Listing 1st 10 obs of MALL

Obs	Sales	Size	Windows	Competitors	Mall_Size	Nearest_Competitor
1	4453	3860	39	12	943700	227
2	4770	4150	41	15	532500	142
3	4821	3880	39	15	390500	263
4	4912	4000	39	13	545500	219
5	4774	4140	40	10	329600	232
6	4638	4370	48	14	802600	257
7	4076	3570	37	16	463300	241
8	3967	3870	39	16	855200	220
9	4000	4020	44	21	443000	188
10	4379	3990	38	16	613400	209

Figure 1.1: Finding a multiple regresion model for the data

The REG Procedure
Model: MODEL1
Dependent Variable: Sales Sales

Number of Observations Read	25
Number of Observations Used	25

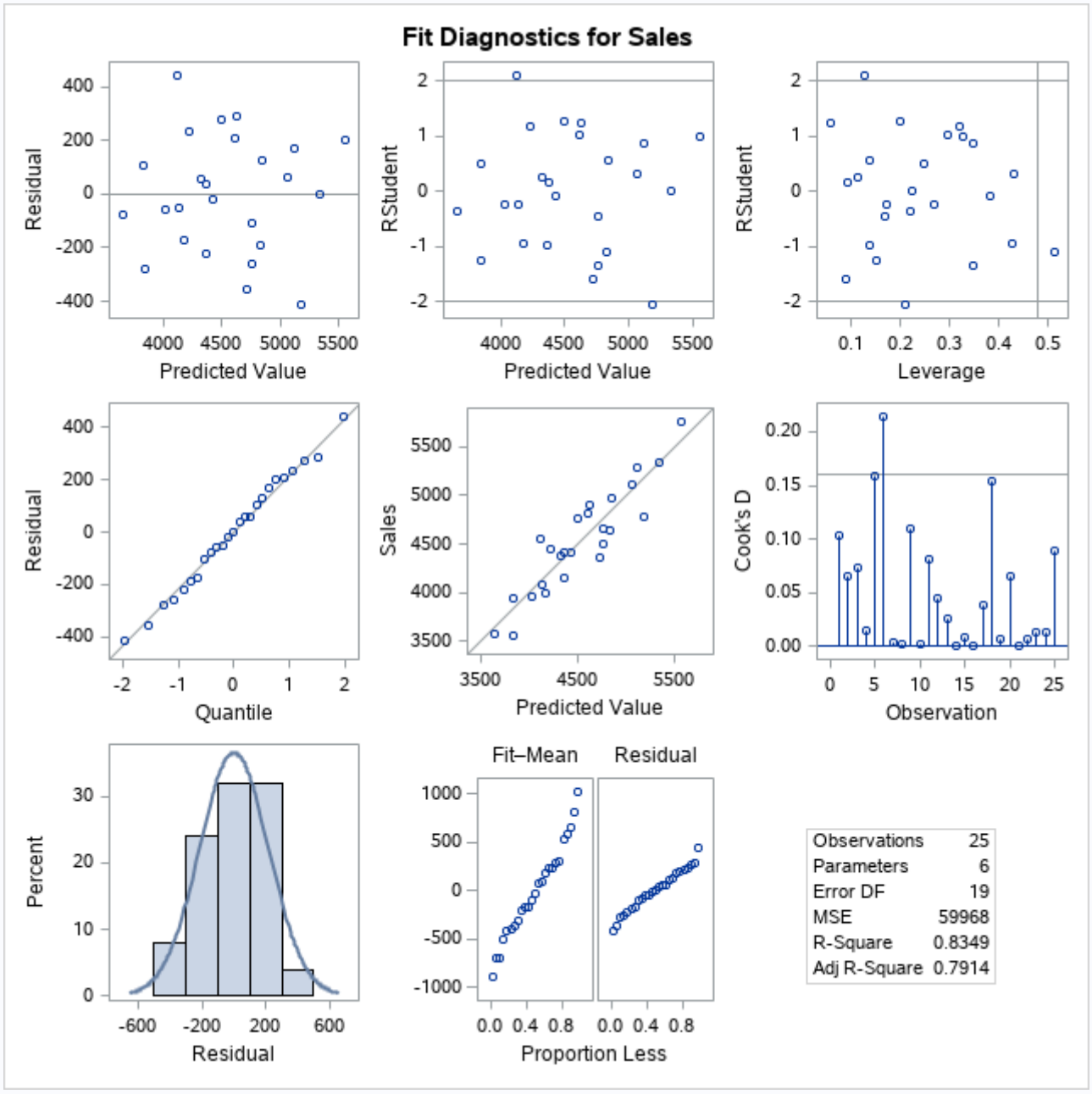
Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	5761406	1152281	19.21	<.0001
Error	19	1139390	59968		
Corrected Total	24	6900796			

Root MSE	244.88345	R-Square	0.8349
Dependent Mean	4535.48000	Adj R-Sq	0.7914
Coeff Var	5.39928		

Parameter Estimates						
Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	1506.80179	672.18680	2.24	0.0371
Competitors	Competitors	1	-67.68553	21.95288	-3.08	0.0061
Mall_Size	Mall_Size	1	-0.00090285	0.00028062	-3.22	0.0045
Nearest_Competitor	Nearest_Competitor	1	2.09589	1.59443	1.31	0.2043
Size	Size	1	0.91937	0.30063	3.06	0.0065
Windows	Windows	1	9.07598	28.82343	0.31	0.7563

Figure 1.1: Finding a multiple regresion model for the data

The REG Procedure
Model: MODEL1
Dependent Variable: Sales Sales


Fit Diagnostics for Sales
Residual
Predicted Value
RStudent
Predicted Value
RStudent
Leverage
Residual
Quantile
Sales
Predicted Value
Cook's D
Observation
Percent
Residual
Fit–Mean
Residual
Proportion Less
Observations 25
Parameters 6
Error DF 19
MSE 59968
R-Square 0.8349
Adj R-Square 0.7914

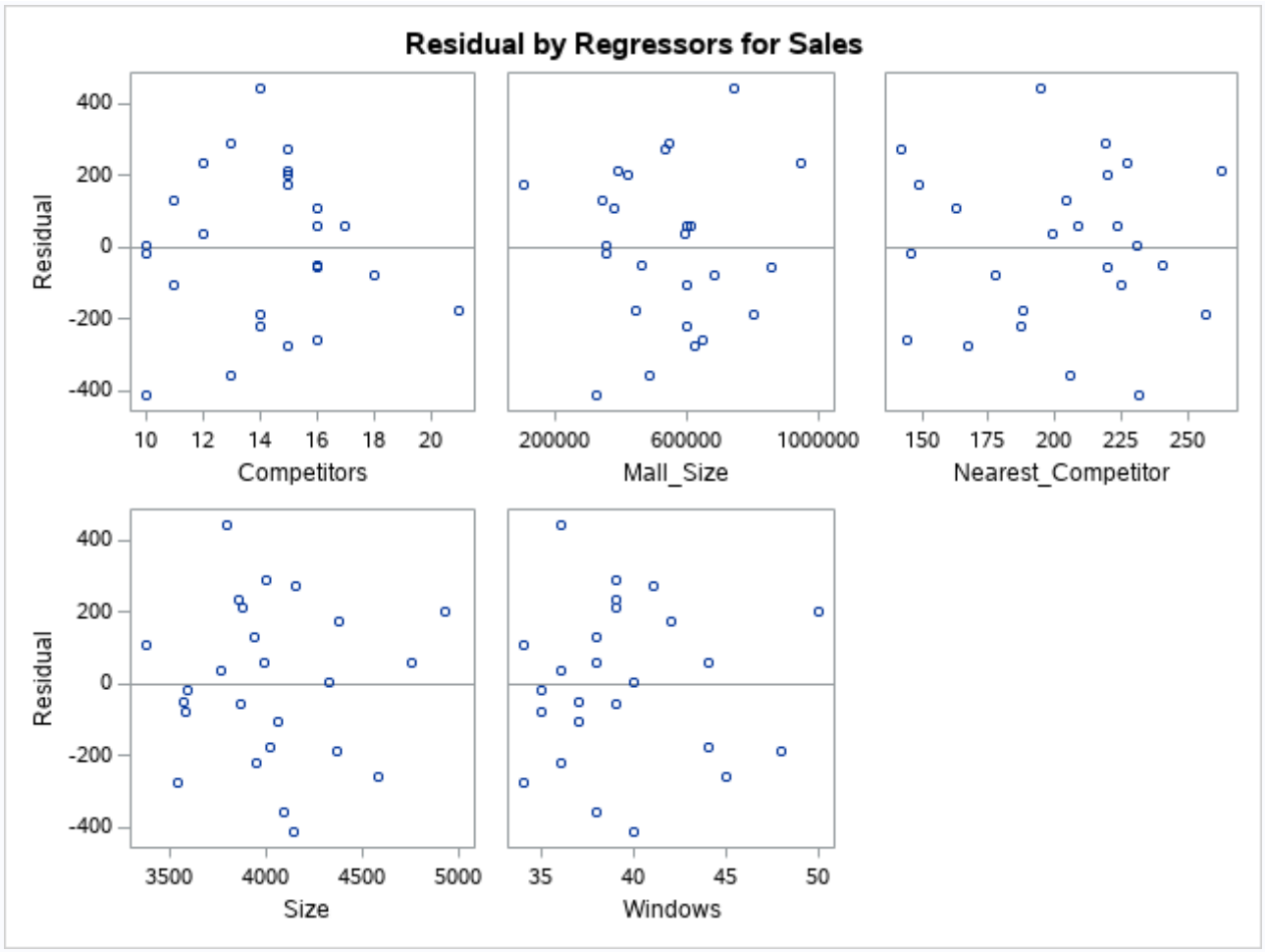


Figure 1.2: Predicting monthly sales

The REG Procedure
Model: MODEL1
Dependent Variable: Sales Sales

Number of Observations Read	25
Number of Observations Used	25

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	5761406	1152281	19.21	<.0001
Error	19	1139390	59968		
Corrected Total	24	6900796			

Root MSE	244.88345	**R-Square**	0.8349
Dependent Mean	4535.48000	**Adj R-Sq**	0.7914
Coeff Var	5.39928		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	1506.80179	672.18680	2.24	0.0371
Competitors	Competitors	1	-67.68553	21.95288	-3.08	0.0061

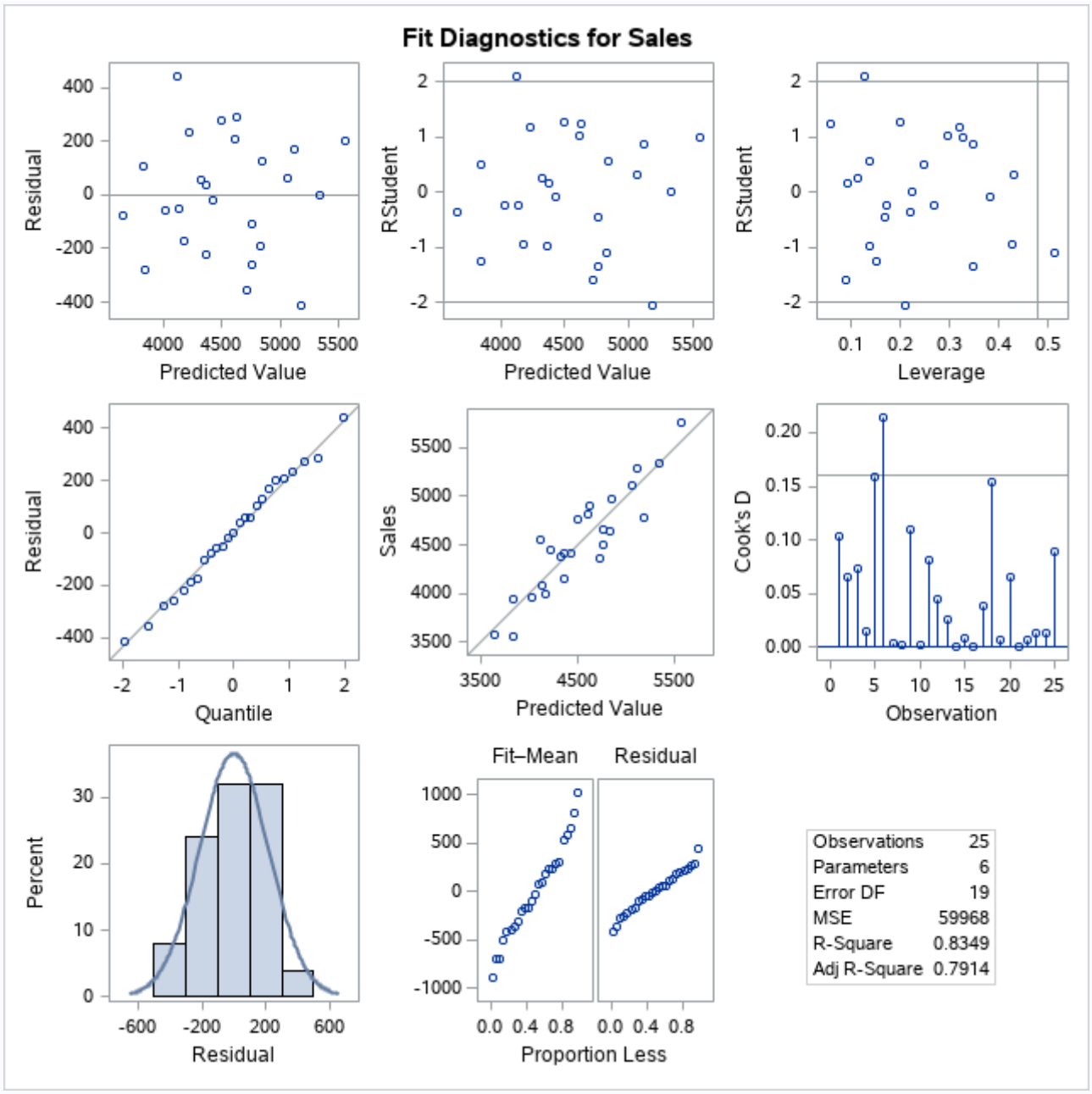
Parameter Estimates						
Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Mall_Size	Mall_Size	1	-0.00090285	0.00028062	-3.22	0.0045
Nearest_Competitor	Nearest_Competitor	1	2.09589	1.59443	1.31	0.2043
Size	Size	1	0.91937	0.30063	3.06	0.0065
Windows	Windows	1	9.07598	28.82343	0.31	0.7563

Figure 1.2: Predicting monthly sales

The REG Procedure
Model: MODEL1
Dependent Variable: Sales Sales

Output Statistics			
Obs	Dependent Variable	Predicted Value	Residual
1	4453	4221	231.9397
2	4770	4496	274.1233
3	4821	4611	209.6974
4	4912	4625	287.1634
5	4774	5188	-413.8542
6	4638	4827	-188.5227
7	4076	4129	-52.6221
8	3967	4025	-57.7434
9	4000	4175	-174.6896
10	4379	4321	57.7525
11	5761	5559	201.5490
12	3561	3839	-277.8760
13	4145	4366	-221.3260
14	4406	4369	36.9650
15	4972	4844	128.3427
16	4414	4433	-18.8276
17	4363	4721	-358.2757
18	4499	4759	-259.6539
19	3573	3651	-78.2762
20	5287	5116	171.0334
21	5339	5338	1.4031
22	4656	4762	-105.7615
23	3943	3837	106.1836
24	5121	5061	59.6326
25	4557	4115	441.6432

Sum of Residuals	0
Sum of Squared Residuals	1139390
Predicted Residual SS (PRESS)	1927897


Fit Diagnostics for Sales
Residual
Predicted Value
RStudent
Predicted Value
RStudent
Leverage
Residual
Quantile
Sales
Predicted Value
Cook's D
Observation
Percent
Residual
Fit–Mean
Residual
Proportion Less
Observations 25
Parameters 6
Error DF 19
MSE 59968
R-Square 0.8349
Adj R-Square 0.7914

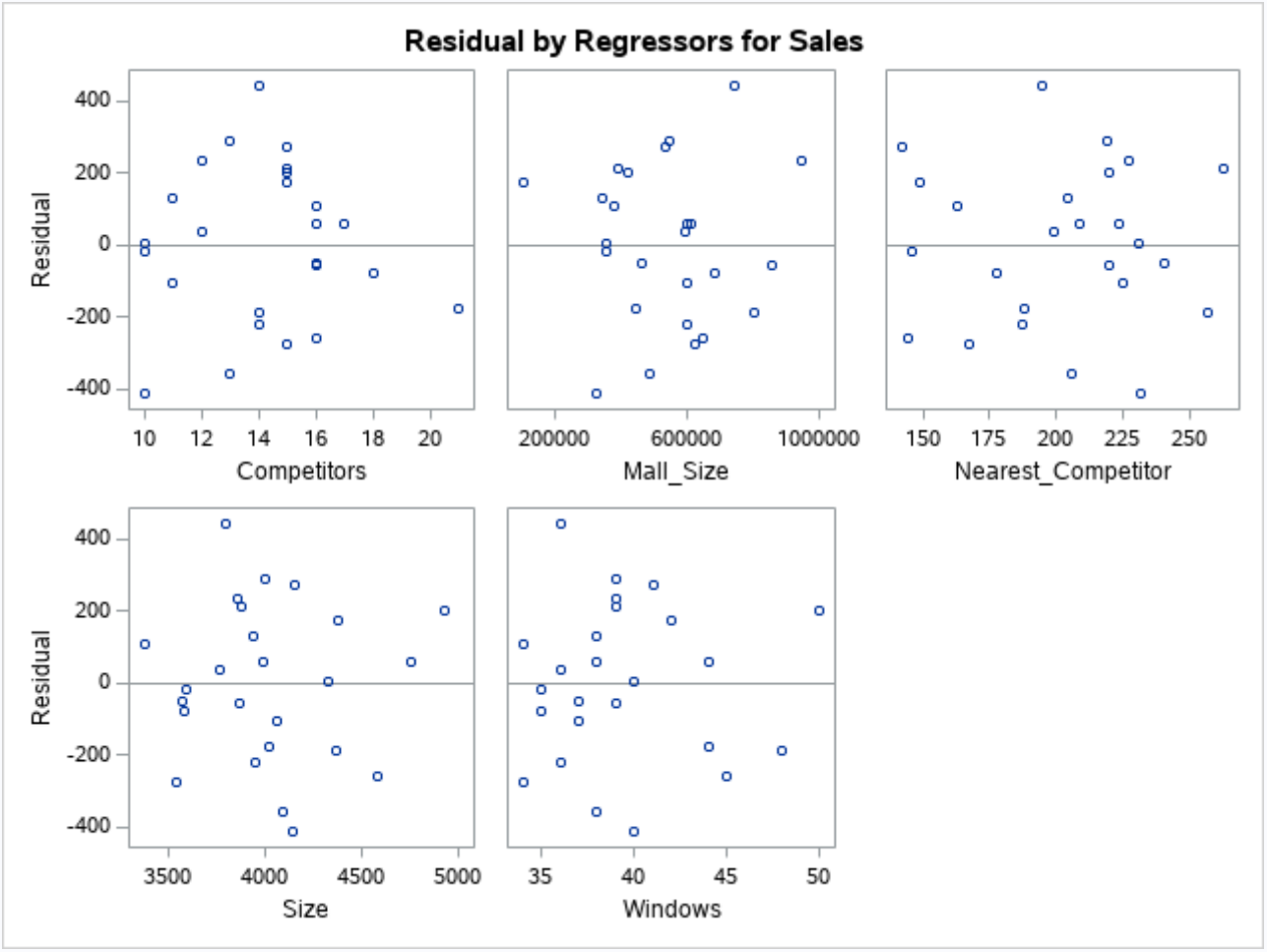


Figure 1.3: Using Stepwise Regression to find the best model

The REG Procedure
Model: Stepwise
Dependent Variable: Sales Sales

Number of Observations Read	25
Number of Observations Used	25

Stepwise Selection: Step 1

Variable Size Entered: R-Square = 0.5814 and C(p) = 27.1707

Analysis of Variance					
Source	**DF**	**Sum of Squares**	**Mean Square**	**F Value**	**Pr > F**
Model	1	4012100	4012100	31.94	<.0001
Error	23	2888696	125595		
Corrected Total	24	6900796			

Variable	**Parameter Estimate**	**Standard Error**	**Type II SS**	**F Value**	**Pr > F**
Intercept	222.40809	766.39576	10577	0.08	0.7743
Size	1.07258	0.18977	4012100	31.94	<.0001

Bounds on condition number: 1, 1

Stepwise Selection: Step 2

Variable Competitors Entered: R-Square = 0.7409 and C(p) = 10.8132

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	5112961	2556481	31.46	<.0001
Error	22	1787835	81265		
Corrected Total	24	6900796			

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	1287.75994	681.05078	290546	3.58	0.0719
Competitors	-79.57360	21.61997	1100861	13.55	0.0013
Size	1.08865	0.15271	4129796	50.82	<.0001

Bounds on condition number: 1.0008, 4.0033

Stepwise Selection: Step 3

Variable Mall_Size Entered: R-Square = 0.8155 and C(p) = 4.2301

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	5627674	1875891	30.94	<.0001
Error	21	1273122	60625		
Corrected Total	24	6900796			

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	1769.60574	611.03962	508470	8.39	0.0086
Competitors	-71.03060	18.90237	856069	14.12	0.0012
Mall_Size	-0.00079216	0.00027187	514713	8.49	0.0083
Size	1.04482	0.13276	3755185	61.94	<.0001

Bounds on condition number: 1.0367, 9.2279

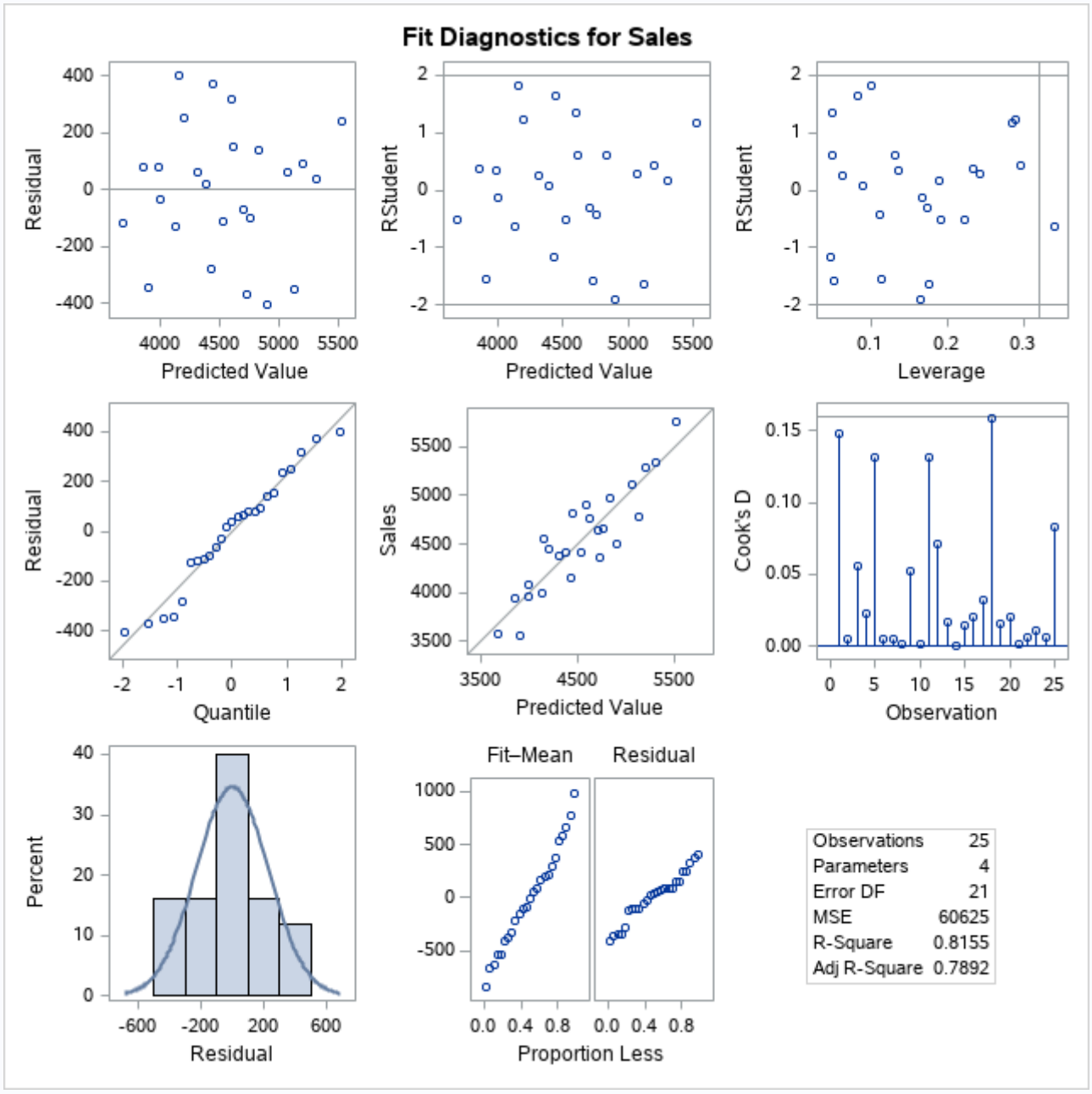
All variables left in the model are significant at the 0.1500 level.

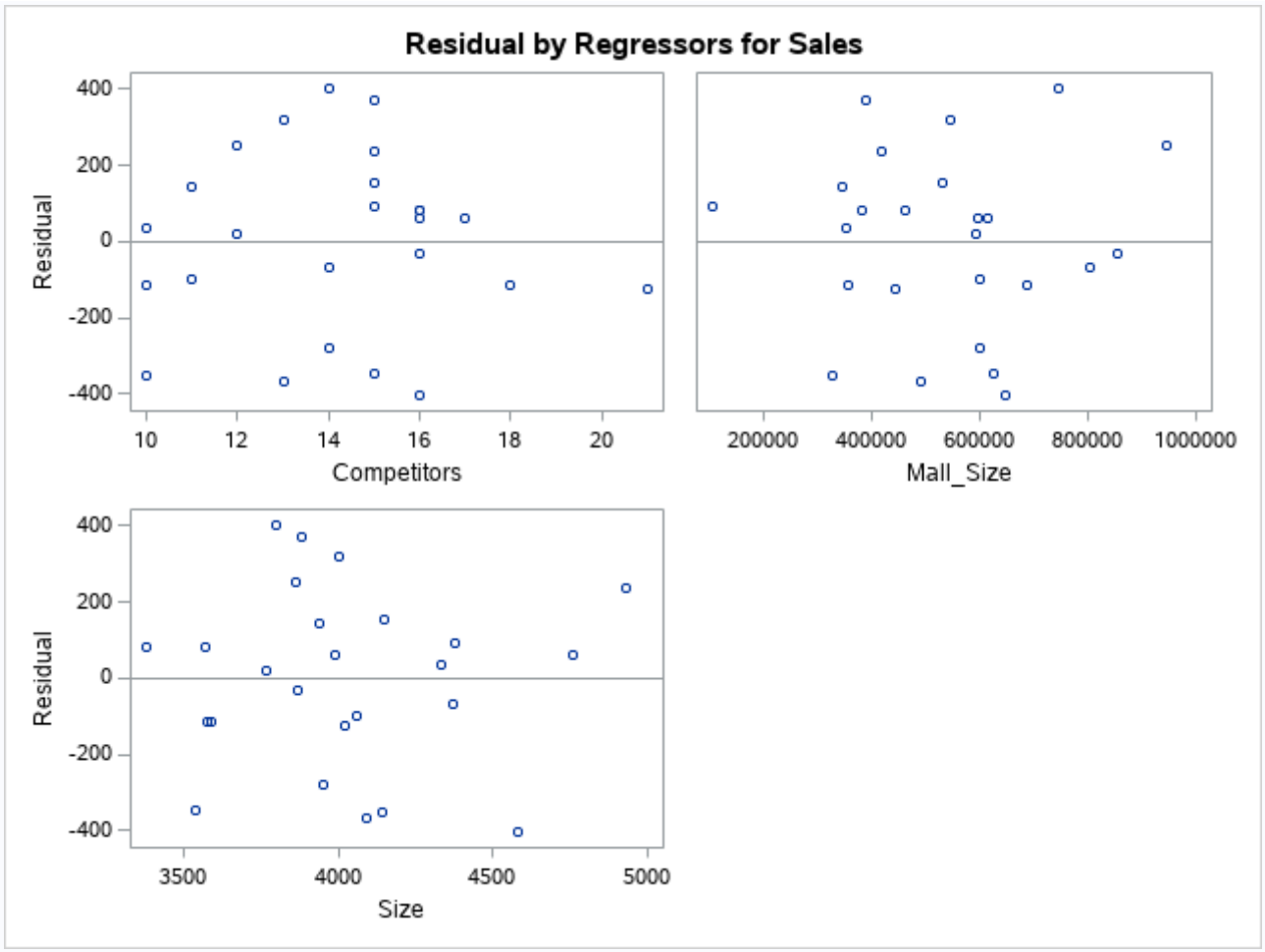
No other variable met the 0.1500 significance level for entry into the model.

Summary of Stepwise Selection									
Step	Variable Entered	Variable Removed	Label	Number Vars In	Partial R-Square	Model R-Square	C(p)	F Value	Pr > F
1	Size		Size	1	0.5814	0.5814	27.1707	31.94	<.0001
2	Competitors		Competitors	2	0.1595	0.7409	10.8132	13.55	0.0013
3	Mall_Size		Mall_Size	3	0.0746	0.8155	4.2301	8.49	0.0083

Figure 1.3: Using Stepwise Regression to find the best model

The REG Procedure
Model: Stepwise
Dependent Variable: Sales Sales


Fit Diagnostics for Sales
Residual
Predicted Value
RStudent
Predicted Value
RStudent
Leverage
Residual
Quantile
Sales
Predicted Value
Cook's D
Observation
Percent
Residual
Fit–Mean
Residual
Proportion Less
Observations 25
Parameters 4
Error DF 21
MSE 60625
R-Square 0.8155
Adj R-Square 0.7892


Residual by Regressors for Sales
Residual
400
200
0
-200
-400
10
12
14
16
18
20
Competitors
200000
400000
600000
800000
1000000
Mall_Size
3500
4000
4500
5000
Size