

```

/* SAS program to analyze a two-factor experiment. */
/* Data are from the text, example 15.8. Response */
/* variable y is yield of fruit from a citrus tree, */
/* factor A is pesticide type, factor B is tree */
/* variety. */
options nocenter ls=72;
data;
  input y b a;
  cards;
49 1 1
39 1 1
50 1 2
55 1 2
43 1 3
38 1 3
53 1 4
48 1 4
55 2 1
41 2 1
67 2 2
58 2 2
53 2 3
42 2 3
85 2 4
73 2 4
66 3 1
68 3 1
85 3 2
92 3 2
69 3 3
62 3 3
85 3 4
99 3 4
;
proc glm;
  class a b;
  model y=a b a*b;
  means a*b;
  output out=new predicted=yhat residual=res;
proc plot;
  plot yhat*a=b;
  plot res*yhat;
run;

```

The GLM Procedure

Class Level Information

Class	Levels	Values
a	4	1 2 3 4
b	3	1 2 3

Number of observations 24

Dependent Variable: y

Source	DF	Sum of Squares	Mean Square	F Value
Model	11	6680.458333	607.314394	14.36
Error	12	507.500000	42.291667	
Corrected Total	23	7187.958333		

Source Pr > F

Model <.0001

Error

Corrected Total

R-Square	Coeff Var	Root MSE	y Mean
0.929396	10.58149	6.503204	61.45833

Source	DF	Type I SS	Mean Square	F Value
a	3	2227.458333	742.486111	17.56
b	2	3996.083333	1998.041667	47.24
a*b	6	456.916667	76.152778	1.80

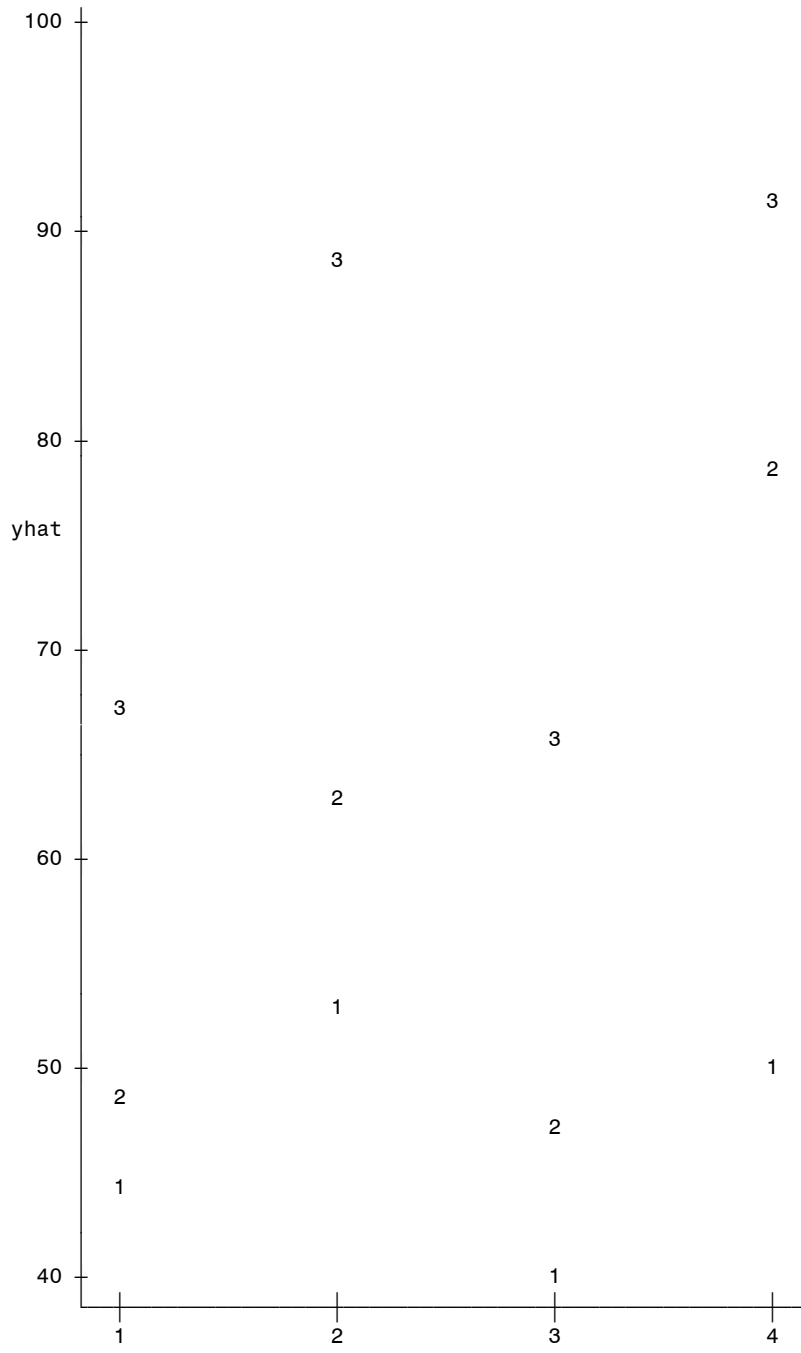
Source	Pr > F
a	0.0001
b	<.0001
a*b	0.1817

Source	DF	Type III SS	Mean Square	F Value
a	3	2227.458333	742.486111	17.56
b	2	3996.083333	1998.041667	47.24
a*b	6	456.916667	76.152778	1.80

Source	Pr > F
a	0.0001
b	<.0001
a*b	0.1817

Level of a	Level of b	N	-----y----- Mean	Std Dev
1	1	2	44.000000	7.07106781
1	2	2	48.000000	9.89949494
1	3	2	67.000000	1.41421356
2	1	2	52.500000	3.53553391
2	2	2	62.500000	6.36396103
2	3	2	88.500000	4.94974747
3	1	2	40.500000	3.53553391
3	2	2	47.500000	7.77817459
3	3	2	65.500000	4.94974747
4	1	2	50.500000	3.53553391
4	2	2	79.000000	8.48528137
4	3	2	92.000000	9.89949494

Plot of $\hat{y} \cdot a$. Symbol is value of b .



a
Plot of res*yhat. Legend: A = 1 obs, B = 2 obs, etc.

