

The SAS CODE for making 1980 forecasts:

```
options pagesize=60 linesize=80;
data insure;
  infile 'insure1.dat' firstobs=2;
  input year cost;
  code = year - 1975.5 ;
proc glm data=insure;
  model cost = code / xpx inverse ;
  estimate 'fit1980' intercept 1 code 4.5 / E;
run ;
proc glm data=insure;
  model cost = code code*code;
  estimate 'fit1980' intercept 1 code 4.5 code*code 20.25 / E;
run ;
proc glm data=insure;
  model cost = code code*code code*code*code;
  estimate 'fit1980' intercept 1 code 4.5
           code*code 20.25 code*code*code 91.125/ E;
run ;
proc glm data=insure;
  model cost = code code*code code*code*code code*code*code*code;
  estimate 'fit1980' intercept 1 code 4.5 code*code 20.25
           code*code*code 91.125 code*code*code*code 410.0625 / E;
run ;
proc glm data=insure;
  model cost = code code*code code*code*code
           code*code*code*code code*code*code*code*code;
  estimate 'fit1980' intercept 1 code 4.5 code*code 20.25
           code*code*code 91.125
           code*code*code*code 410.0625
           code*code*code*code*code 1845.28125/ E;
run ;
```

The SAS output for the first proc glm call:

The X'X Matrix			
	INTERCEPT	CODE	COST
INTERCEPT	9	-4.5	595.83
CODE	-4.5	62.25	5.655
COST	595.83	5.655	41222.9247

X'X Inverse Matrix			
	INTERCEPT	CODE	COST
INTERCEPT	0.1152777778	0.0083333333	68.733083333
CODE	0.0083333333	0.0166666667	5.0595
COST	68.733083333	5.0595	241.080185

Coefficients for estimate fit1980

	Row	1
INTERCEPT		1
CODE		4.5

Dependent Variable: COST

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	1535.9124150	1535.9124150	44.60	0.0003
Error	7	241.0801850	34.4400264		
Corrected Total	8	1776.9926000			

R-Square	C.V.	Root MSE	COST Mean
0.864332	8.864452	5.8685626	66.203333

Source	DF	Type I SS	Mean Square	F Value	Pr > F
CODE	1	1535.9124150	1535.9124150	44.60	0.0003
Source	DF	Type III SS	Mean Square	F Value	Pr > F
CODE	1	1535.9124150	1535.9124150	44.60	0.0003

Parameter	Estimate	T for H0: Parameter=0	Pr > T	Std Error of Estimate
fit1980	91.5008333	21.46	0.0001	4.26341185

Parameter	Estimate	T for H0: Parameter=0	Pr > T	Std Error of Estimate
INTERCEPT	68.73308333	34.50	0.0001	1.99252847
CODE	5.05950000	6.68	0.0003	0.75762817

The SAS output for the second call:

Coefficients for estimate fit1980

	Row	1
INTERCEPT		1
CODE		4.5
CODE*CODE		20.25

Dependent Variable: COST

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	1577.2455608	788.6227804	23.69	0.0014
Error	6	199.7470392	33.2911732		
Corrected Total	8	1776.9926000			

R-Square	C.V.	Root MSE	COST Mean
0.887593	8.715347	5.7698504	66.203333

Source	DF	Type I SS	Mean Square	F Value	Pr > F
CODE	1	1535.9124150	1535.9124150	46.14	0.0005
CODE*CODE	1	41.3331458	41.3331458	1.24	0.3078

Source	DF	Type III SS	Mean Square	F Value	Pr > F
CODE	1	1478.3821162	1478.3821162	44.41	0.0006
CODE*CODE	1	41.3331458	41.3331458	1.24	0.3078

Parameter	Estimate	T for H0: Parameter=0	Pr > T	Std Error of Estimate
fit1980	98.2169048	13.38	0.0001	7.34166158

Parameter	Estimate	T for H0: Parameter=0	Pr > T	Std Error of Estimate
INTERCEPT	66.38245833	23.06	0.0001	2.87890865
CODE	5.42583117	6.66	0.0006	0.81421196
CODE*CODE	0.36633117	1.11	0.3078	0.32876774

The fitted 1980 values using only data through 1979 for various degree polynomials.

Degree	Forecast	T stat	P-value	SE
1	91.5008333	21.46	0.0001	4.26341185
2	98.2169048	13.38	0.0001	7.34166158
3	121.387460	25.60	0.0001	4.74108977
4	132.403889	19.68	0.0001	6.72800955
5	110.400833	24.03	0.0002	4.59460609