Job Estimating

Background

Relative and Absolute References are really important for this assignment. See the summary table on page SS61.

You will be creating formulas for one row and copying them to other rows.

Do not try to type in all the numbers. It will take too much time. Using formulas is much quicker and more accurate. This is the point of the exercise.

When using the Chart Wizard to create the histogram and pie charts, play with the features. That is more valuable than merely following the directions. The directions are given in detail below, but these are intended for use as a last resort.

The final product consists of two items,

- the spreadsheet view, which will include the data, a histogram, and a pie chart, and
- the formula sheet view.

Both are to be printed in Landscape mode. Each one should be fit to only one sheet, selected by the File | Page Setup menu.

Input Data

Use the following data and produce the attached spreadsheet, using formulas and other features of Excel.

Table 1. Hourly Pay and Manhours

Labor	Hourly Pay	Man Hours
Carpenter	$10.25	3500
Brick Mason	$12.50	1750
Electrician	$11.55	2250
Plumber	$14.75	1550
Laborer	$6.25	7500

Table 2. Expense Rates

FICA	FUTA	SUTA	WC	GL
7.65%	0.80%	2.70%	5.75%	4.25%

Sample Output

Datasheet View

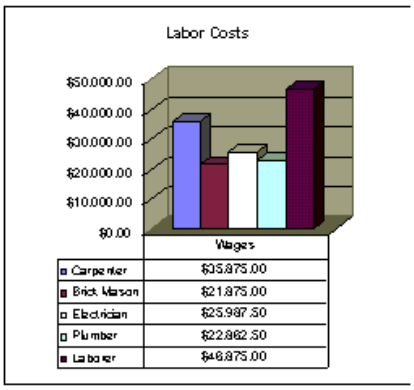
CSC100 Job_Estimating.xls:Sheet1 Your Name

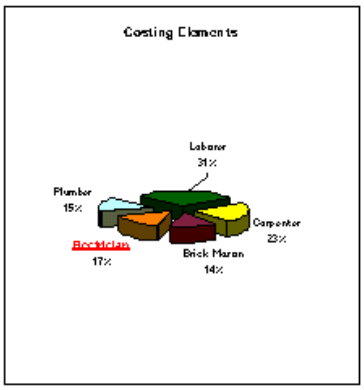
Bid Request

Total Cost $185,904.96

Labor	Hourly Pay	Man Hours	Wages	FICA	FUTA	SUTA	WC	GL	Labor Cost
Carpenter	$10.25	3500	$35,875.00	$2,744.44	$287.00	$968.63	$2,062.81	$1,524.69	$43,462.56
Brick Mason	$12.50	1750	$21,875.00	$1,673.44	$175.00	$590.63	$1,257.81	$929.69	$26,501.56
Electrician	$11.55	2250	$25,987.50	$1,988.04	$207.90	$701.66	$1,494.28	$1,104.47	$31,480.86
Plumber	$14.75	1550	$22,862.50	$1,748.98	$182.90	$617.29	$1,314.59	$971.66	$27,697.92
Laborer	$6.25	7500	$46,875.00	$3,585.94	$375.00	$1,265.63	$2,695.31	$1,992.19	$56,789.06
Individual Labor Cost			$153,475.00				Total Labor Costs		$185,904.96

Expenses	Rate	Expense Total
FICA	7.65%	$11,740.84
FUTA	0.80%	$1,227.80
SUTA	2.70%	$4,143.83
WC	5.75%	$8,824.81
GL	4.25%	$6,522.69
Total Expense Cost		$32,459.96





11/21/03 11:51 AM Job Estimation Bid Request 1 of 1

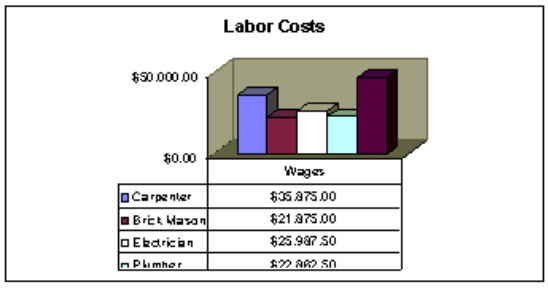
Formula Sheet View

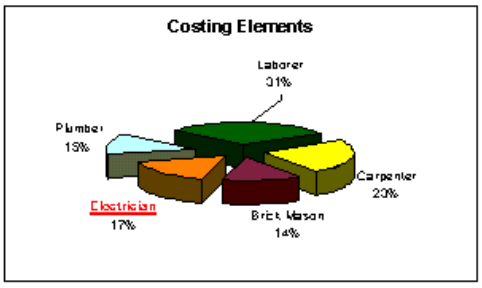
CSC100 Job_Estimating.xls!Sheet1 Your Name

Bid Request

Total Cost	=D8/C17								
Labor		Hourly Pay	Man Hours	Wages	FICA	FUTA	SUTA	WC	GL	Labor Cost
Carpenter	10.25	3500	=B4*C4	=D4*B12	=D4*B13	=D4*B14	=D4*B15	=D4*B16	=SUM(D4:J4)	
Brick Mason	12.5	1750	=B5*C5	=D5*B12	=D5*B13	=D5*B14	=D5*B15	=D5*B16	=SUM(D5:J5)	
Electrician	11.55	2250	=B6*C6	=D6*B12	=D6*B13	=D6*B14	=D6*B15	=D6*B16	=SUM(D6:J6)	
Plumber	14.75	1550	=B7*C7	=D7*B12	=D7*B13	=D7*B14	=D7*B15	=D7*B16	=SUM(D7:J7)	
Laborer	8.25	7500	=B8*C8	=D8*B12	=D8*B13	=D8*B14	=D8*B15	=D8*B16	=SUM(D8:J8)	
Individual Labor Cost			=SUM(D4:D8)				Total Labor Costs		=SUM(J4:J8)	

Expenses		Rate	Expense Total
FICA	0.0765	=SUM(E4:E8)	
FUTA	0.008	=SUM(F4:F8)	
SUTA	0.027	=SUM(G4:G8)	
WC	0.0515	=SUM(H4:H8)	
GL	0.0425	=SUM(I4:I8)	
Total Expense Cost		=SUM(C12:C16)	





Spreadsheet Procedure

1. Create a new spreadsheet. Save it as file "Job Estimating", and enter the following headings.

	A	B	C	D	E	F	G	H	I	J
1	**Bid Request**									
2	**Total Cost**									
3	**Labor**	**Hourly Pay**	**Man Hours**	**Wages**	***FICA***	***FUTA***	***SUTA***	***WC***	***GL***	**Labor Cost**
4										
5										
6										
7										
8										
9			**Individual Labor Cost**					**Total Labor Costs**		
10										
11	**Expenses**	**Rate**	**ExpenseTotal**							
12	*FICA*									
13	*FUTA*									
14	*SUTA*									
15	*WC*									
16	*GL*									
17	**Total Expense Cost**									

Periodically save your file as you do your work.

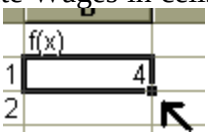
- Make all headings in bold font, except headings in rows 12 through 16.
- Right justify headings in columns B through J in row 3.
- Right justify headings in columns B and C in row 11.
- Make headings in rows 12 through 16 in non-bold italic font.

2. Make the title, "Bid Request", 20 point, bold, to make it obvious this is the spreadsheet report title. Merge and Center the title over cells A1 through A3. 

3. Type in data from Table 1. Hourly Pay and Manhours into the "Labor", "Hourly Pay" and "Man Hours" columns.

4. Enter the data from Table 2. Expense Rates into column B using percentages.

5. Compute Wages by multiplying Man Hours and Hourly Pay.

- Use a formula to compute Wages in cell D4 as the product of cells B4 times C4. Remember that the asterisk is the symbol used for multiplication.
- Compute Wages in cells D5 through D8 by dragging the copy handle of cell D4 down. 

6. Compute FICA, FUTA, SUTA, WC, and GL by multiplying Wages times the percentages given for these quantities.

- Hint: You can change a relative cell reference, such as B13, to an absolute cell reference, such as B13, by pushing the F4 function key immediately after entering the cell reference B13.

7. Use the sum button  to compute the Labor Cost in cells J4 through J8 by

Labor Cost = Wages + (FICA + FUTA + SUTA + WD + GL)

8. Compute the Individual Labor Cost, in cell D9, by adding all the numbers in Wages, column D. If the formula is automatically entered into other columns (E, F, G, I), delete the extra formulas. This appears to be a bug in Excel 2000.

9. Compute the Total Labor Costs by adding all the numbers in Labor Cost.

10. In the Expenses block:

- Add all the values for FICA by using the sum button and store in the FICA row. To do this, select the cell where the sum is to be stored (such as C12), and push the sum button. Select cells to be included in the sum (such as cells E4 through E8). After the last cell has been selected for the sum, push the green check mark button. 
- Do the same for the other quantities in the Expenses block.

11. Use the sum button to compute Total Expense Cost, in cell C17, by adding all the numbers under Expense Total (cells C12 through C16).

12. Compute Total Cost in cell B2 using the formula

Total Cost = (Individual Labor Cost) + (Total Expense Cost).

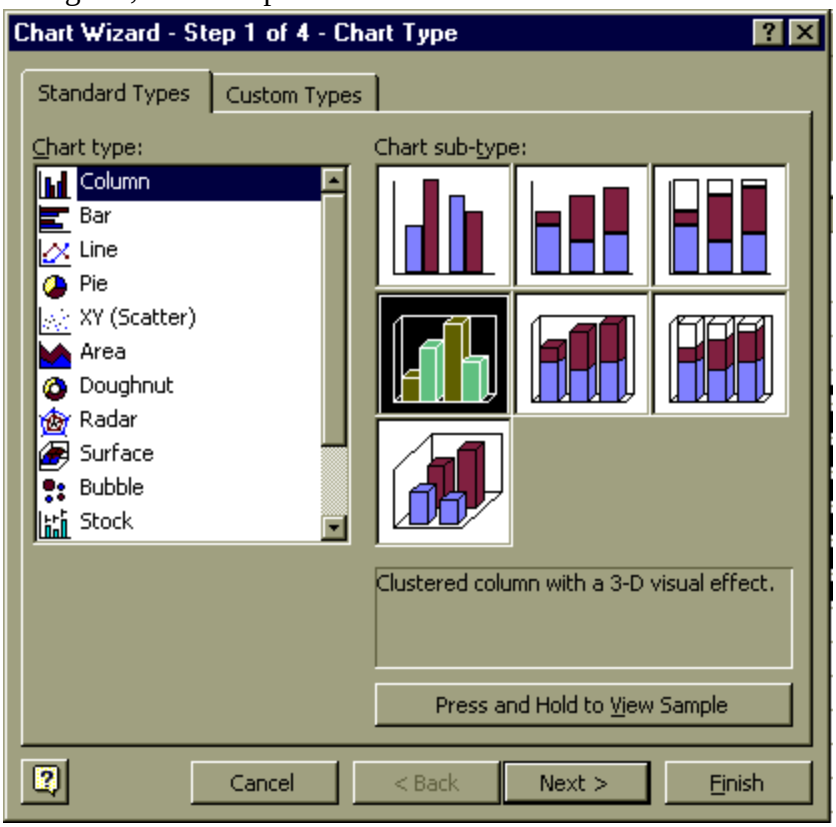
The value in Total Cost, cell B2) should equal Total Labor Cost (J9).

Histogram Procedure

Create the histogram on the same page as the spreadsheet. Note the keys, titles, and labels. Proof read your printed output. Do not worry about matching exactly the number of labels on the vertical axis of the histogram. The high value may be either $50,000 or $60,000.

1. Select the data for the histogram.
    a. In column A, select the six rows containing the label and categories, beginning with “Labor” and ending with “Laborer”.
    b. Push and hold down the CTRL key.
    c. In column D, select the six rows containing the label and data, beginning with “Labor Total” and ending with the value on the same row as “Laborer”. Do not select the number labeled “Individual Labor Cost”.
    d. Release the mouse button. Release the CTRL key.
2. Select the 3-dimensional histogram.
    a. Push the Excel Chart Wizard icon. 

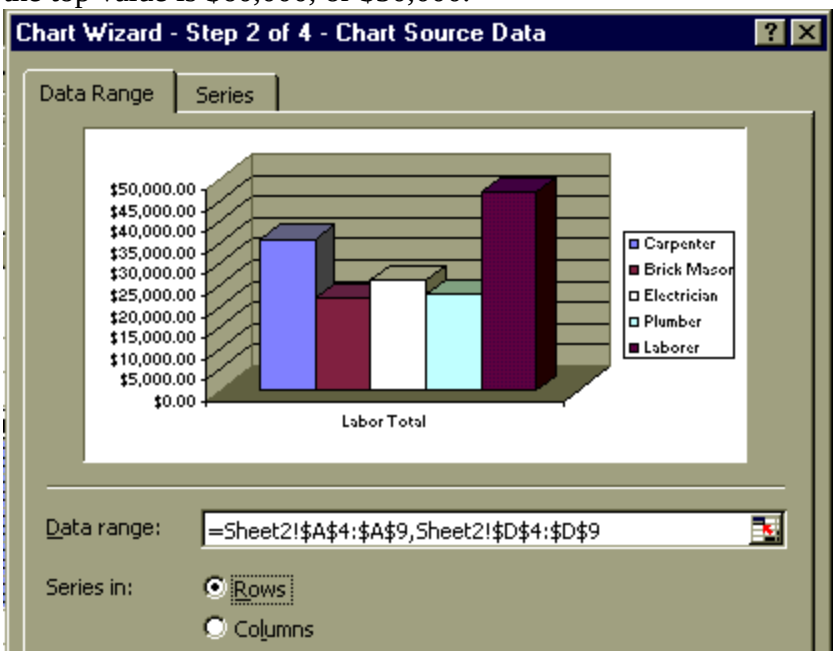
b. Select the "Clustered column with a 3-D visual effect" chart for use as a histogram, and then push the "Next" button.



c. To identify which column contains the frequency or count data for this problem, select "Rows" next to "Series in" on the "Data Range" sheet of "Chart Wizard Step 2 of 4".

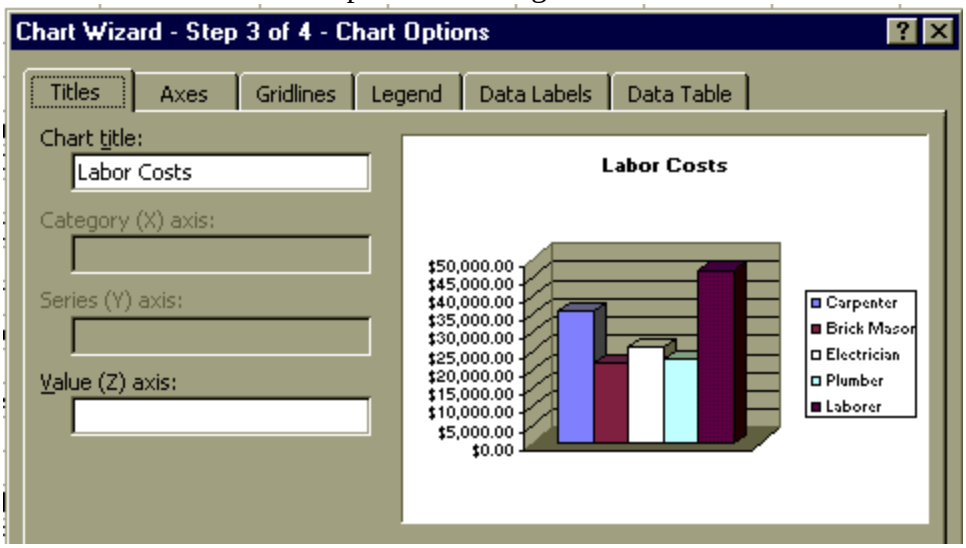
   i. Do not worry about the number of numbers on the left size of the histogram. The number of values displayed in the Wizard is not necessarily the number of values displayed on the histogram that is produced. Further, the number of values will change if you stretch the vertical dimension of the histogram. Your chart will be OK if

the top value is $60,000, or $50,000.

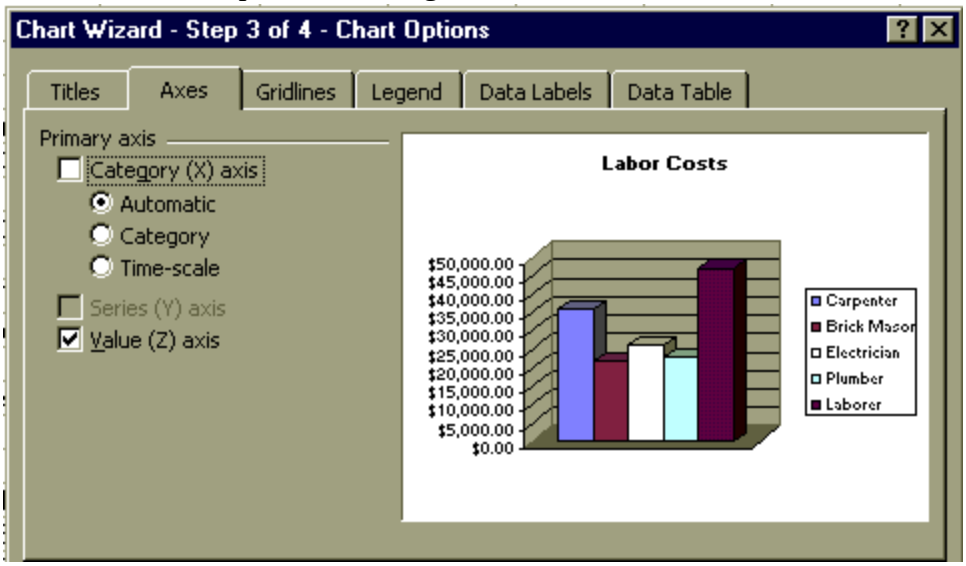


ii. Push the "Next" button of the "Chart Wizard – Step 2 of 4 – Chart Source Data" dialog box.

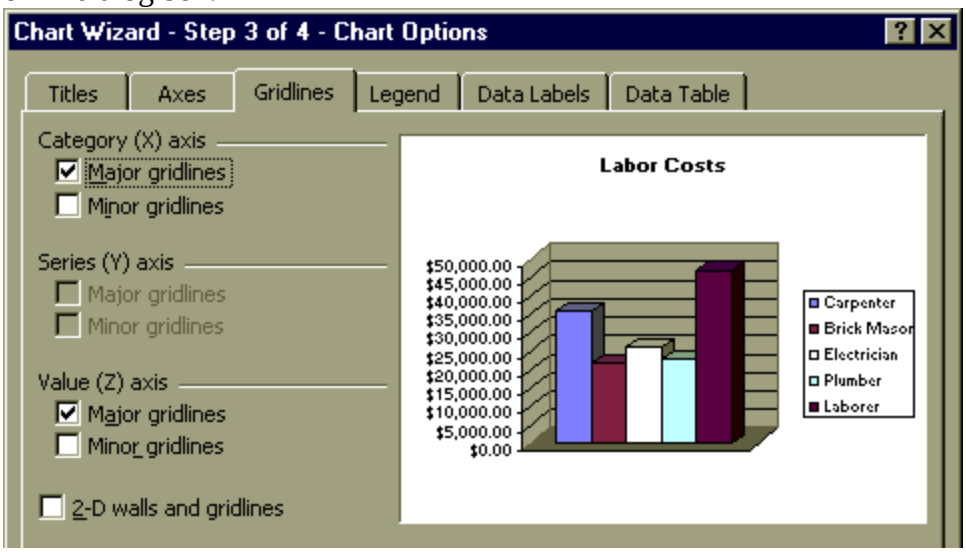
d. Enter the title "Labor Costs" in the "Chart title" edit box on the "Titles" sheet of "Chart Wizard Step 3 of 4" dialog box.



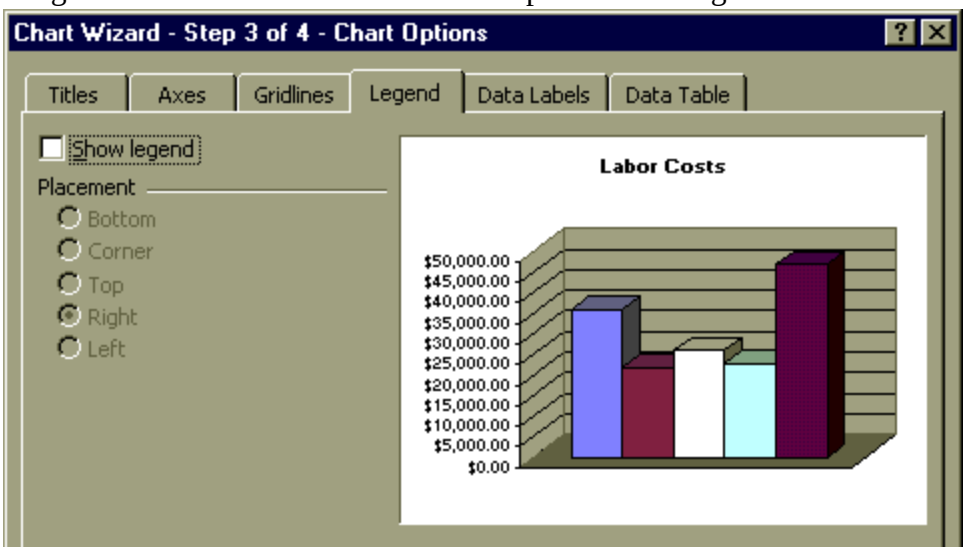
e. Uncheck the "Category (X) axis" checkbox on the "Axes" sheet of the "Chart Wizard Step 3 of 4" dialog box.



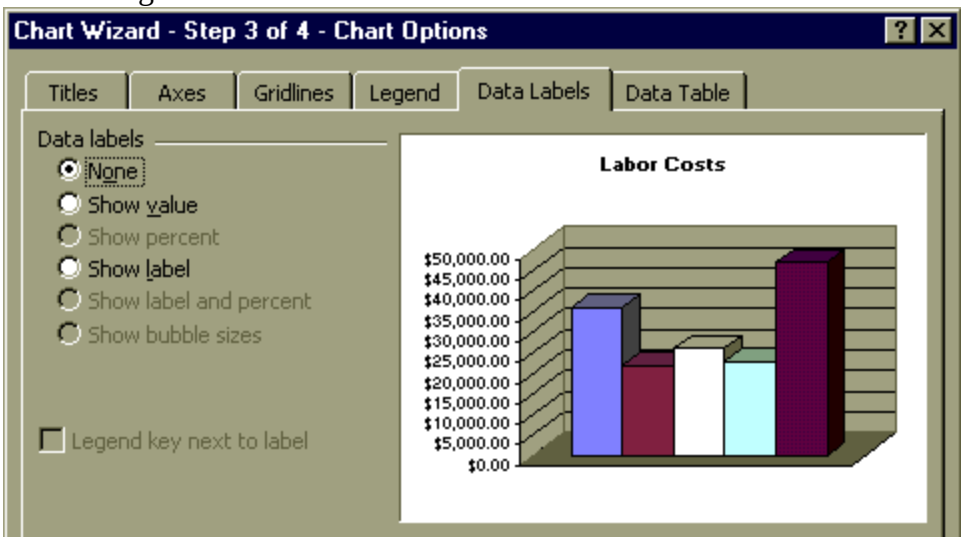
f. Make sure "Major gridlines" boxes are checked for "Category (X) axis" and "Value (Z) axis" on the "Gridlines" sheet of the "Chart Wizard Step 3 of 4" dialog box.



g. Get rid of the legend by ensuring "Show legend" box is unchecked on the "Legend" sheet of the "Chart Wizard Step 3 of 4" dialog box.



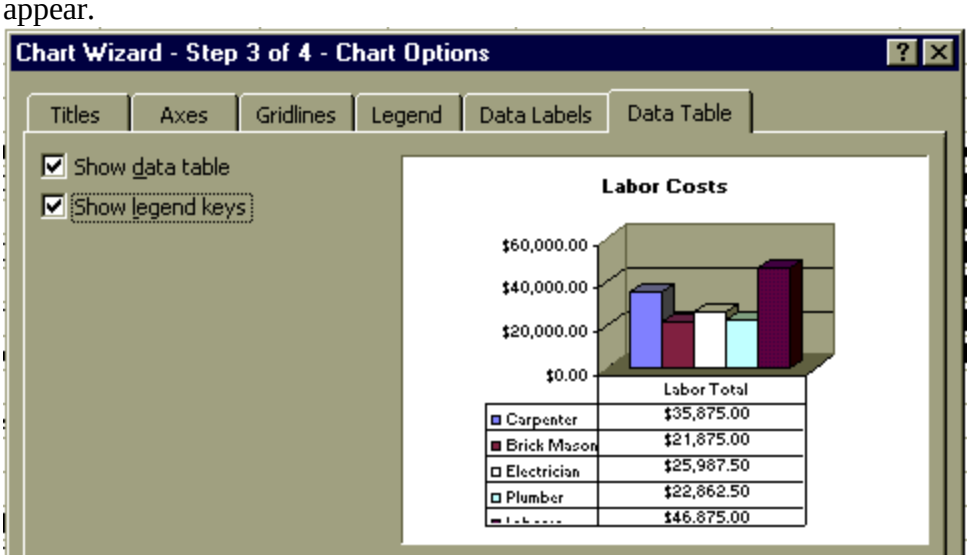
h. Ensure data labels are not applied above the histogram bars by ensuring "None" is selected on the "Data Labels" sheet of the "Chart Wizard Step 3 of 4" dialog box.



i. To obtain the data table with legend below the histogram, check the boxes labeled "Show data table" and "Show legend keys" on the "Data Table" sheet of the "Chart Wizard Step 3 of 4" dialog box.

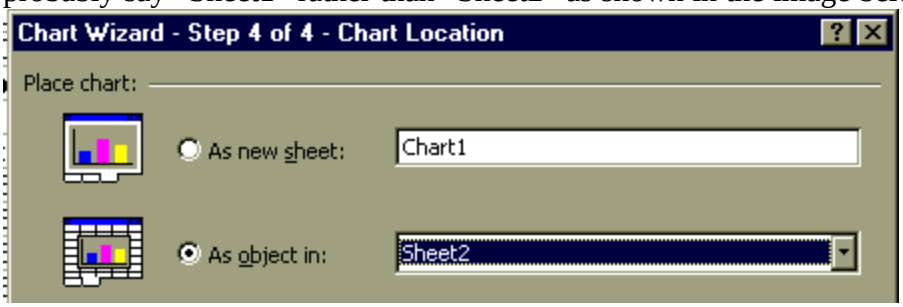
   i. Do not worry if some of the rows of the data table do not completely appear in the preview or in the generated chart. The vertical dimension of the chart can be stretched so those rows will

appear.



j. Click the "Next" button on the "Chart Wizard Step 3 of 4" dialog box.

k. To make the histogram display on the same spreadsheet as the data, select "As object in" on the "Chart Wizard Step 4 of 4" dialog box. The label in the edit box should be the sheet containing your source data. It will probably say "Sheet1" rather than "Sheet2" as shown in the image below.



l. Click the "Finish" button on the "Chart Wizard Step 4 of 4" dialog box.

m. Stretch the vertical dimension of the histogram to get numbers on the vertical axis to appear, and to get data rows below the histogram to appear. Do this by dragging the bottom center resizing handle downward.

3. Drag the histogram to a location that does not cover any of the spreadsheet entries.

   a. Point to an area inside the chart, such as near the upper right corner, until a 4-headed arrow appears. A yellow tag labeled "Chart Area" may also appear for a short period of time.

   b. Drag the histogram to a new location.

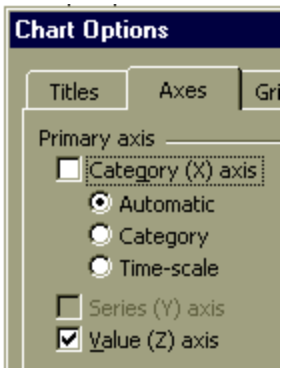
   c. Select any cell of the spreadsheet to deselect the histogram.

4. If your histogram does not look like the one in the handout, do not panic. You can still modify the formats without having to redo the Wizard. To do this, right-

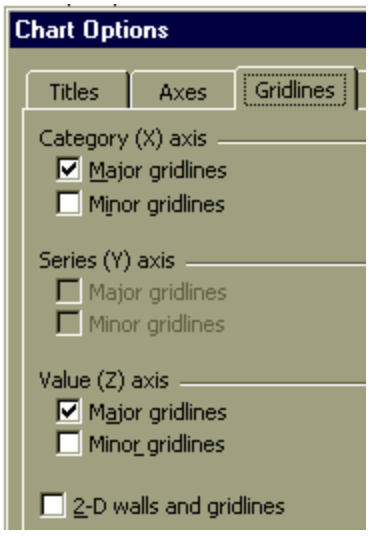
click on the white area of the histogram near one of the corners so that the whole image is selected. Follow the directions below for the item you need to change.

a. Enter the title that goes above the chart into the "Chart title" edit box on the "Titles" sheet of the "Chart Options" dialog box.

b. To make sure the vertical axis has numerical labels, ensure the "Value (Z) axis" box is checked on the "Axes" sheet of the "Chart Options" dialog box.

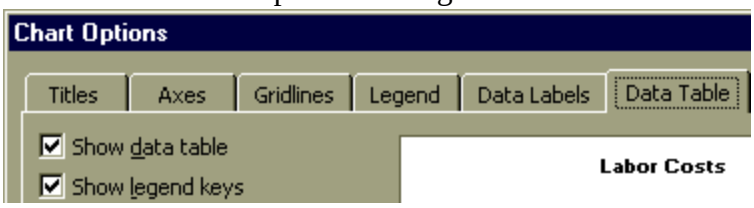


c. To display major gridlines on the histogram, check "Major gridlines" in the "Category (X) axis" and the "Value (Z) axis" sections of the "Gridlines" sheet of the "Chart Options" dialog box.



d. To get rid of the legend, uncheck "Show legend" on the "Legend" sheet of the "Chart Options" dialog box.

e. Select "Show Data Table" and "Show Legend Keys" on the "Data Table" sheet of the "Chart Options" dialog box.



f. Click the "OK" button on the "Chart Options" dialog box to close the dialog box.

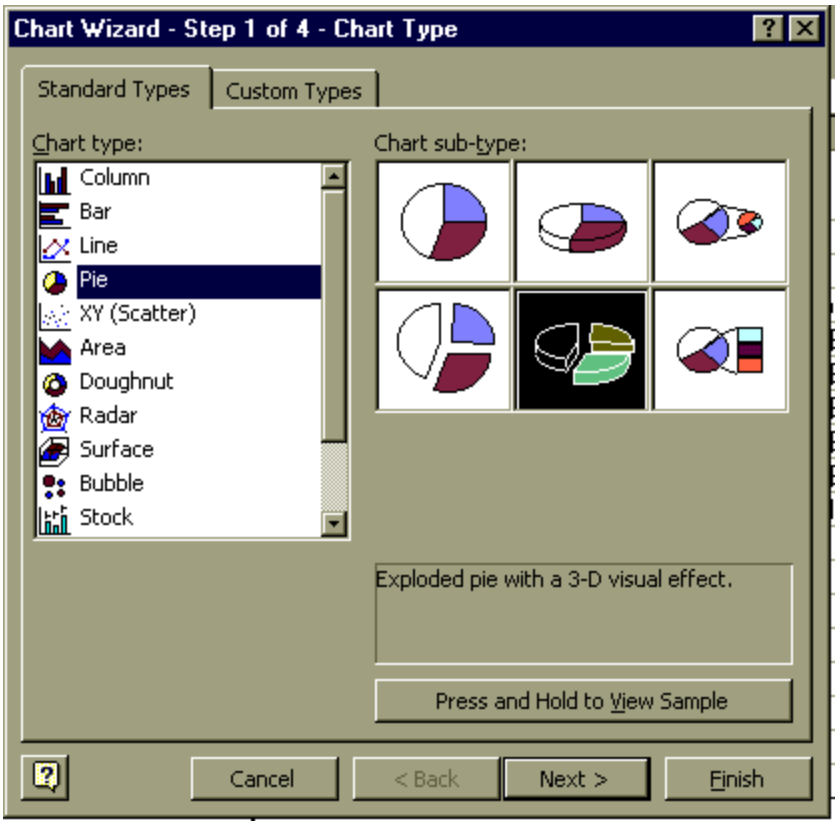
g. After editing the histogram is finished, select any cell of the spreadsheet to deselect the histogram.

Pie Chart Procedure

Create the pie chart on the same page as the spreadsheet. Note the titles, labels, rotation, and pie slice colors. When labels get too close to the bottom of the pie chart, they appear on the monitor, but they might not print. Proof read your printed output. You might need to move some labels higher.

1. Select the data for the pie chart.
   a. In column A, select the six rows containing the label and categories, beginning with "Labor" and ending with "Laborer".
   b. Push and hold down the CTRL key.
   c. In column D, select the six rows containing the label and data, beginning with "Labor Total" and ending with the value on the same row as "Laborer". Do not select the number labeled "Individual Labor Cost".
   d. Release the mouse button. Release the CTRL key.
2. Select the 3-dimensional pie chart.
   a. Push the Excel Chart Wizard icon.

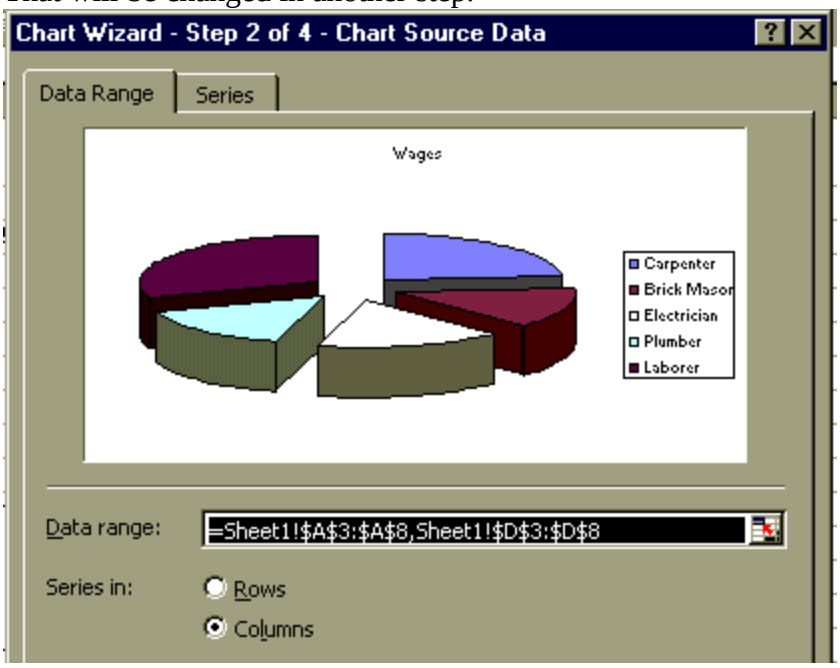
b. Select the “Exploded pie with a 3-D visual effect”, and then push the “Next” button.



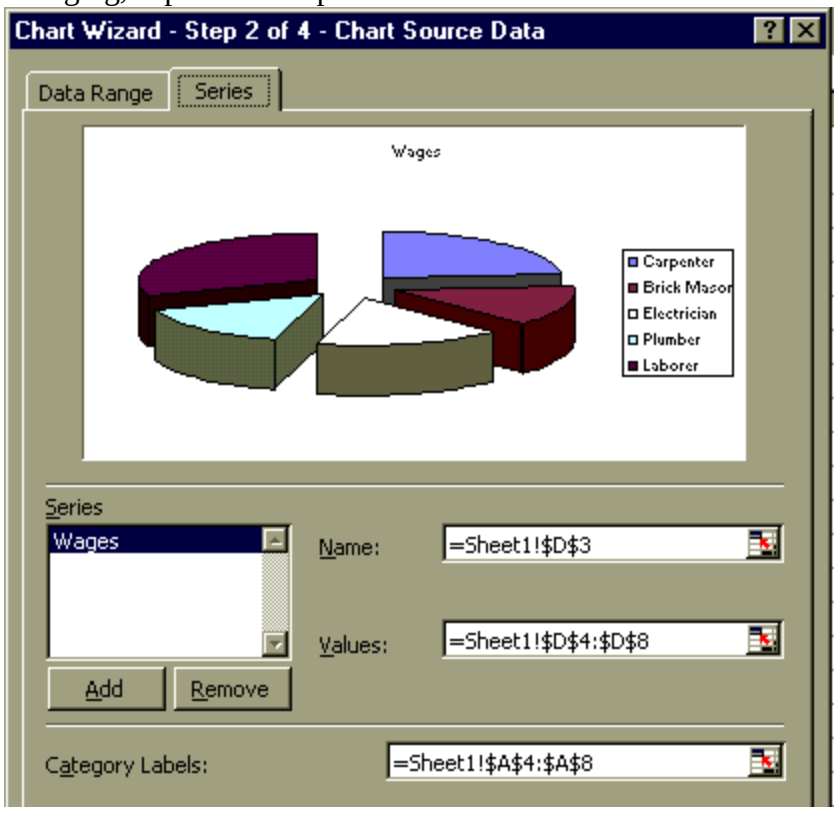
3. To identify which column contains the frequency or count data for this problem, select “Columns” next to “Series in” on the “Data Range” sheet of “Chart Wizard Step 2 of 4”.

   a. Note the inconsistency with conventions used for the histogram. That is a Microsoft issue. Do not worry yet if “Labor Total” appears as the title.

That will be changed in another step.

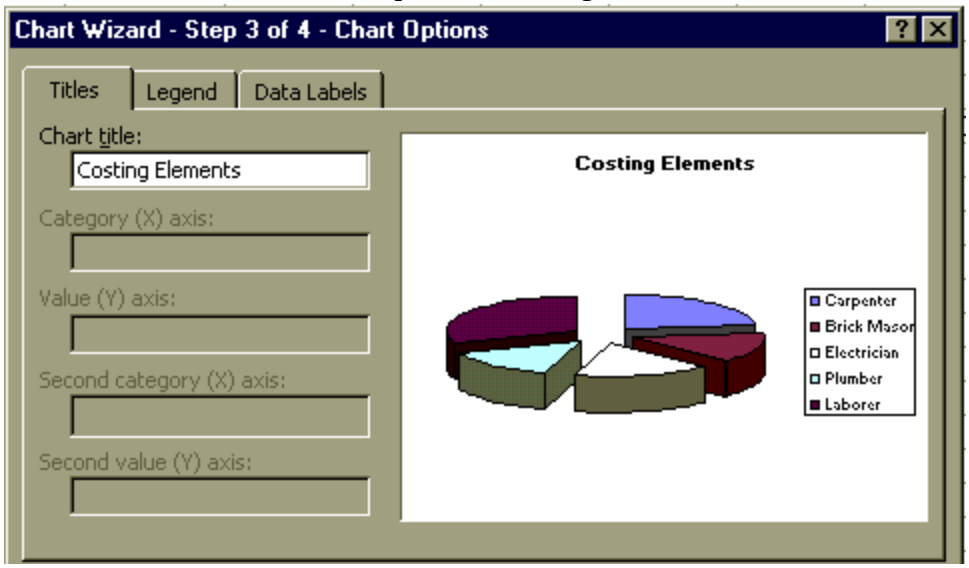


4. The entries on the "Series" sheet of "Chart Wizard Step 2 of 4" should not need changing, if previous steps were done. Here is what it should look like.



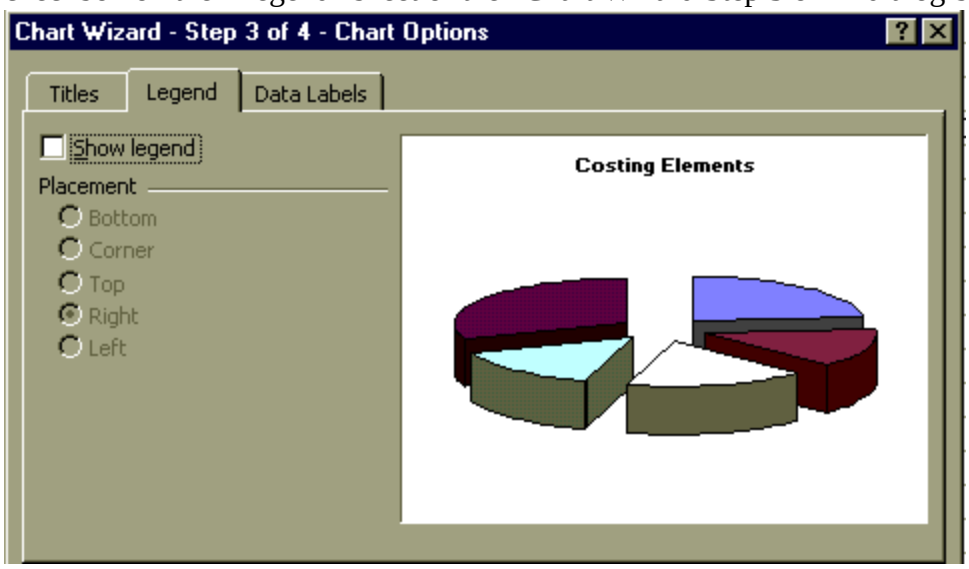
5. Click the "Next" button on the "Chart Wizard Step 2 of 4" dialog box.

6. Enter the title “Costing Elements” into the “Chart title” edit box on the “Titles” sheet of the “Chart Wizard Step 3 of 4” dialog box.



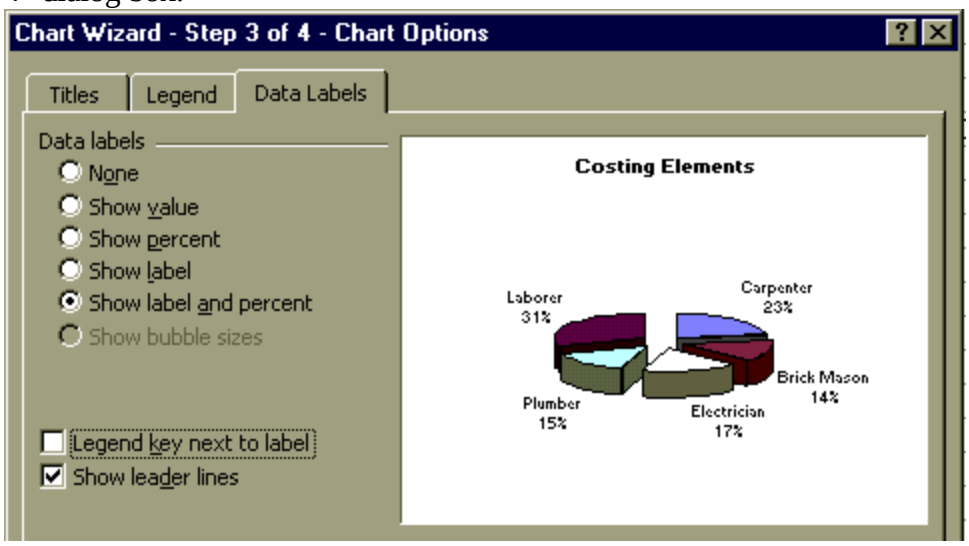
   a. The title shown in the preview image might not change instantaneously. To force the change to appear, click on the “Legend” tab, and then click on the “Titles” tab.

7. Remove the legend from the pie chart by unchecking the “Show legend” checkbox on the “Legend” sheet of the “Chart Wizard Step 3 of 4” dialog box.

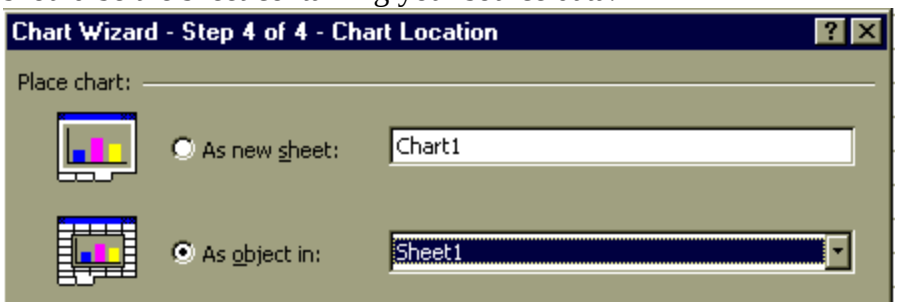


8. Add data labels and percentages by selecting “Show label and percent” in the “Data labels” section on the “Data Labels” sheet of the “Chart Wizard Step 3 of

4" dialog box.

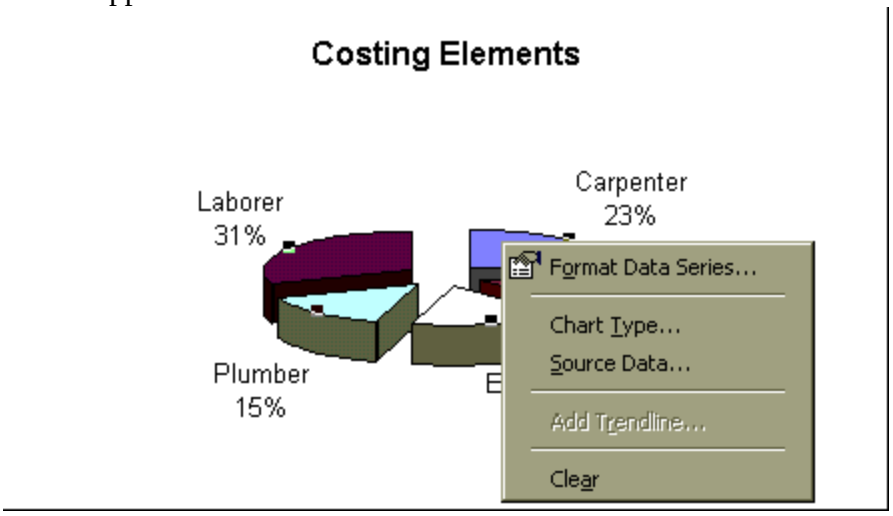


9. Check the "Show leader lines" box on the "Data Labels" sheet of the "Chart Wizard Step 3 of 4" dialog box. This will allow generation of leader lines when labels are moved away from the data slices.
10. Click the "Next" button on the "Chart Wizard Step 3 of 4" dialog box.
11. To make the pie chart display on the same spreadsheet as the data, select "As object in" on the "Chart Wizard Step 4 of 4" dialog box. The label in the edit box should be the sheet containing your source data.



12. Click the "Finish" button on the "Chart Wizard Step 4 of 4" dialog box.
13. Notice that the pie chart is still not exactly like the pie chart in these instructions.
    a. The pie chart needs to be rotated 60 degrees clockwise.
    b. The plumber slice needs to be pulled out.
    c. Colors need to be changed on 3 slices.
    d. Labels need to be moved to cause the leader lines to appear.
14. To rotate the pie chart 60 degrees clockwise:
    a. Right-click one time on one of the slices. One "move handle" should appear one the edge of the arc of each slice of the pie. A short-cut menu

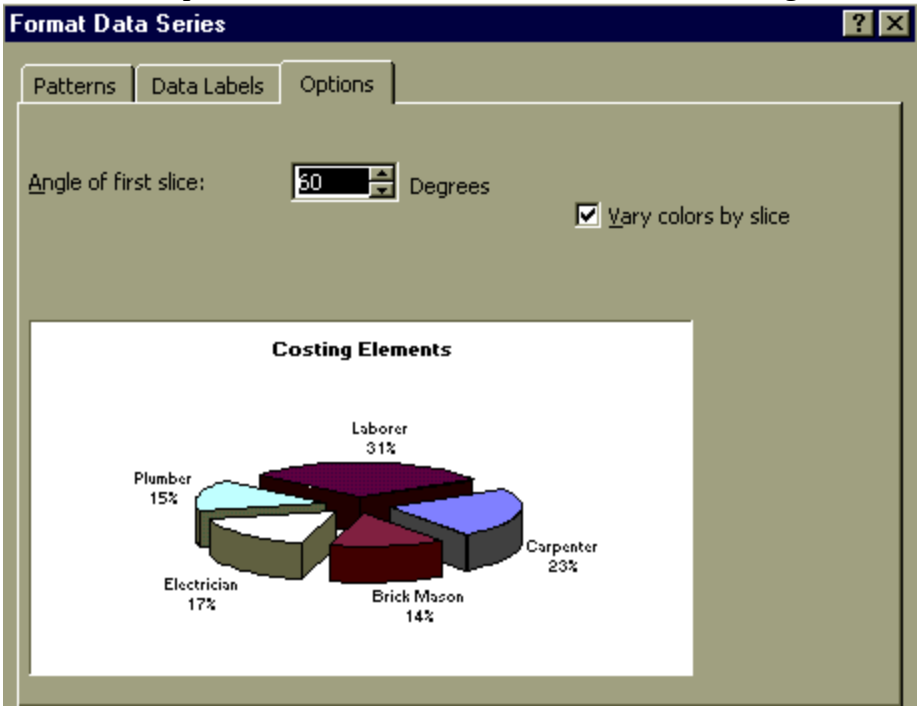
should appear.



b. Select "Format Data Series…" on the short-cut menu.

c. Select the "Options" sheet on the "Format Data Series" dialog box.

d. Set "Angle of first slice" to 60 degrees in the "Angle of first slice" edit box on the "Options" sheet of the "Format Data Series" dialog box.



e. Check "Vary colors by slice" on the "Options" sheet of the "Format Data Series" dialog box.

f. Click the "OK" button on the "Format Data Series" dialog box.

g. Select the "Plumber" slice of the pie. When the "Plumber" slice is properly selected, it will be the only slice of the pie with move handles

visible. There will be one move handle at each corner, and one move handle along each edge.

i. If each slice of the pie has one move handle visible at the curved edge, then click once on the "Plumber" slice.

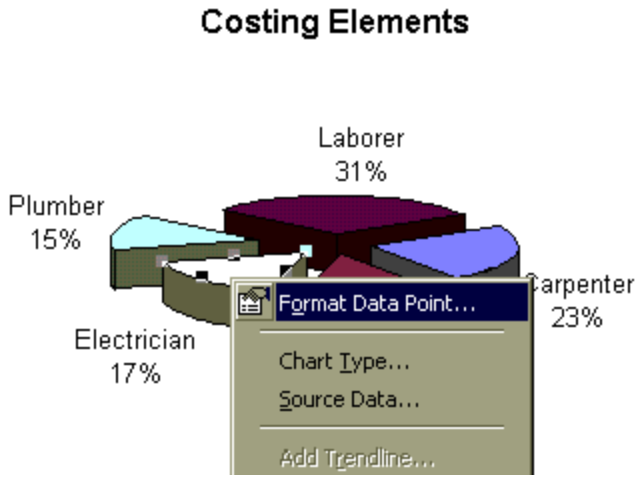
ii. If no slice of the pie has one move handle visible at the curved edge, then single-click twice on the "Plumber" slice. Note: Single-click twice is different that a double-click. Pause slightly between clicks.

h. Drag the "Plumber" slide away a short distance from the center of the pie so that it stands out from the rest of the slices. The slice will move only along one radial axis, toward or away from the center.

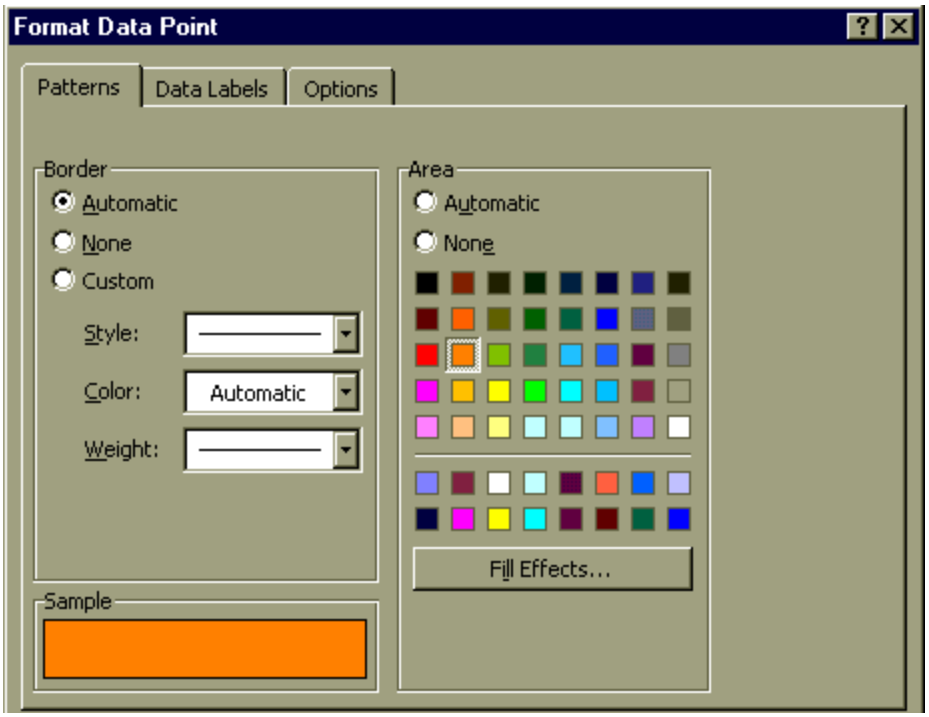
i. Change colors of the electrician, laborer, and carpenter slices.

i. Select the electrician slice, using the same procedure used earlier to select the plumber slice.

ii. After the electrician slice has been selected, right-click the electrician slice. Select "Format Data Point" from the short-cut menu.



iii. Select the "Patterns" sheet of the "Format Data Point" dialog box.

j. 

   i. Change the slice color for the electrician to orange by selecting the color in row 3, column 2, in the "Area" section of the "Patterns" sheet on the "Format Data Point" dialog box.

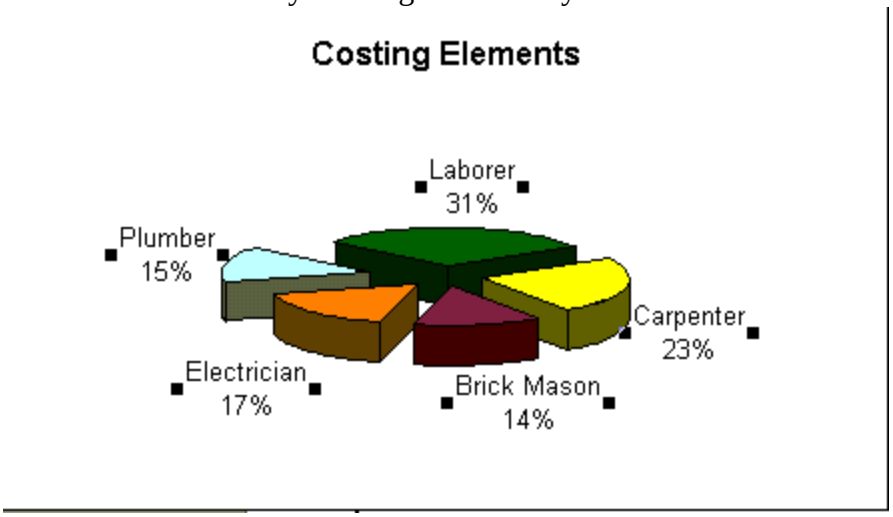
   ii. Click the "OK" button in the "Format Data Point" dialog box.

k. Using a similar procedure, change the slice color for the laborer to green by selecting the color in row 2, column 4, in the "Area" section of the "Patterns" sheet on the "Format Data Point" dialog box.

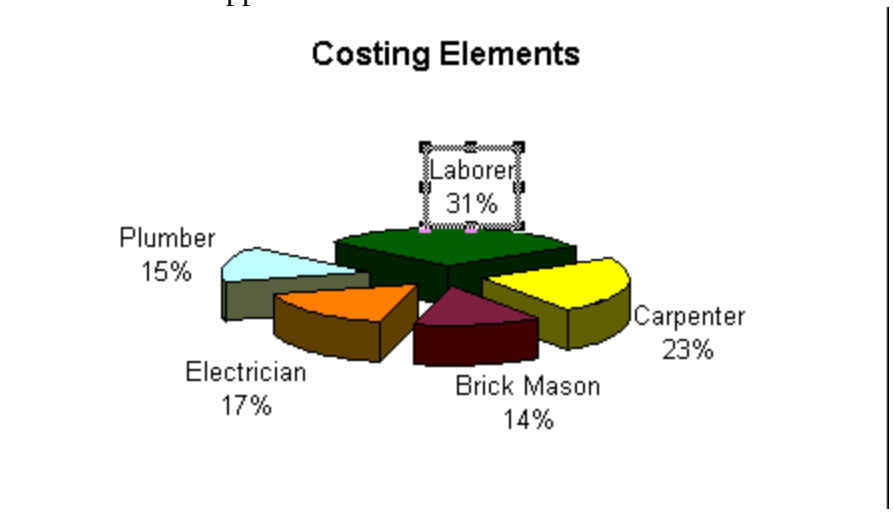
l. Using a similar procedure, change the slice color for the carpenter to poplar yellow by selecting the color in row 4, column 3, in the "Area" section of the "Patterns" sheet on the "Format Data Point" dialog box.

15. Cause leader lines to appear between labels and the associated slices by moving the data labels away from the center of the pie.

a. Select all data labels by clicking once on any of the data labels.

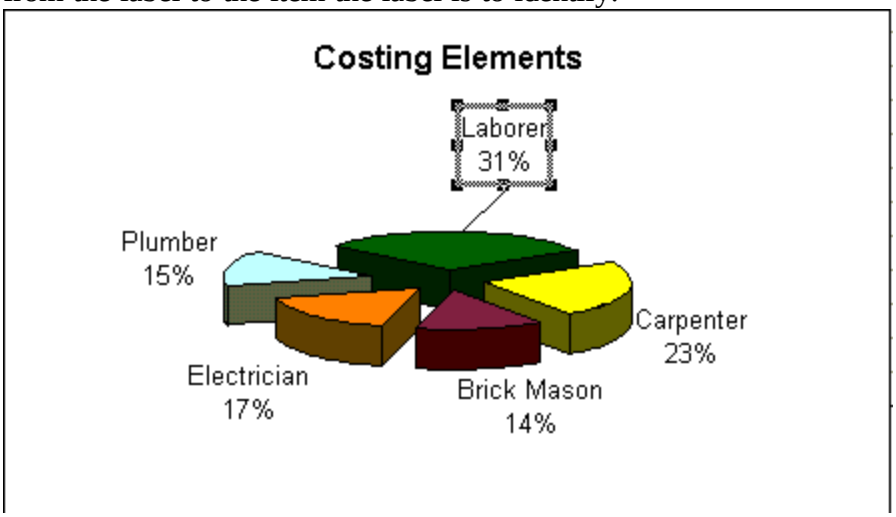


b. Select the "Laborer" data label by clicking once on the "laborer" data label. It will be appear with a box around the label.



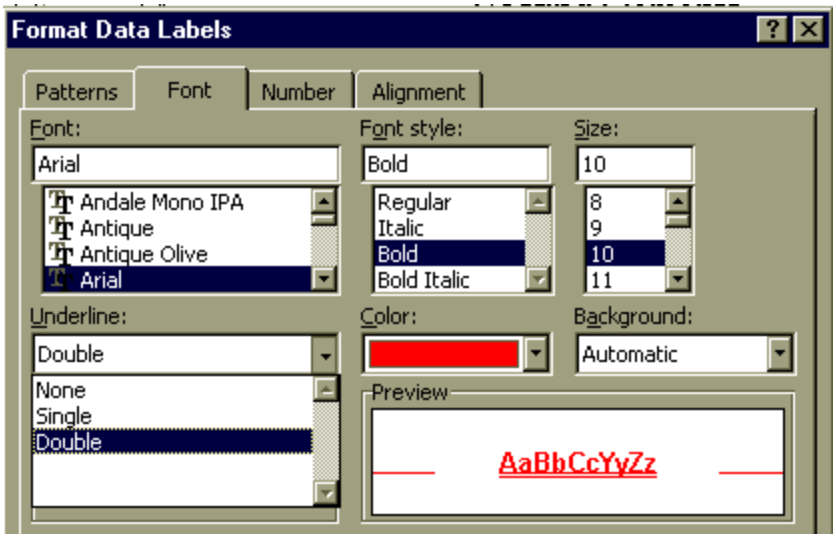
c. Place the mouse cursor on the edge of the box. Drag the label away from the center of the pie. A leader line will appear. A leader line leads the eye

from the label to the item the label is to identify.

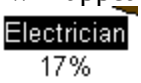


d. Change the position of other slice labels to generate leader lines. Do not worry about obtaining the same shape of leader line shown in the directions.

e. To emphasize the electrician label, double-underline, and change the font to bold red.



i. Single click twice on the electrician data label. When properly selected, the label "Electrician" will appear in white font on a black rectangular background.



ii. Right-click on the data label and select the "Format Data Labels" menu item from the context-sensitive menu.

iii. Select "Bold" form the "Fond style" drop-down list on the "Font" sheet of the "Format Data Labels" dialog box.

iv. Select the color red, row 3, column 1, from the "Color" drop-down list on the "Font" sheet of the "Format Data Labels" dialog box.

v. Select "Double" from the "Underline" drop-down list on the "Font" sheet of the "Format Data Labels" dialog box.

vi. Click the "OK" button in the "Format Data Labels" dialog box.

16. Click in any spreadsheet cell to deselect the pie chart.

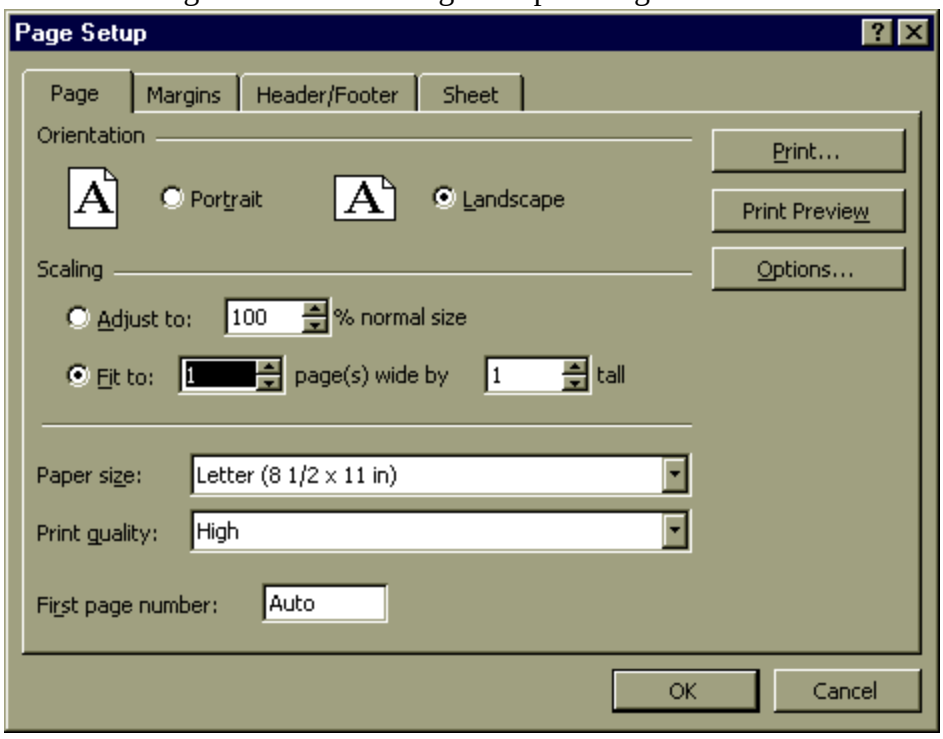
Chart Positioning

Both charts are to be positioned and scaled below the data on the spreadsheet so that everything will be visible simultaneously.

1. Position the histogram upper left corner into the upper left corner of cell A19.
2. Scale the histogram by dragging the histogram lower right corner so that the lower right corner of the histogram is in the lower right corner of cell E39.
3. Position the pie chart upper left corner into the upper left corner of cell F19.
4. Scale the pie chart by dragging the pie chart lower right corner so that the lower right corner of the pie chart is in the lower right corner of cell J39.
5. Click in any spreadsheet cell to deselect the pie chart.

Printout Procedure

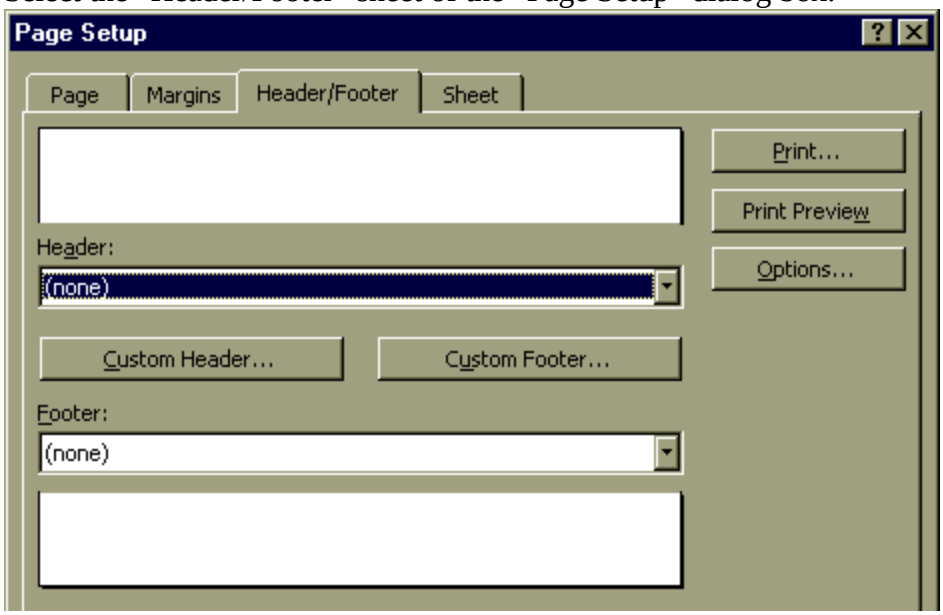
1. Select File | Page Setup
2. Select the "Page" sheet of the "Page Setup" dialog box.



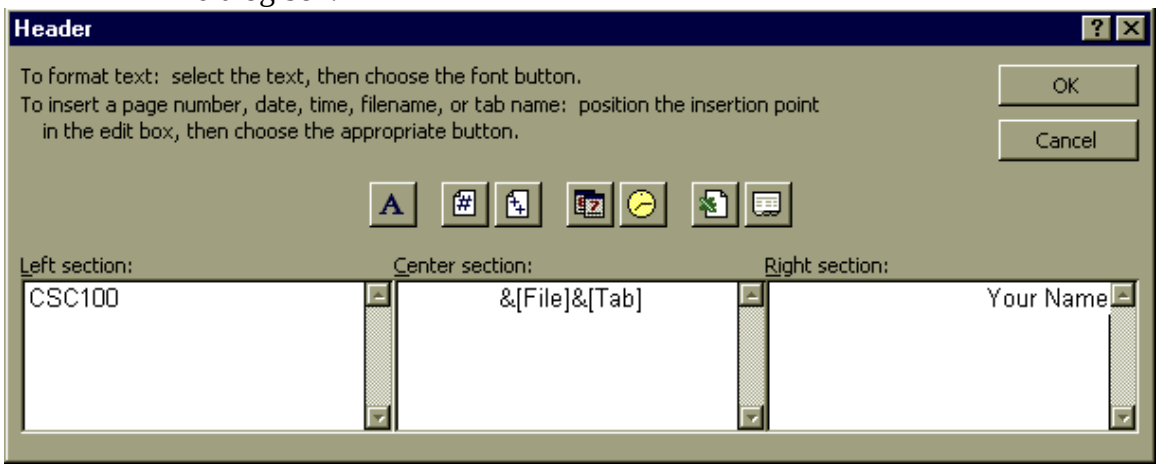
a. Select "Landscape" in the "Orientation" section of the "Page" sheet of the "Page Setup" dialog box.

b. Select “Fit to” in the “Scaling” section of the “Page” sheet of the “Page Setup” dialog box. Enter “1” into both edit boxes for the scaling.

3. Select the “Header/Footer” sheet of the “Page Setup” dialog box.

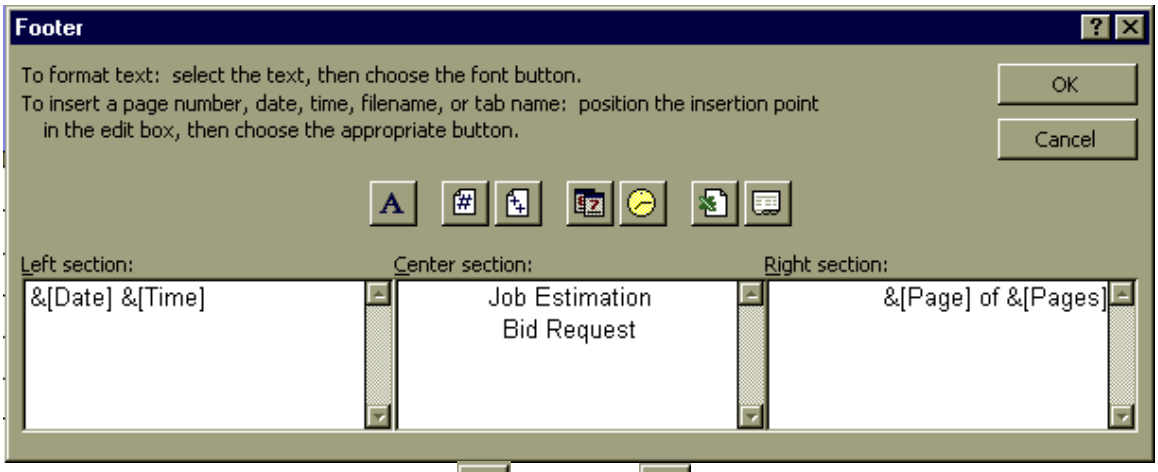


a. Select “Custom Header” on the “Header/Footer” sheet of the “Page Setup” dialog box.



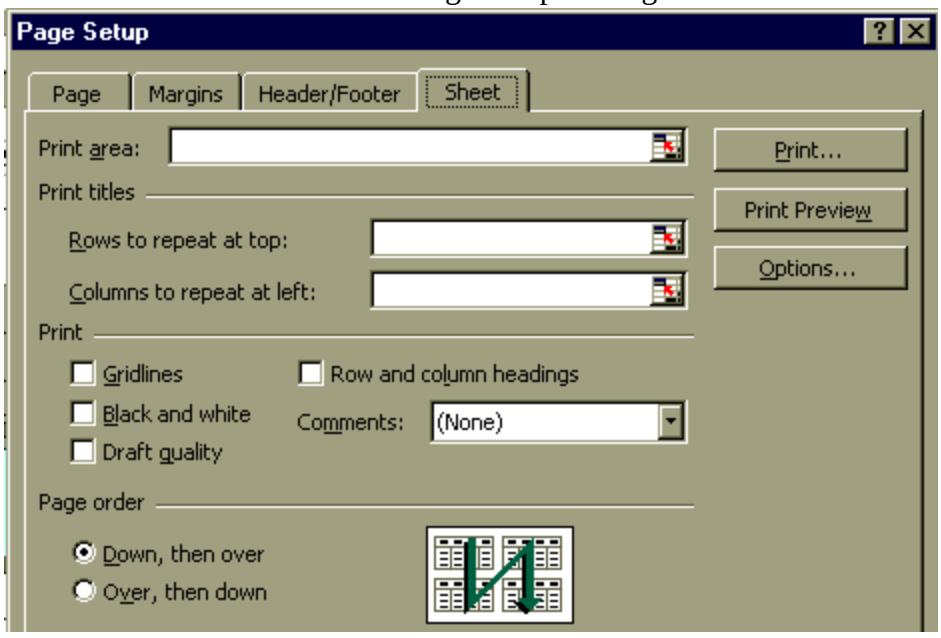
1. Enter “CSC100” into the “Left section” edit box of the “Header” dialog box.
2. Use the File icon  and Tab  icon to enter codes for inserting the source file name and the sheet tab name into the “Center section” edit box of the “Header” dialog box.
3. Enter your name into the “Right section” of the “Header” dialog box.
4. Click the “OK” button on the “Header” dialo g box.

b. Select “Custom Footer” on the “Header/Footer” sheet of the “Page Setup” dialog box.



1. Use the date  and time  icons on the "Footer" dialog box to enter codes for date and time into the "Left section" of the "Footer" dialog box.
2. Enter "Job Estimation" and "Bid Request" on separate lines into the "Center section" of the "Footer" dialog box.
3. Use the page number  and total pages  icons on the "Footer" dialog box to enter codes for the page number and the total pages into the "Right section" of the "Footer" dialog box.
4. Click the "OK" button in the "Footer" dialog box.

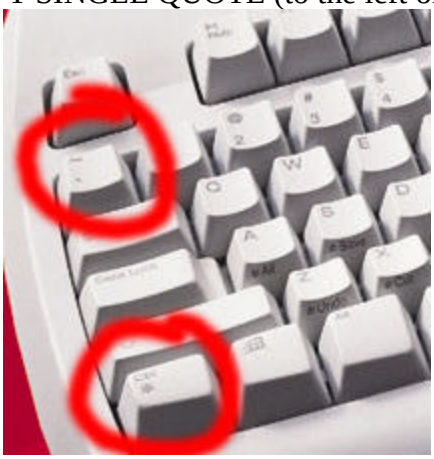
4. Select the "Sheet" sheet of the "Page Setup" dialog box.



   a. Ensure gridlines do not print with the spreadsheet by making sure the "Gridlines" checkbox is unchecked on the "Sheet" sheet of the "Page Setup" dialog box.
5. Click the "OK" button on the "Page Setup" dialog box.
6. **Print the spreadsheet in data sheet view (normal view in Landscape orientation, fit to one sheet.**

a. Print Preview before printing to make sure the output is correct.

b. If the output is OK, then select Print. The datasheet view should appear as the sample given early in the directions for this lab.

7. **Print the formula sheet in Landscape orientation, fit to one sheet.** Recall to push CTRL+LEFT SINGLE QUOTE (to the left of the '1' key) to get the formula sheet displayed. 

a. Print Preview before printing to make sure the output is correct.

b. If the output is OK, then select Print. The formula sheet should appear similar to the sample given early in the directions for this lab.