	0.75 Wilman Kala	Keskuskatu 45
1959	11005	31	2	4/7/1998 0:00	5/5/1998 0:00	4/10/1998 0:00	1	0.75 Wilman Kala	Keskuskatu 45
1960	11006	19	3	4/7/1998 0:00	5/5/1998 0:00	4/15/1998 0:00	2	25.19 Great Lakes Food Market	2732 Baker Blvd.
1961	11006	19	3	4/7/1998 0:00	5/5/1998 0:00	4/15/1998 0:00	2	25.19 Great Lakes Food Market	2732 Baker Blvd.
1962	11007	77	8	4/8/1998 0:00	5/6/1998 0:00	4/13/1998 0:00	2	202.24 Princesa Isabel Vinhos	Estrada da saúde n. 58
1963	11007	77	8	4/8/1998 0:00	5/6/1998 0:00	4/13/1998 0:00	2	202.24 Princesa Isabel Vinhos	Estrada da saúde n. 58
1964	11007	77	8	4/8/1998 0:00	5/6/1998 0:00	4/13/1998 0:00	2	202.24 Princesa Isabel Vinhos	Estrada da saúde n. 58

Figure 1: Output

Once all the dates are copied, select the data tab, select the Remove Duplicates option and click OK twice. Use the Month and Year Excel functions to fetch the corresponding month numbers and years from the dates. Make sure all the dates have the respective month numbers and years in the adjacent columns as shown below in the 2 snapshots.

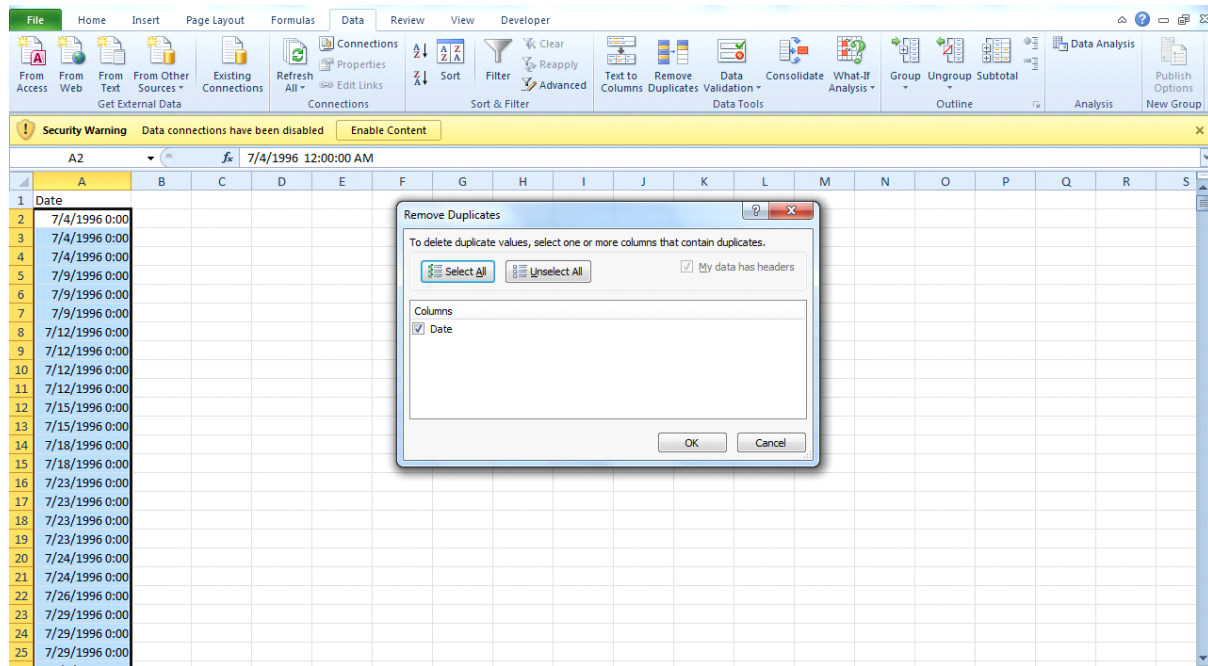


Figure 2: Output

	B2				
	A	B	C	D	E
1	Date				
2	7/4/1996 0:00	7			
3	7/9/1996 0:00	7			
4	7/12/1996 0:00	7			
5	7/15/1996 0:00	7			
6	7/18/1996 0:00	7			
7	7/23/1996 0:00	7			
8	7/24/1996 0:00	7			
9	7/26/1996 0:00	7			
10	7/29/1996 0:00	7			
11	8/1/1996 0:00	8			
12	8/7/1996 0:00	8			
13	8/12/1996 0:00	8			
14	8/13/1996 0:00	8			
15	8/15/1996 0:00	8			
16	8/16/1996 0:00	8			
17	8/19/1996 0:00	8			
18	8/21/1996 0:00	8			
19	8/27/1996 0:00	8			
20	8/30/1996 0:00	8			
21	9/2/1996 0:00	9			
22	9/4/1996 0:00	9			
23	9/5/1996 0:00	9			
24	9/10/1996 0:00	9			
25	9/13/1996 0:00	9			

Figure 3: Output

C2 fx =YEAR(A2)				
	A	B	C	D
1	Date	Month Number	Year	
2	7/4/1996 0:00	7	1996	
3	7/9/1996 0:00	7	1996	
4	7/12/1996 0:00	7	1996	
5	7/15/1996 0:00	7	1996	
6	7/18/1996 0:00	7	1996	
7	7/23/1996 0:00	7	1996	
8	7/24/1996 0:00	7	1996	
9	7/26/1996 0:00	7	1996	
10	7/29/1996 0:00	7	1996	
11	8/1/1996 0:00	8	1996	
12	8/7/1996 0:00	8	1996	
13	8/12/1996 0:00	8	1996	
14	8/13/1996 0:00	8	1996	
15	8/15/1996 0:00	8	1996	
16	8/16/1996 0:00	8	1996	
17	8/19/1996 0:00	8	1996	
18	8/21/1996 0:00	8	1996	
19	8/27/1996 0:00	8	1996	
20	8/30/1996 0:00	8	1996	
21	9/2/1996 0:00	9	1996	
22	9/4/1996 0:00	9	1996	
23	9/5/1996 0:00	9	1996	
24	9/10/1996 0:00	9	1996	
25	9/13/1996 0:00	9	1996	

Figure 4: Output

Create a dataset in a new excel sheet as shown below:

1	Month Number of year	Month Name	Calendar Quarter
2	1	January	Quarter 1
3	2	February	Quarter 1
4	3	March	Quarter 1
5	4	April	Quarter 2
6	5	May	Quarter 2
7	6	June	Quarter 2
8	7	July	Quarter 3
9	8	August	Quarter 3
10	9	September	Quarter 3
11	10	October	Quarter 4
12	11	November	Quarter 4
13	12	December	Quarter 4
14			

Figure 5: Output

Select the entire dataset and name it as Time in the Name Box as shown below. Do not forget to hit Enter once name is typed in the name box.

Time		fx		Month Number of year	
Name Box		B		C	
1	Month Number of year	Month Name	Calendar Quarter		
2	1	January	Quarter 1		
3	2	February	Quarter 1		
4	3	March	Quarter 1		
5	4	April	Quarter 2		
6	5	May	Quarter 2		
7	6	June	Quarter 2		
8	7	July	Quarter 3		
9	8	August	Quarter 3		
10	9	September	Quarter 3		
11	10	October	Quarter 4		
12	11	November	Quarter 4		
13	12	December	Quarter 4		
14					
15					

Figure 6: Output

In the sheet where we have the Date, Month Number and Year, add a new column ? ?Month Name? and type the vlookup formula as shown below;

1	Date	Month Number	Year	Month Name	Calendar Quarter					
2	7/4/1996 0:00	7	1996	=VLOOKUP(
3	7/9/1996 0:00	7	1996	J	VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])					
4	7/12/1996 0:00	7	1996	July	Quarter 3					
5	7/15/1996 0:00	7	1996	July	Quarter 3					

Figure 7: Output

Follow the same procedure for Calendar Quarter and use the formula=VLOOKUP(B2,Time,3,False).

Organizing and Analyzing the Data When we have a large amount of data, we want to organize it, analyze it, get summary information and then graph it. We need analytical tools for this, and the PivotTable and PivotChart tools in Microsoft Excel are some of the most popular tools. The data does not need to be in one workbook. We may analyze data from multiple workbooks without too much trouble.

Basics of PivotTables Pivot Tables allow us to consolidate huge amounts of data with similar fields and analyze the consolidated data or just make a summary of the consolidated data. The PivotTable in Excel gives us a simple way to create a PivotTable for our data. Please note that the data should have at least 1 field in common, or else the consolidation will not work and any spelling error in the data will produce incorrect PivotTables. PivotTables in Excel are synonymous to Cubes in other analytical tools. **Basics of Charts** are used to graphically represent data. The PivotChart tool in Excel provides a simple way to create a PivotTable and an accompanying chart. Remember, a chart is only as good as the data or the summary table (PivotTable). If we try to cram too many fields into a chart, we will end up with a non-informative chart. We must always try and keep it simple and informative. Let us see some scenarios which explore the different ways of analyzing the Northwind data.

Scenario 1: Graph the percentage sales over time to see the trends.

Here is the answer:

Sum of Quantity	Column Labels								
Row Labels	Beverages	Condiments	Confections	Dairy Products	Grains/Cereals	Meat/Poultry	Produce	Seafood	Grand Total
Calendar 1996	20.85%	11.69%	15.00%	18.78%	6.30%	8.88%	5.02%	13.49%	100.00%
Calendar 1997	15.80%	11.02%	15.90%	18.23%	10.18%	8.68%	5.76%	14.43%	100.00%
Calendar 1998	21.15%	9.05%	14.96%	17.17%	7.76%	7.45%	5.76%	16.70%	100.00%
Grand Total	18.38%	10.45%	15.45%	17.95%	8.78%	8.29%	5.65%	15.07%	100.00%

Figure 8: Output

Creating a PivotTable and PivotChart

1. Open the Northwind Traders data.xlsx workbook.
2. Go to the Insert tab on the ribbon.
3. Look for the Tables group, and select PivotTable. Choose PivotChart from the drop-down options.

4. You should now see the Create PivotTable with PivotChart dialog box.

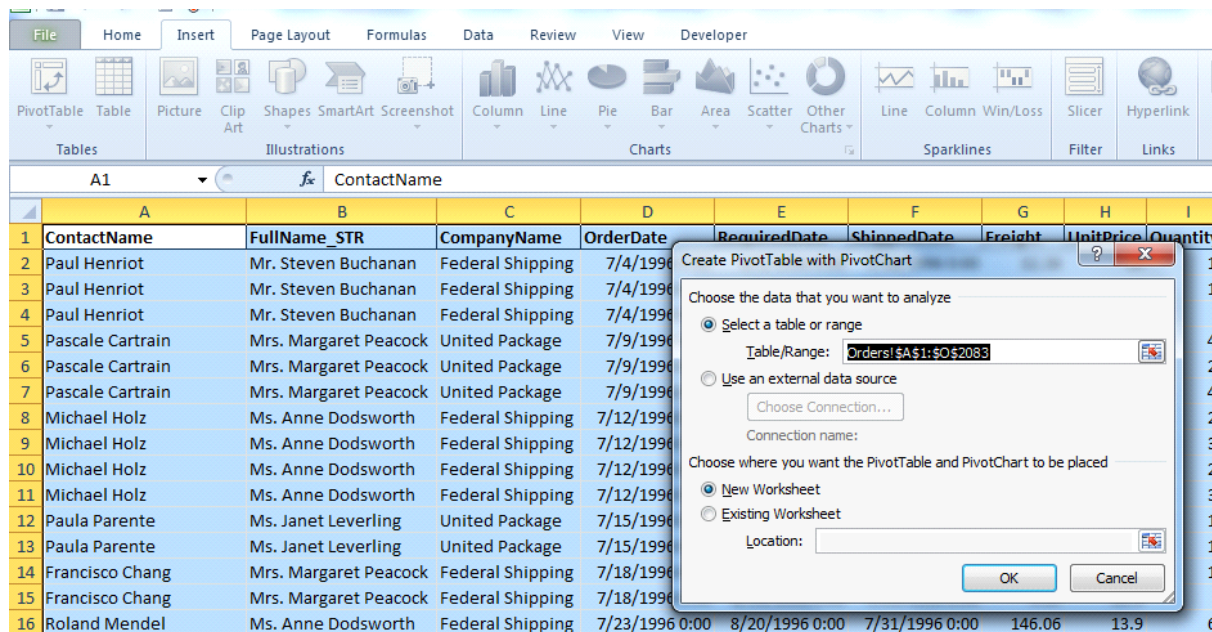


Figure 9: Output

5. There are a couple of things you'll need to define in order to create your PivotTable. First, you need to tell Excel where to get the data from. In the Choose the data you want to analyze section of the dialog box, you will define where Excel is going to get the data for the PivotTable from.

Since the data for this example is within the workbook, we will choose Select a table or range.

(a) Under Table/Range, Excel might be smart enough to automatically select the proper range of data from the worksheet.

(b) If it does not, click on the little button on the right of the range box. Select the range of data. In the example, we have data in cells A1 to O2083. This means that we have selected fifteen columns (A through O) and 2083 rows.

6. In the Choose where you want the PivotTable and PivotChart to be placed section of the dialog box, you can choose to either create the PivotTable and the accompanying PivotChart on a new worksheet in the Excel work-book, or you can place both on the current worksheet. For this exercise, we will choose to create a new worksheet for the PivotTable and PivotChart. To do this, select New Worksheet, and click OK. You should now be taken to the new worksheet.

1. While on the new worksheet, you should see four new tabs on the ribbon:

(a) Design, Layout, Format, and Analyze.

(b) You should also see the PivotTable Field List and the PivotChart Filter Pane (if you don't see the panes, click on the Analyze tab in the ribbon, and, in the Show/Hide group, make sure that at least Field List is selected).

2. You now need to set up the PivotTable so that you can get the data summary you desire. The new tabs, as well as the two panes, will be used to help format your PivotTable and PivotChart to do the necessary analysis. For this exercise, let's see the total number of products sold by category in each year. In the PivotTable Field List, select Quantity, Year and CategoryName to add to the PivotTable report. Place the CategoryName in the Legend field, Year in the Axis Field and Quantity in the Value field. You should see the PivotTable and PivotChart update appropriately. Select the chart type as Stacked List to get the chart as shown below

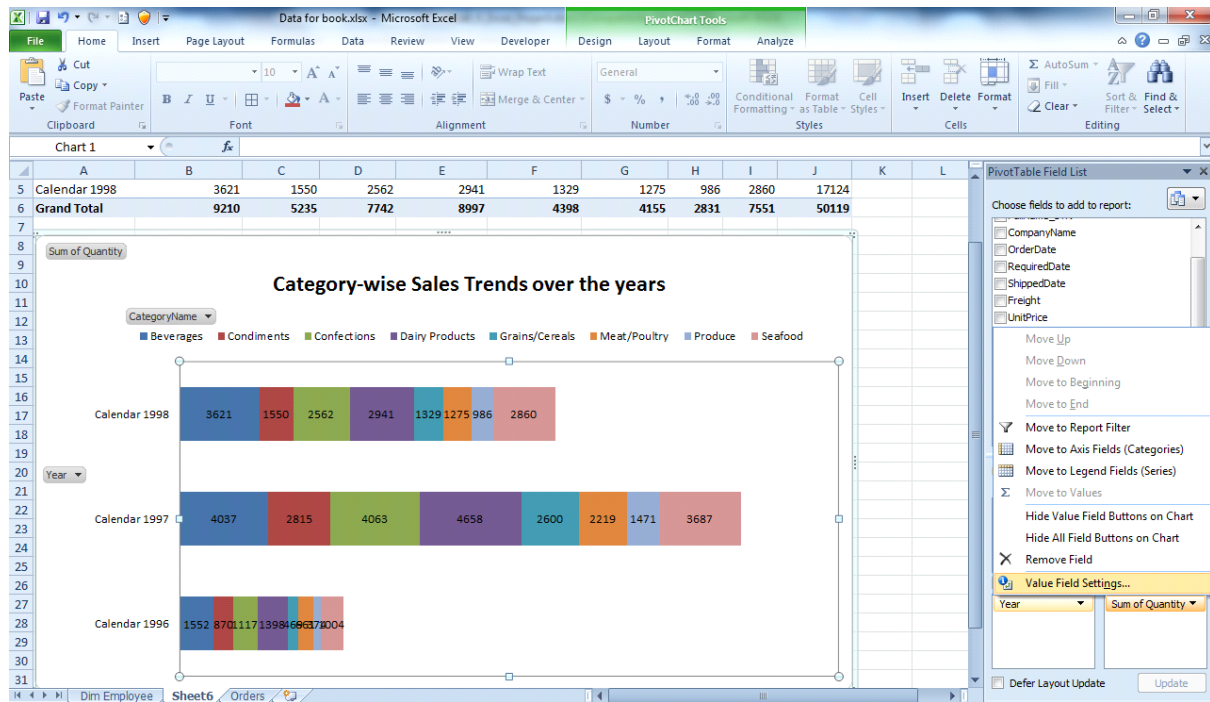


Figure 10: Output

You can use different functions on the field placed under Values. For example, if you wanted to see average quantity for each category, you would click on Sum of Quantity and choose Value Field Settings. In the Value Field Settings dialog box, choose the 'Show Values As' tab and select the % of Row Total function to apply to Sum of Quantity (see the screenshot below). A number of the functions are available here to use in your PivotTable.

Scenario 2: Pivot the data to see total sales by quarter and category. Are there any highs? Are there any lows that need to be addressed? Here is the solution:

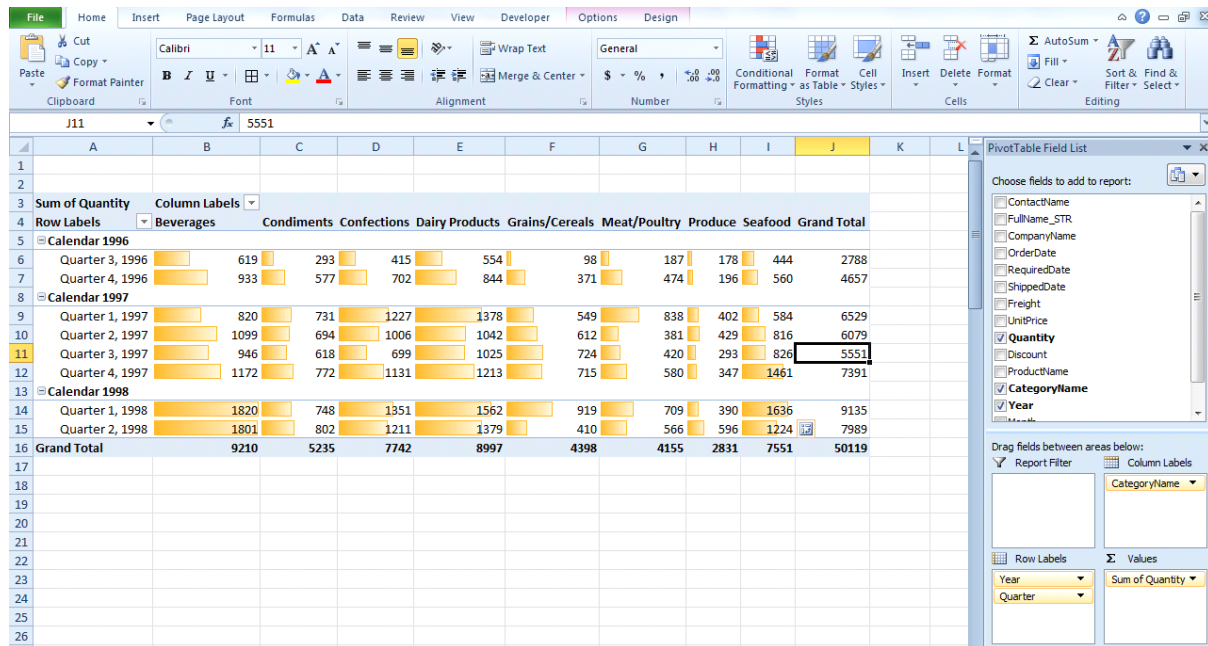


Figure 11: Output

Here is how we do it:

1. Select the the entire table in the Orders worksheet.
2. Go to the Insert menu, select PivotTable.

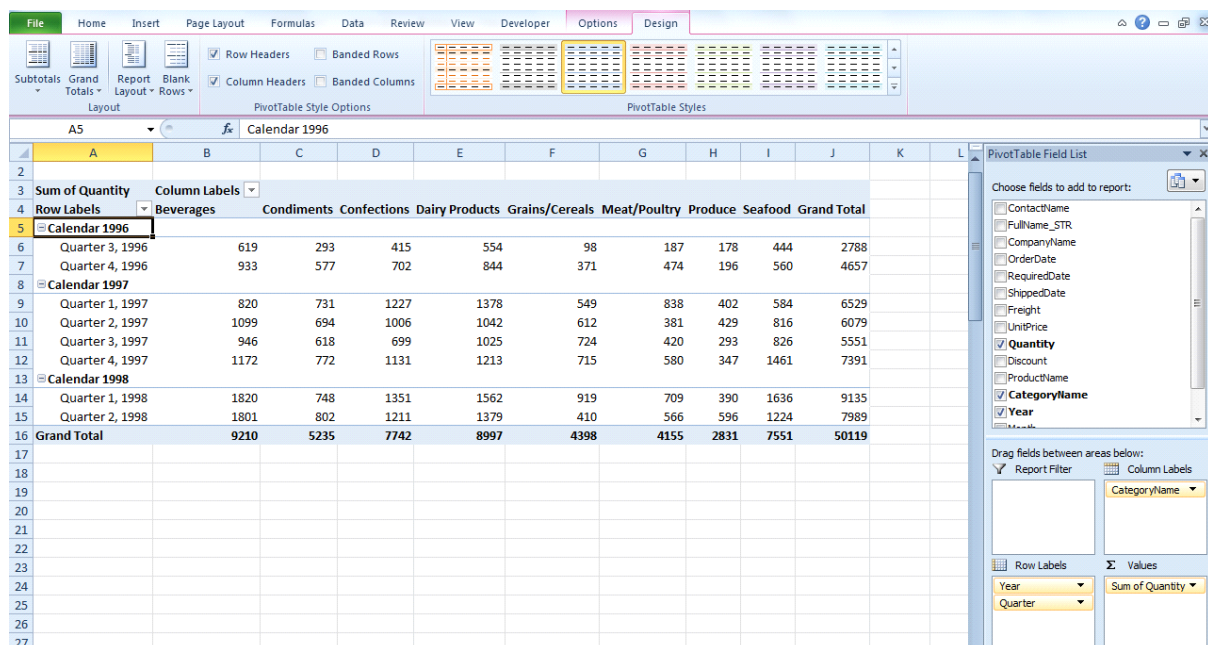
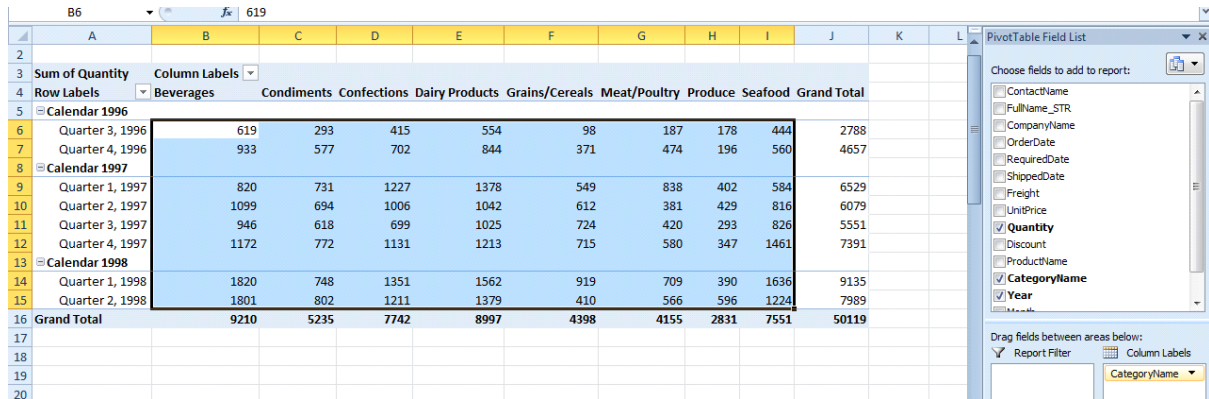


Figure 12: Output

3. Select the columns as highlighted in the circle below (make sure Quantity is represented as Sum of Quantity. Else use the previously used ValueField Settings option to sum it).

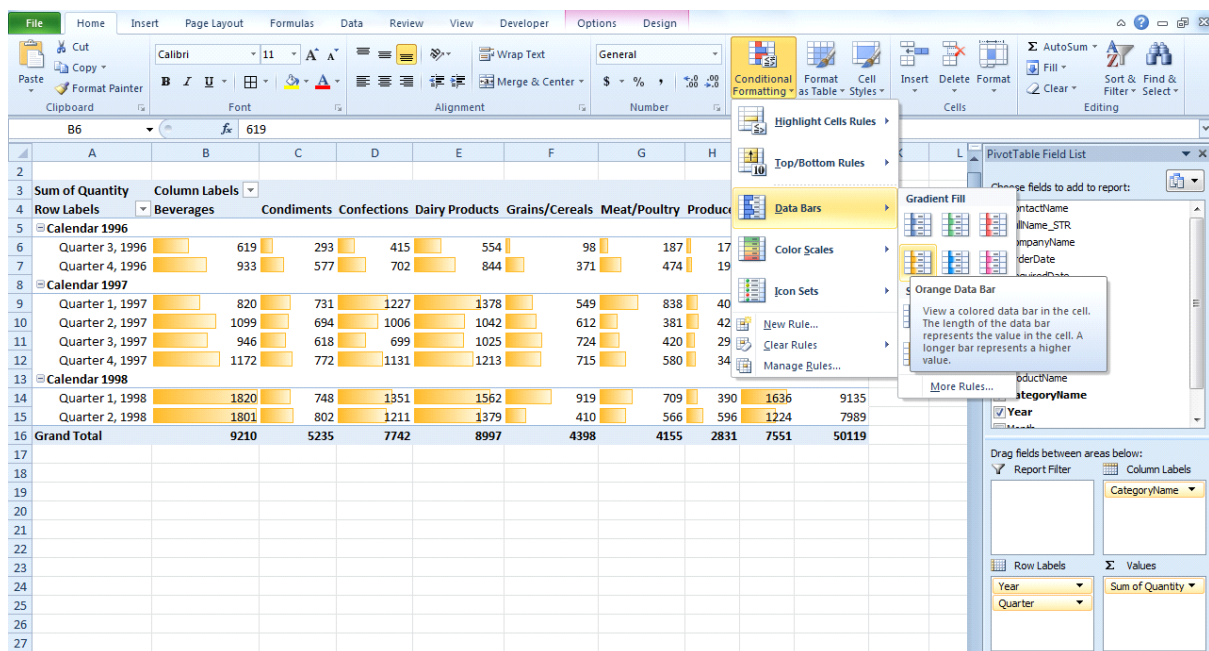
4. Select the data as shown in the screenshot below



Row Labels	Beverages	Condiments	Confections	Dairy Products	Grains/Cereals	Meat/Poultry	Produce	Seafood	Grand Total
Calendar 1996									
Quarter 3, 1996	619	293	415	554	98	187	178	444	2788
Quarter 4, 1996	933	577	702	844	371	474	196	560	4657
Calendar 1997									
Quarter 1, 1997	820	731	1227	1378	549	838	402	584	6529
Quarter 2, 1997	1099	694	1006	1042	612	381	429	816	6079
Quarter 3, 1997	946	618	699	1025	724	420	293	826	5551
Quarter 4, 1997	1172	772	1131	1213	715	580	347	1461	7391
Calendar 1998									
Quarter 1, 1998	1820	748	1351	1562	919	709	390	1636	9135
Quarter 2, 1998	1801	802	1211	1379	410	566	596	1224	7989
Grand Total	9210	5235	7742	8997	4398	4155	2831	7551	50119

Figure 13: Output

5. Apply the conditional formatting as shown below. (Make sure you are in the Home menu to view the Conditional Formatting tab)



Row Labels	Beverages	Condiments	Confections	Dairy Products	Grains/Cereals	Meat/Poultry	Produce	Seafood	Grand Total
Calendar 1996									
Quarter 3, 1996	619	293	415	554	98	187	178	444	2788
Quarter 4, 1996	933	577	702	844	371	474	196	560	4657
Calendar 1997									
Quarter 1, 1997	820	731	1227	1378	549	838	402	584	6529
Quarter 2, 1997	1099	694	1006	1042	612	381	429	816	6079
Quarter 3, 1997	946	618	699	1025	724	420	293	826	5551
Quarter 4, 1997	1172	772	1131	1213	715	580	347	1461	7391
Calendar 1998									
Quarter 1, 1998	1820	748	1351	1562	919	709	390	1636	9135
Quarter 2, 1998	1801	802	1211	1379	410	566	596	1224	7989
Grand Total	9210	5235	7742	8997	4398	4155	2831	7551	50119

Figure 14: Output

By applying conditional formatting we are able to achieve better visualisation of data. It can be observed that the 2nd quarter of 1998 had the highest total sales and also the beverages category had the highest total sales for all years, closely followed by dairy products.

Scenario 3: How are quarterly sales totals by salesperson? Subtotal the data. Here is the answer:

PivotTable Field List

Choose fields to add to report:

- ☐ ContactName
- ☒ FullName_STR
- ☐ CompanyName
- ☐ OrderDate
- ☐ RequiredDate
- ☐ ShippedDate
- ☐ Freight
- ☐ UnitPrice
- ☒ Quantity
- ☐ Discount
- ☐ ProductName
- ☒ CategoryName
- ☒ Year

Drag fields between areas below:

Report Filter

Column Labels

CategoryName

Row Labels

Year
Quarter
FullName_STR

Σ Values

Sum of Quantity

	Year	Quarter	Sum of Quantity
1996	Quarter 3, 1996	Dr. Andrew Fuller	62
1996	Quarter 3, 1996	Mr. Michael Suyama	35
1996	Quarter 3, 1996	Mr. Robert King	15
1996	Quarter 3, 1996	Mr. Steven Buchanan	116
1996	Quarter 3, 1996	Mrs. Margaret Peacock	48
1996	Quarter 3, 1996	Ms. Anne Dodsworth	75
1996	Quarter 3, 1996	Ms. Janet Leverling	120
1996	Quarter 3, 1996	Ms. Laura Callahan	148
1996	Quarter 3, 1996	Ms. Nancy Davolio	619
1996	Quarter 3, 1996	Quarter 3, 1996 Total	933
1996	Quarter 4, 1996	Dr. Andrew Fuller	12
1996	Quarter 4, 1996	Mr. Michael Suyama	6
1996	Quarter 4, 1996	Mr. Robert King	30
1996	Quarter 4, 1996	Mr. Steven Buchanan	97
1996	Quarter 4, 1996	Mrs. Margaret Peacock	176
1996	Quarter 4, 1996	Ms. Anne Dodsworth	30
1996	Quarter 4, 1996	Ms. Janet Leverling	105
1996	Quarter 4, 1996	Ms. Laura Callahan	19
1996	Quarter 4, 1996	Ms. Nancy Davolio	12
1996	Quarter 4, 1996	Quarter 4, 1996 Total	371
1996	Quarter 3, 1996	Quarter 3, 1996 Total	187
1996	Quarter 4, 1996	Quarter 4, 1996 Total	474
1996	Quarter 3, 1996	Quarter 3, 1996 Total	178
1996	Quarter 4, 1996	Quarter 4, 1996 Total	196
1996	Quarter 3, 1996	Quarter 3, 1996 Total	444
1996	Quarter 4, 1996	Quarter 4, 1996 Total	560
1996	Quarter 3, 1996	Quarter 3, 1996 Total	2788
1996	Quarter 4, 1996	Quarter 4, 1996 Total	4657
1996	Quarter 3, 1996	Quarter 3, 1996 Total	1552
1996	Quarter 4, 1996	Quarter 4, 1996 Total	870
1996	Quarter 3, 1996	Quarter 3, 1996 Total	1117
1996	Quarter 4, 1996	Quarter 4, 1996 Total	1398
1996	Quarter 3, 1996	Quarter 3, 1996 Total	469
1996	Quarter 4, 1996	Quarter 4, 1996 Total	661
1996	Quarter 3, 1996	Quarter 3, 1996 Total	374
1996	Quarter 4, 1996	Quarter 4, 1996 Total	1004
1996	Quarter 3, 1996	Quarter 3, 1996 Total	7445
1996	Quarter 4, 1996	Quarter 4, 1996 Total	25550
1996	Quarter 3, 1996	Quarter 3, 1996 Total	3621
1996	Quarter 4, 1996	Quarter 4, 1996 Total	1550
1996	Quarter 3, 1996	Quarter 3, 1996 Total	2562
1996	Quarter 4, 1996	Quarter 4, 1996 Total	2941
1996	Quarter 3, 1996	Quarter 3, 1996 Total	1329
1996	Quarter 4, 1996	Quarter 4, 1996 Total	1275
1996	Quarter 3, 1996	Quarter 3, 1996 Total	986
1996	Quarter 4, 1996	Quarter 4, 1996 Total	2860
1996	Quarter 3, 1996	Quarter 3, 1996 Total	17124
1996	Quarter 4, 1996	Quarter 4, 1996 Total	50119

Figure 15: Output

Here is how it is done:

Just drag and drop FullName STR (Name of the salesperson) to the Row Label. Then, in the PivotTable tools, select the Design menu, in the Design menu select the Subtotals tab and then select the option-Show all Subtotals at Bottom of Group as shown below.

PivotTable Subtotals

Do Not Show Subtotals

Show all Subtotals at Bottom of Group

Show all Subtotals at Top of Group

Include Filtered Items in Totals

	Year	Quarter	Sum of Quantity
1996	Quarter 3, 1996	Dr. Andrew Fuller	62
1996	Quarter 3, 1996	Mr. Michael Suyama	35
1996	Quarter 3, 1996	Mr. Robert King	15
1996	Quarter 3, 1996	Mr. Steven Buchanan	116
1996	Quarter 3, 1996	Mrs. Margaret Peacock	48
1996	Quarter 3, 1996	Ms. Anne Dodsworth	75
1996	Quarter 3, 1996	Ms. Janet Leverling	120
1996	Quarter 3, 1996	Ms. Laura Callahan	148
1996	Quarter 3, 1996	Ms. Nancy Davolio	619
1996	Quarter 3, 1996	Quarter 3, 1996 Total	933
1996	Quarter 4, 1996	Dr. Andrew Fuller	12
1996	Quarter 4, 1996	Mr. Michael Suyama	6
1996	Quarter 4, 1996	Mr. Robert King	30
1996	Quarter 4, 1996	Mr. Steven Buchanan	97
1996	Quarter 4, 1996	Mrs. Margaret Peacock	176
1996	Quarter 4, 1996	Ms. Anne Dodsworth	30
1996	Quarter 4, 1996	Ms. Janet Leverling	105
1996	Quarter 4, 1996	Ms. Laura Callahan	19
1996	Quarter 4, 1996	Ms. Nancy Davolio	12
1996	Quarter 4, 1996	Quarter 4, 1996 Total	371
1996	Quarter 3, 1996	Quarter 3, 1996 Total	187
1996	Quarter 4, 1996	Quarter 4, 1996 Total	474
1996	Quarter 3, 1996	Quarter 3, 1996 Total	178
1996	Quarter 4, 1996	Quarter 4, 1996 Total	196
1996	Quarter 3, 1996	Quarter 3, 1996 Total	444
1996	Quarter 4, 1996	Quarter 4, 1996 Total	560
1996	Quarter 3, 1996	Quarter 3, 1996 Total	2788
1996	Quarter 4, 1996	Quarter 4, 1996 Total	4657
1996	Quarter 3, 1996	Quarter 3, 1996 Total	1552
1996	Quarter 4, 1996	Quarter 4, 1996 Total	870
1996	Quarter 3, 1996	Quarter 3, 1996 Total	1117
1996	Quarter 4, 1996	Quarter 4, 1996 Total	1398
1996	Quarter 3, 1996	Quarter 3, 1996 Total	469
1996	Quarter 4, 1996	Quarter 4, 1996 Total	661
1996	Quarter 3, 1996	Quarter 3, 1996 Total	374
1996	Quarter 4, 1996	Quarter 4, 1996 Total	1004
1996	Quarter 3, 1996	Quarter 3, 1996 Total	7445
1996	Quarter 4, 1996	Quarter 4, 1996 Total	25550
1996	Quarter 3, 1996	Quarter 3, 1996 Total	3621
1996	Quarter 4, 1996	Quarter 4, 1996 Total	1550
1996	Quarter 3, 1996	Quarter 3, 1996 Total	2562
1996	Quarter 4, 1996	Quarter 4, 1996 Total	2941
1996	Quarter 3, 1996	Quarter 3, 1996 Total	1329
1996	Quarter 4, 1996	Quarter 4, 1996 Total	1275
1996	Quarter 3, 1996	Quarter 3, 1996 Total	986
1996	Quarter 4, 1996	Quarter 4, 1996 Total	2860
1996	Quarter 3, 1996	Quarter 3, 1996 Total	17124
1996	Quarter 4, 1996	Quarter 4, 1996 Total	50119

Figure 16: Output

Scenario 4: Is there any increase in sales when the products are sold at a discounted rate? Here is the answer: In the Pivot Table, drag the Year and

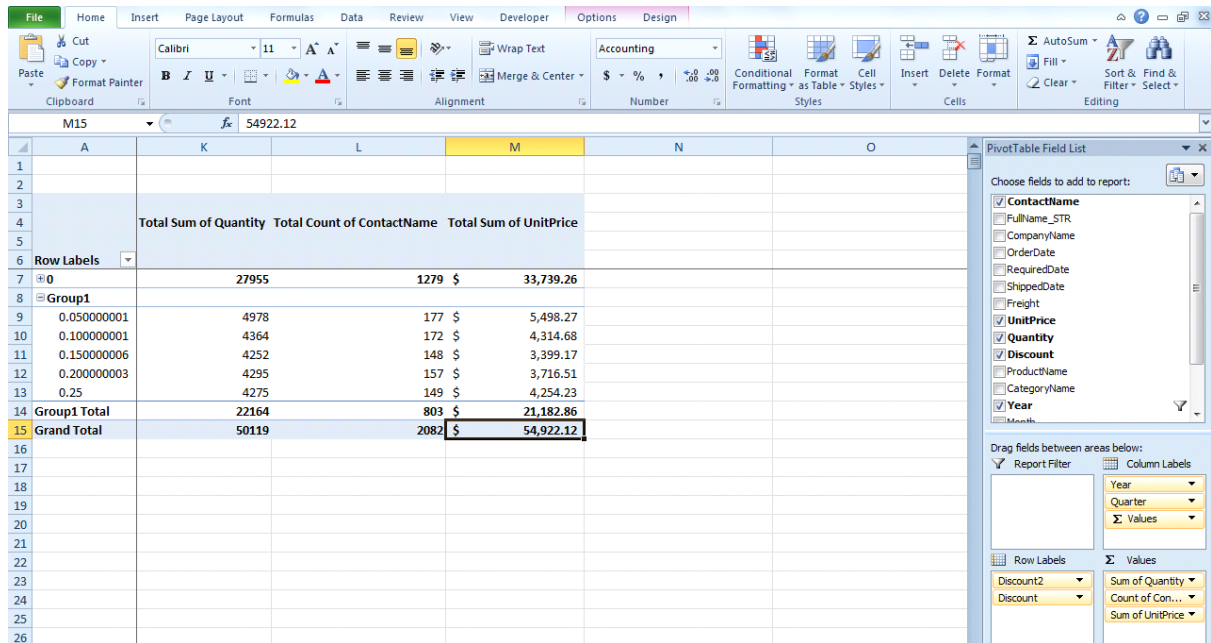


Figure 17: Output

the Quarter as Column Labels, Discount as the Row Labels and Quantity and Unit Price as Values. To see how many customers bought something at different discount rates drag the ContactName to Values. You will see the ContactName automatically changing to Count of ContactName. The screenshot is shown below for reference.

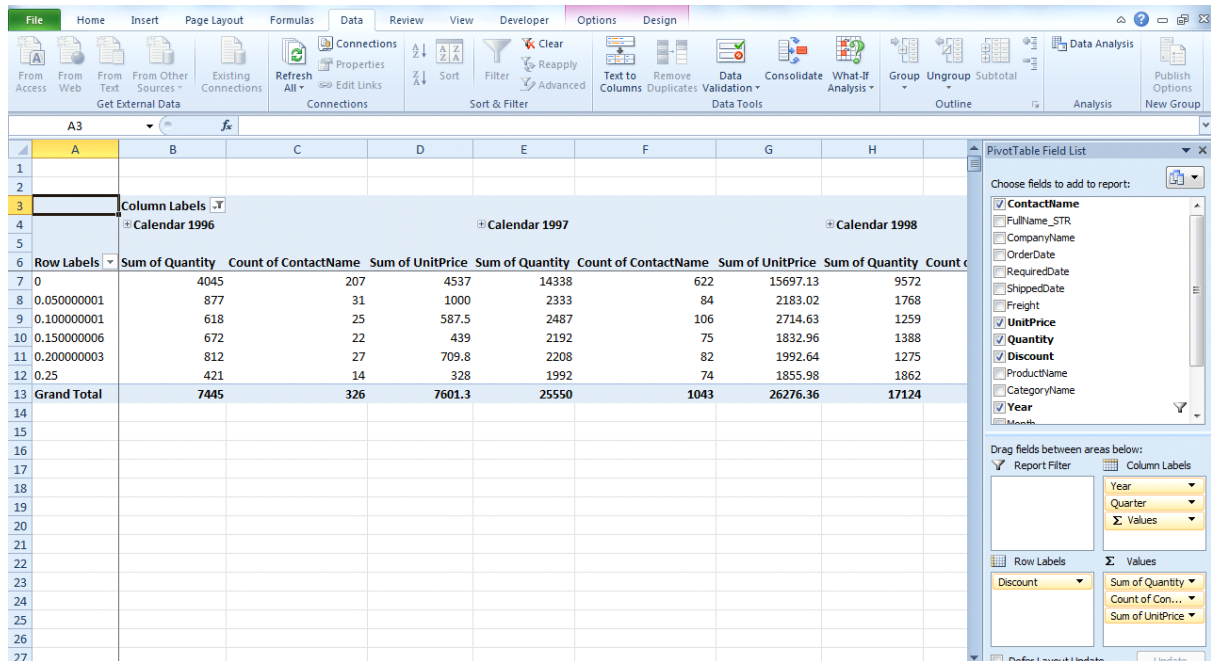


Figure 18: Output

Except for 0, ctrl select the row label and right click. You will see an option called Group in the menu that appears. Select that option as shown below. Once it is selected, you will be able to see the performance of products with and without discounts.

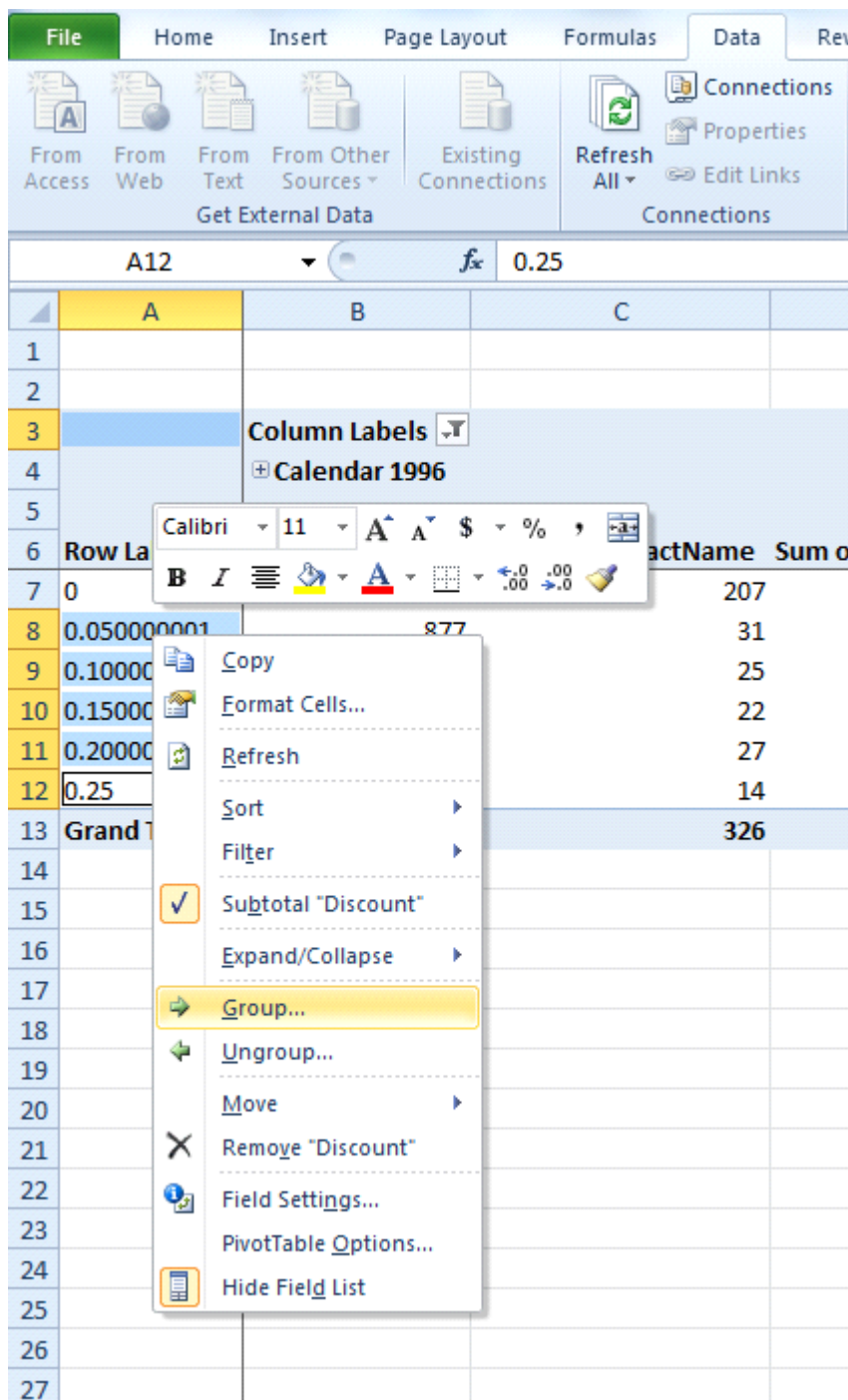


Figure 19: Output

Scenario 5: Report the sales by category and the corresponding freight charges. Filtering should be enabled in the Year and Quarter columns, and the selected Year and Quarter need to be visible. We will take a slightly different approach to

solve this scenario. Please take a look at the below screenshot. To see the individual Years and Quarters, the concept of slicers is used.

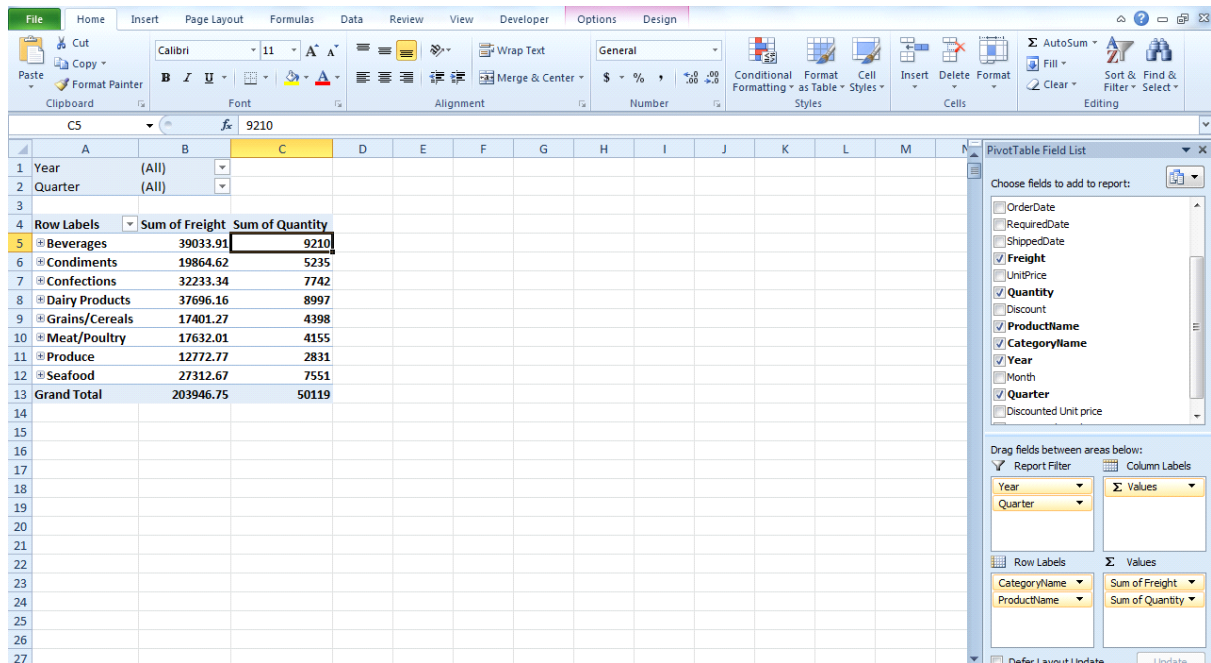


Figure 20: Output

Let's see how it is done: Click on the Options menu which gets highlighted under PivotTable Options. Click on the Insert Slicer. You will get to see the Insert Slicers window as shown. Select the Year and Quarter and click OK.

Scenario 6: Sort the Sales data in terms of Year, Quarter and Month.

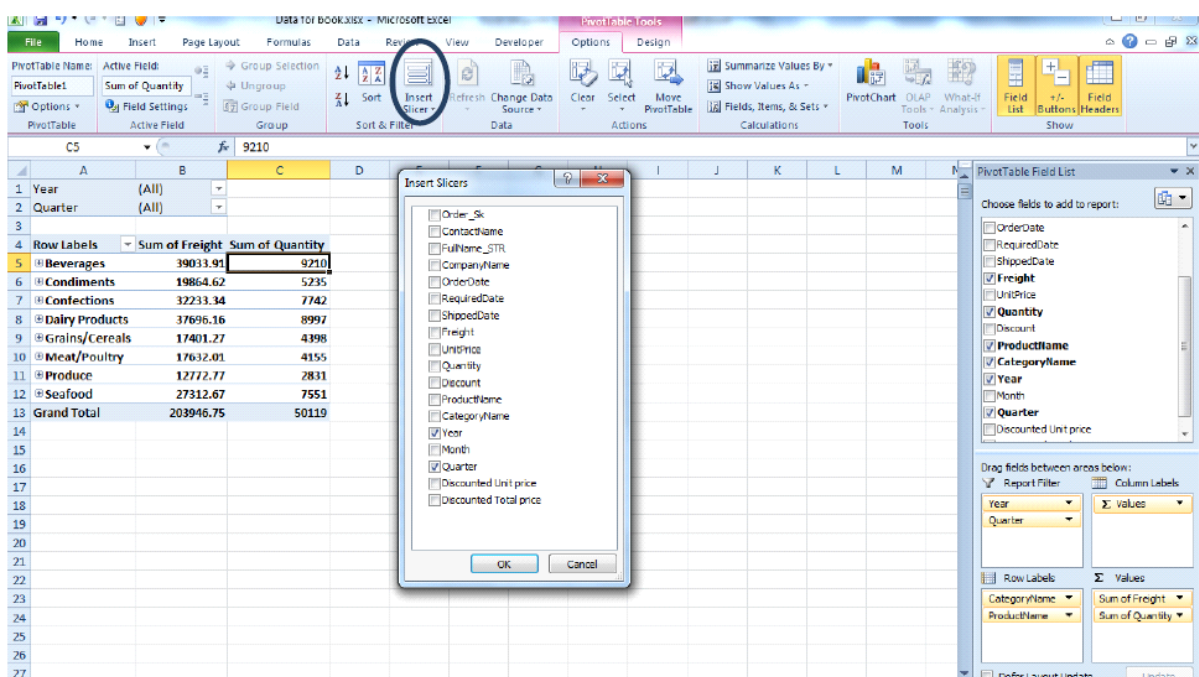


Figure 21: Output

While splitting the components of a cell make sure that the Quarter column is cut and pasted in the neighboring column because the two outputs of the split will occupy the adjacent columns and if the Quarter column is not moved as described, it will be overwritten by the data as shown.

The screenshot shows an Excel PivotTable with the following data:

Year	Quarter	Sum of Freight	Sum of Quantity
1996	Quarter 1	26394.16	6358
1996	Quarter 2	12782.33	3233
1996	Quarter 3	20177.9	4807
1996	Quarter 4	26205.05	5733
1997	Quarter 1	11215.34	2866
1997	Quarter 2	11808.86	2462
1997	Quarter 3	8684.32	1804
1997	Quarter 4	20672.67	5591
1998	Quarter 1	138000.63	32854

The PivotTable Field List on the right shows the following configuration:

- Report Filter: Year, Quarter
- Column Labels: Sum of Freight, Sum of Quantity
- Row Labels: CategoryName, ProductName

Figure 22: Output

Once the above steps are achieved, sort the Month column by Month first as shown below.

The screenshot shows an Excel PivotTable with the following data:

Year	Month	Sum of Freight	Sum of Quantity
1996	December	6167.27	1664
1996	November	4907.21	1684
1996	October	3871.48	1309
1996	September	765.91	331
1996	August	284.97	116
1996	July	647.87	248
1996	June	613.83	214
1996	May	117.07	28
1996	April	383.77	100
1996	March	175.89	55
1996	February	1273.68	278
1996	January	42.7	58
1997	December	220.4	73
1997	November	330.86	83
1997	October	809.89	201
1997	September	834.62	187
1997	August	678.87	293
1997	July	806.88	187
1997	June	461.85	282
1997	May	927.02	265
1997	April	1345.69	337
1997	March	969.35	267
1997	February	600.82	179
1997	January	1055.64	337

The PivotTable Field List on the right shows the following configuration:

- Report Filter: Year, Month
- Column Labels: Sum of Freight, Sum of Quantity
- Row Labels: CategoryName, ProductName

Figure 23: Output

	E	F	G	H	I	J	K	L	M	N	O	P	Q
	OrderDate	RequiredDate	ShippedDate	Freight	UnitPrice	Quantity	Discount	ProductName	CategoryName	Year	Month	Column1	Quarter
1	7/4/1996 0:00	8/1/1996 0:00	7/16/1996 0:00	32.38	14.00	12	0.00	Queso Cabrales	Dairy Products	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
2	7/4/1996 0:00	8/1/1996 0:00	7/16/1996 0:00	32.38	9.80	10	0.00	Singaporean Hokkien Fried Mee	Grains/Cereals	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
3	7/4/1996 0:00	8/1/1996 0:00	7/16/1996 0:00	32.38	34.80	5	0.00	Mozzarella di Giovanni	Dairy Products	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
4	7/9/1996 0:00	8/6/1996 0:00	7/11/1996 0:00	51.3	64.80	40	0.05	Sir Rodney's Marmalade	Confections	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
5	7/9/1996 0:00	8/6/1996 0:00	7/11/1996 0:00	51.3	2.00	25	0.05	Geitost	Dairy Products	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
6	7/9/1996 0:00	8/6/1996 0:00	7/11/1996 0:00	51.3	27.20	40	0.00	Camembert Pierrot	Dairy Products	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
7	7/12/1996 0:00	8/9/1996 0:00	7/15/1996 0:00	148.33	15.20	20	0.00	Chang	Beverages	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
8	7/12/1996 0:00	8/9/1996 0:00	7/15/1996 0:00	148.33	13.90	35	0.00	Pavlova	Confections	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
9	7/12/1996 0:00	8/9/1996 0:00	7/15/1996 0:00	148.33	15.20	25	0.00	Inlagd Sill	Seafood	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
10	7/12/1996 0:00	8/9/1996 0:00	7/15/1996 0:00	148.33	44.00	80	0.00	Raclette Courdavault	Dairy Products	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
11	7/15/1996 0:00	8/12/1996 0:00	7/17/1996 0:00	13.97	26.20	15	0.00	Perth Pasties	Meat/Poultry	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
12	7/15/1996 0:00	8/12/1996 0:00	7/17/1996 0:00	13.97	10.40	12	0.00	Original Frankfurter grüne Soße	Condiments	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
13	7/18/1996 0:00	8/15/1996 0:00	7/25/1996 0:00	3.25	8.00	10	0.00	Sir Rodney's Scones	Confections	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
14	7/18/1996 0:00	8/15/1996 0:00	7/25/1996 0:00	3.25	20.80	1	0.00	Gravad lax	Seafood	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
15	7/23/1996 0:00	8/20/1996 0:00	7/31/1996 0:00	146.06	13.90	60	0.25	Pavlova	Confections	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
16	7/23/1996 0:00	8/20/1996 0:00	7/31/1996 0:00	146.06	3.60	28	0.00	Guaraná Fantástica	Beverages	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
17	7/23/1996 0:00	8/20/1996 0:00	7/31/1996 0:00	146.06	20.70	60	0.25	Nord-Ost Matjeshering	Seafood	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
18	7/23/1996 0:00	8/20/1996 0:00	7/31/1996 0:00	146.06	8.00	36	0.25	Longlife Tofu	Produce	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
19	7/24/1996 0:00	8/21/1996 0:00	8/23/1996 0:00	3.67	7.70	25	0.15	Jack's New England Clam Chowder	Seafood	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
20	7/24/1996 0:00	8/21/1996 0:00	8/23/1996 0:00	3.67	15.20	35	0.00	Chang	Beverages	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
21	7/26/1996 0:00	9/6/1996 0:00	7/31/1996 0:00	25.73	30.40	12	0.05	Queso Manchego La Pastora	Dairy Products	Calendar 1996	September	6/18/1905 0:00	Quarter 3, 1
22	7/29/1996 0:00	8/26/1996 0:00	8/6/1996 0:00	208.58	14.70	50	0.00	Boston Crab Meat	Seafood	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
23	7/29/1996 0:00	8/26/1996 0:00	8/6/1996 0:00	208.58	44.00	70	0.15	Raclette Courdavault	Dairy Products	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
24	7/29/1996 0:00	8/26/1996 0:00	8/6/1996 0:00	208.58	14.40	15	0.15	Lakkalikööri	Beverages	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
25	8/1/1996 0:00	8/29/1996 0:00	8/30/1996 0:00	4.54	2.00	24	0.00	Geitost	Dairy Products	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
26	8/1/1996 0:00	8/29/1996 0:00	8/2/1996 0:00	136.54	15.20	30	0.00	Inlagd Sill	Seafood	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
27	8/1/1996 0:00	8/29/1996 0:00	8/2/1996 0:00	136.54	36.80	25	0.00	Ippoh Coffee	Beverages	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
28	8/7/1996 0:00	9/4/1996 0:00	8/1/1996 0:00	26.93	3.60	12	0.05	Guaraná Fantástica	Beverages	Calendar 1996	September	6/18/1905 0:00	Quarter 3, 1
29	8/7/1996 0:00	9/4/1996 0:00	8/9/1996 0:00	26.93	44.00	6	0.05	Raclette Courdavault	Dairy Products	Calendar 1996	September	6/18/1905 0:00	Quarter 3, 1
30	8/7/1996 0:00	9/4/1996 0:00	8/9/1996 0:00	26.93	44.00	6	0.05	Raclette Courdavault	Dairy Products	Calendar 1996	September	6/18/1905 0:00	Quarter 3, 1

Figure 24: Output

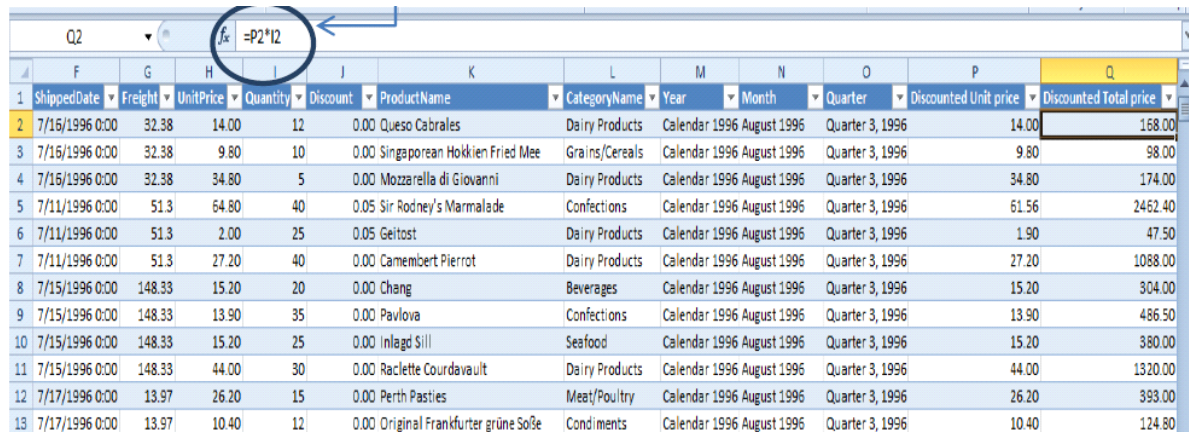
If analysis based on the discounts is required, add 2 columns as explained below and create a new Pivot Table on this sheet. First go to the Orderssheet and create 2 new columns as shown:

Column 1: Discounted Unit Price: This column will contain the unit prices after discount. So the formula would be $(1 - \text{Discount}) * (\text{Unit Price})$. In terms of excel columns the formula would be $(1 - J2) * (H2)$.

	E	F	G	H	I	J	K	L	M	N	O	P	Q
	OrderDate	RequiredDate	ShippedDate	Freight	UnitPrice	Quantity	Discount	ProductName	CategoryName	Year	Month	Column1	Quarter
1	7/4/1996 0:00	8/1/1996 0:00	7/16/1996 0:00	32.38	14.00	12	0.00	Queso Cabrales	Dairy Products	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
2	7/4/1996 0:00	8/1/1996 0:00	7/16/1996 0:00	32.38	9.80	10	0.00	Singaporean Hokkien Fried Mee	Grains/Cereals	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
3	7/4/1996 0:00	8/1/1996 0:00	7/16/1996 0:00	32.38	34.80	5	0.00	Mozzarella di Giovanni	Dairy Products	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
4	7/9/1996 0:00	8/6/1996 0:00	7/11/1996 0:00	51.3	64.80	40	0.05	Sir Rodney's Marmalade	Confections	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
5	7/9/1996 0:00	8/6/1996 0:00	7/11/1996 0:00	51.3	2.00	25	0.05	Geitost	Dairy Products	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
6	7/9/1996 0:00	8/6/1996 0:00	7/11/1996 0:00	51.3	27.20	40	0.00	Camembert Pierrot	Dairy Products	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
7	7/12/1996 0:00	8/9/1996 0:00	7/15/1996 0:00	148.33	15.20	20	0.00	Chang	Beverages	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
8	7/12/1996 0:00	8/9/1996 0:00	7/15/1996 0:00	148.33	13.90	35	0.00	Pavlova	Confections	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
9	7/12/1996 0:00	8/9/1996 0:00	7/15/1996 0:00	148.33	15.20	25	0.00	Inlagd Sill	Seafood	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
10	7/12/1996 0:00	8/9/1996 0:00	7/15/1996 0:00	148.33	44.00	80	0.00	Raclette Courdavault	Dairy Products	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
11	7/15/1996 0:00	8/12/1996 0:00	7/17/1996 0:00	13.97	26.20	15	0.00	Perth Pasties	Meat/Poultry	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
12	7/15/1996 0:00	8/12/1996 0:00	7/17/1996 0:00	13.97	10.40	12	0.00	Original Frankfurter grüne Soße	Condiments	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
13	7/18/1996 0:00	8/15/1996 0:00	7/25/1996 0:00	3.25	8.00	10	0.00	Sir Rodney's Scones	Confections	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
14	7/18/1996 0:00	8/15/1996 0:00	7/25/1996 0:00	3.25	20.80	1	0.00	Gravad lax	Seafood	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
15	7/23/1996 0:00	8/20/1996 0:00	7/31/1996 0:00	146.06	13.90	60	0.25	Pavlova	Confections	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
16	7/23/1996 0:00	8/20/1996 0:00	7/31/1996 0:00	146.06	3.60	28	0.00	Guaraná Fantástica	Beverages	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
17	7/23/1996 0:00	8/20/1996 0:00	7/31/1996 0:00	146.06	20.70	60	0.25	Nord-Ost Matjeshering	Seafood	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
18	7/23/1996 0:00	8/20/1996 0:00	7/31/1996 0:00	146.06	8.00	36	0.25	Longlife Tofu	Produce	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
19	7/24/1996 0:00	8/21/1996 0:00	8/23/1996 0:00	3.67	7.70	25	0.15	Jack's New England Clam Chowder	Seafood	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
20	7/24/1996 0:00	8/21/1996 0:00	8/23/1996 0:00	3.67	15.20	35	0.00	Chang	Beverages	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
21	7/26/1996 0:00	9/6/1996 0:00	7/31/1996 0:00	25.73	30.40	12	0.05	Queso Manchego La Pastora	Dairy Products	Calendar 1996	September	6/18/1905 0:00	Quarter 3, 1
22	7/29/1996 0:00	8/26/1996 0:00	8/6/1996 0:00	208.58	14.70	50	0.00	Boston Crab Meat	Seafood	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
23	7/29/1996 0:00	8/26/1996 0:00	8/6/1996 0:00	208.58	44.00	70	0.15	Raclette Courdavault	Dairy Products	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
24	7/29/1996 0:00	8/26/1996 0:00	8/6/1996 0:00	208.58	14.40	15	0.15	Lakkalikööri	Beverages	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
25	8/1/1996 0:00	8/29/1996 0:00	8/30/1996 0:00	4.54	2.00	24	0.00	Geitost	Dairy Products	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
26	8/1/1996 0:00	8/29/1996 0:00	8/2/1996 0:00	136.54	15.20	30	0.00	Inlagd Sill	Seafood	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
27	8/1/1996 0:00	8/29/1996 0:00	8/2/1996 0:00	136.54	36.80	25	0.00	Ippoh Coffee	Beverages	Calendar 1996	August	6/18/1905 0:00	Quarter 3, 1
28	8/7/1996 0:00	9/4/1996 0:00	8/1/1996 0:00	26.93	3.60	12	0.05	Guaraná Fantástica	Beverages	Calendar 1996	September	6/18/1905 0:00	Quarter 3, 1
29	8/7/1996 0:00	9/4/1996 0:00	8/9/1996 0:00	26.93	44.00	6	0.05	Raclette Courdavault	Dairy Products	Calendar 1996	September	6/18/1905 0:00	Quarter 3, 1
30	8/7/1996 0:00	9/4/1996 0:00	8/9/1996 0:00	26.93	44.00	6	0.05	Raclette Courdavault	Dairy Products	Calendar 1996	September	6/18/1905 0:00	Quarter 3, 1

Figure 25: Output

Column 2: Discounted Total Price: This column would contain discounted unit price multiplied by quantity. In terms of excel columns, it would be P2*I2.



	F	G	H	I	J	K	L	M	N	O	P	Q
	ShippedDate	Freight	UnitPrice	Quantity	Discount	ProductName	CategoryName	Year	Month	Quarter	Discounted Unit price	Discounted Total price
2	7/15/1996 0:00	32.38	14.00	12	0.00	Queso Cabrales	Dairy Products	Calendar: 1996	August 1996	Quarter 3, 1996	14.00	168.00
3	7/15/1996 0:00	32.38	9.80	10	0.00	Singaporean Hokkien Fried Mee	Grains/Cereals	Calendar: 1996	August 1996	Quarter 3, 1996	9.80	98.00
4	7/15/1996 0:00	32.38	34.80	5	0.00	Mozzarella di Giovanni	Dairy Products	Calendar: 1996	August 1996	Quarter 3, 1996	34.80	174.00
5	7/11/1996 0:00	51.3	64.80	40	0.05	Sir Rodney's Marmalade	Confections	Calendar: 1996	August 1996	Quarter 3, 1996	61.56	2462.40
6	7/11/1996 0:00	51.3	2.00	25	0.05	Geitost	Dairy Products	Calendar: 1996	August 1996	Quarter 3, 1996	1.90	47.50
7	7/11/1996 0:00	51.3	27.20	40	0.00	Camembert Pierrot	Dairy Products	Calendar: 1996	August 1996	Quarter 3, 1996	27.20	1088.00
8	7/15/1996 0:00	148.33	15.20	20	0.00	Chang	Beverages	Calendar: 1996	August 1996	Quarter 3, 1996	15.20	304.00
9	7/15/1996 0:00	148.33	13.90	35	0.00	Pavlova	Confections	Calendar: 1996	August 1996	Quarter 3, 1996	13.90	486.50
10	7/15/1996 0:00	148.33	15.20	25	0.00	Inlagd Sill	Seafood	Calendar: 1996	August 1996	Quarter 3, 1996	15.20	380.00
11	7/15/1996 0:00	148.33	44.00	30	0.00	Raclette Courdavault	Dairy Products	Calendar: 1996	August 1996	Quarter 3, 1996	44.00	1320.00
12	7/17/1996 0:00	13.97	26.20	15	0.00	Perth Pasties	Meat/Poultry	Calendar: 1996	August 1996	Quarter 3, 1996	26.20	393.00
13	7/17/1996 0:00	13.97	10.40	12	0.00	Original Frankfurter grüne Soße	Condiments	Calendar: 1996	August 1996	Quarter 3, 1996	10.40	124.80

Figure 26: Output

Conclusion:

We have successfully studied the tool used for business intelligence and analytics tools to recommend the combination of share purchases and sales for maximizing the profit