





3. It is now time to start drawing the boxplot. The first thing you need to do is select the whole table that you just created.

The screenshot shows a Microsoft Excel window titled "ScatterplotData". The main data table is as follows:

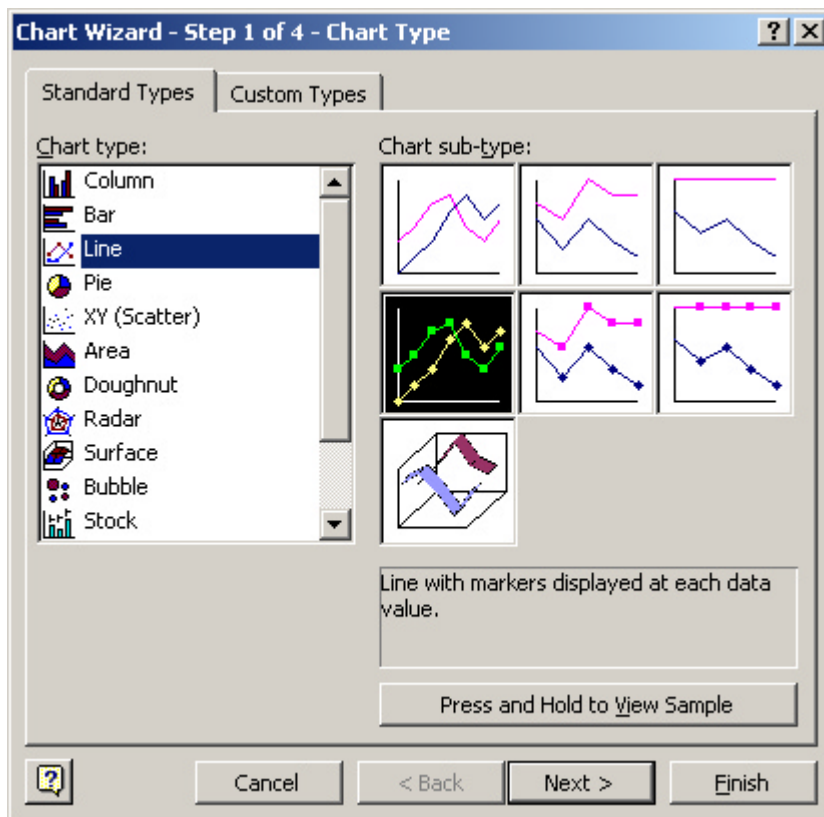
	A	B	C	D	E	F	G	H	I
1	Gender	Mass	Rate						
2	M	62	1792				LQ	41.6	
3	M	62.9	1666				Median	47.4	
4	F	36.1	995				Minimum	33.1	
5	F	54.6	1425				Maximum	62.9	
6	F	48.5	1396				UQ	51.5	
7	F	42	1418						
8	M	47.4	1362						
9	F	50.6	1502						
10	F	42	1256						
11	M	48.7	1614						
12	F	40.3	1189						
13	F	33.1	913						
14	M	51.9	1460						
15	F	42.4	1124						
16	F	34.5	1052						
17	F	51.1	1347						
18	F	41.2	1204						
19	M	51.9	1867						
20	M	46.9	1439						
21									
22									
23									

Summary statistics for Mass are shown in a separate table:

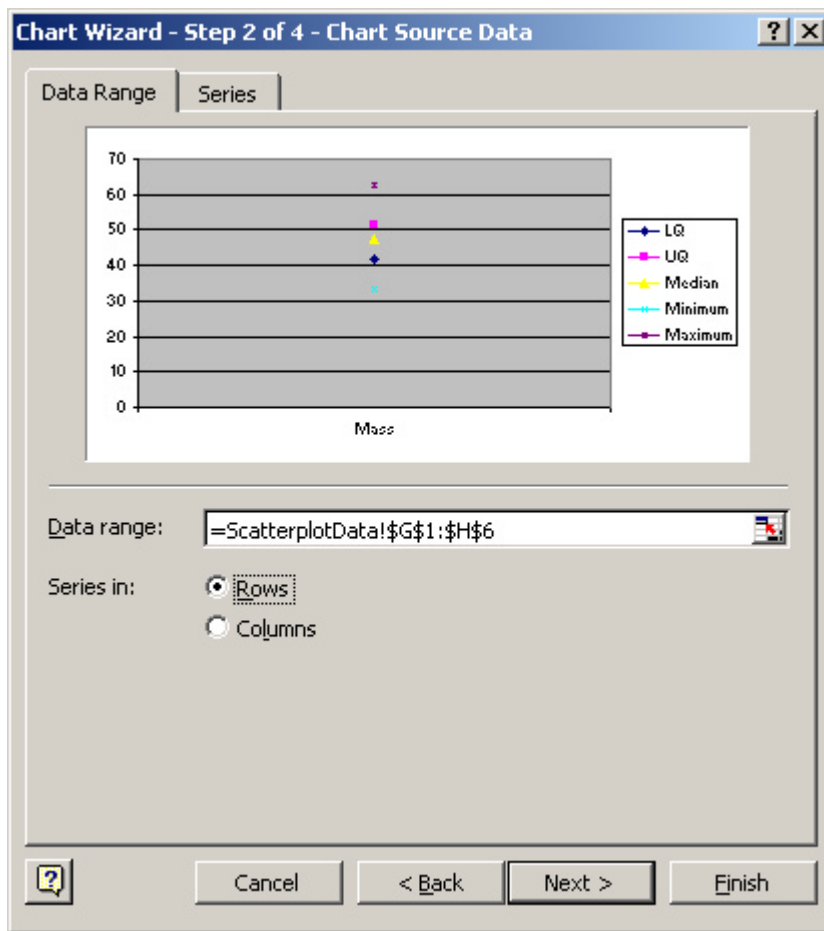
	G	H
LQ		41.6
Median		47.4
Minimum		33.1
Maximum		62.9
UQ		51.5

The status bar at the bottom shows "Ready" and "Sum=236.5".

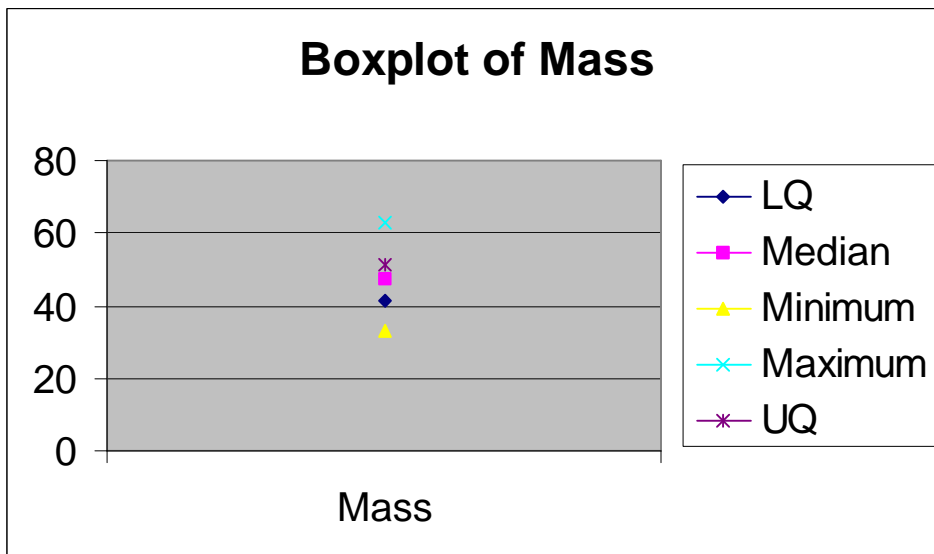
4. Then start the chart wizard and select the line type chart. I recommend that you also select the line chart with marker points. This will make it a little bit easier later on. Move to the next step by clicking next.



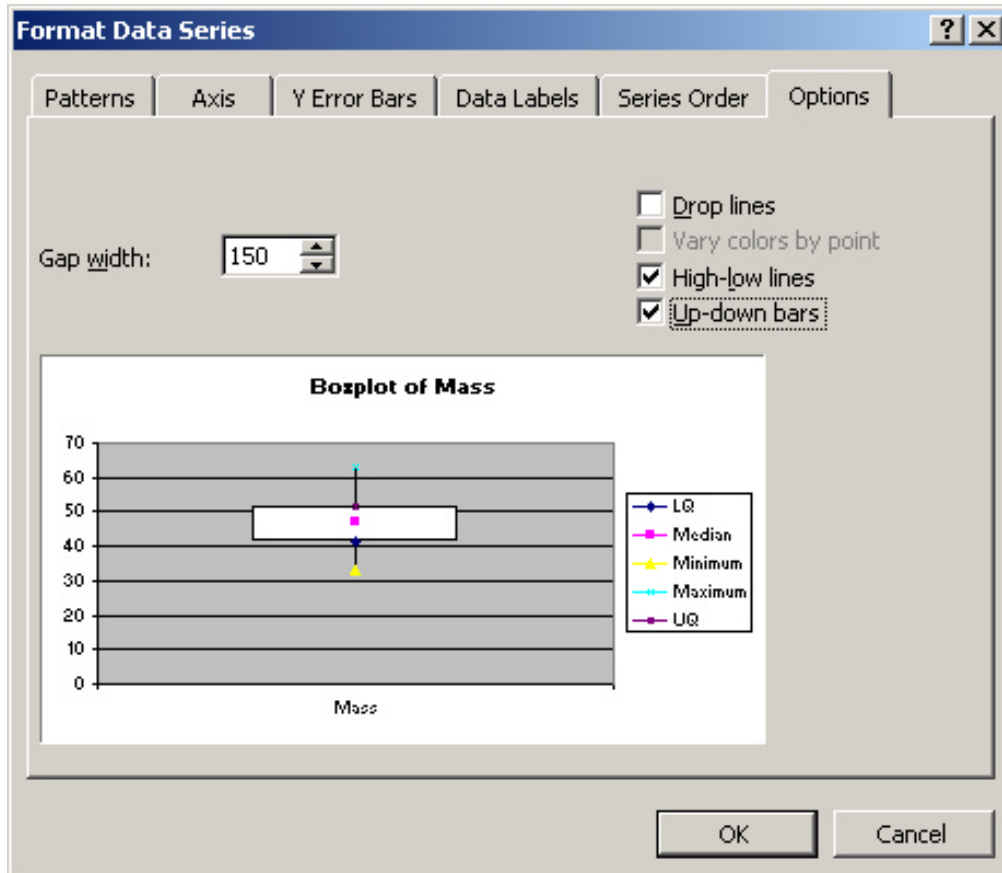
5. On step 2 of the chart wizard make sure that you click “Series in rows”. You could now click finish or you could click next move to the next step where you could set the title of the plot and then click finish.



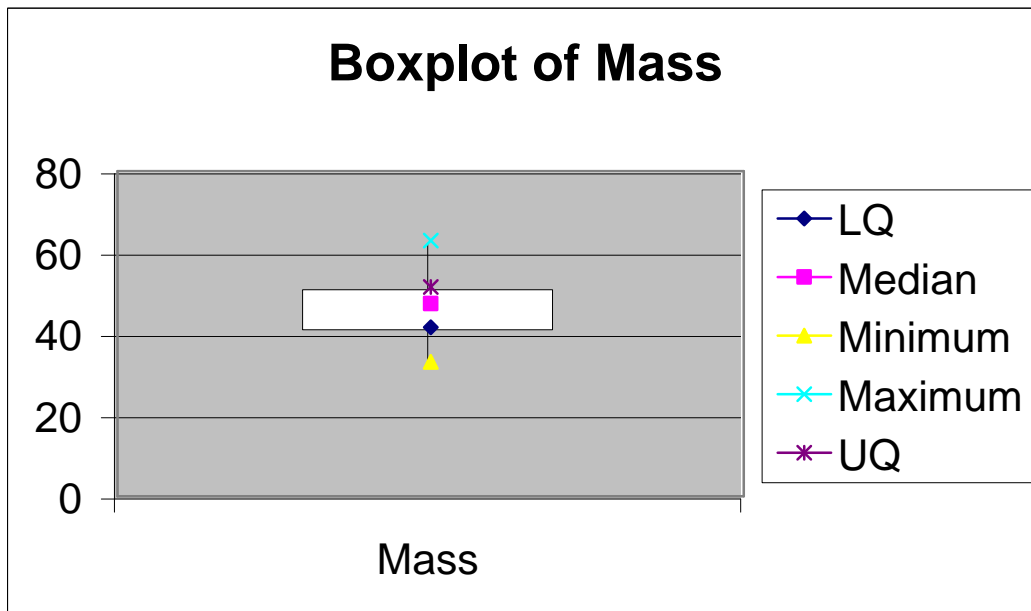
6. Now you should have a plot that looks something like the following



7. The next step is a little tricky. You need to double click on one of the points. I recommend trying for the median. Once you double click on the data point the *Format Data Series* dialog opens. Click on the *options* tab. Then make sure that *High-low lines* and *Up-down bars* get checked. Finally click ok.

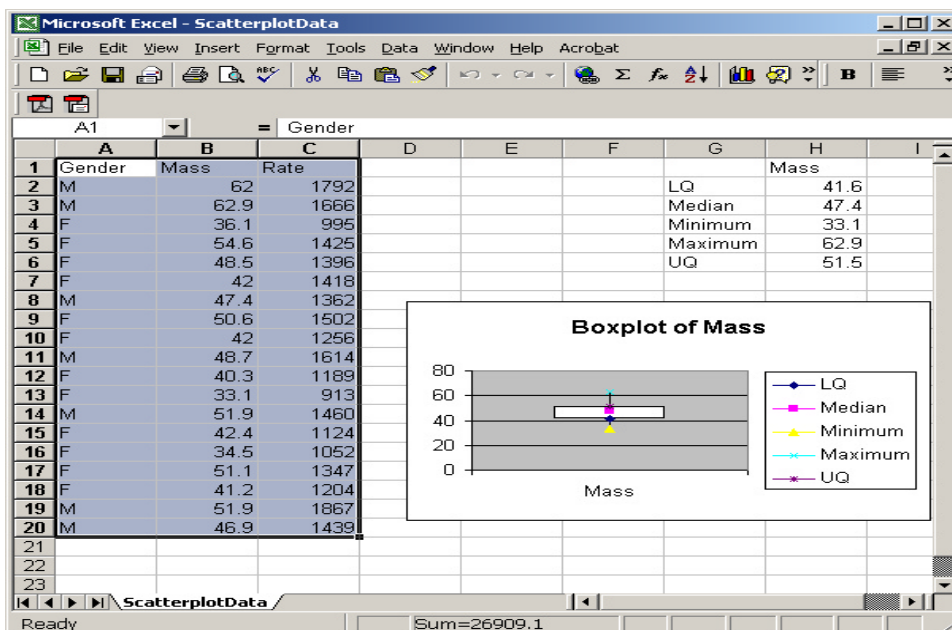


8. Your boxplot is now done. It should look something like the following.



### Making boxplots of a variable by levels of a categorical variable

1. In class we talked about using different boxplots based on different levels of a categorical variable. Excel allows us to do this, but it is a little bit harder than the simple plot we did before.
2. The first step is to sort the data so that all the female measurements are together and the male measurements are together. I recommend that you copy and paste the data columns into another location on the spreadsheet, so that the original data is not affected. To do this select the three data columns and select copy from the edit menu.



3. Now move over to an empty part of the spreadsheet (say column K). Click on cell K1 and then choose paste from the edit menu. Your spreadsheet should now look something like this

	K	L	M
1	Gender	Mass	Rate
2	M	62	1792
3	M	62.9	1666
4	F	36.1	995
5	F	54.6	1425
6	F	48.5	1396
7	F	42	1418
8	M	47.4	1362
9	F	50.6	1502
10	F	42	1256
11	M	48.7	1614
12	F	40.3	1189
13	F	33.1	913
14	M	51.9	1460
15	F	42.4	1124
16	F	34.5	1052
17	F	51.1	1347
18	F	41.2	1204
19	M	51.9	1867
20	M	46.9	1439

4. Now we will sort the data. Select the data in the new columns (ie K, L, M) and then select Sort from the Data menu. In this sort dialog box make sure that *Gender* is in the Sort by drop down menu. Also make sure that the *My list has header row* check box is checked. To finish this dialog box click ok.

Sort

Sort by   Ascending  Descending

Then by   Ascending  Descending

Then by   Ascending  Descending

My list has  Header row  No header row

Options... OK Cancel



5. The data should now be sorted by gender. Your spreadsheet window should look like this:

	I	J	K	L	M	N	O	P	Q
1			Gender	Mass	Rate				
2			F	36.1	995				
3			F	54.6	1425				
4			F	48.5	1396				
5			F	42	1418				
6			F	50.6	1502				
7			F	42	1256				
8			F	40.3	1189				
9			F	33.1	913				
10			F	42.4	1124				
11			F	34.5	1052				
12			F	51.1	1347				
13			F	41.2	1204				
14			M	62	1792				
15			M	62.9	1666				
16			M	47.4	1362				
17			M	48.7	1614				
18			M	51.9	1460				
19			M	51.9	1867				
20			M	46.9	1439				

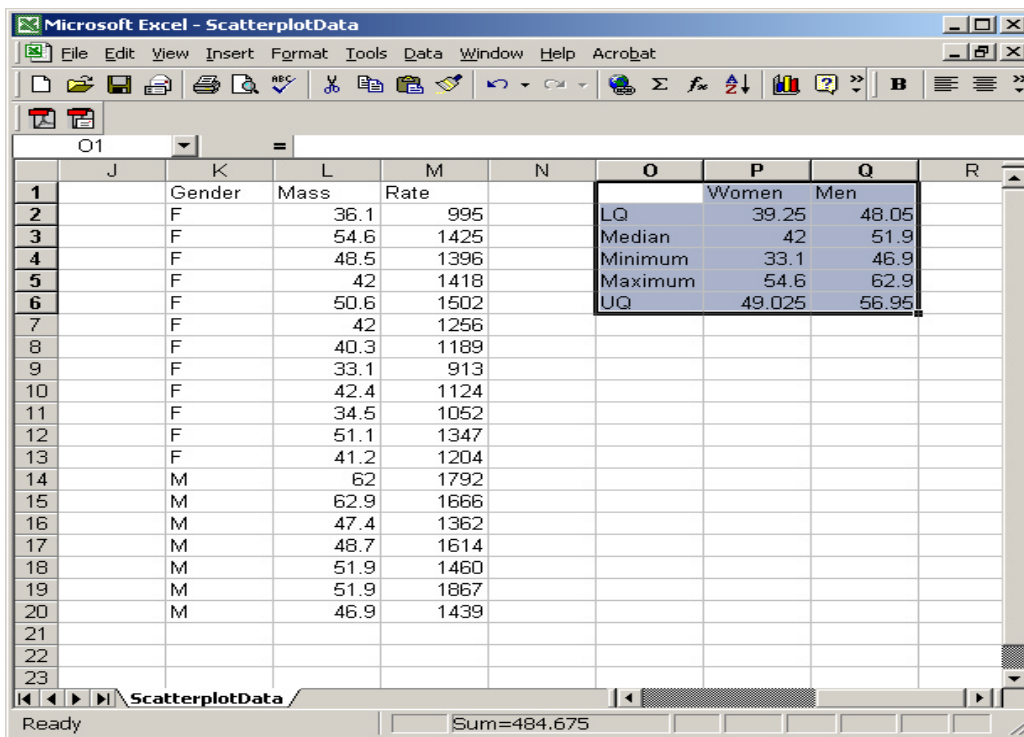
6. The next stage is to create yourself a table of LQ, Median, Minimum, Maximum and UQ values broken down by Gender. Set yourself up a table that looks something like this:

	J	K	L	M	N	O	P	Q	R
1		Gender	Mass	Rate			Women	Men	
2		F	36.1	995		LQ			
3		F	54.6	1425		Median			
4		F	48.5	1396		Minimum			
5		F	42	1418		Maximum			
6		F	50.6	1502		UQ			
7		F	42	1256					
8		F	40.3	1189					
9		F	33.1	913					
10		F	42.4	1124					
11		F	34.5	1052					
12		F	51.1	1347					
13		F	41.2	1204					
14		M	62	1792					
15		M	62.9	1666					
16		M	47.4	1362					
17		M	48.7	1614					
18		M	51.9	1460					
19		M	51.9	1867					
20		M	46.9	1439					

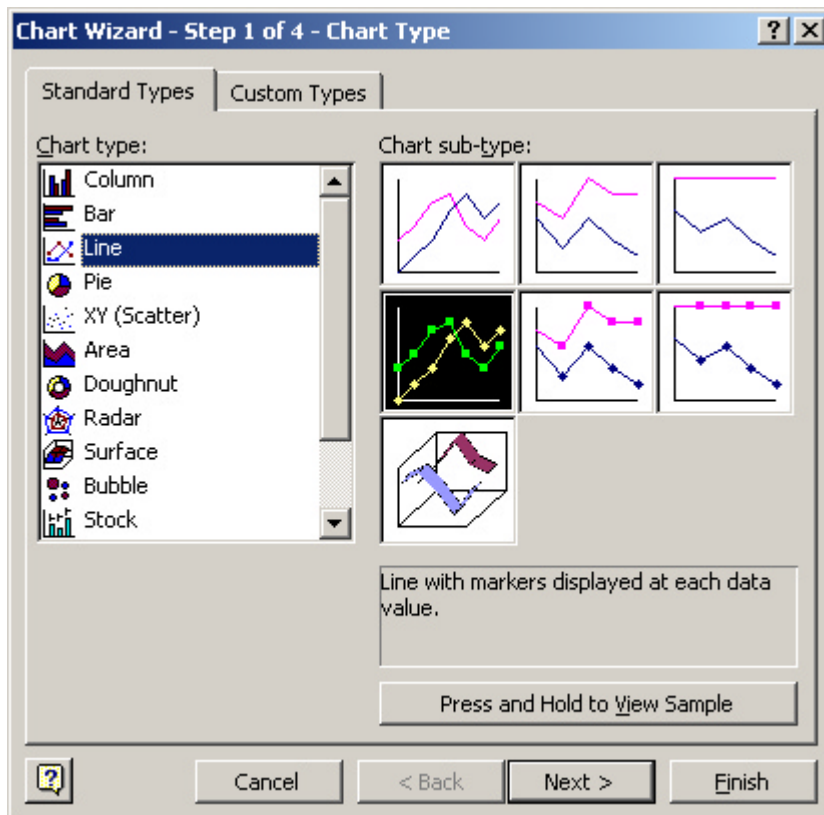
7. And of course you need to enter the formulas for computing all these quantities:

	Formula for Women	Formula for Men
LQ	=QUARTILE(L2:L13,1)	=QUARTILE(L14:L20,1)
Median	=MEDIAN(L2:L13)	=MEDIAN(L14:L20)
Minimum	=MIN(L2:L13)	=MIN(L14:L20)
Maximum	=MAX(L2:L13)	=MAX(L14:L20)
UQ	=QUARTILE(L2:L13,3)	=QUARTILE(L14:L20,3)

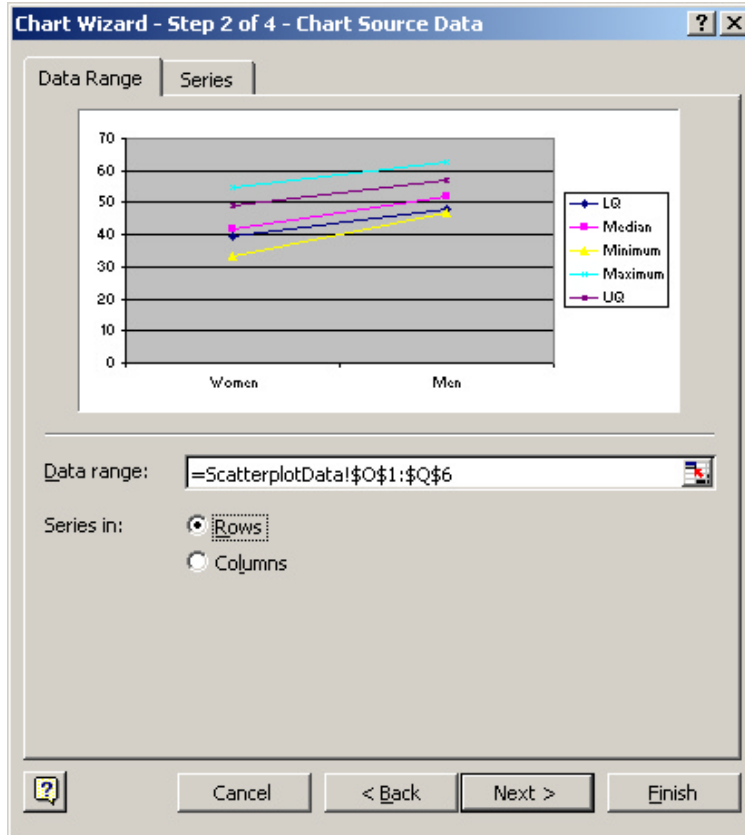
8. Next select the entire table like this:



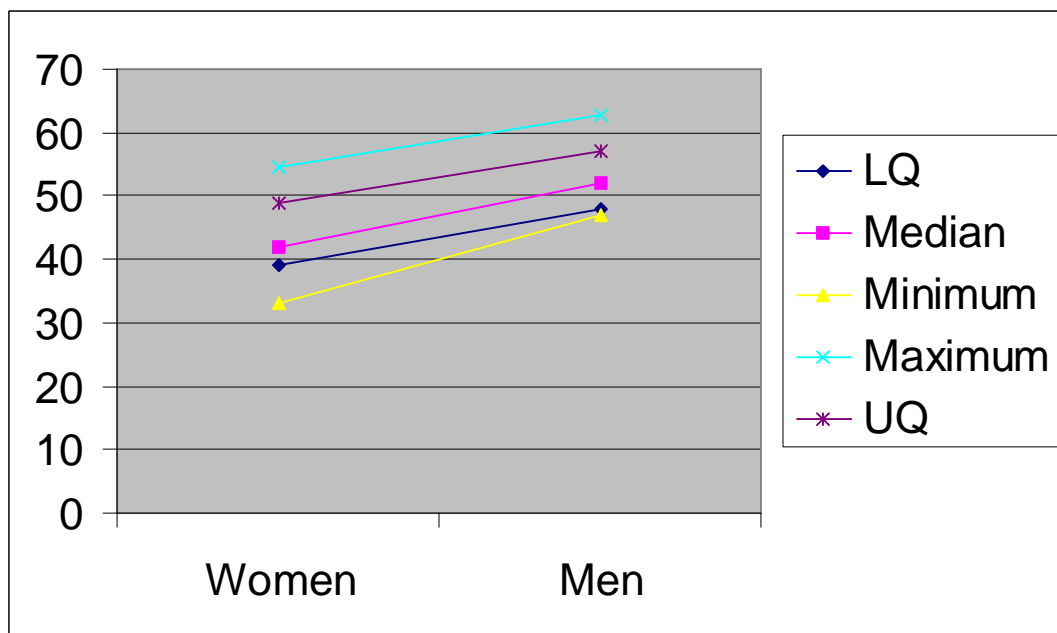
9. Start the chart wizard. Select the line chart type as before then click next



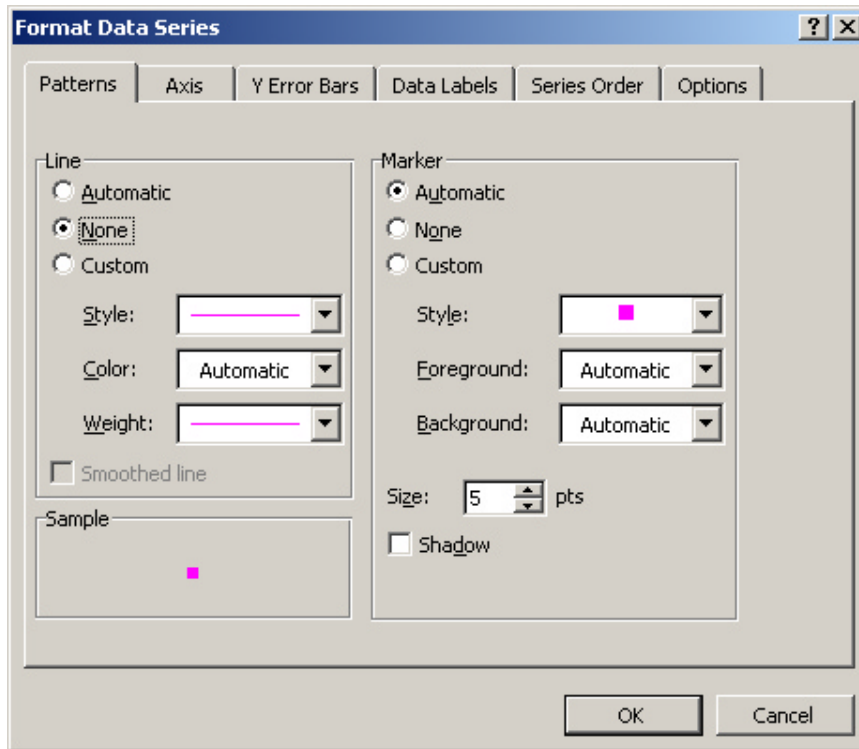
10. As before make sure that select Series in rows. Click finish to draw the chart.



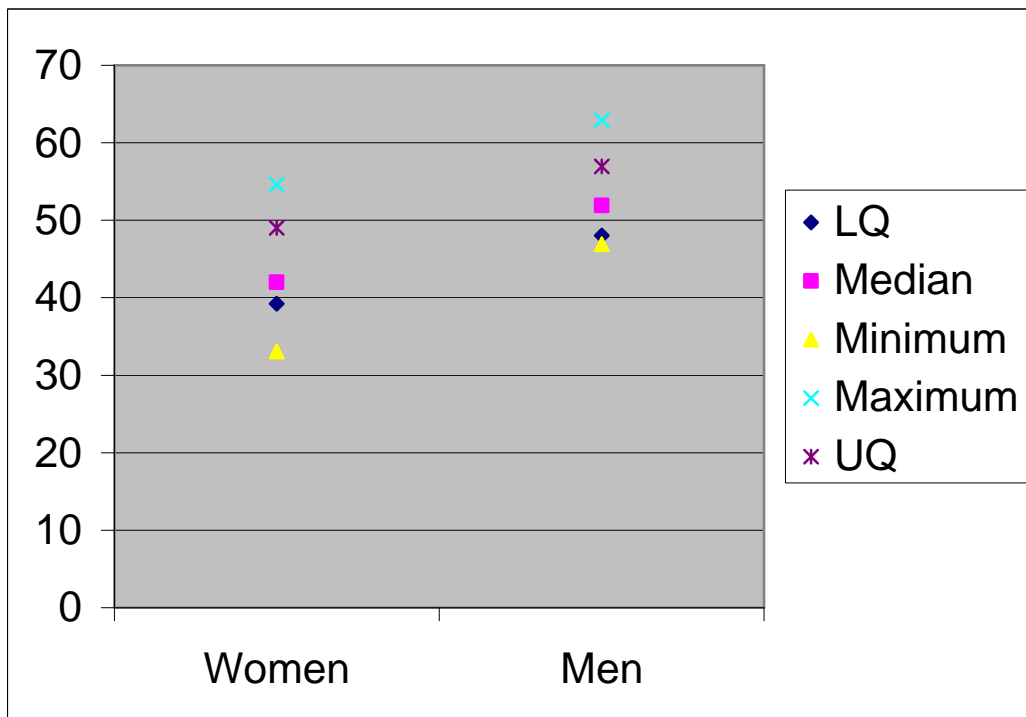
11. Your chart should look something like this:



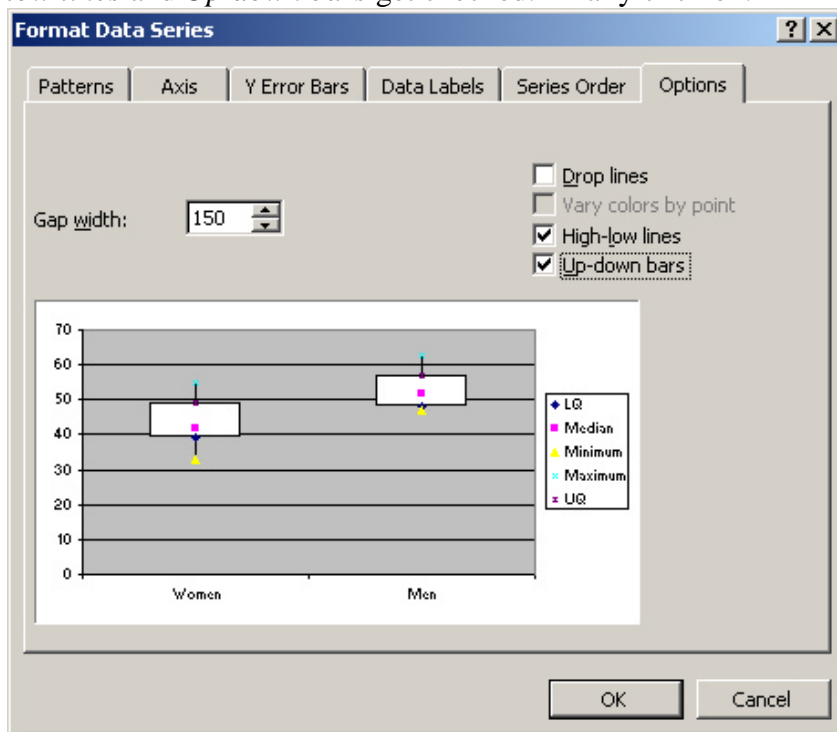
12. The next stage is to remove the connecting lines. To do this you need to double click on each line individually bringing up the Format Data Series dialog. Make sure that you click None in the Line radiobox group. The click ok. The line should have disappeared. You should repeat this process another four times to get rid of the remaining lines.



13. Once you've finished removing all the lines your plot should look like this:



14. Now double click on one of the points (I recommend the median) to again bring up the format data series dialog box. This time go to the Options tab and then make sure that *High-low lines* and *Up-down bars* get checked. Finally click ok.



15. Congratulations you are now done. Your boxplots should look something like this:

