

```

data concrete;
input X1 X2 Y;
X1X2 = X1*X2;
cards;
21      0.65      33.55
21      0.55      47.55
7       0.65      35.00
7       0.55      35.90
28      0.60      40.90
0       0.60      39.10
14      0.70      31.55
14      0.50      48.00
14      0.60      42.30
;

proc reg data = concrete;
model y = x1 x2 x1x2;
run;

proc genmod data = concrete;
model y = x1 x2 x1x2;

proc genmod data = concrete;
model y = ;
run;

```

The REG Procedure

Model: MODEL1  
Dependent Variable: Y

Number of Observations Read 9  
Number of Observations Used 9

Analysis of Variance

| Source          | DF | Sum of Squares | Mean Square | F Value | Pr > F |
|-----------------|----|----------------|-------------|---------|--------|
| Model           | 3  | 249.17583      | 83.05861    | 14.15   | 0.0071 |
| Error           | 5  | 29.34917       | 5.86983     |         |        |
| Corrected Total | 8  | 278.52500      |             |         |        |

Root MSE 2.42277 R-Square 0.8946  
Dependent Mean 39.31667 Adj R-Sq 0.8314  
Coeff Var 6.16221

Parameter Estimates

| Variable  | DF | Parameter Estimate | Standard Error | t Value | Pr >  t |
|-----------|----|--------------------|----------------|---------|---------|
| Intercept | 1  | 6.21667            | 30.30351       | 0.21    | 0.8455  |
| X1        | 1  | 5.77857            | 2.07907        | 2.78    | 0.0389  |
| X2        | 1  | 51.33333           | 50.43406       | 1.02    | 0.3555  |
| X1X2      | 1  | -9.35714           | 3.46111        | -2.70   | 0.0426  |

# The GENMOD Procedure

## Model Information

|                    |               |
|--------------------|---------------|
| Data Set           | WORK.CONCRETE |
| Distribution       | Normal        |
| Link Function      | Identity      |
| Dependent Variable | Y             |

|                             |   |
|-----------------------------|---|
| Number of Observations Read | 9 |
| Number of Observations Used | 9 |

## Criteria For Assessing Goodness Of Fit

| Criterion                | DF | Value    | Value/DF |
|--------------------------|----|----------|----------|
| Deviance                 | 5  | 29.3492  | 5.8698   |
| Scaled Deviance          | 5  | 9.0000   | 1.8000   |
| Pearson Chi-Square       | 5  | 29.3492  | 5.8698   |
| Scaled Pearson X2        | 5  | 9.0000   | 1.8000   |
| Log Likelihood           |    | -18.0896 |          |
| Full Log Likelihood      |    | -18.0896 |          |
| AIC (smaller is better)  |    | 46.1792  |          |
| AICC (smaller is better) |    | 66.1792  |          |
| BIC (smaller is better)  |    | 47.1654  |          |

Algorithm converged.

## Analysis Of Maximum Likelihood Parameter Estimates

| Parameter | DF | Estimate | Standard Error | Wald 95% Confidence Limits | Wald Chi-Square | Pr > ChiSq |
|-----------|----|----------|----------------|----------------------------|-----------------|------------|
| Intercept | 1  | 6.2167   | 22.5869        | -38.0529 50.4862           | 0.08            | 0.7831     |
| X1        | 1  | 5.7786   | 1.5496         | 2.7413 8.8158              | 13.91           | 0.0002     |
| X2        | 1  | 51.3333  | 37.5913        | -22.3443 125.0110          | 1.86            | 0.1721     |
| X1X2      | 1  | -9.3571  | 2.5798         | -14.4134 -4.3009           | 13.16           | 0.0003     |
| Scale     | 1  | 1.8058   | 0.4256         | 1.1377 2.8662              |                 |            |

NOTE: The scale parameter was estimated by maximum likelihood.

# The GENMOD Procedure

## Model Information

|                    |               |
|--------------------|---------------|
| Data Set           | WORK.CONCRETE |
| Distribution       | Normal        |
| Link Function      | Identity      |
| Dependent Variable | Y             |

|                             |   |
|-----------------------------|---|
| Number of Observations Read | 9 |
| Number of Observations Used | 9 |

## Criteria For Assessing Goodness Of Fit

| Criterion                | DF | Value    | Value/DF |
|--------------------------|----|----------|----------|
| Deviance                 | 8  | 278.5250 | 34.8156  |
| Scaled Deviance          | 8  | 9.0000   | 1.1250   |
| Pearson Chi-Square       | 8  | 278.5250 | 34.8156  |
| Scaled Pearson X2        | 8  | 9.0000   | 1.1250   |
| Log Likelihood           |    | -28.2157 |          |
| Full Log Likelihood      |    | -28.2157 |          |
| AIC (smaller is better)  |    | 60.4314  |          |
| AICC (smaller is better) |    | 62.4314  |          |
| BIC (smaller is better)  |    | 60.8259  |          |

Algorithm converged.

## Analysis Of Maximum Likelihood Parameter Estimates

| Parameter | DF | Estimate | Standard Error | Wald 95% Confidence Limits | Wald Chi-Square | Pr > ChiSq |
|-----------|----|----------|----------------|----------------------------|-----------------|------------|
| Intercept | 1  | 39.3167  | 1.8543         | 35.6822 42.9511            | 449.55          | <.0001     |
| Scale     | 1  | 5.5630   | 1.3112         | 3.5049 8.8296              |                 |            |

NOTE: The scale parameter was estimated by maximum likelihood.