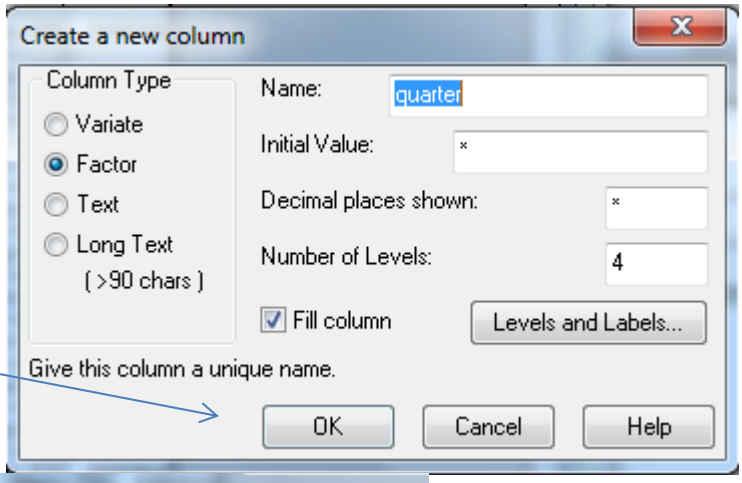
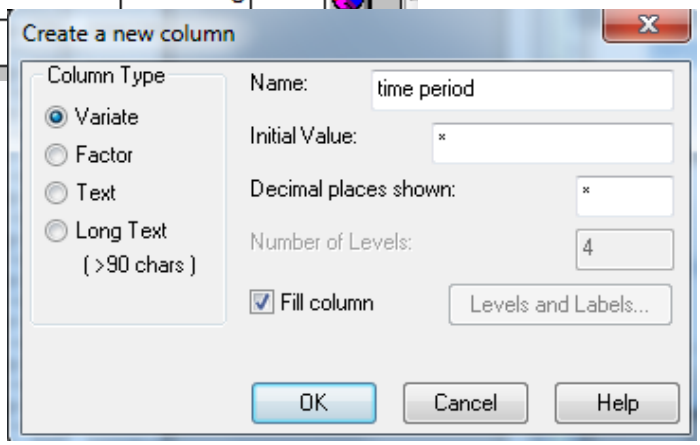
Genstat Instructions

1. Check you have a quarters/month etc factor column. If not,
   a.  insert new column
   b. Obviously if you have monthly data you will need 12 levels not 4
   c. Click on Levels and Labels to put names in.
   d. Fill in as shown

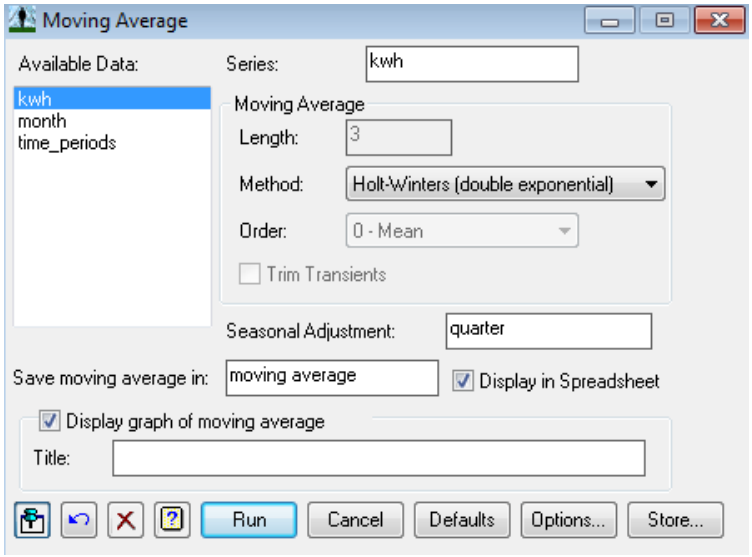


Ordinals	Levels	Labels	Counts	Colour
1	1	Mar	0	
2	2	Jun	0	
3	3	Sep	0	
4	4	Dec		

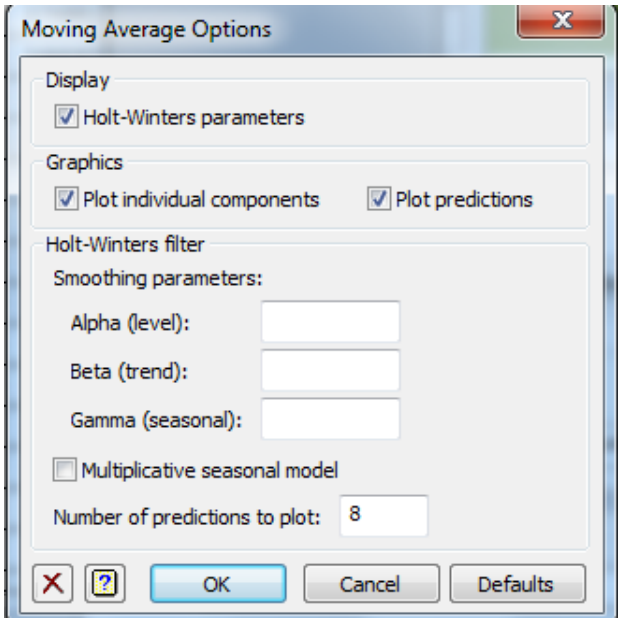
2. Check you have a time period column. If not,
   a.  insert new column
   b. Fill in as shown



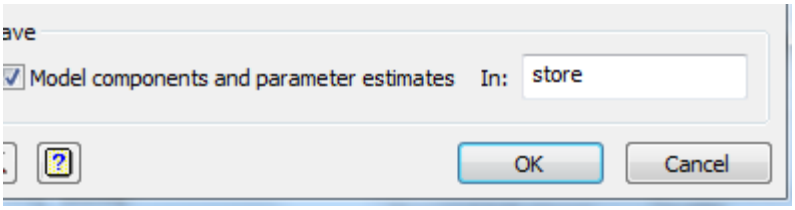
3. To smooth the data go to **Stats/Time Series/ Moving Average**
4. Fill in as shown **and**



5. Click on **Options**
   a. Fill in as shown
   b. Click **OK**

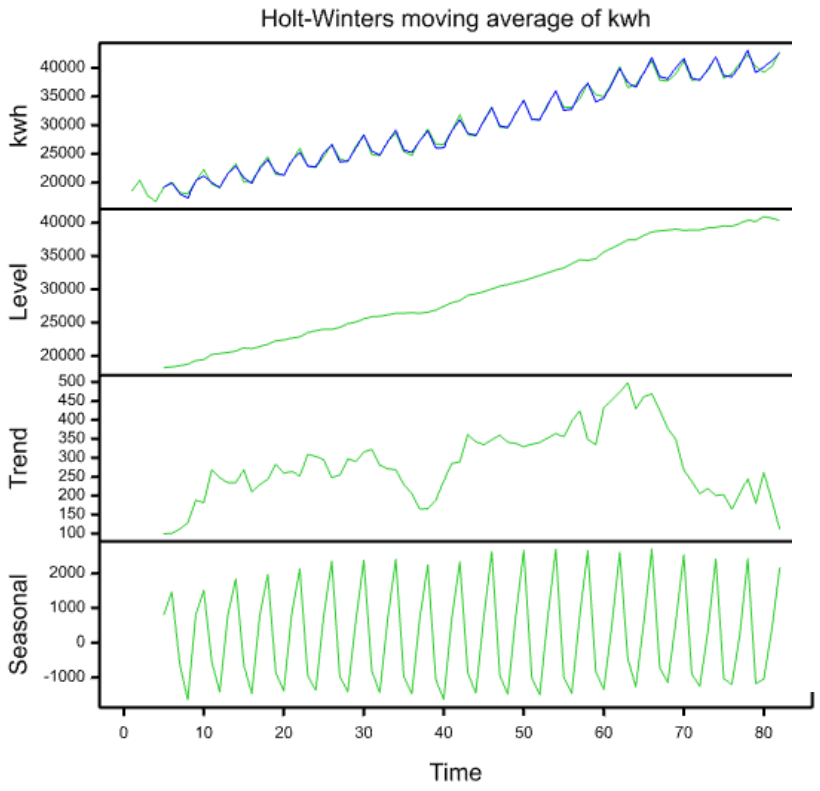


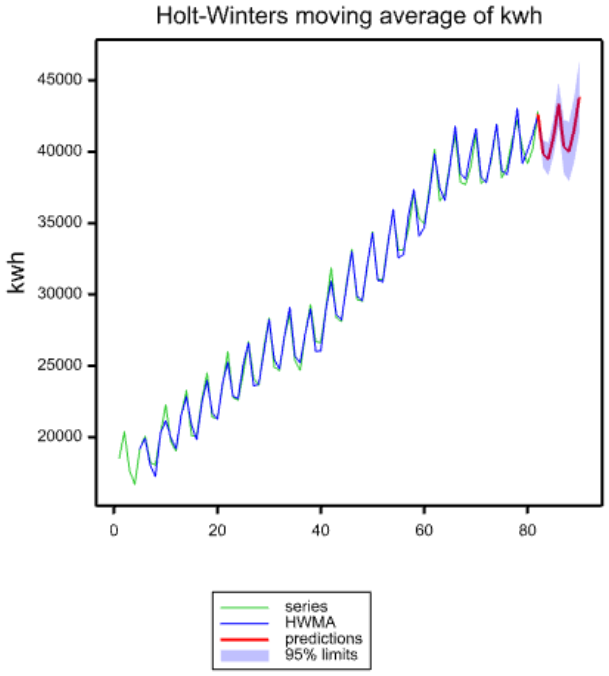
6. Click on **Store** in the **Moving Average window**



7. Click Run

8. You should get the following graphs:





9. You spreadsheet should look like this

time_periods	quarter	month	kwh	moving_average	store['Level']	store['Trend']	store['Season']
1	1	Mar-74	18515	*	*	*	*
2	2	Jun-74	20377	*	*	*	*
3	3	Sep-74	17681	*	*	*	*
4	4	Dec-74	16692	*	*	*	*
5	1	Mar-75	19184	19168.4	18263	99.5	805.875
6	2	Jan-75	20078	19932.7	18370.9	100.707	1461.13
7	3	Sep-75	18260	18045.4	18549.3	111.936	-615.875
8	4	Dec-75	18023	17253.5	18776.1	128.52	-1651.13
9	1	Mar-76	20234	20315.1	19316.5	187.983	810.567
10	2	Jun-76	22272	21147.6	19461.1	181.719	1504.75
11	3	Sep-76	19684	19961.8	20244.7	268.613	-551.441
12	4	Dec-76	19031	19191.6	20364.6	247.143	-1420.09
13	1	Mar-77	21545	21546.7	20525.7	234.73	786.229

10. There should be another sheet that looks like this

Row	store['Prediction']	store['Lower']	store['Upper']
1	39832	38864.6	40799.4
2	39491.9	38357.4	40626.3
3	41020.6	39704.5	42336.8
4	43334.4	41823.5	44845.3
5	40353.9	38480.7	42227.1

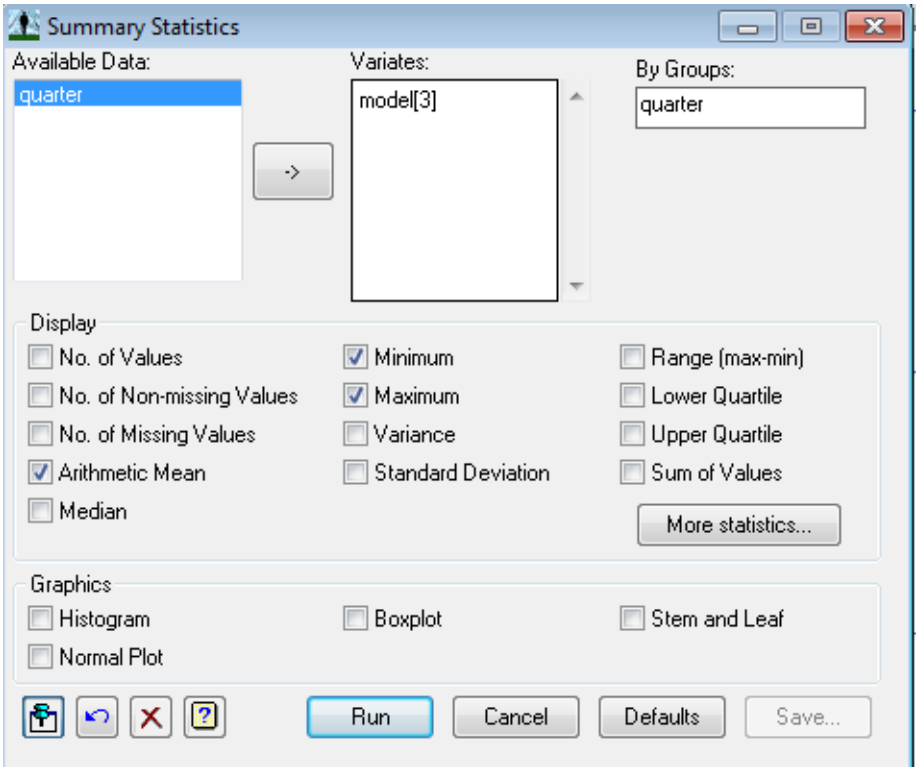
This sheet contains the predictions and the lower and upper limits of your confidence interval for predictions

Summary Stats

If you want to investigate the variation in seasonal data

Use **Summary Statistics** from the **Stats** menu

Fill in as shown



You will get the following in the **Output** (look in the **Window** menu)

Summary statistics for model['Season']: quarter mar

Mean = 654.1
Minimum = 214.7
Maximum = 840.7

Summary statistics for model['Season']: quarter jun

Mean = 2307
Minimum = 1461
Maximum = 2704

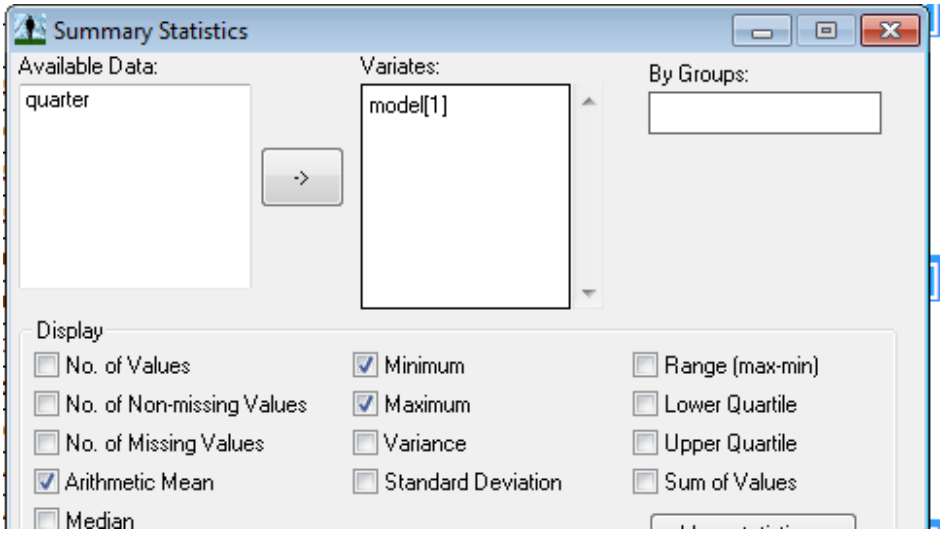
Summary statistics for model['Season']: quarter sep

Mean = -861.8
Minimum = -1179
Maximum = -453.0

Summary statistics for model['Season']: quarter dec

Mean = -1392
Minimum = -1651
Maximum = -1048

To investigate the long term trend: repeat but fill in box

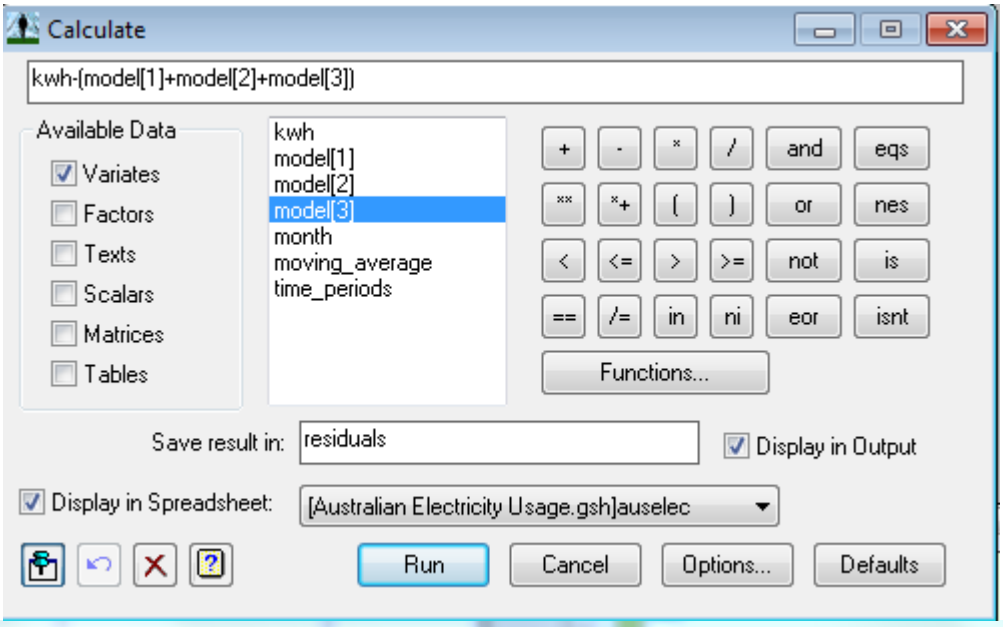


Summary statistics for model['Level']

Mean = 29754
Minimum = 18263
Maximum = 40910

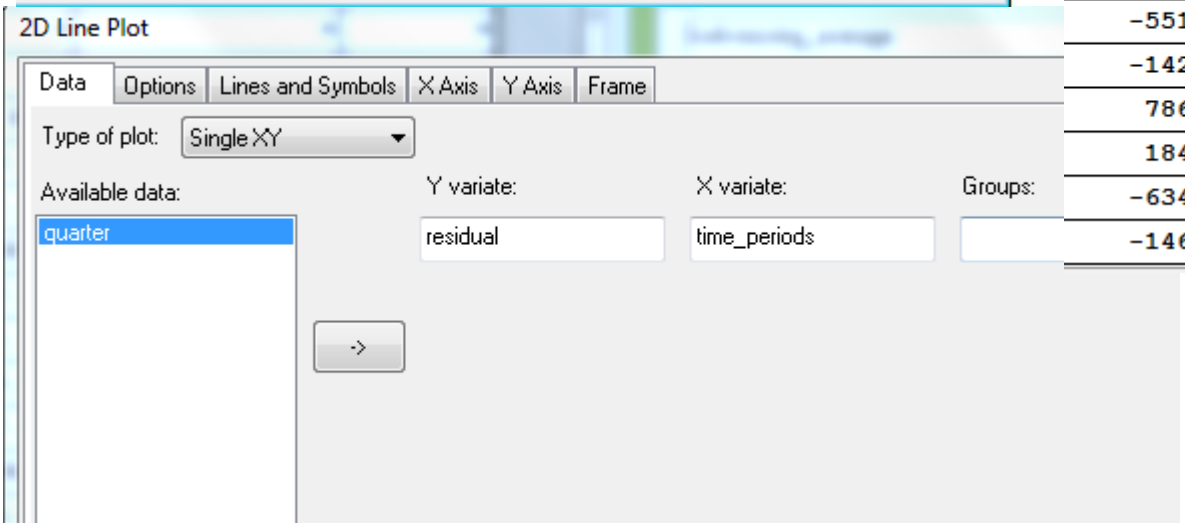
Residuals

To calculate the residuals, use the calculator  and fill in as shown



They will be displayed in the spreadsheet

el['Season']	residuals
*	*
*	*
*	*
*	*
805.875	-382.375
1461.13	-358.233
-615.875	-457.023
-1651.13	-130.174
810.567	-1584.92
1504.75	-511.052
-551.441	-2963.96
-1420.09	-2879.19
786.229	-2818.46
1842.37	-2616.31
-634.862	-4505.76
-1468.32	-2898.47



You can also graph these on a line graph …

This will allow you to look at times when the actual data series was much more or less than the model predicts.