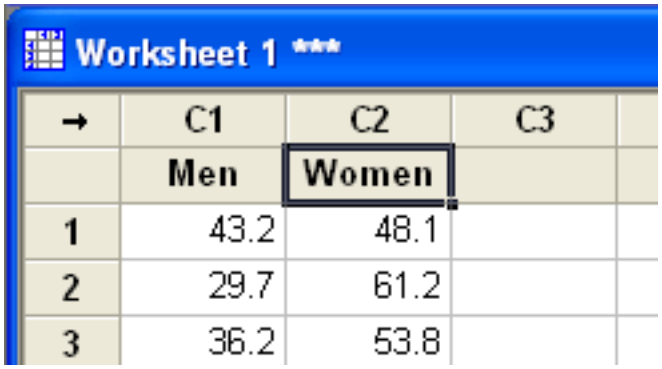
Minitab Directions – 01

Descriptive Statistics

1. Numerical Descriptive Statistics

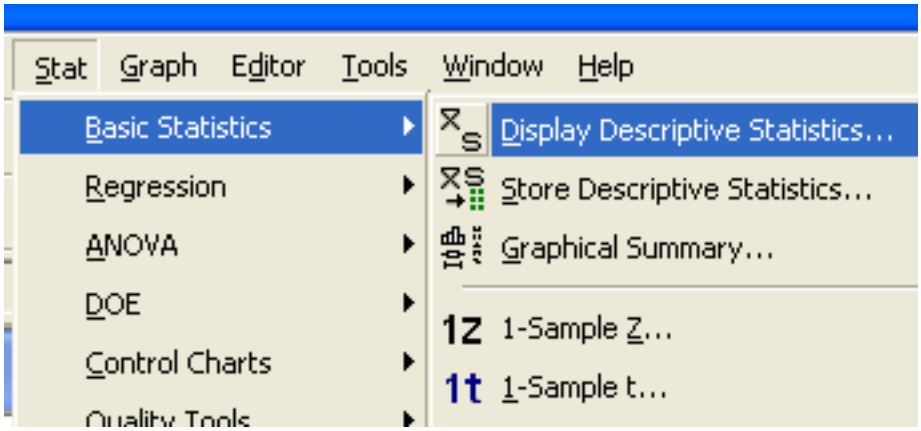
1.1. Put data in columns:

Note: if your measurement is time, convert all times to seconds or minutes, or whatever is most appropriate. For instance, convert 1 minute 40 seconds to either 100 seconds or 1.67 minutes. Minitab does have a Date data type, but I do not recommend it.

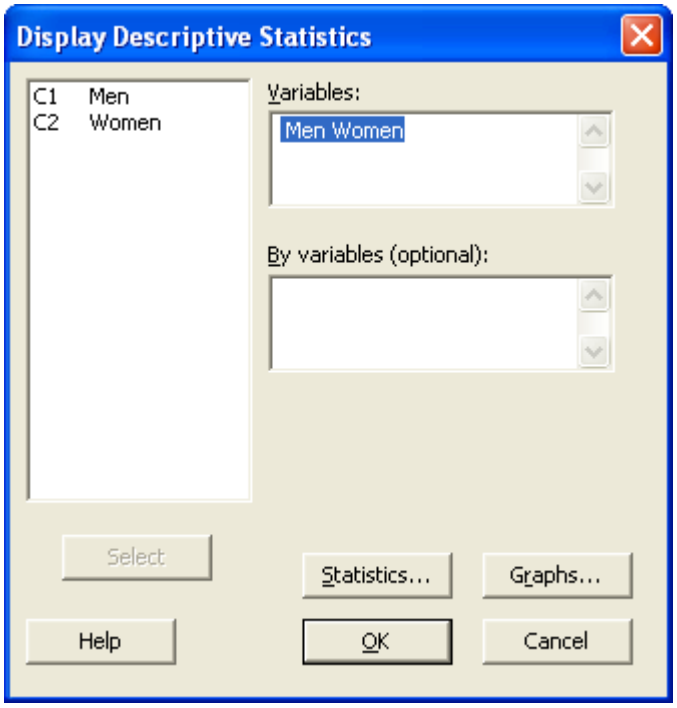


→	C1	C2	C3
	Men	Women	
1	43.2	48.1	
2	29.7	61.2	
3	36.2	53.8	

1.2. Choose: *Stats/Basic Statistics/Display Descriptive Statistics*

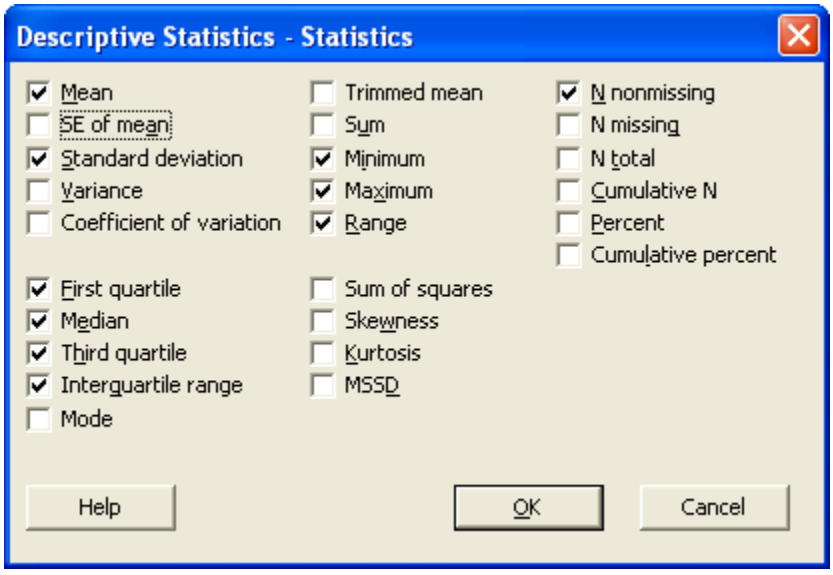


1.3. Select the data sets (columns) you want to analyze.



1.4. Choose *Statistics...* from the dialog above.

1.5. Choose the descriptive measures shown below, then *OK*.



1.6. Finally, choose *OK* on the *Store Descriptive Statistics* dialog. The descriptive statistics are shown in *Session* window:

Descriptive Statistics: Men, Women

```
Variable   N   Mean  StDev  Minimum     Q1  Median     Q3  Maximum  Range
Men       40  39.15   9.21    28.20  31.02   36.30  44.75    60.00  31.80
Women     40  45.42   7.68    27.50  41.35   45.75  49.97    61.20  33.70

Variable    IQR
Men       13.73
Women      8.63
```

1.7. Using the data from your output, in Word, create three tables as shown below. It is probably quickest to do this by hand. (However, you can *store* the descriptive statistics (Stats/Basic Statistics/Store Descriptive Statisitics), copy them to Excel and manipulate there, then copy back to Word as tables.)

Hint: just copy the output from Minitab to Word and create these tables later.

Measures of Center

	N	Mean	Median	Difference
Men	40	39.2	36.3	**2.9**
Women	40	45.4	45.8	**-0.4**
Difference		**-6.2**	**-9.5**	

Measures of Spread

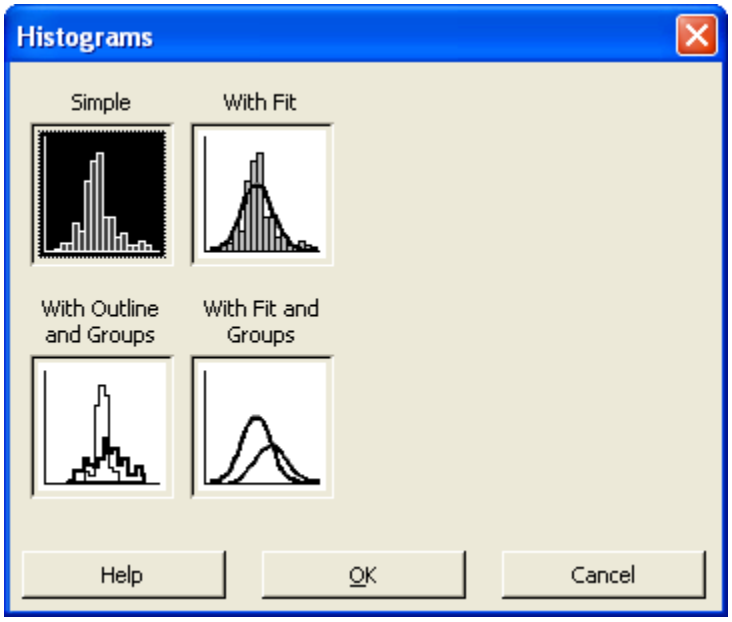
	Range	StdDev	IQR
Men	31.8	9.2	13.7
Women	33.7	7.7	8.6
Difference	**-1.9**	**1.5**	**5.1**

Measures of Position

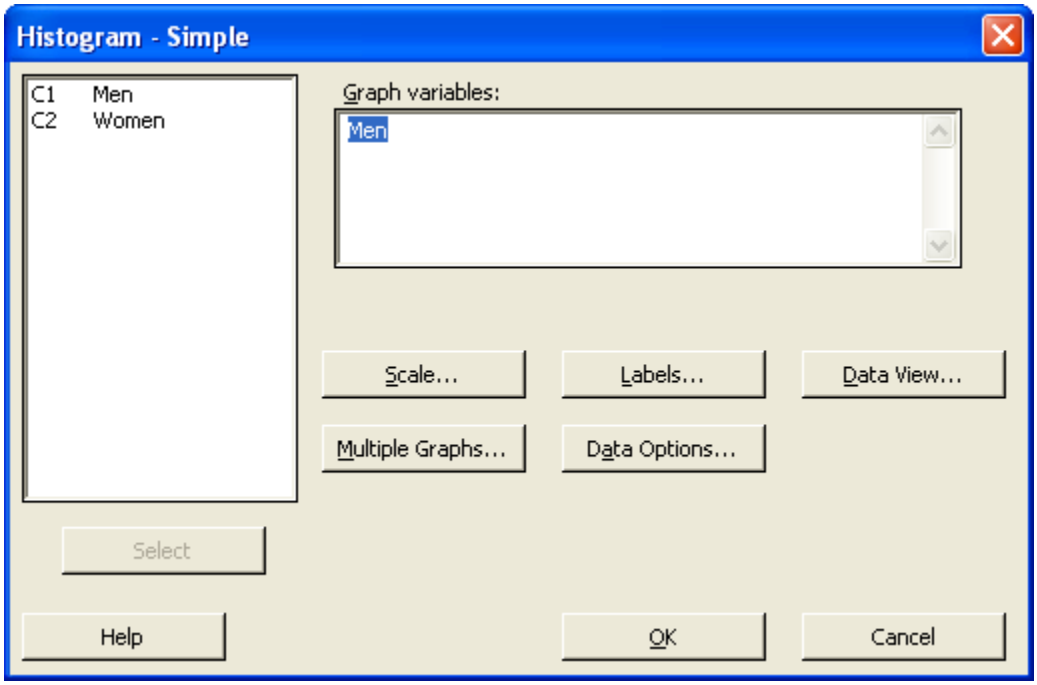
	Min	Q1	Median	Q3	Max
Women	28.2	31.0	36.3	44.8	60.0
Men	27.5	41.4	45.8	50.0	61.2

2. Individual Histogram

2.1. Choose: *Graph/HIstogram*, then *Simple* and *OK*.

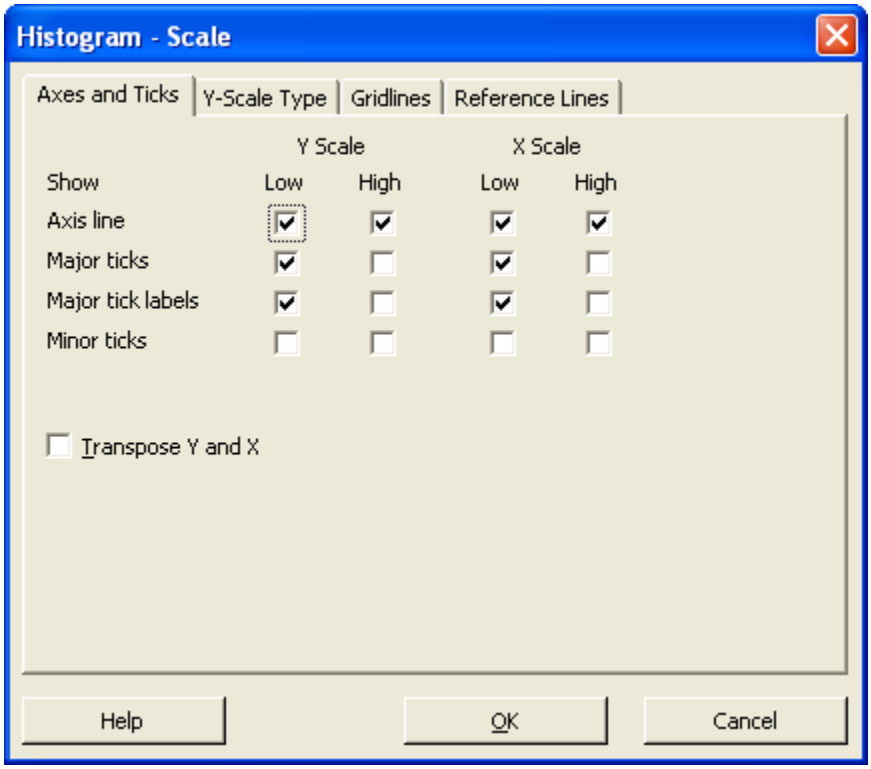


2.2. Select a ***single*** data set.

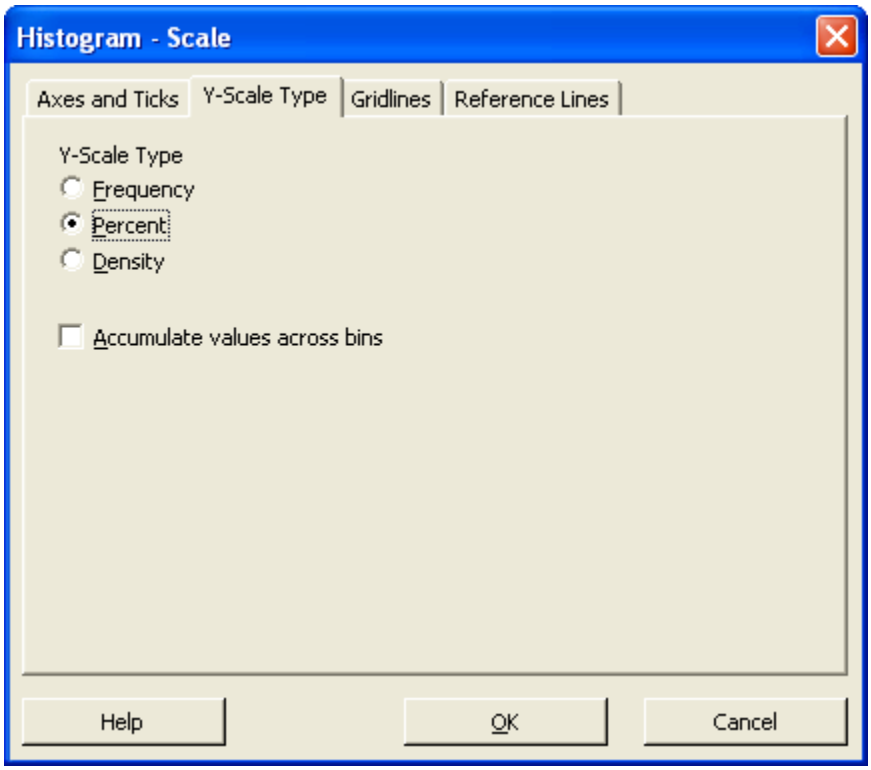


2.3. Choose *Scale...* from the dialog above.

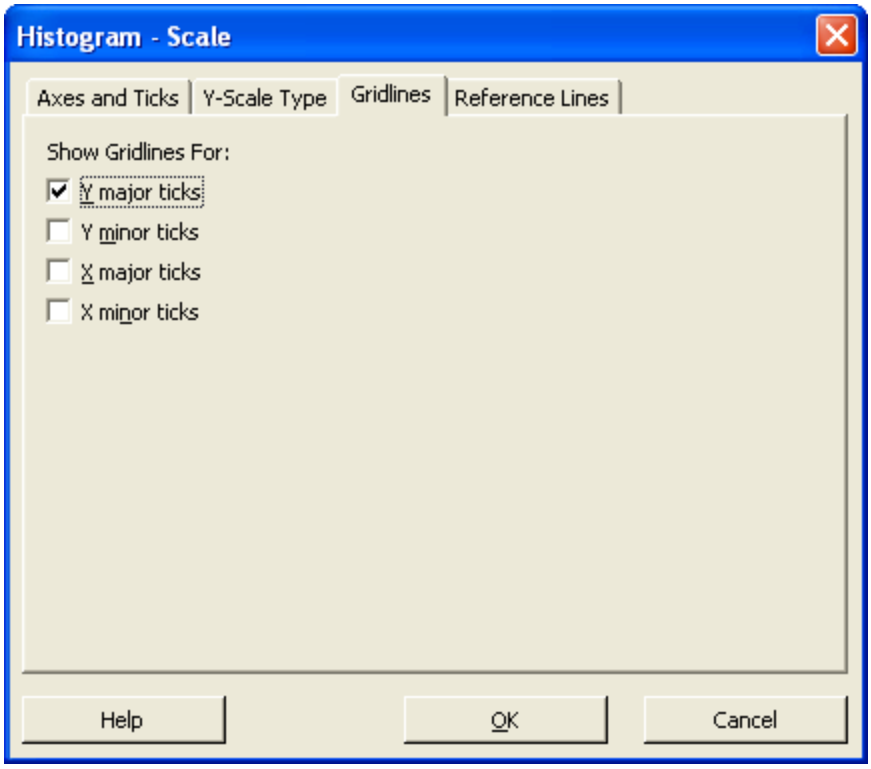
2.4. Make sure the items below are selected.



2.5. Choose *Y-Scale Type* and make sure *Percent* is selected.

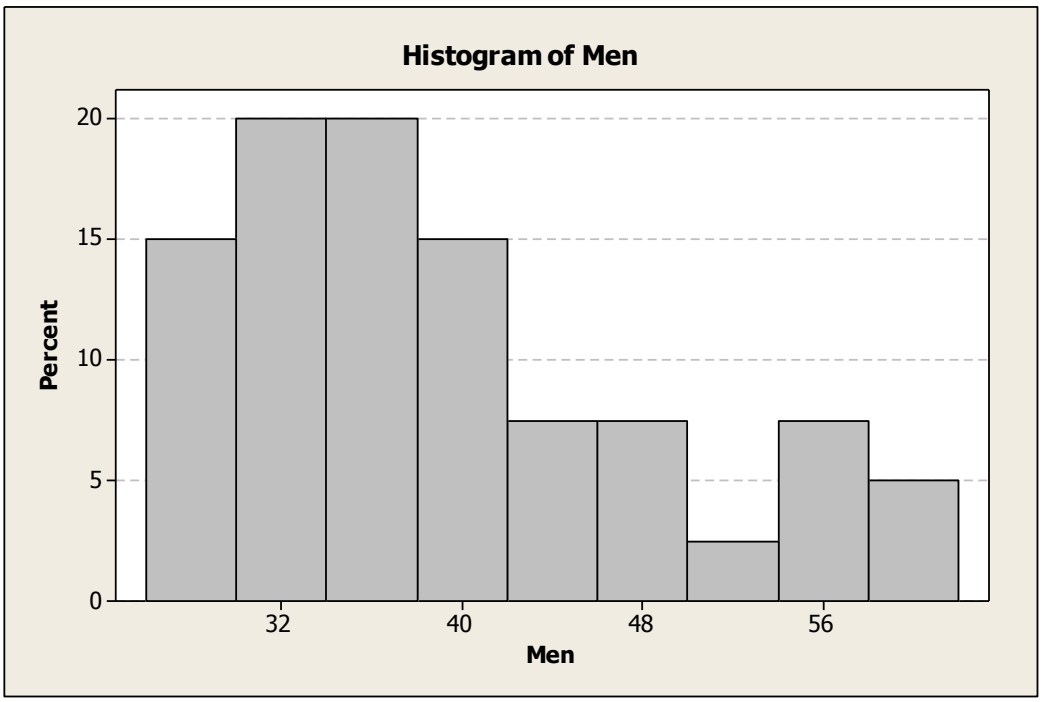


2.6. Choose the *Gridlines* tab and make sure that *Y major ticks* is selected.

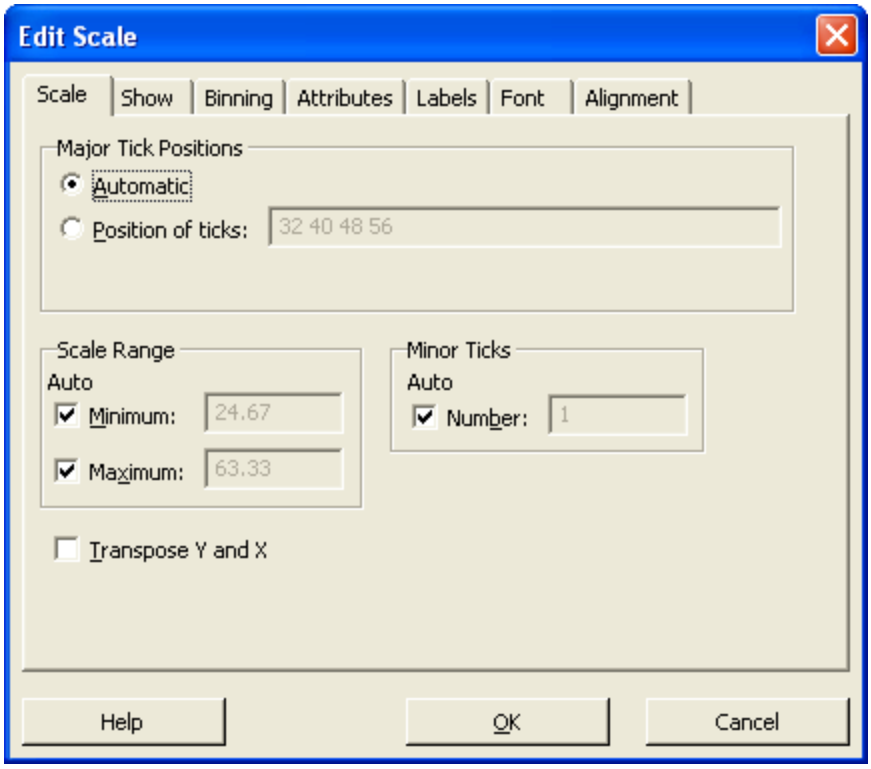


2.7. Choose *OK*.

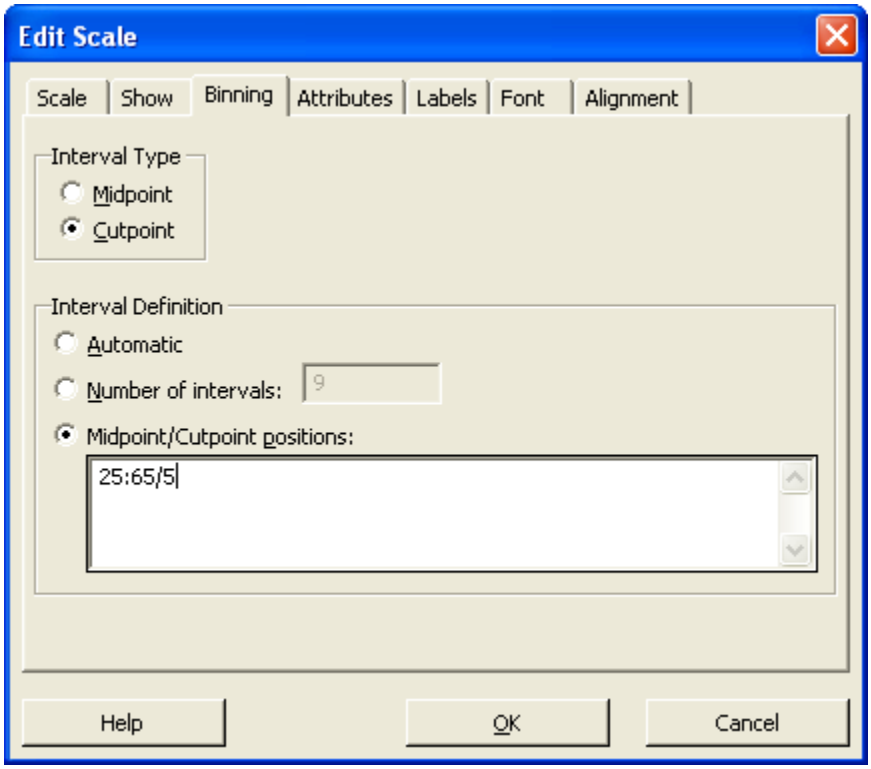
2.8. Choose *OK* on the *Histogram – Simple* dialog. This will display the histogram



2.9. Double-click a value on the *x*-axis.



2.10. Choose the *Binning* tab. Select *Cutpoint*.



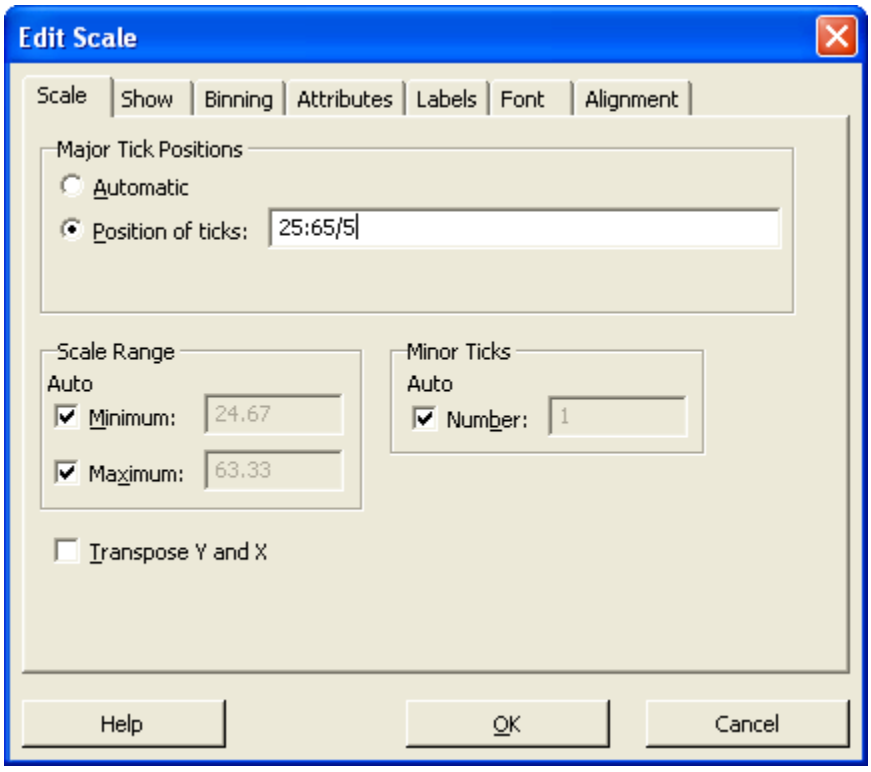
2.11. Also on the previous dialog, select *Midpoint/Cutpoint positions*. Type in:

beginning / ending : bar width

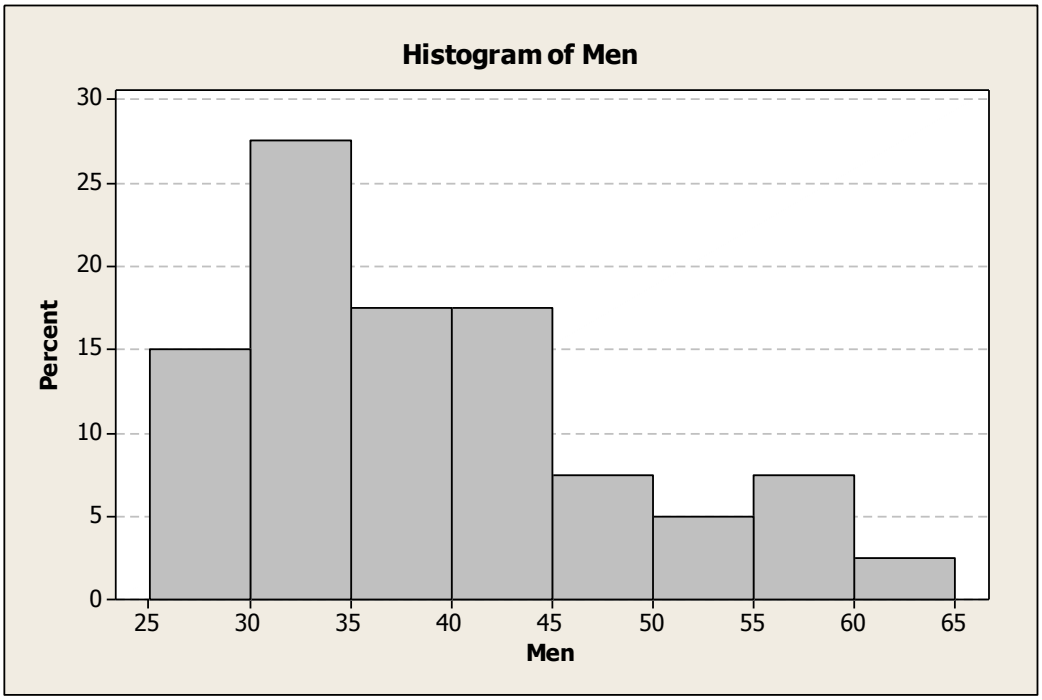
For instance, if you type in 10:20/2 you will get a histogram that starts at 10 and ends at 20, and each bar has width 2. Thus, there are 5 bars in that histogram. For this example, the minimum is 28.9 and the maximum is 60.0. Thus, one possible set of values is: 25:65/5 for a histogram with 8 bars.

Remember the value you typed in. You will need it on the next step.

2.12. Choose the *Scale* tab. Select the *Position of ticks* and supply the exact same value you use in the previous dialog.

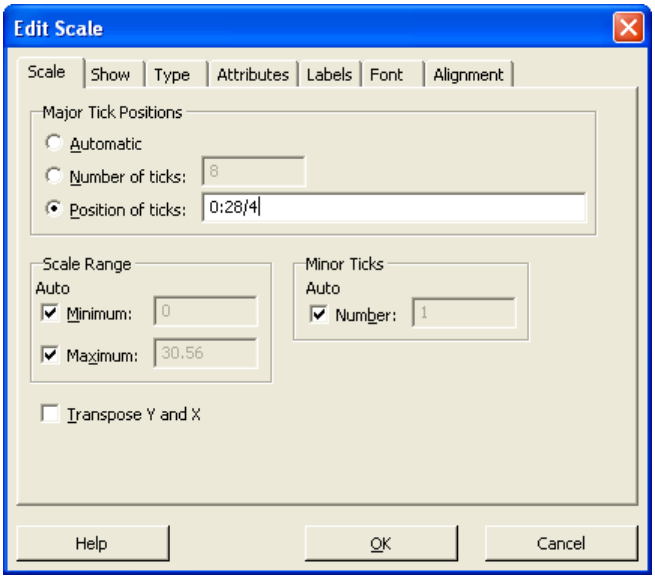


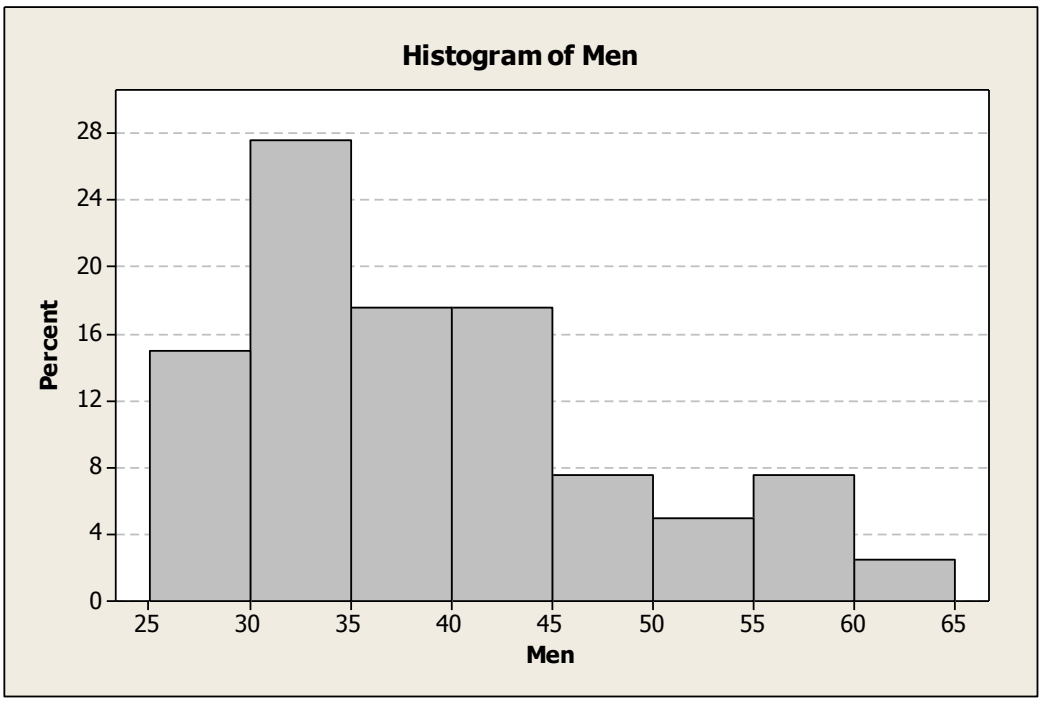
2.13. Choose *OK* to redraw the histogram.



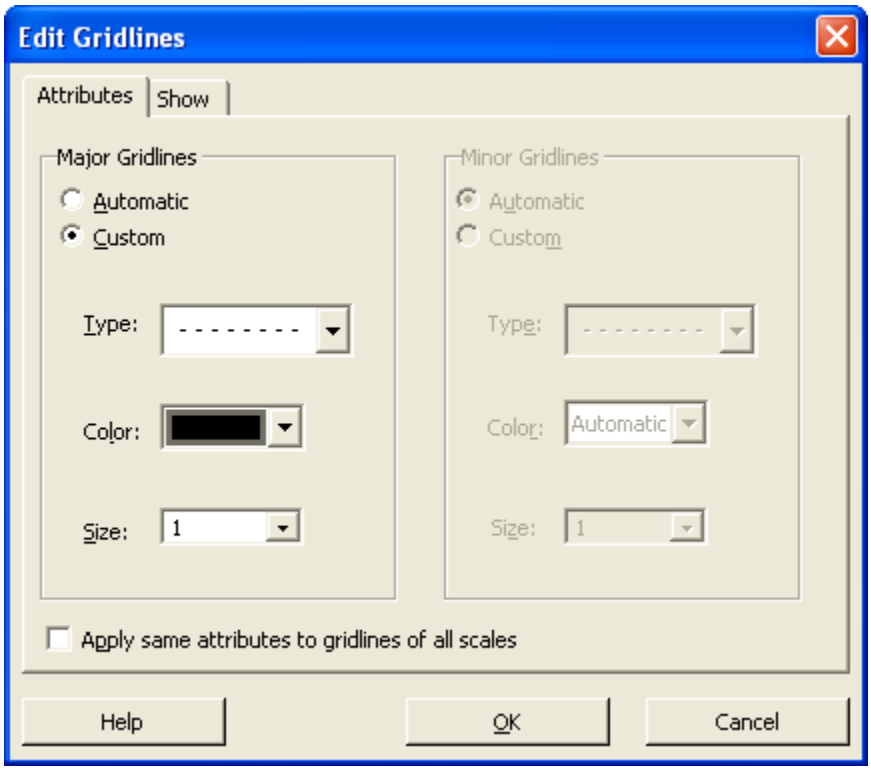
2.14. **As necessary:** Sometimes the values on the *y*-axis are spaced too widely. In the example above, the spacing seems fine. Notice it goes from 0 to 30 with increments of 5. However, you could tighten it up a bit. For instance, you might make the axis go from 0 to 28 with increments of 4. If you want to change the *y*-axis

Double-click the y-axis
Choose the *Position of ticks*
Supply a value with the same format (beg:end/increment) as the cutpoint positions.
Choose *OK* to display the histogram.

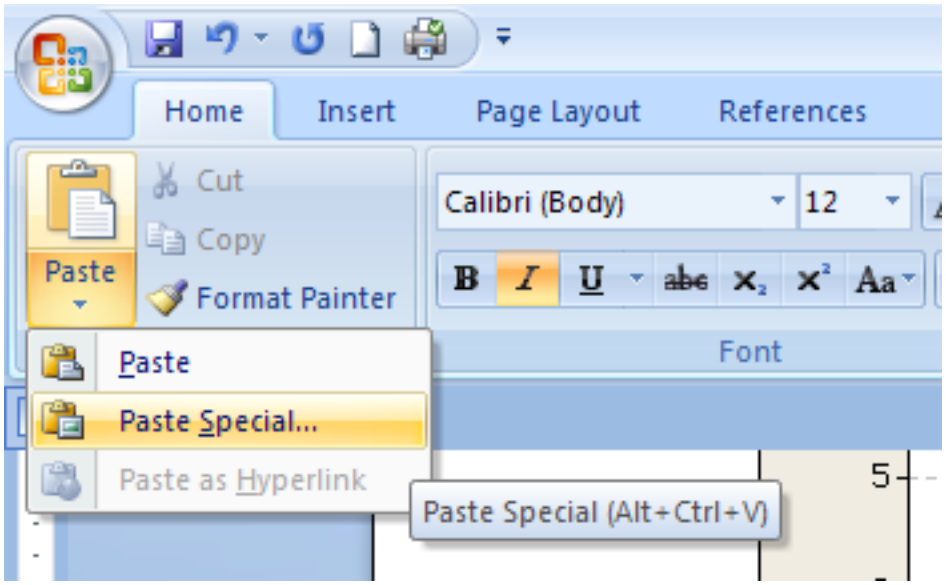




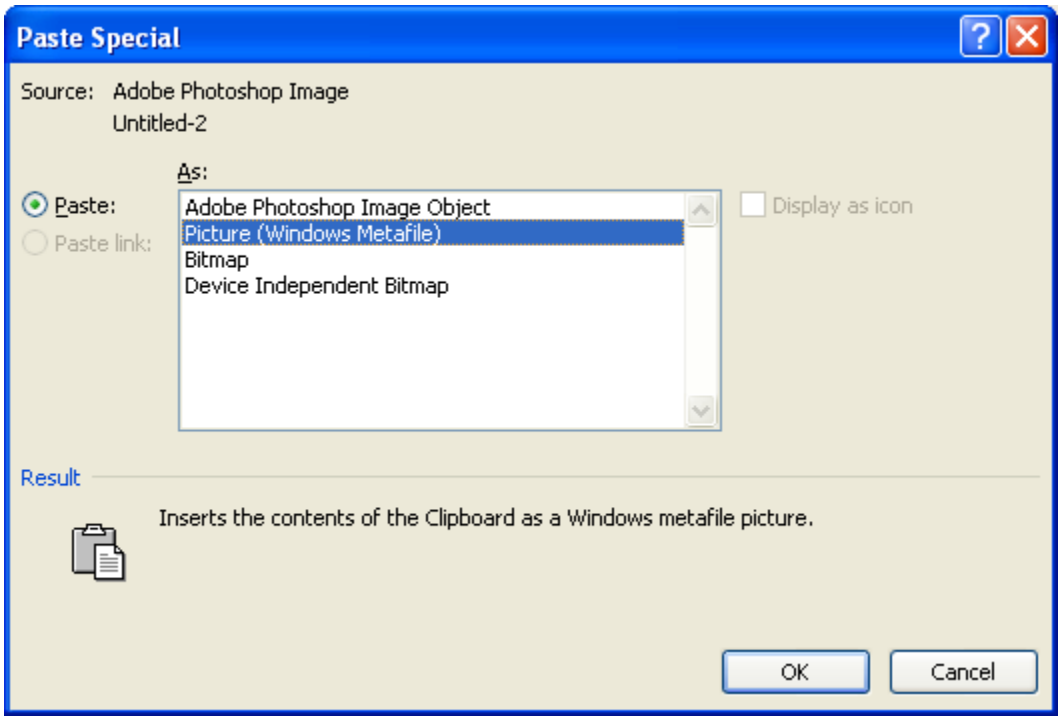
2.15. Double-click a gridline. Choose *Custom* and set the *Color* to *black*. (Do this so that the gridlines will show up when you print the histogram.)



2.16. Select the graph window. Then, choose *Edit/Copy Graph*.
2.17. Go to Word and position the cursor where you want the picture to appear.
2.18. Choose *Paste/Paste Special*



2.19. Select, *Picture (Windows Metafile)* and then choose *OK*. (This allows you to resize the graph in Word, if necessary.)

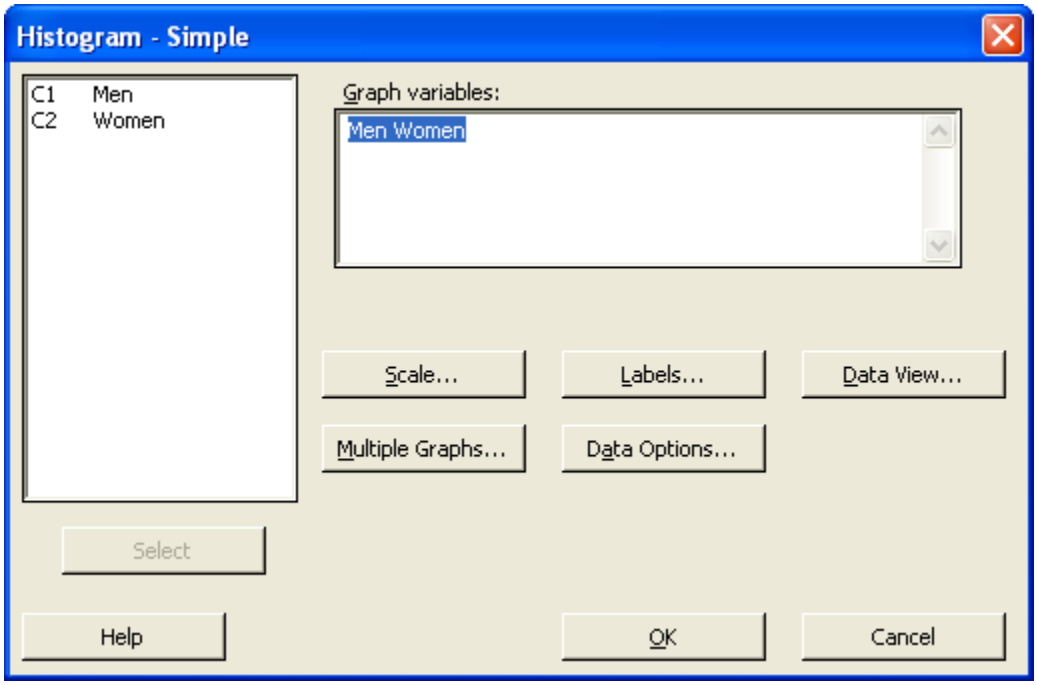


3. Individual Histograms, Part 2

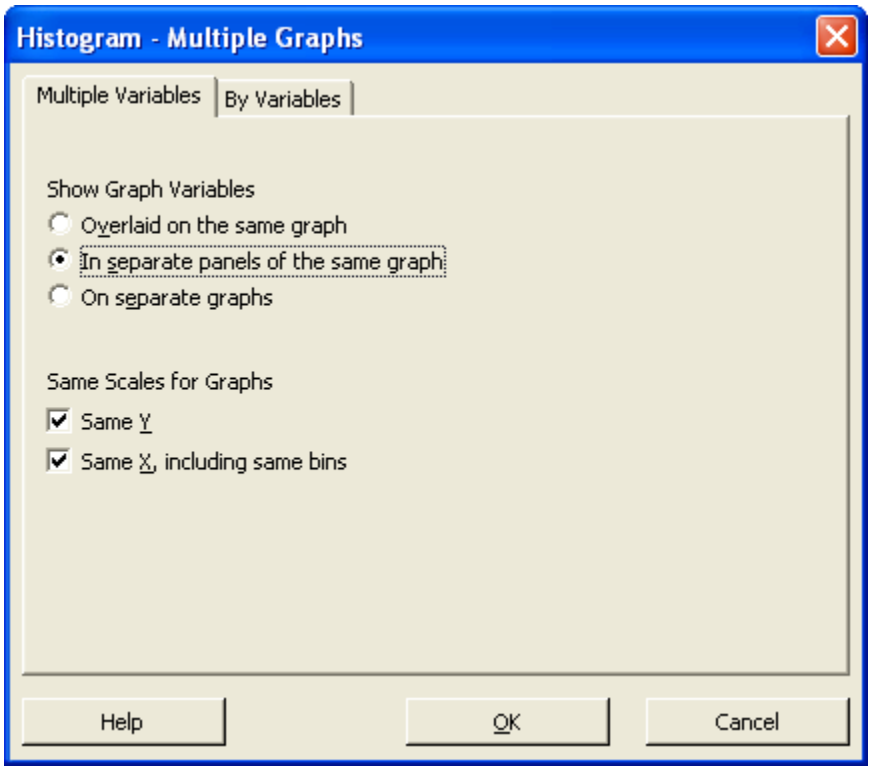
3.1. Repeat Step 2 with the second data set.

4. Both Histograms, Same Scale

4.1. Choose, *Graph/Histogram* and then *Simple* and select both data sets.

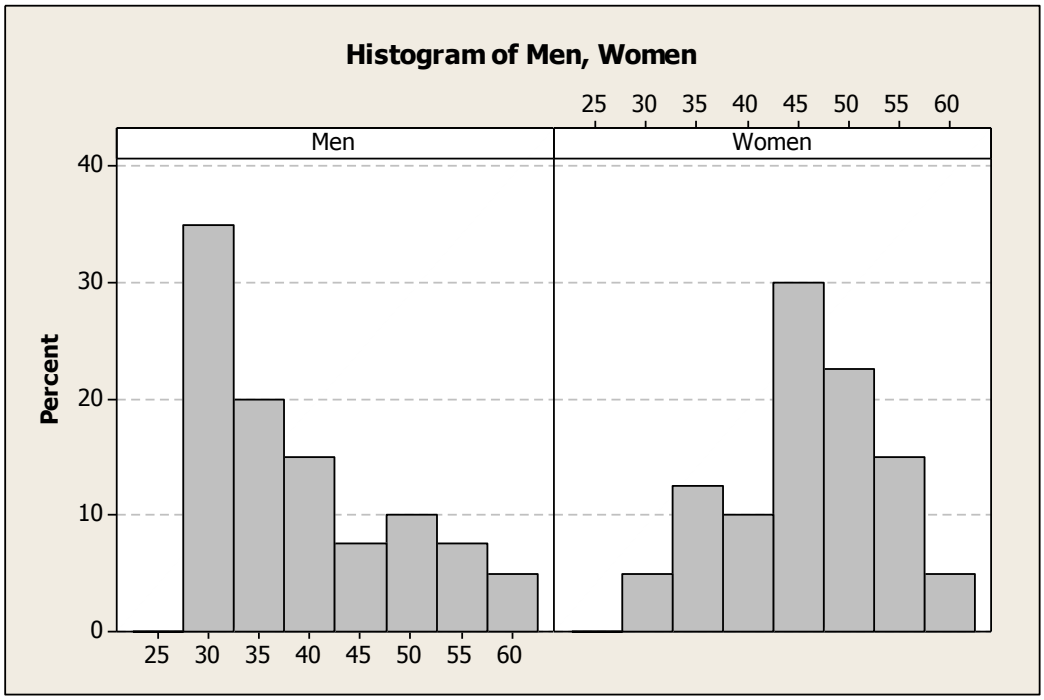


4.2. Choose the options below and then *OK.*

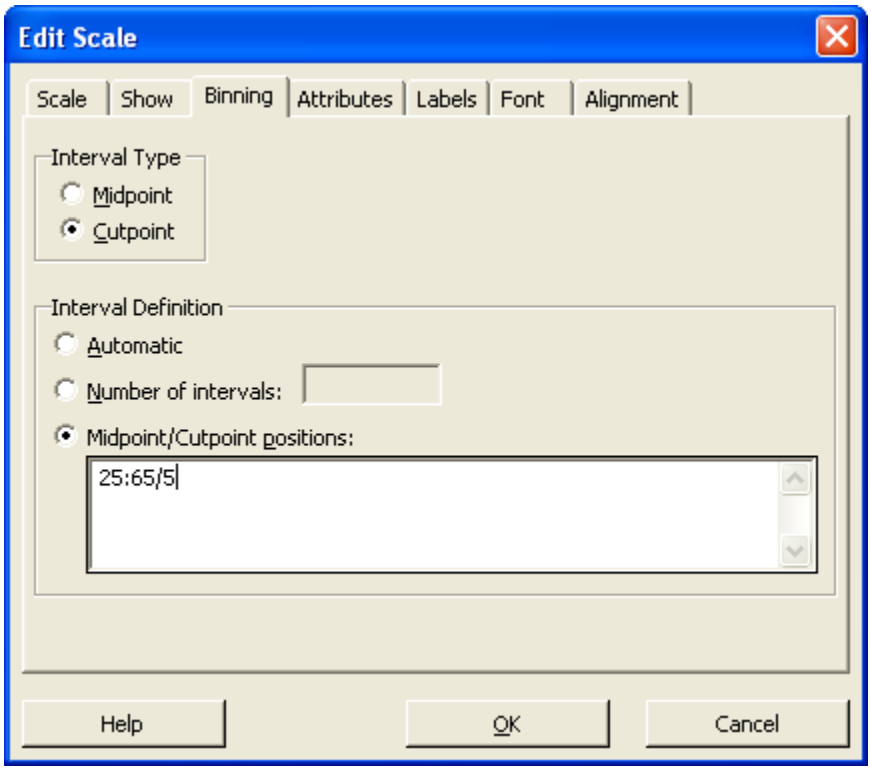


4.3. Repeat Steps 2.3-2.6 (making sure the *Scale* options are correct. You probably won't have to change anything.

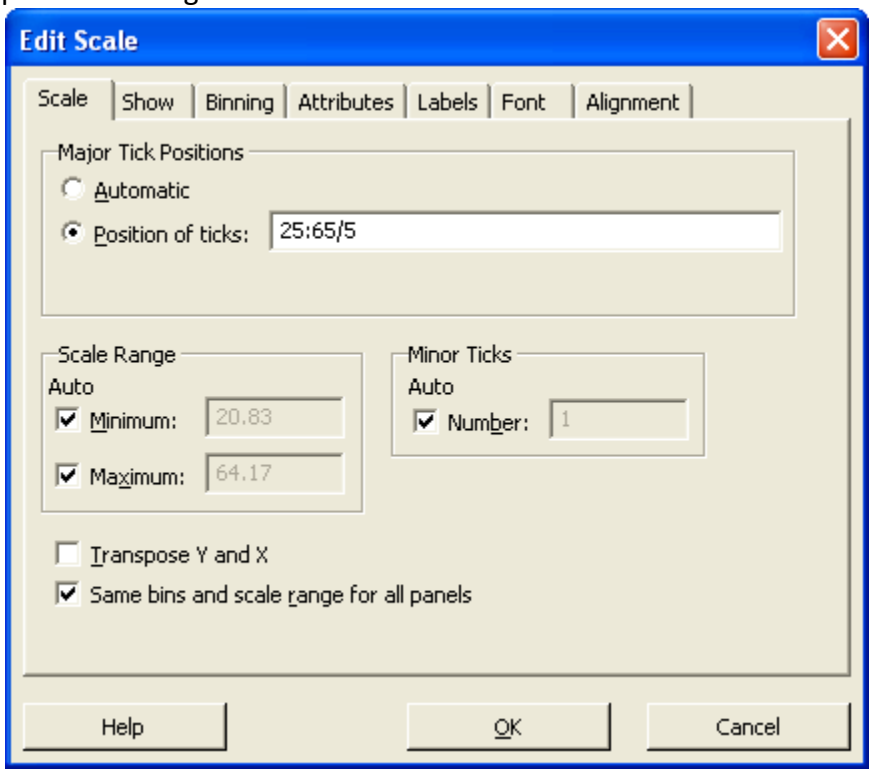
4.4. Choose *OK* on the *Histogram – Simple* dialog. This will display the histogram



4.5. Double-click either *x*-axis. Select the *Binning* tab. Select *Cutpoint*, then select *Midpoint/Cutpoint positions.* Use an expression that will accommodate both data sets.



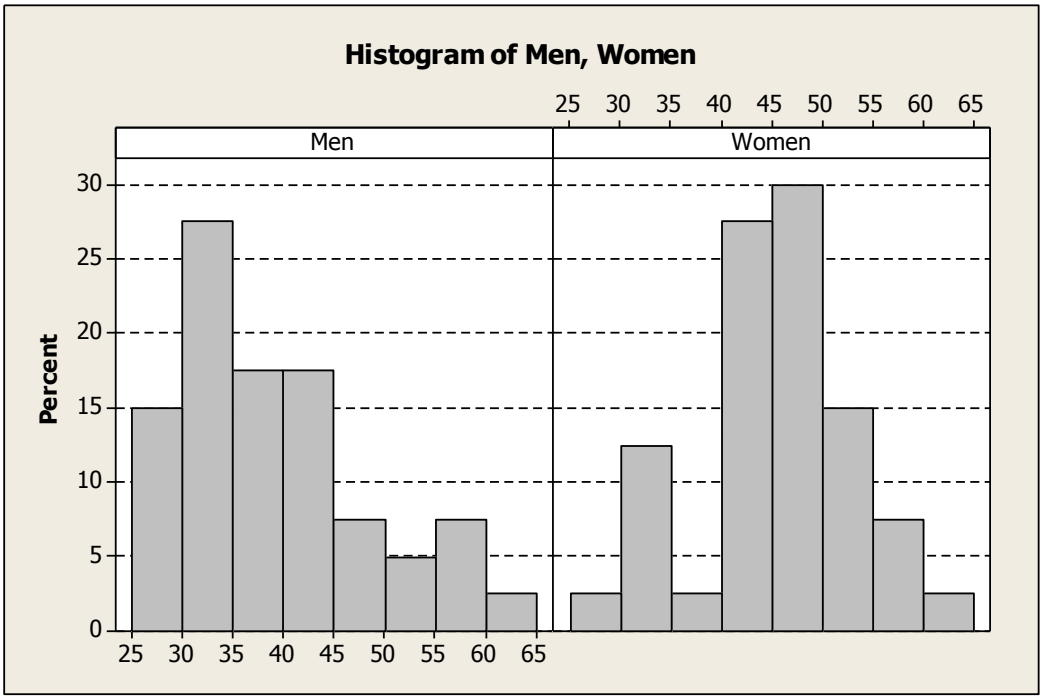
4.6. Select the *Scale* tab and set the *Position of ticks* to the same expression used on the previous dialog.



4.7. Change the scale on the *y*-axis if necessary, by double-clicking on it and setting the *Position of ticks.*

4.8. Double-click a gridline. Choose *Custom* and set the *Color* to *black*. (Do this so that the gridlines will show up when you print the histogram.)

4.9. Choose *OK* to display the graph.

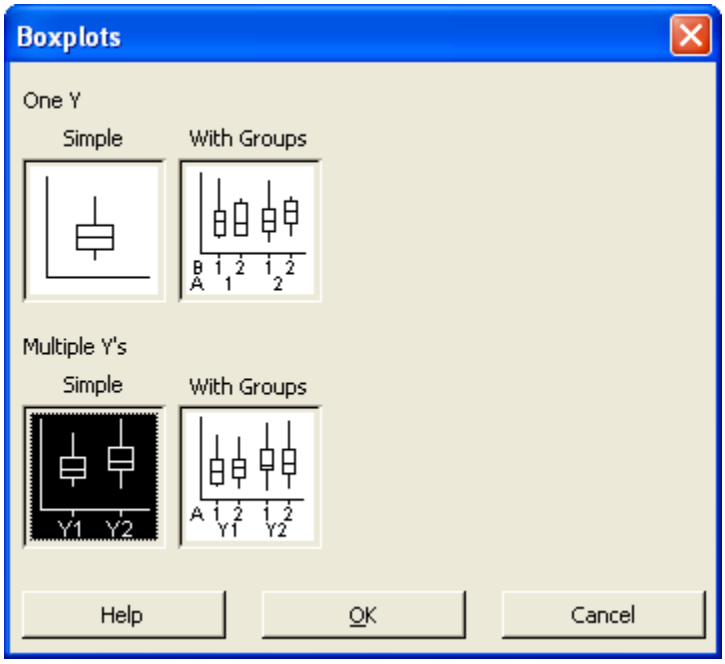


4.10. Select the graph window. Then, choose *Edit/Copy Graph*.
4.11. Go to Word and position the cursor where you want the picture to appear.
4.12. Choose *Paste/Paste Special*

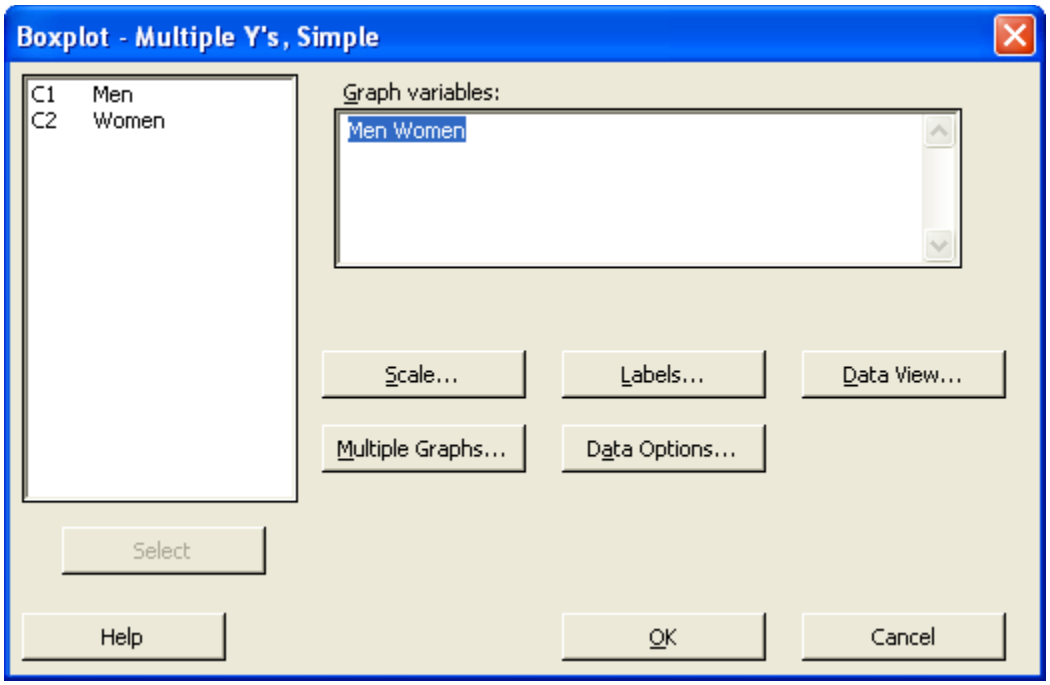
4.13. Select, *Picture (Windows Metafile)* and then choose *OK*.

5. Boxplots

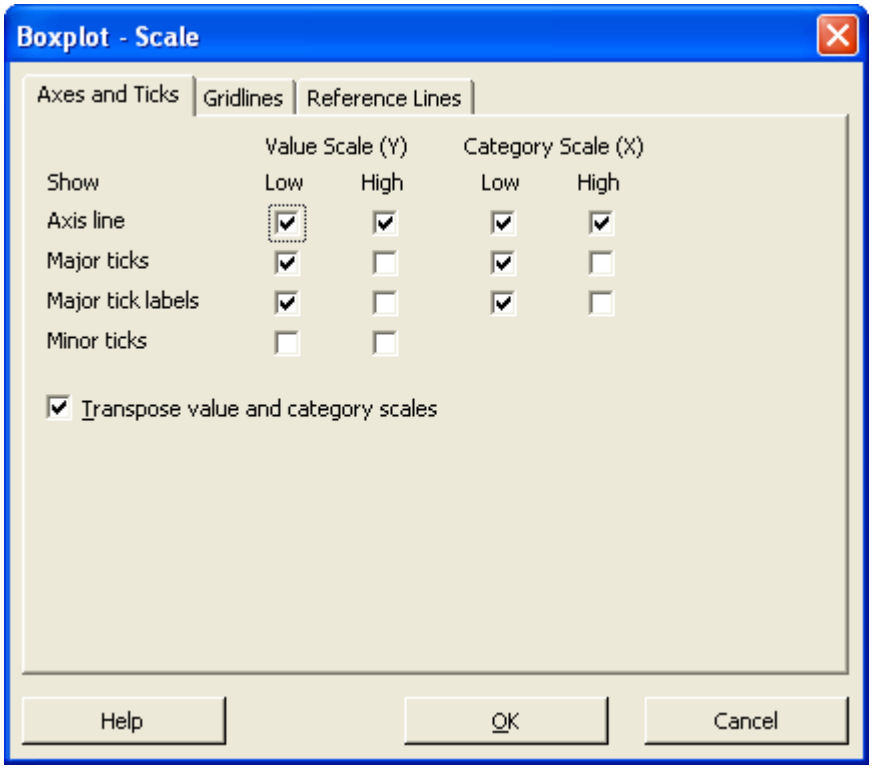
5.1. Choose, *Graph/Boxplot* and then *Multiple Y's – Simple*, then choose *OK.* data sets.



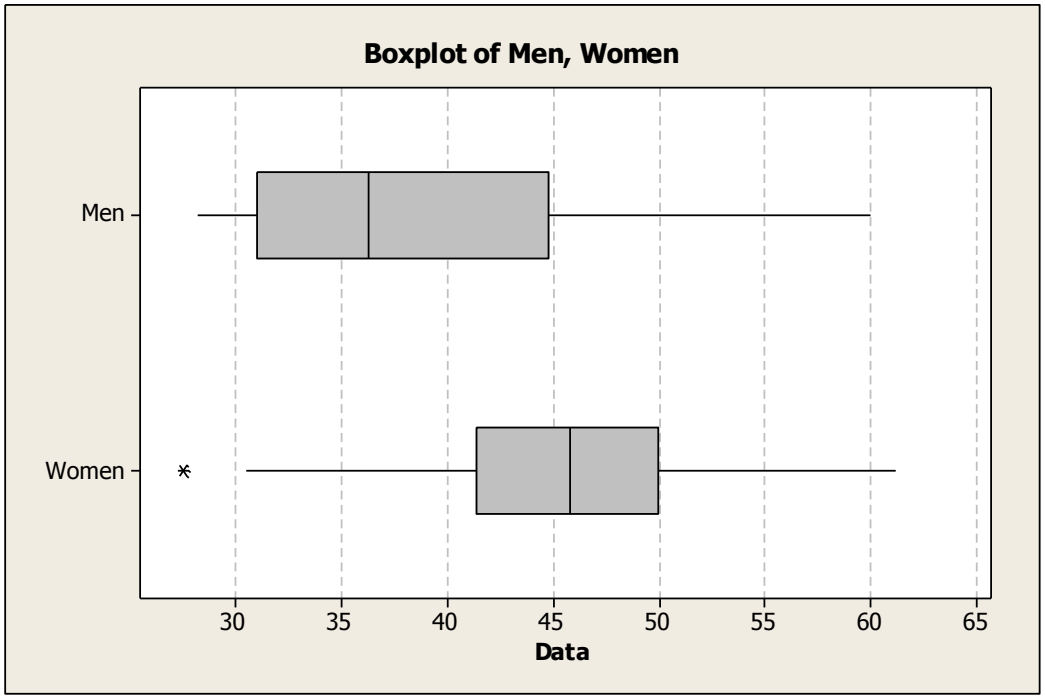
5.2. Choose the two data sets.



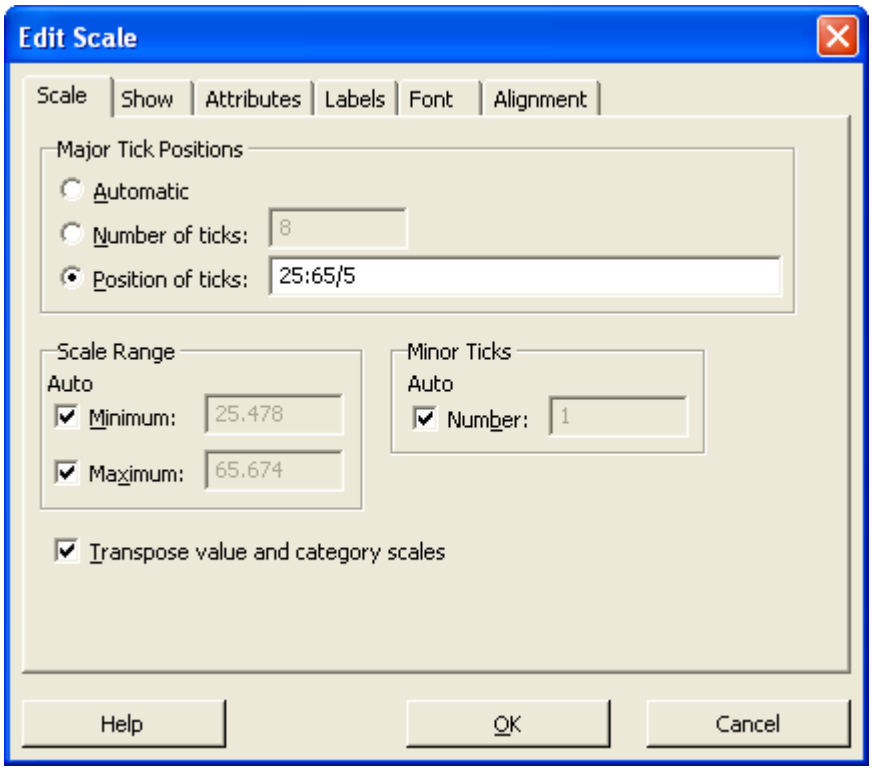
5.3. Choose the *Axes and Ticks* tab. Select *Transpose value...*. Choose *OK*.



5.4. Choose *OK* again and the boxplots will be displayed.



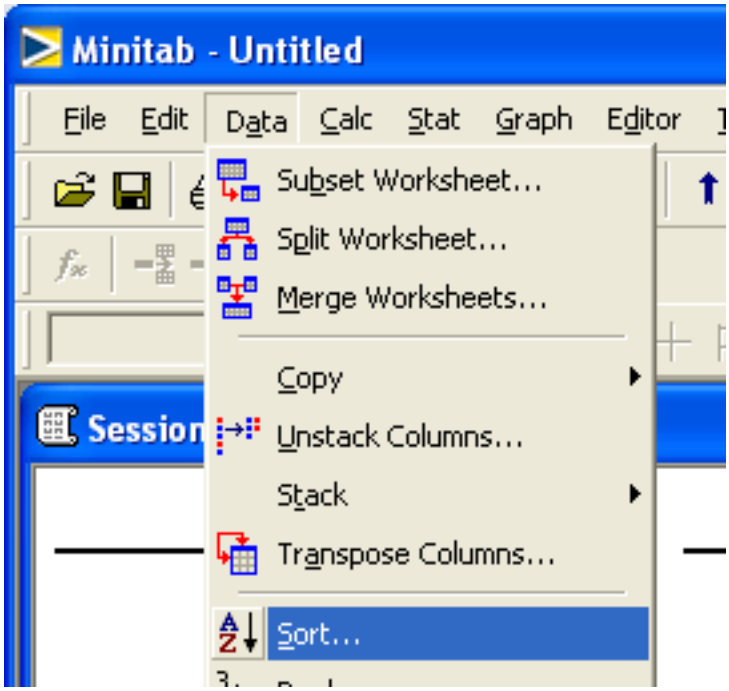
5.5. Double-click a value on the *x*-axis. On the *Scale* tab, set the *Position of ticks.* You may not have to do this if you are satisfied with the scale.



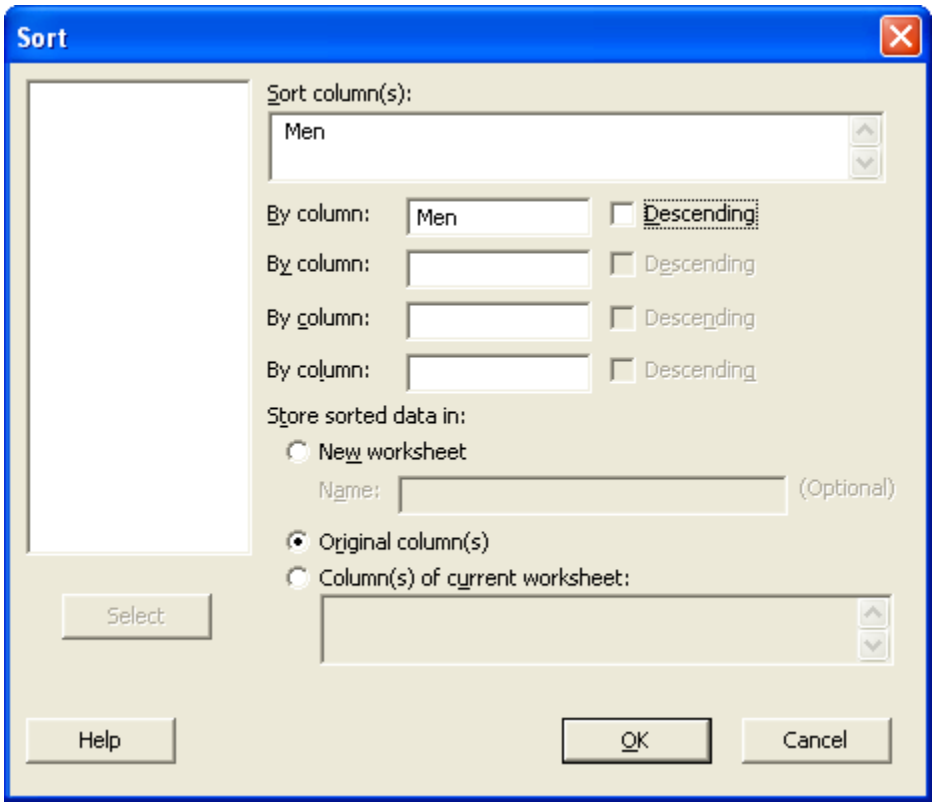
5.6. Choose *OK* to redisplay the boxplots.
5.7. Double-click a gridline. Choose *Custom* and set the *Color* to *black*.
5.8. Select the graph window. Then, choose *Edit/Copy Graph*.
5.9. Go to Word and position the cursor where you want the picture to appear.
5.10. Choose *Paste/Paste Special.*
5.11. Select, *Picture (Windows Metafile)* and then choose *OK*.

6. Z-Scores

6.1. Choose, *Data/Sort*.

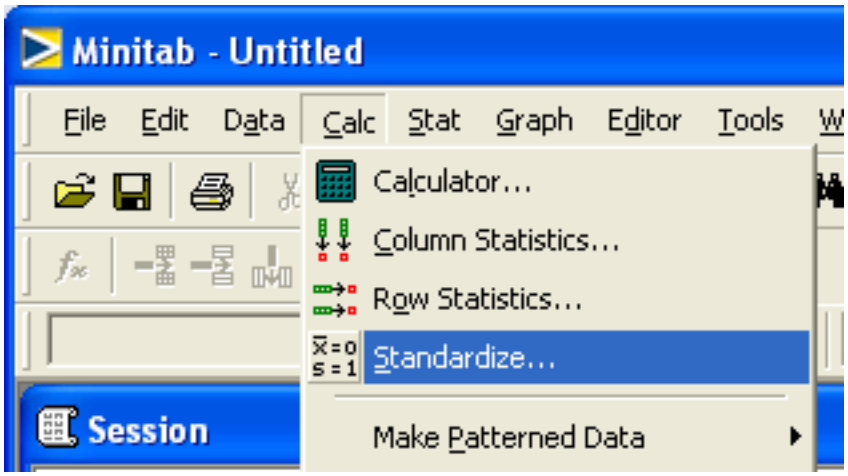


6.2. Set the *Sort column* to a single data set. Set the *By column* to the same data set. Select the *Original column(s)* options. Choose *OK.*

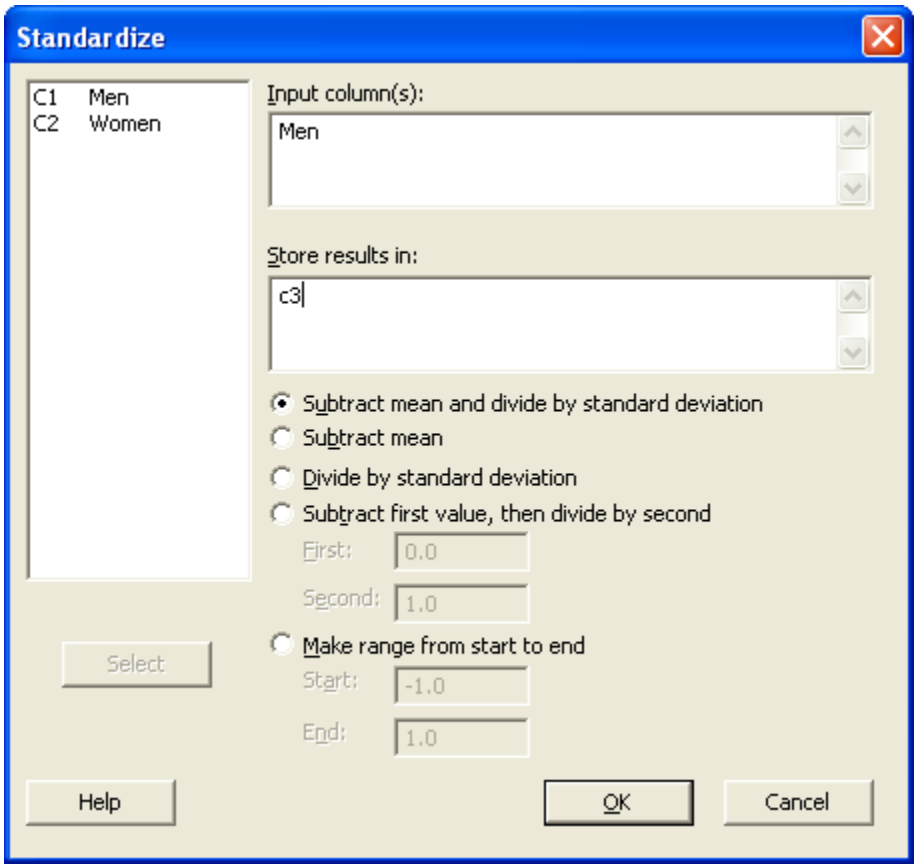


6.3. Repeat steps 6.1 and 6.2 for the other data set.

6.4. Choose, *Calc/Standardize*.



6.5. Set the *Input column* to a single data set. Set the *Store results in* to a **new** column (in the example below, C3). Choose *OK.* The z-scores will appear in the new column.



6.6. Repeat steps 6.4 and 6.5 with the other data set. Store the results in C4.

6.7. Name the columns for the Z-scores.

Worksheet 1 ***

→	C1	C2	C3	C4
	Men	Women	Z-Men	Z-Women
1	28.2	27.5	-1.18926	-2.33289
2	28.7	30.5	-1.13497	-1.94229
3	29.3	33.8	-1.06982	-1.51262
4	29.5	33.9	-1.04810	-1.49960
5	29.7	34.0	-1.02639	-1.48658

6.8. Select the columns of data and z-scores:

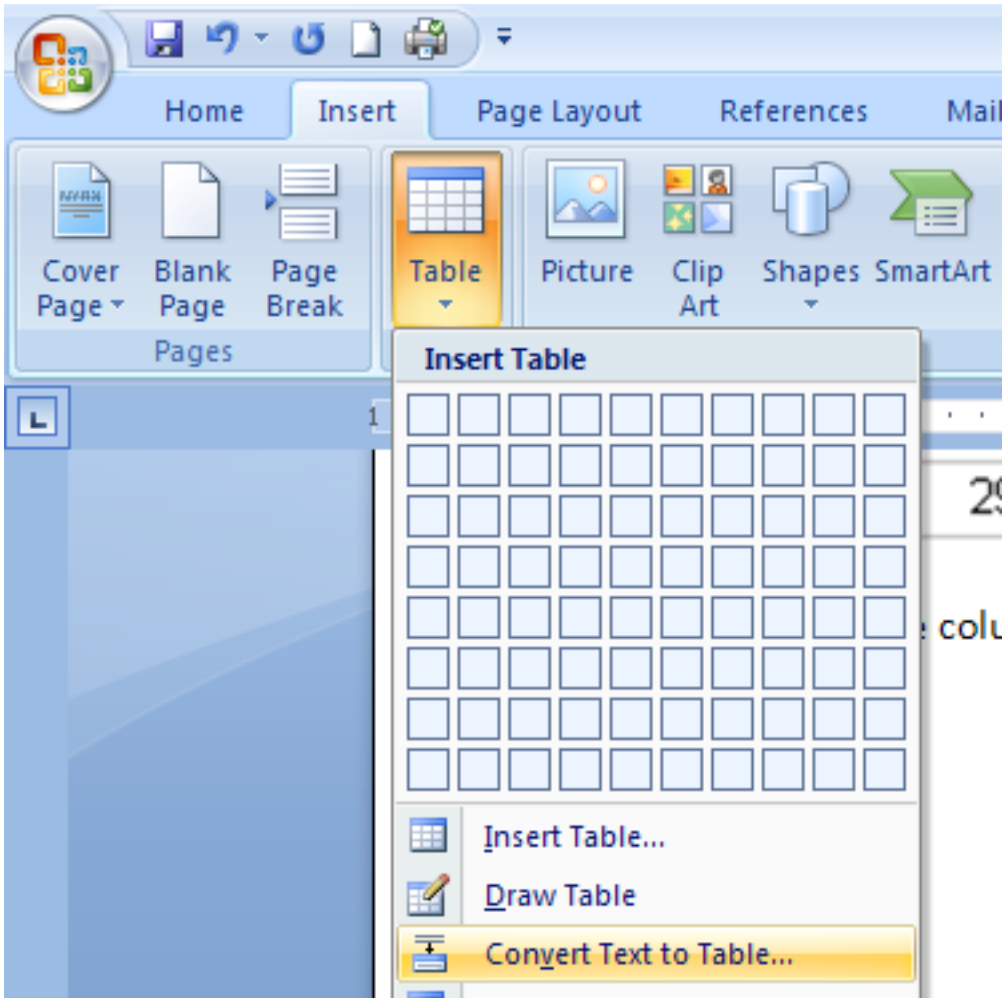
Worksheet 1 ***

→	C1	C2	C3	C4
	Men	Women	Z-Men	Z-Women
1	28.2	27.5	-1.18926	-2.33289
2	28.7	30.5	-1.13497	-1.94229
3	29.3	33.8	-1.06982	-1.51262

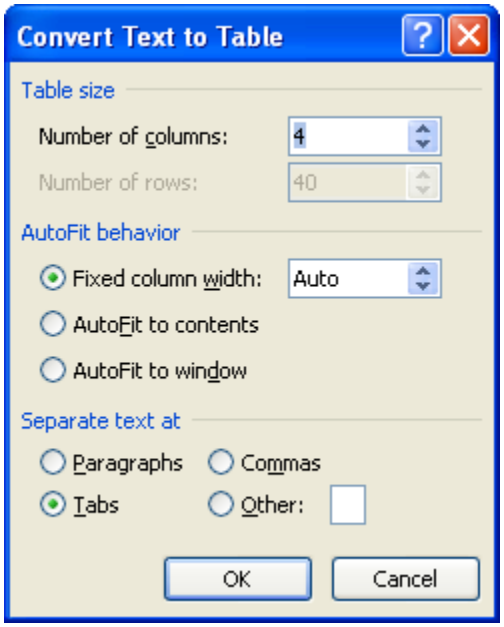
6.9. Choose, *Edit/Copy Cells*

6.10. Go to Word and position the cursor where you want the data to be displayed and paste the data.

6.11. With the data selected in Word, choose *Insert/Table/Convert Text to Table...*



6.12. Make sure the *Number of columns* is 4.



6.13. Double-click a column line while the table is selected. This will resize the table to fit the contents.

7. Save Your Work

7.1. Choose, *File/Save* and save your Minitab project. It will use the extention *.MPJ*. To re-open your work, just double-click the *.MPJ* file on a computer that has Minitab.

This is the end of *Descriptive Statistics*