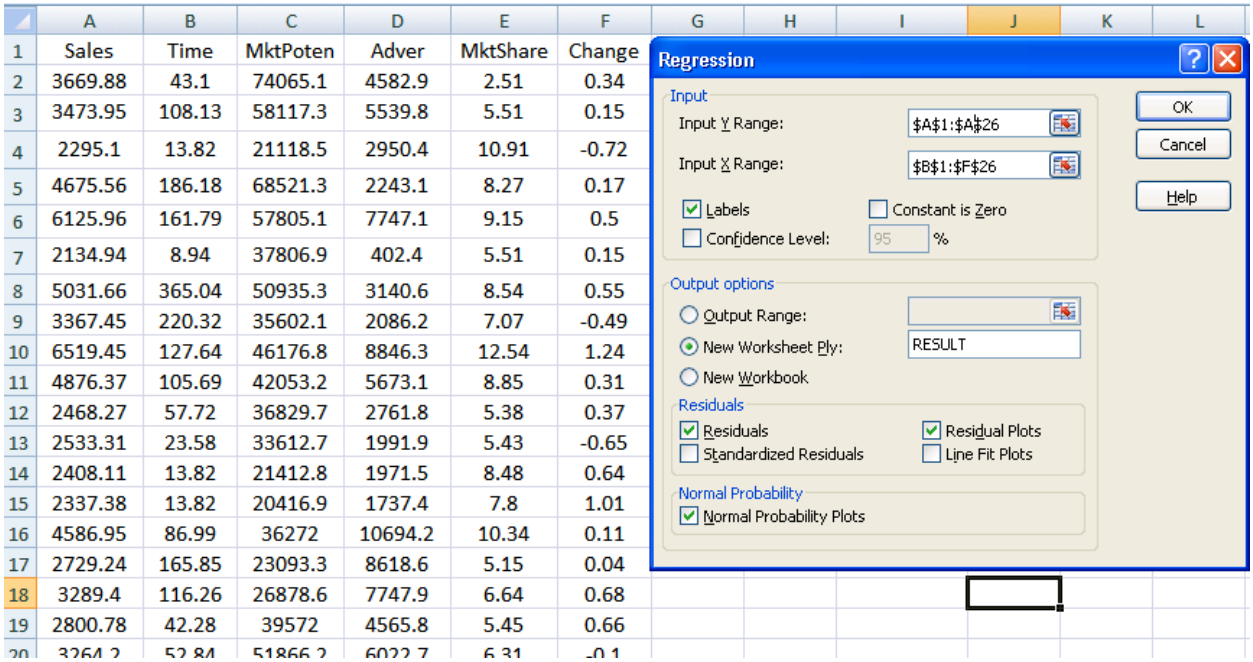
Example 1 : Fit a multiple linear regression (MLR) equation to Y as a function of the other 5 variables in the following data table -

Sales	Time	MktPoten	Adver	MktShare	Change
3669.88	43.1	74065.1	4582.9	2.51	0.34
3473.95	108.13	58117.3	5539.8	5.51	0.15
2295.1	13.82	21118.5	2950.4	10.91	-0.72
4675.56	186.18	68521.3	2243.1	8.27	0.17
6125.96	161.79	57805.1	7747.1	9.15	0.5
2134.94	8.94	37806.9	402.4	5.51	0.15
5031.66	365.04	50935.3	3140.6	8.54	0.55
3367.45	220.32	35602.1	2086.2	7.07	-0.49
6519.45	127.64	46176.8	8846.3	12.54	1.24
4876.37	105.69	42053.2	5673.1	8.85	0.31
2468.27	57.72	36829.7	2761.8	5.38	0.37
2533.31	23.58	33612.7	1991.9	5.43	-0.65
2408.11	13.82	21412.8	1971.5	8.48	0.64
2337.38	13.82	20416.9	1737.4	7.8	1.01
4586.95	86.99	36272	10694.2	10.34	0.11
2729.24	165.85	23093.3	8618.6	5.15	0.04
3289.4	116.26	26878.6	7747.9	6.64	0.68
2800.78	42.28	39572	4565.8	5.45	0.66
3264.2	52.84	51866.2	6022.7	6.31	-0.1
3453.62	165.04	58749.8	3721.1	6.35	-0.03
1741.45	10.57	23990.8	861	7.37	-1.63
2035.75	13.82	25694.9	3571.5	8.39	-0.43
1578	8.13	23736.4	2845.5	5.15	0.04
4167.44	58.54	34314.3	5060.1	12.88	0.22
2799.97	21.14	22809.5	3552	9.14	-0.74

Y = Sales		y = sales figures for a sales rep
X1	Time	x_1=time the sales rep has been with the company
X2	MktPoten	x_2=market potential = produce sales in the sales territory
X3	Adver	x_3= $ advertising expense in the sales territory
X4	MktShare	x_4=weighted average market share of company over last 4 years
X5	Change	x_5 =change in market share of company over last 4 years

Open the data file Multiple Linear Regression.xlsx, click on Data/Data Analysis/Regression, then

Select Input Y-Range (A1:A26), Input X-Range (B1:F26), Check the boxes as shown in Figure 1a, name the Output Worksheet and click OK. The results are shown in Figure 1b.



	A	B	C	D	E	F
1	Sales	Time	MktPoten	Adver	MktShare	Change
2	3669.88	43.1	74065.1	4582.9	2.51	0.34
3	3473.95	108.13	58117.3	5539.8	5.51	0.15
4	2295.1	13.82	21118.5	2950.4	10.91	-0.72
5	4675.56	186.18	68521.3	2243.1	8.27	0.17
6	6125.96	161.79	57805.1	7747.1	9.15	0.5
7	2134.94	8.94	37806.9	402.4	5.51	0.15
8	5031.66	365.04	50935.3	3140.6	8.54	0.55
9	3367.45	220.32	35602.1	2086.2	7.07	-0.49
10	6519.45	127.64	46176.8	8846.3	12.54	1.24
11	4876.37	105.69	42053.2	5673.1	8.85	0.31
12	2468.27	57.72	36829.7	2761.8	5.38	0.37
13	2533.31	23.58	33612.7	1991.9	5.43	-0.65
14	2408.11	13.82	21412.8	1971.5	8.48	0.64
15	2337.38	13.82	20416.9	1737.4	7.8	1.01
16	4586.95	86.99	36272	10694.2	10.34	0.11
17	2729.24	165.85	23093.3	8618.6	5.15	0.04
18	3289.4	116.26	26878.6	7747.9	6.64	0.68
19	2800.78	42.28	39572	4565.8	5.45	0.66
20	3264.2	52.84	51866.2	6022.7	6.31	-0.1

Figure 1a: Running MLR in Excel

	A	B	C	D	E	F	G	H	I
1	SUMMARY OUTPUT								
2									
3	*Regression Statistics*								
4	Multiple R	0.95656117							
5	R Square	0.915009272							
6	Adjusted R Square	0.892643291							
7	Standard Error	430.2311485							
8	Observations	25							
9									
10	ANOVA								
11		*df*	*SS*	*MS*	*F*	*Significance F*			
12	Regression	5	37862670.95	7572534	40.91076	1.58525E-09			
13	Residual	19	3516877.982	185098.8					
14	Total	24	41379548.93						
15									
16		*Coefficients*	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
17	Intercept	-1113.787852	419.8863019	-2.65259	0.0157132	-1992.61998	-234.95572	-1992.61998	-234.955724
18	Time	3.612099048	1.181698122	3.056702	0.0064915	1.13877646	6.08542164	1.13877646	6.085421637
19	MktPoten	0.04208807	0.006731216	6.25267	5.273E-06	0.027999474	0.05617667	0.02799947	0.056176666
20	Adver	0.128857242	0.037036022	3.479241	0.0025109	0.051339957	0.20637453	0.05133996	0.206374526
21	MktShare	256.9553336	39.13601347	6.5657	2.758E-06	175.0427162	338.867951	175.042716	338.867951
22	Change	324.5334065	157.2827383	2.063376	0.0530111	-4.663147321	653.72996	-4.66314732	653.7299603

Figure 1b: MLR Results in Excel

We can see from Figure 1b that (1) the regression equation seems to fit data well as R^2 = 91.5%, (2) the overall F-test shows the model to be statistically significant (P-value = 1.58525E-09), and (3) all independent variables in the model are significant since each P-value < .05.