

```

1 *****;
2 *** EXST7034 Multiple Regression Example ***;
3 *** Problem from Neter, Kutner, Nachtsheim & Wasserman 1996, #6.18 ***;
4 *****;
5
6 OPTIONS LS=99 PS=80 NOCENTER NODATE NONUMBER;
7
8 DATA ONE; INFILE CARDS MISSOVER;
9 TITLE1 'EXST7034 - NKNW 6.18 : Mathematician salaries';
10 * LABEL X1 = 'Index of publication quality';
11 * LABEL X2 = 'Number of years experience';
12 * LABEL X3 = 'Grant support success';
13 * LABEL Y = 'Thousands of dollars';
14 INPUT Y X1 X2 X3;
15 CARDS;
NOTE: The data set WORK.ONE has 24 observations and 4 variables.
NOTE: DATA statement used:
      real time          0.14 seconds
      cpu time           0.00 seconds
15      !                RUN;
40      ;
41      PROC REG DATA=ONE; TITLE2 'Multiple Regression Example';
42      MODEL Y = X1 X2 X3 / partial all; RUN;

```

NOTE: 24 observations read.  
NOTE: 24 observations used in computations.

NOTE: The PROCEDURE REG printed pages 1-9.  
NOTE: PROCEDURE REG used:  
 real time 0.26 seconds  
 cpu time 0.13 seconds

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	627.81700	209.27233	68.12	<.0001
Error	20	61.44300	3.07215		
Corrected Total	23	689.26000			

Root MSE	1.75276	R-Square	0.9109
Dependent Mean	39.50000	Adj R-Sq	0.8975
Coeff Var	4.43735		

Parameter Estimates								
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr >  t	Type I SS	Type II SS	Standardized Estimate
Intercept	1	17.84693	2.00188	8.92	<.0001	37446	244.17168	0
X1	1	1.10313	0.32957	3.35	0.0032	306.73233	34.41851	0.26023
X2	1	0.32152	0.03711	8.66	<.0001	263.79445	230.62548	0.65915
X3	1	1.28894	0.29848	4.32	0.0003	57.29022	57.29022	0.30694

Parameter Estimates								
Variable	DF	Squared Semi-partial Corr Type I	Squared Partial Corr Type I	Squared Semi-partial Corr Type II	Squared Partial Corr Type II	Tolerance	Variance Inflation	
Intercept	1	.	.	.	.	.	0	
X1	1	0.44502	0.44502	0.04994	0.35904	0.73736	1.35619	
X2	1	0.38272	0.68961	0.33460	0.78963	0.77010	1.29852	
X3	1	0.08312	0.48251	0.08312	0.48251	0.88225	1.13347	

Parameter Estimates			
Variable	DF	95% Confidence Limits	
Intercept	1	13.67109	22.02277
X1	1	0.41565	1.79061
X2	1	0.24411	0.39893
X3	1	0.66632	1.91156

EXST7034 - NKNW 6.18 : Mathematician salaries  
Multiple Regression Example

The REG Procedure  
Model: MODEL1  
Dependent Variable: Y

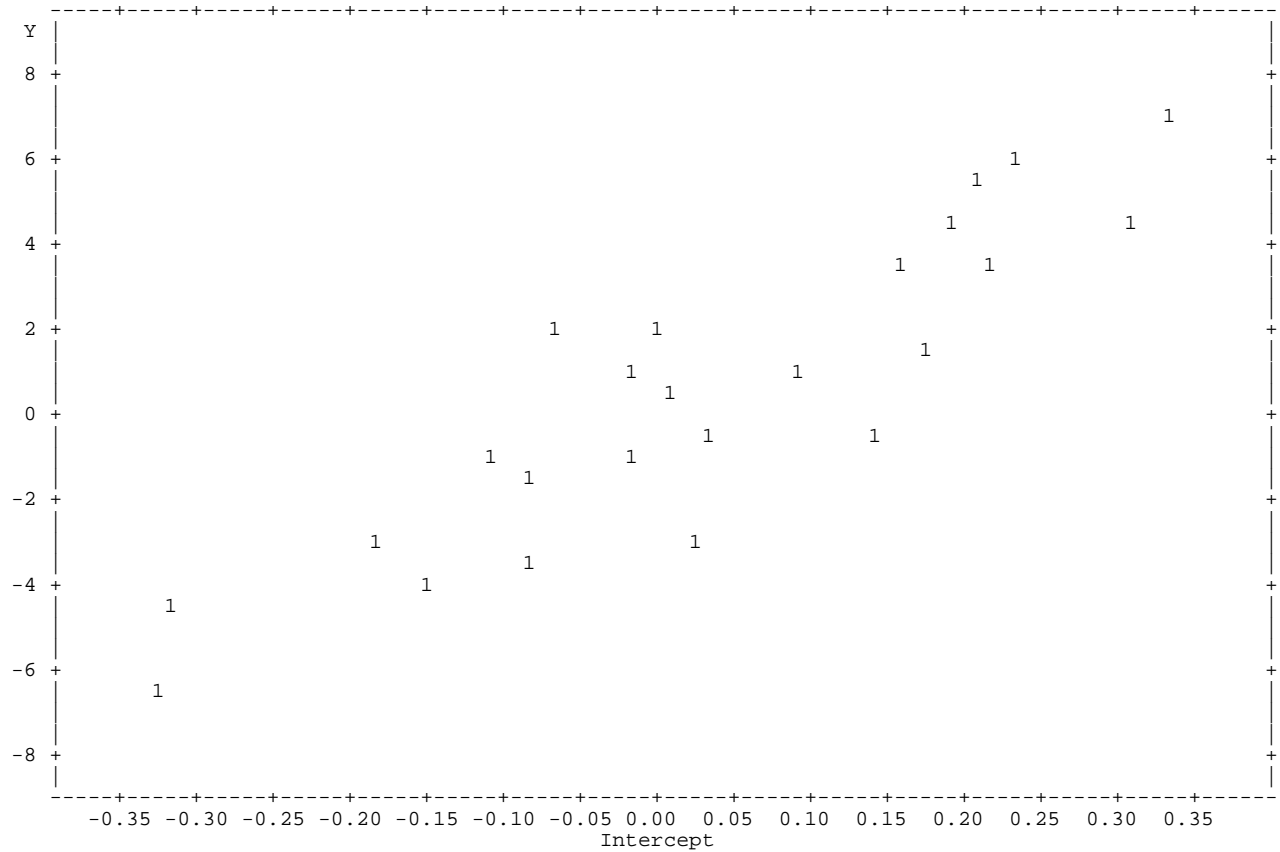
Obs	Dep Var Y	Output Statistics						
		Predicted Value	Std Error Mean Predict	95% CL Mean		95% CL Predict		Residual
1	33.2000	32.4641	0.7514	30.8968	34.0314	28.4861	36.4421	0.7359
2	40.3000	38.3731	0.4256	37.4854	39.2609	34.6107	42.1356	1.9269
3	38.7000	38.7984	0.6365	37.4707	40.1261	34.9086	42.6882	-0.0984
4	46.8000	43.4911	0.4653	42.5205	44.4618	39.7083	47.2740	3.3089
5	41.4000	42.1142	0.8107	40.4232	43.8053	38.0859	46.1426	-0.7142
6	37.5000	36.2502	0.6701	34.8524	37.6481	32.3359	40.1645	1.2498
7	39.0000	41.1199	0.5936	39.8817	42.3580	37.2597	44.9800	-2.1199
8	40.7000	38.7155	0.7418	37.1681	40.2629	34.7453	42.6857	1.9845
9	30.1000	30.3501	0.8601	28.5559	32.1443	26.2774	34.4228	-0.2501
10	52.9000	51.5991	0.9408	49.6366	53.5616	47.4495	55.7487	1.3009
11	38.2000	37.2937	0.5055	36.2392	38.3482	33.4885	41.0989	0.9063
12	31.8000	35.0382	0.6269	33.7304	36.3460	31.1552	38.9212	-3.2382
13	43.3000	43.8629	0.9923	41.7930	45.9327	39.6615	48.0643	-0.5629
14	44.1000	45.2931	0.5475	44.1509	46.4352	41.4626	49.1235	-1.1931
15	42.8000	44.1116	0.7549	42.5368	45.6863	40.1307	48.0925	-1.3116
16	33.6000	34.3518	0.6815	32.9302	35.7734	30.4289	38.2746	-0.7518
17	34.2000	34.0262	0.9062	32.1359	35.9164	29.9103	38.1420	0.1738
18	48.0000	47.4522	0.6708	46.0530	48.8515	43.5374	51.3670	0.5478
19	38.0000	41.2463	0.7798	39.6197	42.8729	37.2446	45.2480	-3.2463
20	35.9000	34.7173	0.7960	33.0568	36.3778	30.7017	38.7328	1.1827
21	40.4000	41.2814	0.6008	40.0280	42.5347	37.4163	45.1464	-0.8814
22	36.8000	38.2479	0.6460	36.9005	39.5954	34.3514	42.1445	-1.4479
23	45.2000	44.3852	0.8309	42.6520	46.1184	40.3390	48.4313	0.8148
24	35.1000	33.4166	0.5819	32.2029	34.6304	29.5643	37.2690	1.6834

Obs	Std Error Residual	Student Residual	Output Statistics					Cook's D
			-2	-1	0	1	2	
1	1.584	0.465						0.012
2	1.700	1.133				**		0.020
3	1.633	-0.0603						0.000
4	1.690	1.958				***		0.073
5	1.554	-0.460						0.014
6	1.620	0.772				*		0.025
7	1.649	-1.285			**			0.054
8	1.588	1.250			**			0.085
9	1.527	-0.164						0.002
10	1.479	0.880				*		0.078
11	1.678	0.540				*		0.007
12	1.637	-1.978			***			0.144
13	1.445	-0.390						0.018
14	1.665	-0.717			*			0.014
15	1.582	-0.829			*			0.039
16	1.615	-0.466						0.010
17	1.500	0.116						0.001
18	1.619	0.338						0.005
19	1.570	-2.068			****			0.264
20	1.562	0.757			*			0.037
21	1.647	-0.535			*			0.010
22	1.629	-0.889			*			0.031
23	1.543	0.528			*			0.020
24	1.653	1.018			**			0.032

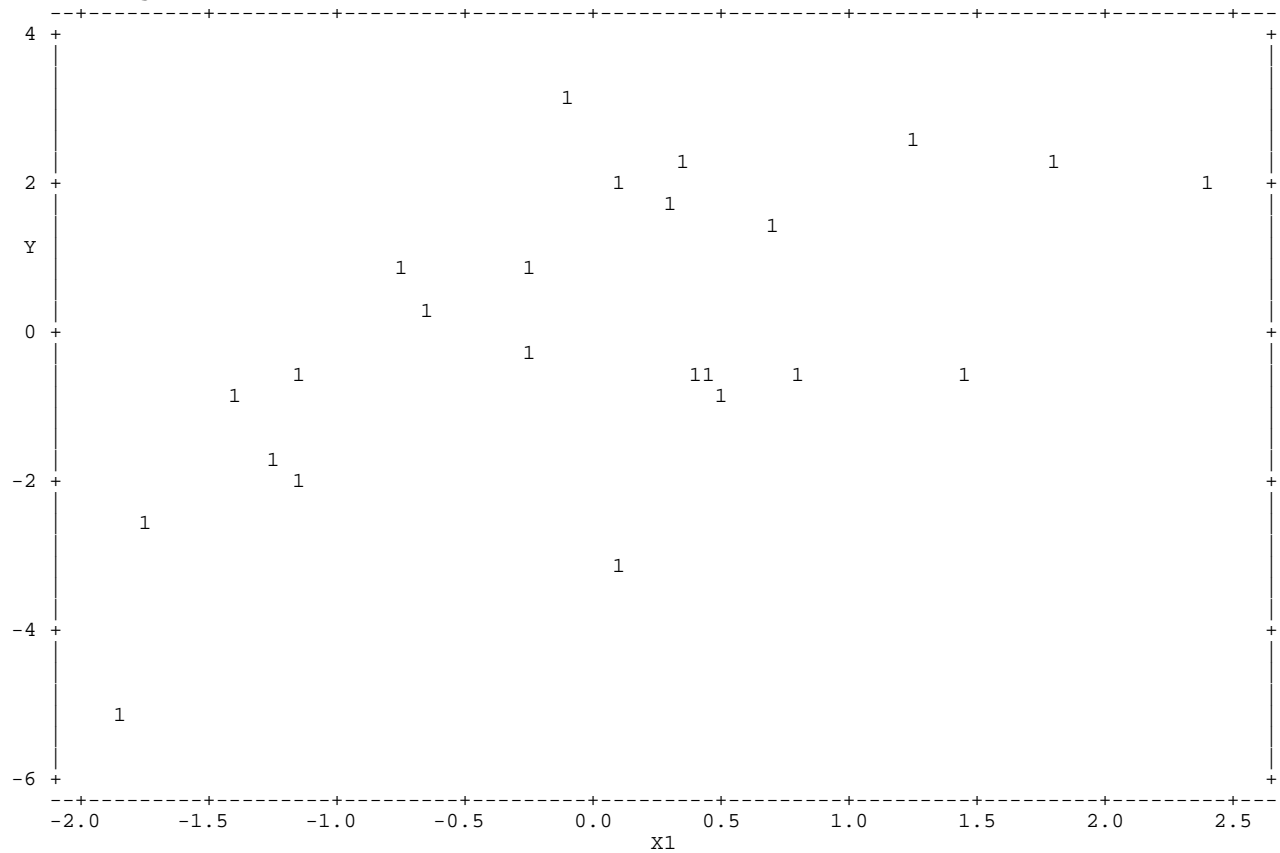
Sum of Residuals 0  
Sum of Squared Residuals 61.44300  
Predicted Residual SS (PRESS) 83.81944

EXST7034 - NKNW 6.18 : Mathematician salaries  
Multiple Regression Example

The REG Procedure  
Model: MODEL1  
Partial Regression Residual Plot



Partial Regression Residual Plot



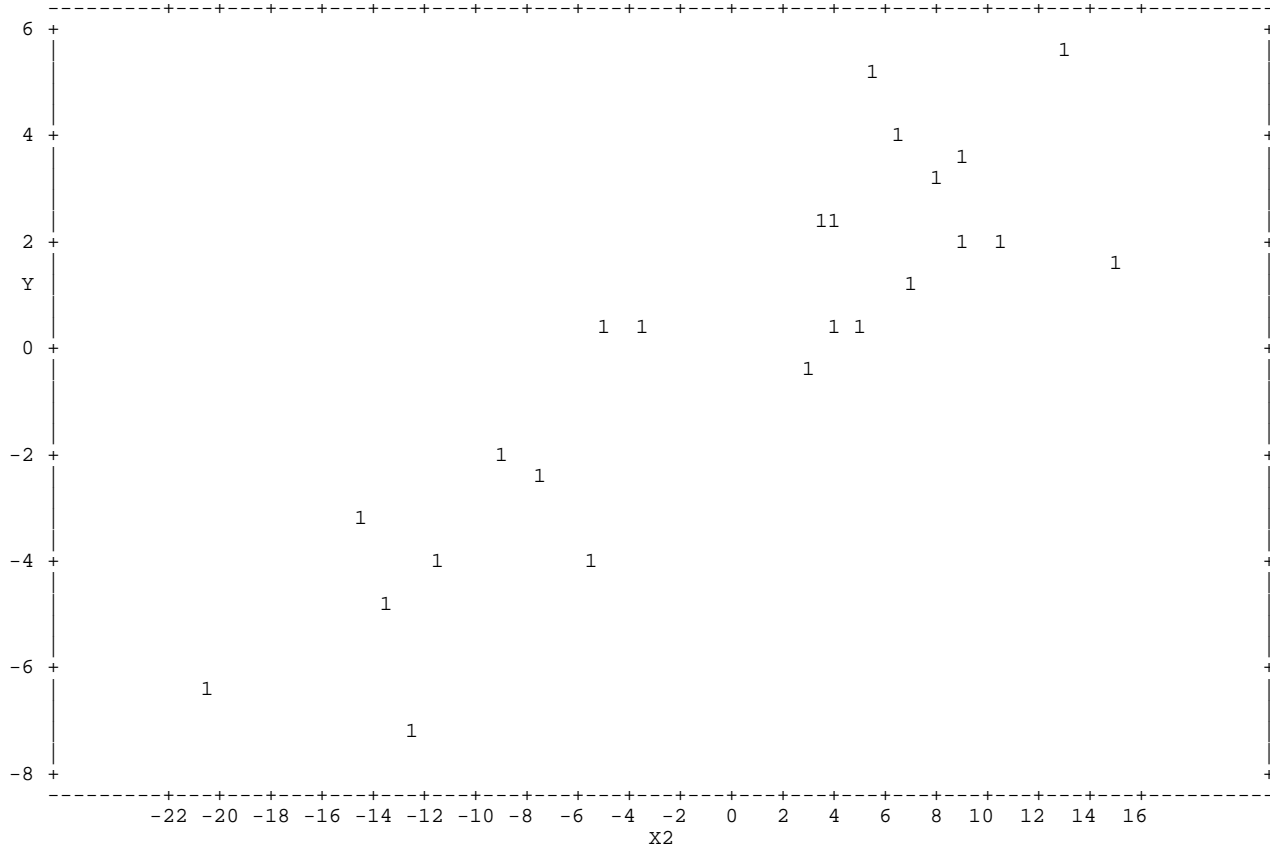
EXST7034 - NKNW 6.18 : Mathematician salaries

Multiple Regression Example

The REG Procedure

Model: MODEL1

Partial Regression Residual Plot



Partial Regression Residual Plot

