The GLM Procedure

Number of Observations Read	34
Number of Observations Used	34

The SAS System

The GLM Procedure

Dependent Variable: y

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	22849.94350	4569.98870	9.46	<.0001
Error	28	13526.79180	483.09971		
Corrected Total	33	36376.73529			

R-Square	Coeff Var	Root MSE	y Mean
0.628147	35.50138	21.97953	61.91176

Source	DF	Type I SS	Mean Square	F Value	Pr > F
x1	1	15194.79874	15194.79874	31.45	<.0001
x2	1	4813.05416	4813.05416	9.96	0.0038
x1x2	1	2764.03720	2764.03720	5.72	0.0237
x1sq	1	53.75902	53.75902	0.11	0.7412
x2sq	1	24.29438	24.29438	0.05	0.8242

Source	DF	Type III SS	Mean Square	F Value	Pr > F
x1	1	13.36668817	13.36668817	0.03	0.8691
x2	1	0.20361150	0.20361150	0.00	0.9838
x1x2	1	54.55382930	54.55382930	0.11	0.7393
x1sq	1	1.81208637	1.81208637	0.00	0.9516
x2sq	1	24.29437981	24.29437981	0.05	0.8242

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	143.0691442	610.5424997	0.23	0.8164
x1	-5.6390439	33.9009569	-0.17	0.8691
x2	-0.1822060	8.8752356	-0.02	0.9838
x1x2	0.0785336	0.2337015	0.34	0.7393
x1sq	0.0291738	0.4763447	0.06	0.9516
x2sq	-0.0081209	0.0362136	-0.22	0.8242

The GLM Procedure

Number of Observations Read	34
Number of Observations Used	34

The SAS System

The GLM Procedure

Dependent Variable: y

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	4	22795.38967	5698.84742	12.17	<.0001
Error	29	13581.34563	468.32226		
Corrected Total	33	36376.73529			

R-Square	Coeff Var	Root MSE	y Mean
0.626647	34.95419	21.64075	61.91176

Source	DF	Type I SS	Mean Square	F Value	Pr > F
x1	1	15194.79874	15194.79874	32.45	<.0001
x2	1	4813.05416	4813.05416	10.28	0.0033
x1sq	1	1982.42634	1982.42634	4.23	0.0487
x2sq	1	805.11043	805.11043	1.72	0.2001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
x1	1	132.551314	132.551314	0.28	0.5988
x2	1	2613.709657	2613.709657	5.58	0.0251
x1sq	1	201.045552	201.045552	0.43	0.5175
x2sq	1	805.110429	805.110429	1.72	0.2001

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	-57.45004566	127.2441101	-0.45	0.6550
x1	5.24487464	9.8586056	0.53	0.5988
x2	2.77321693	1.1738905	2.36	0.0251
x1sq	-0.11851435	0.1808823	-0.66	0.5175
x2sq	-0.01921483	0.0146548	-1.31	0.2001

The GLM Procedure

Number of Observations Read	34
Number of Observations Used	34

The GLM Procedure

Dependent Variable: y

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	22771.89010	7590.63003	16.74	<.0001
Error	30	13604.84520	453.49484		
Corrected Total	33	36376.73529			

R-Square	Coeff Var	Root MSE	y Mean
0.626001	34.39640	21.29542	61.91176

Source	DF	Type I SS	Mean Square	F Value	Pr > F
x1	1	15194.79874	15194.79874	33.51	<.0001
x2	1	4813.05416	4813.05416	10.61	0.0028
x1x2	1	2764.03720	2764.03720	6.09	0.0195

Source	DF	Type III SS	Mean Square	F Value	Pr > F
x1	1	2269.345164	2269.345164	5.00	0.0329
x2	1	612.497975	612.497975	1.35	0.2543
x1x2	1	2764.037198	2764.037198	6.09	0.0195

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	150.7098887	68.02394815	2.22	0.0345
x1	-4.7227579	2.11121072	-2.24	0.0329
x2	-1.2966953	1.11576255	-1.16	0.2543
x1x2	0.0972817	0.03940447	2.47	0.0195

The GLM Procedure

Number of Observations Read	34
Number of Observations Used	34

The GLM Procedure

Dependent Variable: y

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	20007.85290	10003.92645	18.95	<.0001
Error	31	16368.88239	528.02846		
Corrected Total	33	36376.73529			

R-Square	Coeff Var	Root MSE	y Mean
0.550018	37.11551	22.97887	61.91176

Source	DF	Type I SS	Mean Square	F Value	Pr > F
x1	1	15194.79874	15194.79874	28.78	<.0001
x2	1	4813.05416	4813.05416	9.12	0.0050

Source	DF	Type III SS	Mean Square	F Value	Pr > F
x1	1	117.175866	117.175866	0.22	0.6409
x2	1	4813.054157	4813.054157	9.12	0.0050

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	35.82546961	53.53877238	0.67	0.5084
x1	-0.67645365	1.43597747	-0.47	0.6409
x2	1.28113633	0.42433968	3.02	0.0050

The GLM Procedure
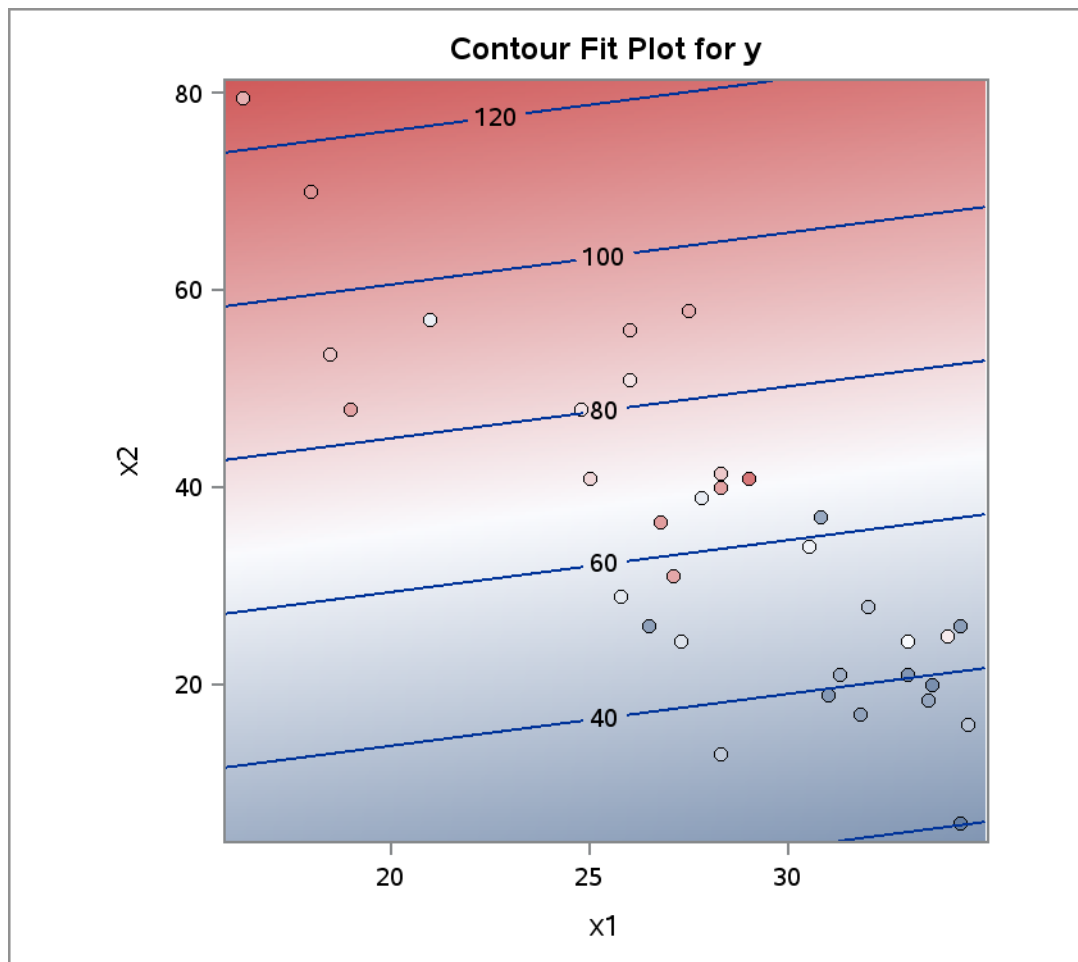
Dependent Variable: y

Contour Fit Plot for y

The GLM Procedure

Number of Observations Read	34
Number of Observations Used	34

The GLM Procedure

Dependent Variable: y

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	17585.21957	8792.60979	14.50	<.0001
Error	31	18791.51572	606.17793		
Corrected Total	33	36376.73529			

R-Square	Coeff Var	Root MSE	y Mean
0.483419	39.76737	24.62068	61.91176

Source	DF	Type I SS	Mean Square	F Value	Pr > F
x1sq	1	16098.22983	16098.22983	26.56	<.0001
x2sq	1	1486.98974	1486.98974	2.45	0.1274

Source	DF	Type III SS	Mean Square	F Value	Pr > F
x1sq	1	2025.303318	2025.303318	3.34	0.0772
x2sq	1	1486.989745	1486.989745	2.45	0.1274

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	90.15478711	28.81937090	3.13	0.0038
x1sq	-0.04946882	0.02706366	-1.83	0.0772
x2sq	0.00789591	0.00504137	1.57	0.1274

The GLM Procedure
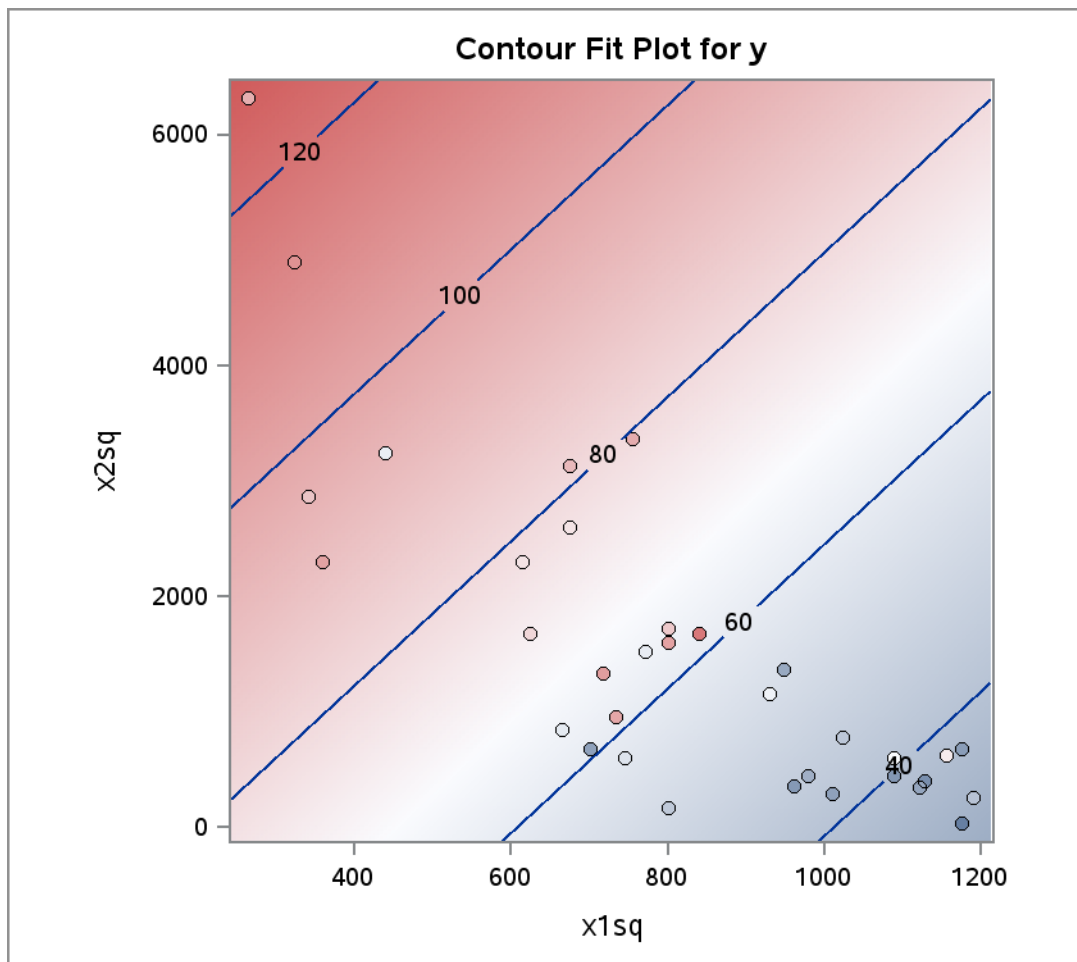
Dependent Variable: y

Contour Fit Plot for y

The GLM Procedure

Number of Observations Read	34
Number of Observations Used	34

The GLM Procedure

Dependent Variable: y

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	22778.37787	7592.79262	16.75	<.0001
Error	30	13598.35742	453.27858		
Corrected Total	33	36376.73529			

R-Square	Coeff Var	Root MSE	y Mean
0.626180	34.38820	21.29034	61.91176

Source	DF	Type I SS	Mean Square	F Value	Pr > F
x1x2	1	18451.02899	18451.02899	40.71	<.0001
x1sq	1	3938.95768	3938.95768	8.69	0.0061
x2sq	1	388.39120	388.39120	0.86	0.3620

Source	DF	Type III SS	Mean Square	F Value	Pr > F
x1x2	1	5193.158300	5193.158300	11.46	0.0020
x1sq	1	3371.865964	3371.865964	7.44	0.0106
x2sq	1	388.391199	388.391199	0.86	0.3620

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	63.86853448	26.10308343	2.45	0.0205
x1x2	0.06436296	0.01901528	3.38	0.0020
x1sq	-0.06505306	0.02385147	-2.73	0.0106
x2sq	-0.00543905	0.00587585	-0.93	0.3620

The GLMSELECT Procedure

Data Set	WORK.STEEL
Dependent Variable	y
Selection Method	Forward
Select Criterion	Significance Level
Stop Criterion	Significance Level
Entry Significance Level (SLE)	0.25
Effect Hierarchy Enforced	None

Number of Observations Read	34
Number of Observations Used	34

Dimensions	
Number of Effects	6
Number of Parameters	6

The GLMSELECT Procedure

		Forward Selection Summary		
Step	Effect Entered	Number Effects In	F Value	Pr > F
0	Intercept	1	0.00	1.0000
1	x2	2	38.61	<.0001
2	x2sq	3	5.21	0.0295

Selection stopped as the candidate for entry has SLE > 0.25.

		Stop Details			
Candidate For	Effect	Candidate Significance		Compare Significance	
Entry	x1sq	0.3565	>	0.2500	(SLE)
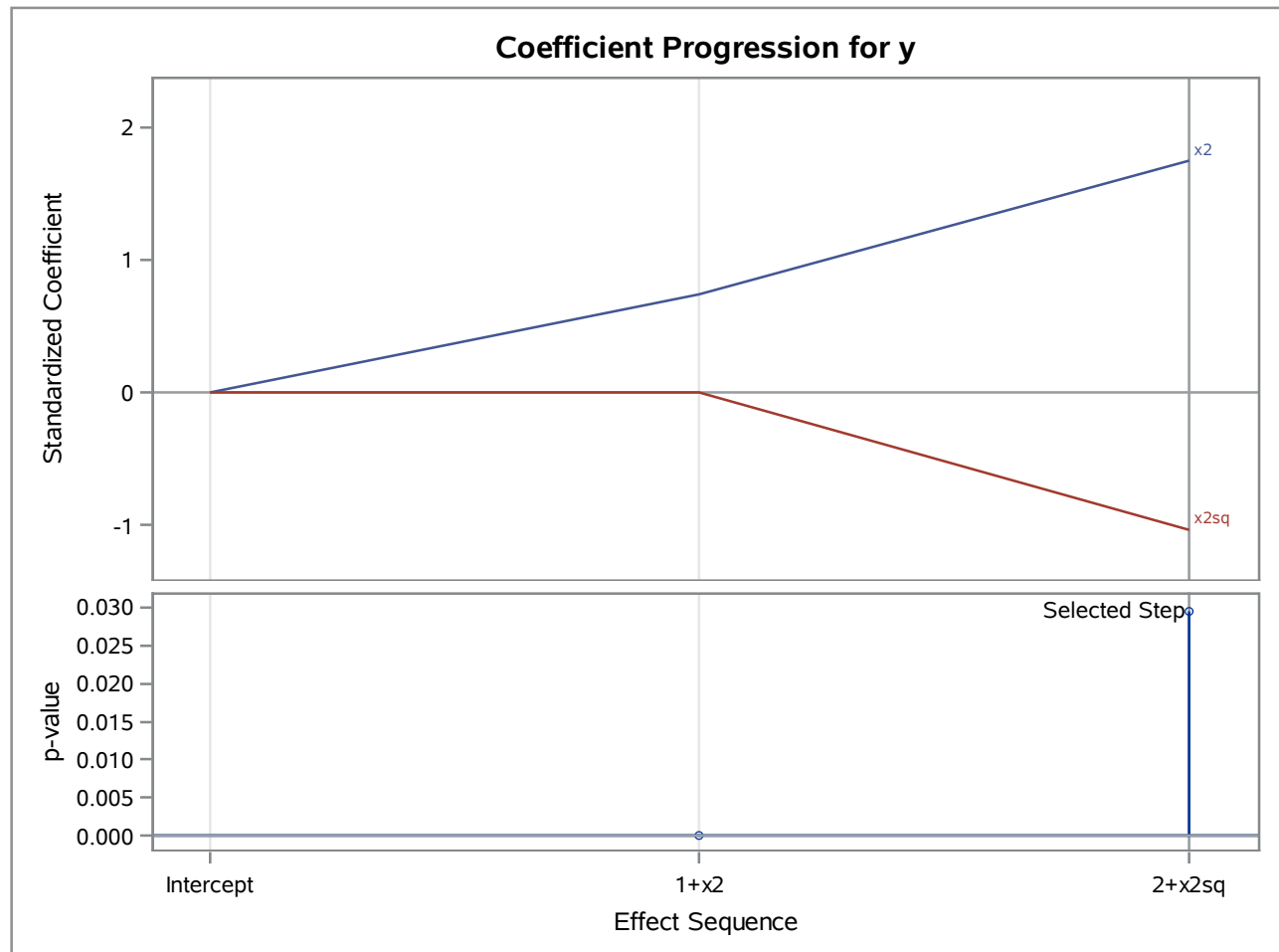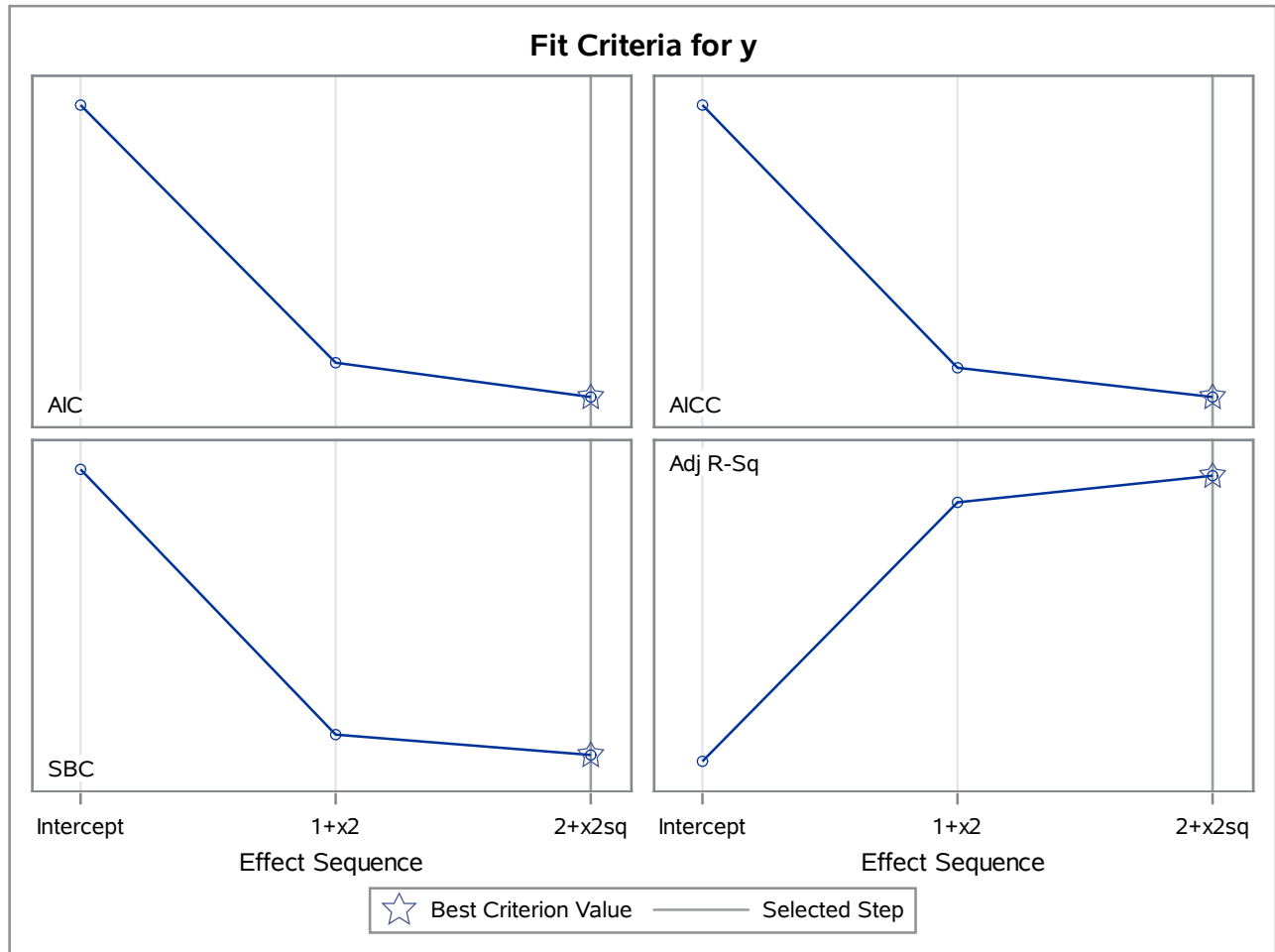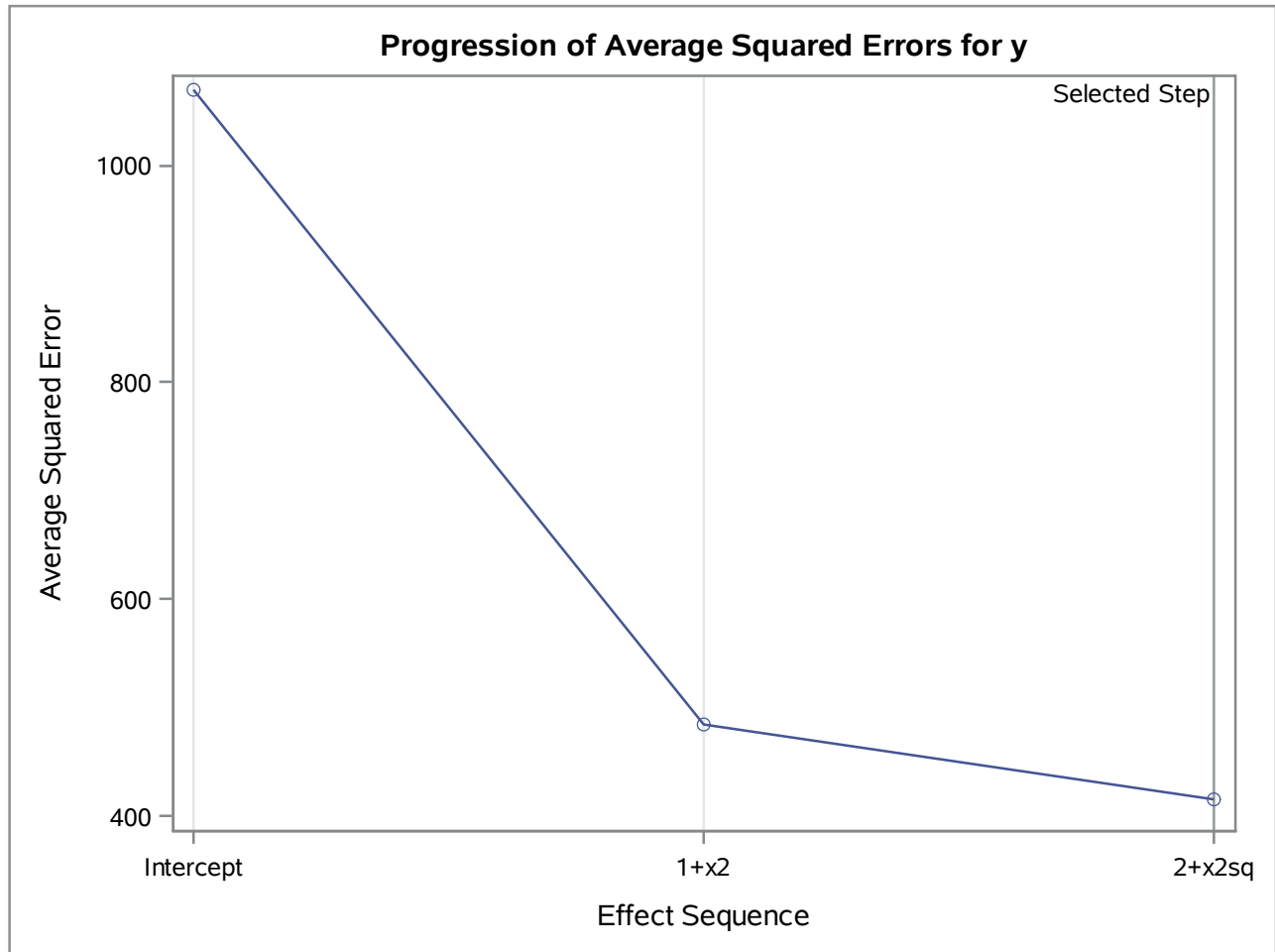
Coefficient Progression for y

The GLMSELECT Procedure

Fit Criteria for y

The GLMSELECT Procedure

Progression of Average Squared Errors for y

The GLMSELECT Procedure
Selected Model

The selected model is the model at the last step (Step 2).

Effects:	Intercept x2 x2sq

Analysis of Variance				
Source	**DF**	**Sum of Squares**	**Mean Square**	**F Value**
Model	2	22262	11131	24.45
Error	31	14115	455.31668	
Corrected Total	33	36377		

Root MSE	21.33815
Dependent Mean	61.91176
R-Square	0.6120
Adj R-Sq	0.5869
AIC	246.97308
AICC	248.35239
SBC	215.55216

Parameter Estimates				
Parameter	**DF**	**Estimate**	**Standard Error**	**t Value**
Intercept	1	-21.542883	16.609089	-1.30
x2	1	3.418123	0.890927	3.84
x2sq	1	-0.024269	0.010635	-2.28

The GLM Procedure

Number of Observations Read	34
Number of Observations Used	34

The SAS System

The GLM Procedure

Dependent Variable: y

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	16847.55157	8423.77579	13.37	<.0001
Error	31	19529.18372	629.97367		
Corrected Total	33	36376.73529			

R-Square	Coeff Var	Root MSE	y Mean
0.463141	40.54040	25.09928	61.91176

Source	DF	Type I SS	Mean Square	F Value	Pr > F
x1	1	15194.79874	15194.79874	24.12	<.0001
x2sq	1	1652.75283	1652.75283	2.62	0.1154

Source	DF	Type III SS	Mean Square	F Value	Pr > F
x1	1	1287.635322	1287.635322	2.04	0.1628
x2sq	1	1652.752831	1652.752831	2.62	0.1154

Parameter	Estimate	Standard Error	t Value	Pr > |t|	95% Confidence Limits	
Intercept	110.6040076	50.67851123	2.18	0.0368	7.2445025	213.9635127
x1	-2.2112552	1.54669126	-1.43	0.1628	-5.3657529	0.9432424
x2sq	0.0088367	0.00545569	1.62	0.1154	-0.0022902	0.0199637

The GLM Procedure
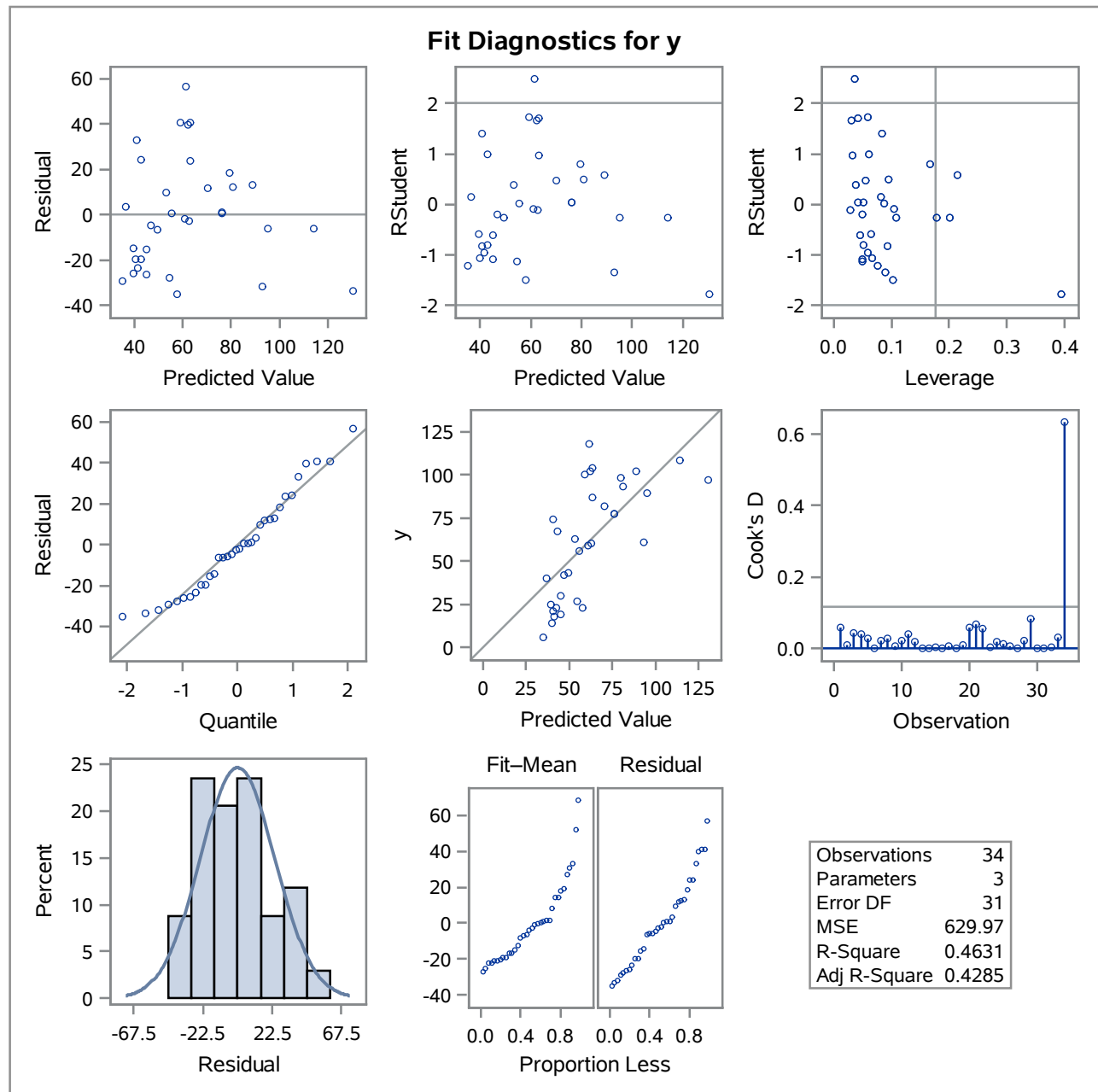
Dependent Variable: y

Fit Diagnostics for y

Observations	34
Parameters	3
Error DF	31
MSE	629.97
R-Square	0.4631
Adj R-Square	0.4285

The GLM Procedure

Dependent Variable: y

Residual Plots for y

Contour Fit Plot for y
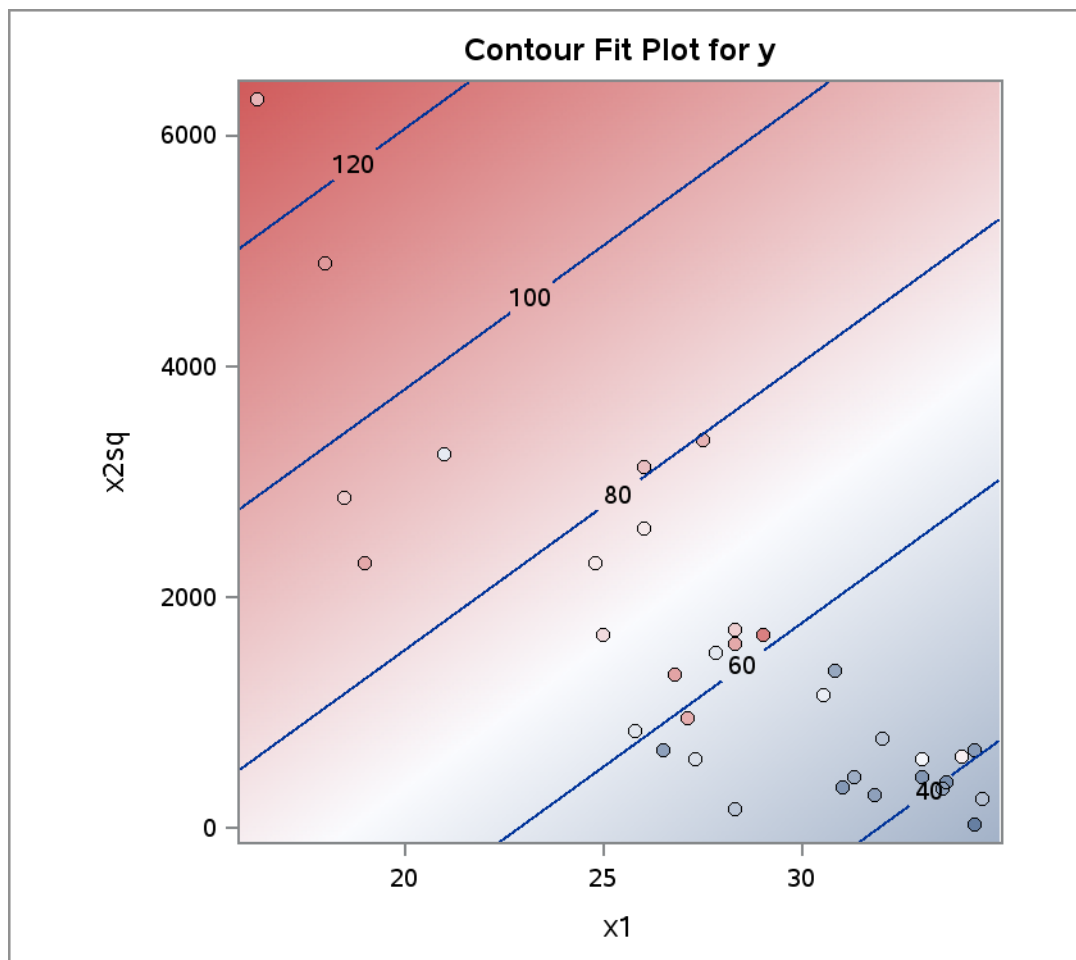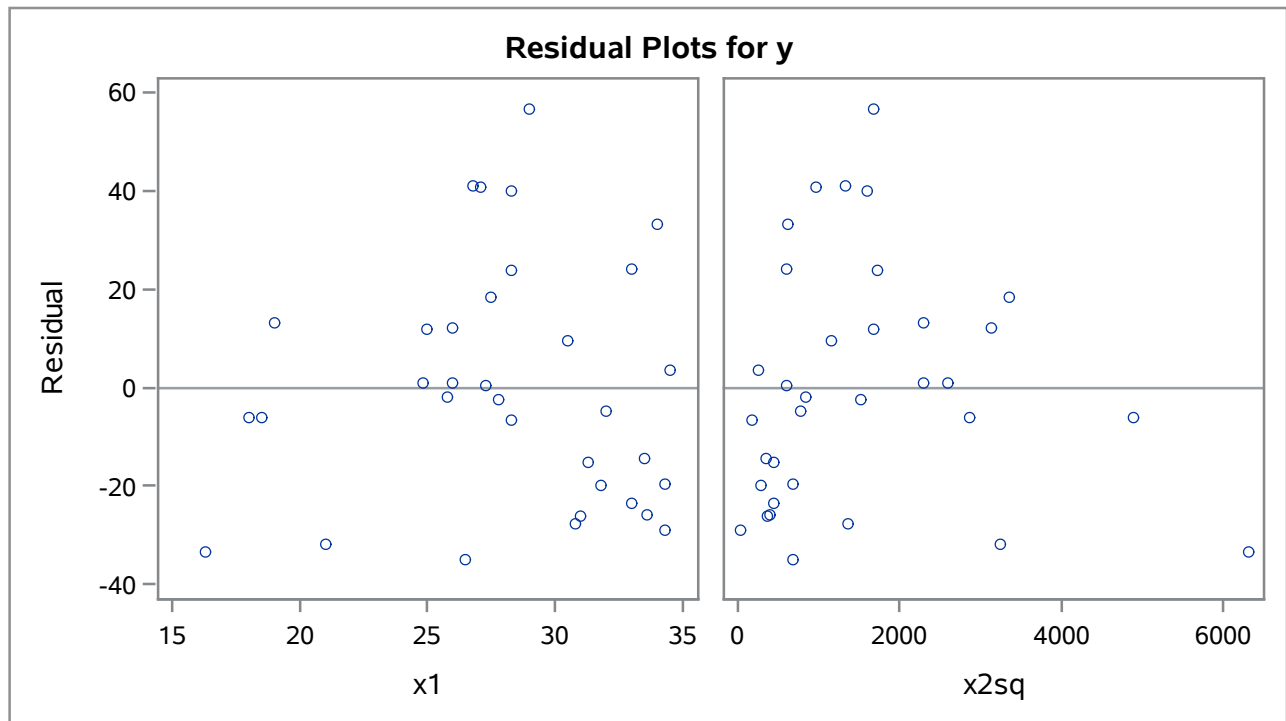
The GLMSELECT Procedure

Data Set	WORK.STEEL
Dependent Variable	y
Selection Method	Backward
Select Criterion	Significance Level
Stop Criterion	Significance Level
Stay Significance Level (SLS)	0.2
Effect Hierarchy Enforced	None

Number of Observations Read	34
Number of Observations Used	34

Dimensions	
Number of Effects	6
Number of Parameters	6

The GLMSELECT Procedure

		Backward Selection Summary			
Step	Effect Removed	Number Effects In	F Value	Pr > F
0		6		
1	x2	5	0.00	0.9838
2	x1sq	4	0.01	0.9263
3	x2sq	3	1.52	0.2270

Selection stopped because the next candidate for removal has SLS < 0.2.

	Stop Details			
Candidate For	Effect	Candidate Significance	Compare Significance	
Removal	x1	0.0078	< 0.2000	(SLS)
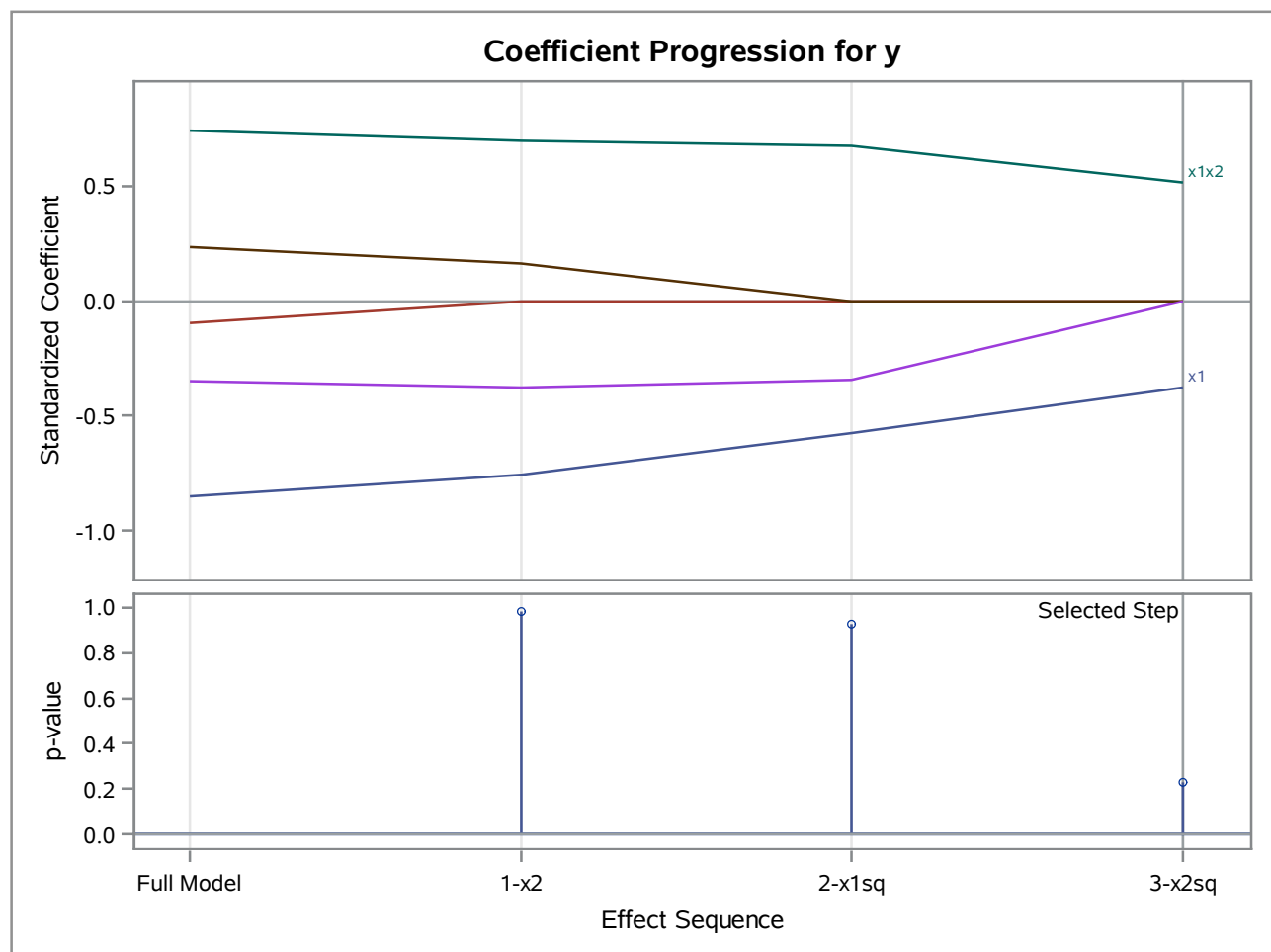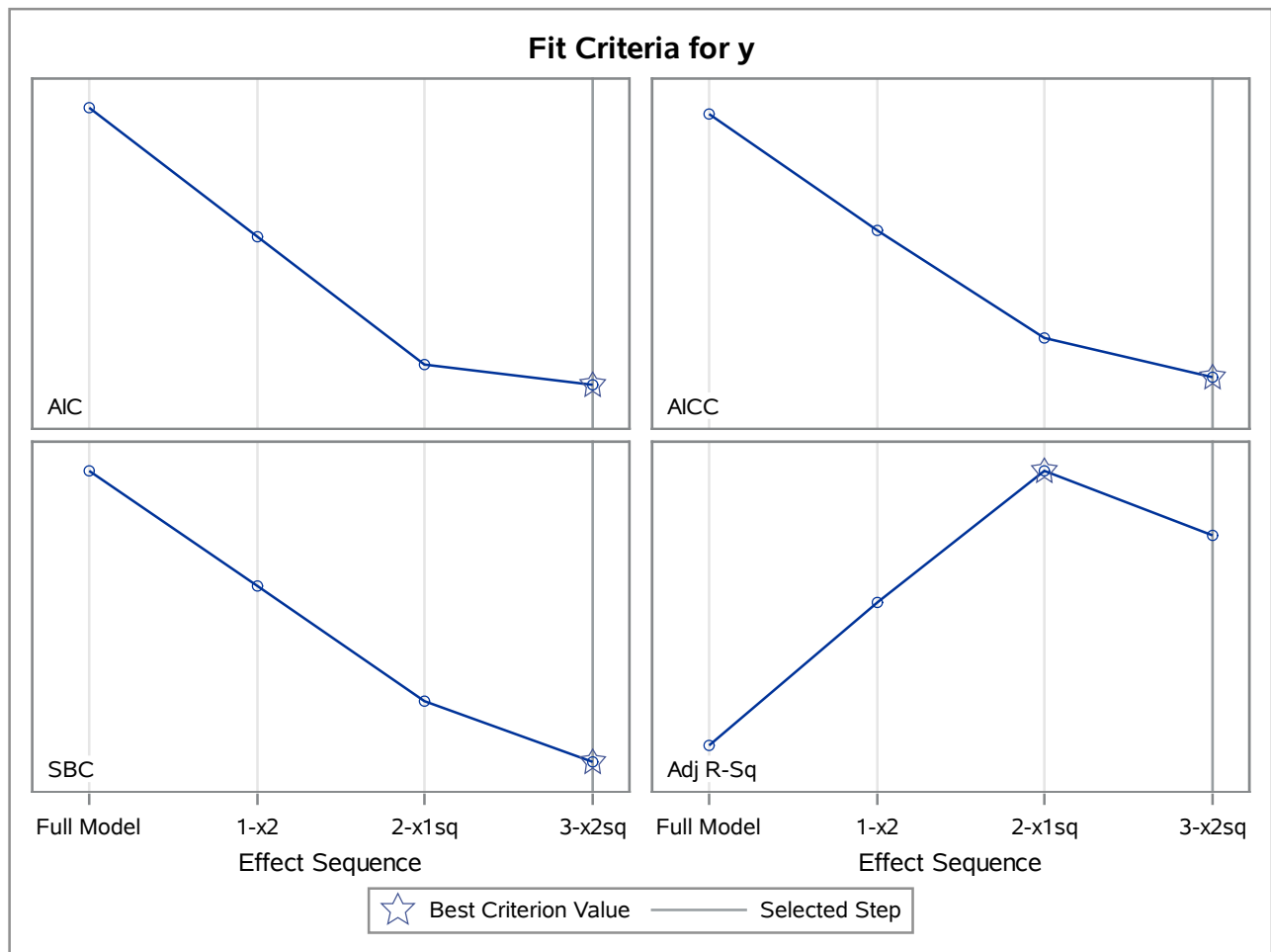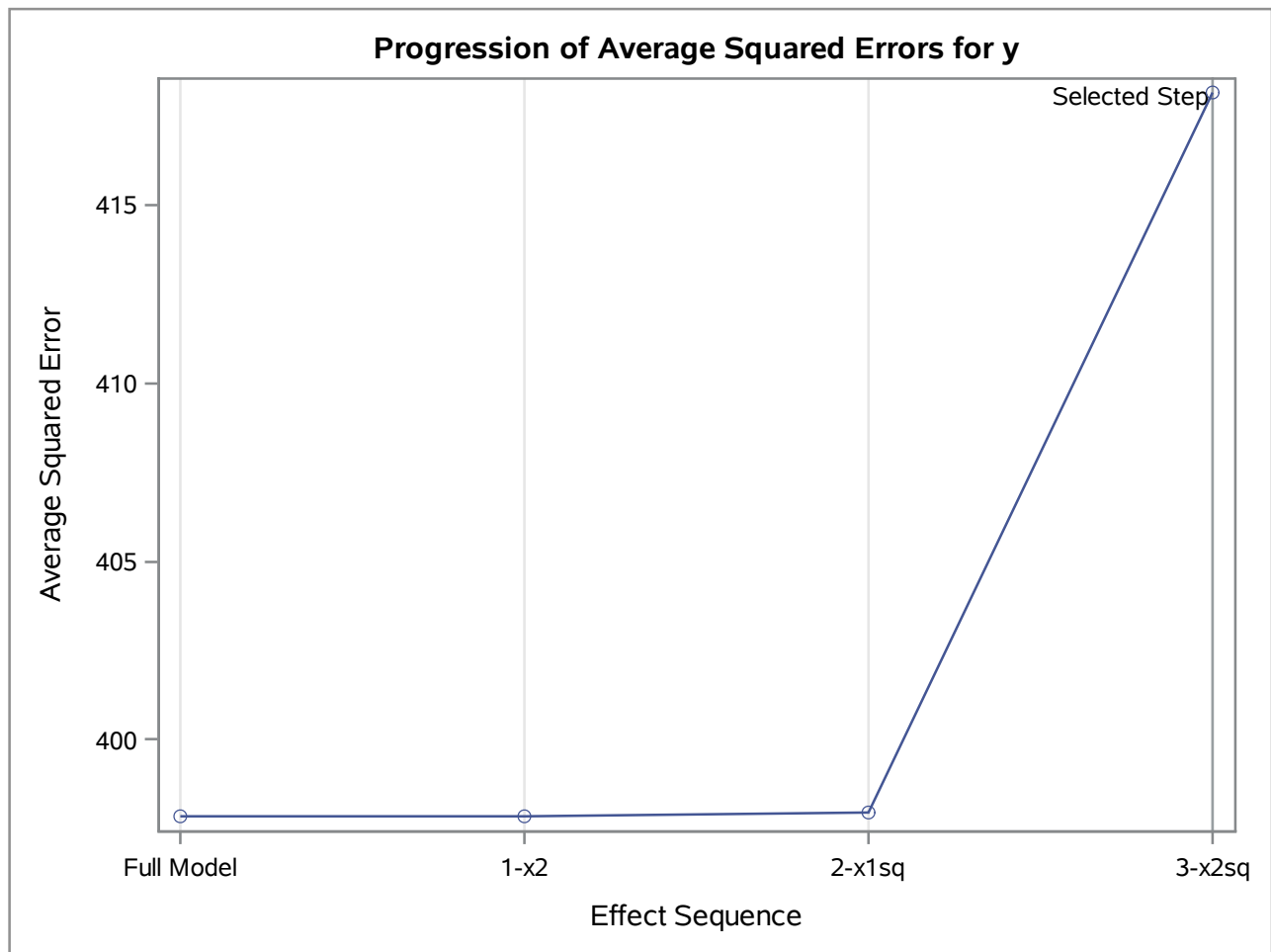
Coefficient Progression for y

The GLMSELECT Procedure

Fit Criteria for y

The GLMSELECT Procedure

Progression of Average Squared Errors for y

The GLMSELECT Procedure
Selected Model

The selected model is the model at the last step (Step 3).

Effects:	Intercept x1 x1x2

Analysis of Variance				
Source	DF	Sum of Squares	Mean Square	F Value
Model	2	22159	11080	24.16
Error	31	14217	458.62397	
Corrected Total	33	36377		

Root MSE	21.41551
Dependent Mean	61.91176
R-Square	0.6092
Adj R-Sq	0.5839
AIC	247.21915
AICC	248.59846
SBC	215.79823

Parameter Estimates				
Parameter	DF	Estimate	Standard Error	t Value
Intercept	1	81.703585	33.376900	2.45
x1	1	-2.487058	0.874628	-2.84
x1x2	1	0.054426	0.013966	3.90

The GLM Procedure

Number of Observations Read	34
Number of Observations Used	34

The SAS System

The GLM Procedure

Dependent Variable: y

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	22159.39212	11079.69606	24.16	<.0001
Error	31	14217.34317	458.62397		
Corrected Total	33	36376.73529			

R-Square	Coeff Var	Root MSE	y Mean
0.609164	34.59037	21.41551	61.91176

Source	DF	Type I SS	Mean Square	F Value	Pr > F
x1	1	15194.79874	15194.79874	33.13	<.0001
x1x2	1	6964.59338	6964.59338	15.19	0.0005

Source	DF	Type III SS	Mean Square	F Value	Pr > F
x1	1	3708.363133	3708.363133	8.09	0.0078
x1x2	1	6964.593381	6964.593381	15.19	0.0005

Parameter	Estimate	Standard Error	t Value	Pr > |t|	95% Confidence Limits	
Intercept	81.70358484	33.37690023	2.45	0.0202	13.63094802	149.77622165
x1	-2.48705791	0.87462754	-2.84	0.0078	-4.27087253	-0.70324329
x1x2	0.05442602	0.01396648	3.90	0.0005	0.02594119	0.08291085

The GLM Procedure

Dependent Variable: y

Fit Diagnostics for y

Observations	34
Parameters	3
Error DF	31
MSE	458.62
R-Square	0.6092
Adj R-Square	0.5839

The GLM Procedure

Dependent Variable: y

Residual Plots for y

Contour Fit Plot for y