FFT IN EXCEL:
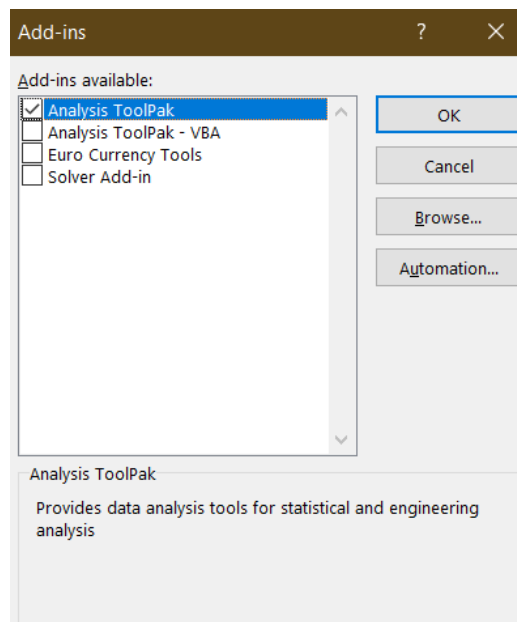
INPUTS:

The inputs must be in separate columns containing the time, X -Axis and Y -Axis data. Like this:

Time	DATA - X	DATA - Y
0	0.846055212	0.568021352
1	0.177611868	0.312074024
2	0.195563038	0.592176379
3	0.889125736	0.313843271
4	0.354602211	0.722310979
5	0.280934206	0.641682625
6	0.863441471	0.349909965
7	0.308955587	0.751970155
8	0.260010334	0.594757028
9	0.200056724	0.58940611
10	0.5552143	0.394447318
11	0.275721015	0.325203866
12	0.624254372	0.511772784
13	0.610752338	0.647962851
14	0.197415321	0.457503275
15	0.178838869	0.777335215

DATA ANALYSIS PACK:

For calculating FFT in excel we must add the File -> Options -> Add-Ins -> Manage: Excel Add-Ins -> Go

Then choose the 'Analysis ToolPak' and then install.

FFT:

For applying FFT, we must select the Data Analysis tool in Data menu. In the pop-up window, we must select the input data for which we want the FFT. The number of elements must be in powers of 2 for the function to work. We must also select where we want to paste the FFT results. After choosing both, the menu looks like this:

FREQUENCY RANGE:

The frequency is related to the sampling frequency and the number of samples. The time of each sample is divided by N/Fs, where N is the number of samples and Fs is the sampling frequency. When each value is divided by this term, we get a column containing all frequency ranges required.

Time	DATA - X	DATA - Y	FFT frequency
0	0.846055212	0.568021352	0
1	0.177611868	0.312074024	0.000488281
2	0.195563038	0.592176379	0.000976563
3	0.889125736	0.313843271	0.001464844
4	0.354602211	0.722310979	0.001953125
5	0.280934206	0.641682625	0.002441406
6	0.863441471	0.349909965	0.002929688
7	0.308955587	0.751970155	0.003417969
8	0.260010334	0.594757028	0.00390625
9	0.200056724	0.58940611	0.004394531
10	0.5552143	0.394447318	0.004882813
11	0.275721015	0.325203866	0.005371094
12	0.624254372	0.511772784	0.005859375
13	0.610752338	0.647962851	0.006347656
14	0.197415321	0.457503275	0.006835938
15	0.178838869	0.777335215	0.007324219

MAGNITUDE OF FFT:

The plot should show the magnitude of each frequency, so we must the absolute value of the data and then plot it against the frequency.

To take the absolute value of the imaginary value, the function IMABS() is used. The function is applied on one cell and then dragged all the way to the end so, it is applied on the values. After this the sheet looks like this:

Time	DATA - X	DATA - Y	FFT frequency	FFT X - 2048	FFT Y - 2048	X magnitude	Y magnitude
0	0.846055212	0.568021352	0	1026.63305610066	1141.43008807996	1026.633056	1141.430088
1	0.177611868	0.312074024	0.000488281	-5.52138226907061-2.12664891585744i	0.24560945376502-6.31410859382873i	5.916781031	6.31888371
2	0.195563038	0.592176379	0.000976563	5.61902538347198+2.22237256024927i	-0.924611936930144-3.85939565590409i	6.042547977	3.968607068
3	0.889125736	0.313843271	0.001464844	-1.19535400503116-10.5799972054945i	-11.604454820966-2.74672456034102i	10.64731009	11.92509402
4	0.354602211	0.722310979	0.001953125	-1.33975876396836-4.51249415177555i	1.18882775182718+8.90149572747143i	4.70718143	8.980531032
5	0.280934206	0.641682625	0.002441406	-1.73749855528698+9.4676078841505i	12.5608354982779+0.334517448362552i	9.625720767	12.56528911
6	0.863441471	0.349909965	0.002929688	5.58002354086753-0.663247936368077i	-8.21933476858009+6.16269282169621i	5.619302496	10.27308361
7	0.308955587	0.751970155	0.003417969	9.91018509819607-1.03336599194791i	4.31123908539049+6.67586887632593i	9.963915593	7.946949585
8	0.260010334	0.594757028	0.00390625	-8.24735182244962+3.05014398678882i	-3.65420822458646-6.49110419385366i	8.793303726	7.449004726
9	0.200056724	0.58940611	0.004394531	1.55893918922816-1.37243352819836i	-8.17306265506293-9.11008647268327i	2.076984638	12.23897989
10	0.5552143	0.394447318	0.004882813	-5.07698324259325-1.77502400705554i	2.94079740292116-4.4199326815541i	5.378333299	5.308869397
11	0.275721015	0.325203866	0.005371094	-2.57683481263317+1.42280459857335i	1.07298149662468-7.9357572240253i	2.943543881	8.007966784
12	0.624254372	0.511772784	0.005859375	1.26609247906376-8.51809698174191i	-3.38325713698935-2.53560338279457i	8.611676164	4.227967995
13	0.610752338	0.647962851	0.006347656	8.42120161488844+8.52703478791909i	9.74284409013459+6.42488777957297i	11.98444654	11.67056956
14	0.197415321	0.457503275	0.006835938	-14.8020033349155+2.39888582415595i	8.53293902021964+0.115720278642139i	14.99513107	8.53372366
15	0.178838869	0.777335215	0.007324219	-2.32042852578357-2.91857130440672i	0.195568597170665-2.8493954958994E-002i	3.728598531	0.197633453
16	0.691179633	0.458369767	0.0078125	-1.41387089920865-15.8921485313355i	-3.22784692657442-4.53271632806004i	15.95491823	5.564576632
17	0.267590924	0.731742307	0.008300781	-7.91208211369531+1.32136138214044i	2.40597335869327+9.44005359983042i	8.021660631	9.741833491
18	0.699294589	0.65264327	0.008789063	-2.31504614839583+7.03480998854509i	-4.46894733991188+7.88373011436125i	7.4059429	9.062267423
19	0.40937166	0.795208651	0.009277344	-2.38853039878464-2.69612974089401i	-1.31486192754661+2.06054524687821i	3.601970717	2.444321706
20	0.781446429	0.438983603	0.009765625	-0.502282936218774-7.10008684872796i	8.57947859395729+2.42012777789909i	7.117831229	8.914284683
21	0.889123385	0.321445995	0.010253906	3.3199478489691-1.45075230490082i	-7.80231765534781-4.53202778838674i	3.623083765	9.023050297
22	0.222502716	0.721347826	0.010742188	5.87718909283237-9.83281785781735i	9.62505813387835+1.87734349486939i	11.45537684	9.806434759
23	0.837054115	0.620188159	0.011230469	6.30925659960869+7.41598191599423i	-4.79276257350219-0.319925877900728i	9.736709229	4.803428531
24	0.551574661	0.519305636	0.01171875	14.4878609080882-0.472341174285976i	1.5275372046497+1.62312136129345i	14.49555863	2.228877041
25	0.383164728	0.55332167	0.012207031	-4.912799669144-6.91117159806839i	-1.57154130068927-0.698229755851804i	8.479380487	1.719670565
26	0.653269668	0.355221556	0.012695313	4.63114387569933+6.86182686649176i	7.73707608074844-2.11207195017965i	8.2784154	8.0201742
27	0.866727589	0.783384835	0.013183594	-4.59995804299064+14.7781403655448i	-6.53040915127216-6.10605104892241i	15.47750131	8.9403637
28	0.683636722	0.468516433	0.013671875	-11.0455075496517-0.726591858842098i	-6.157154507294-1.13903955538999i	11.06937996	6.261626205
29	0.1580291	0.365314862	0.014160156	2.40906478706037+2.17756602950516i	-3.93909003373527-6.16237212669302i	3.247366158	7.313771976
30	0.177946028	0.775924275	0.014648438	-3.99229951668221+9.63391174450249i	-1.63784379474514+6.313419704419i	10.42836089	6.522407582

PLOT:

The frequency spectrum is obtained by plotting the X and Y magnitudes vs the frequency. The desired plotting style can be chosen from the Insert Chart menu. The final output looks like this.

Frequency Domain