Marketing Effectiveness Analysis
Summary measures of raw variables

The SUMMARY Procedure

Variable	Minimum	Mean	Maximum	Std Dev
Sales	1764.90	2223.53	2969.70	327.6274436
Formulary	3.5000000	5.9604167	8.8000000	1.8290492
DTC_TV	150.0000000	357.1875000	750.0000000	203.0850002
TV	0	68.7500000	200.0000000	62.3178196
PDEs	5.2000000	17.0187500	26.2000000	6.1956971
Display	0.4945396	1.2108412	1.8514892	0.3831512
UR	3.1000000	4.9562500	6.8000000	0.9935764
Nov_Ind	0	0.0833333	1.0000000	0.2793102
Dec_Ind	0	0.0833333	1.0000000	0.2793102

The REG Procedure
Model: MODEL1
Dependent Variable: Sales

Number of Observations Read	48
Number of Observations Used	48

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	8	4777021	597128	86.91	<.0001
Error	39	267946	6870.42103		
Corrected Total	47	5044968			

Root MSE	82.88800	R-Square	0.9469
Dependent Mean	2223.53125	Adj R-Sq	0.9360
Coeff Var	3.72776		

Parameter Estimates						
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	Variance Inflation
Intercept	1	1508.73096	92.74811	16.27	<.0001	0
Formulary	1	41.82768	7.01112	5.97	<.0001	1.12497
DTC_TV	1	-0.41607	0.11381	-3.66	0.0008	3.65422
TV	1	4.30378	0.35351	12.17	<.0001	3.32006
PDEs	1	12.00214	2.09733	5.72	<.0001	1.15513
Display	1	68.30121	34.10914	2.00	0.0522	1.16841
UR	1	-5.85931	12.88949	-0.45	0.6519	1.12199
Nov_Ind	1	359.09986	49.06269	7.32	<.0001	1.28467
Dec_Ind	1	364.47564	48.96050	7.44	<.0001	1.27932

Marketing Effectiveness Analysis
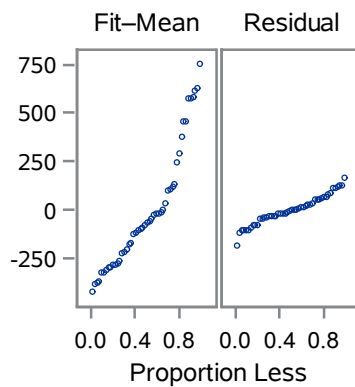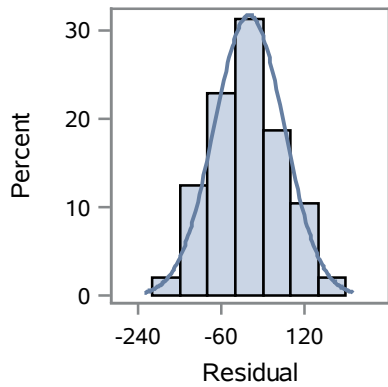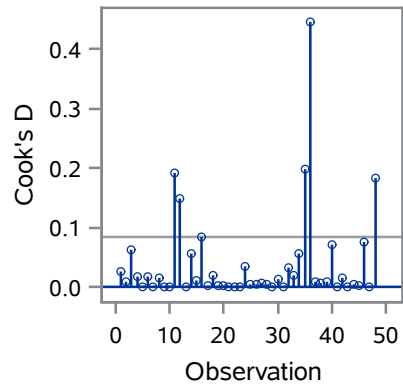## Summary measures of raw variables
Naive Linear Regression Model

The REG Procedure
Model: MODEL1
Dependent Variable: Sales

Durbin-Watson D	1.463
Number of Observations	48
1st Order Autocorrelation	0.240

The REG Procedure
Model: MODEL1
Dependent Variable: Sales

Fit Diagnostics for Sales
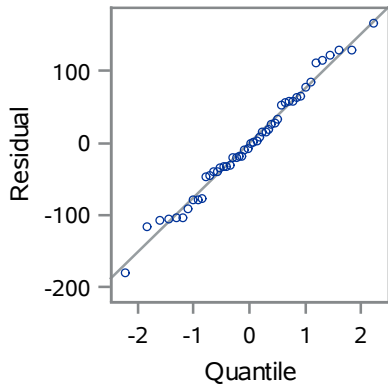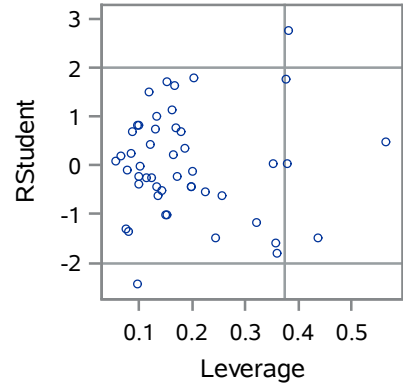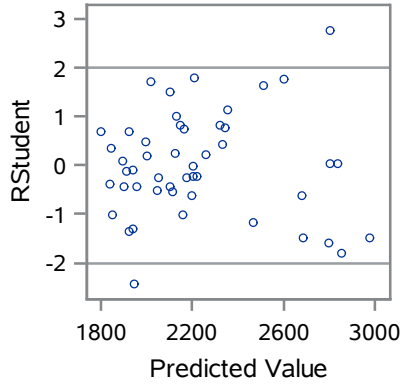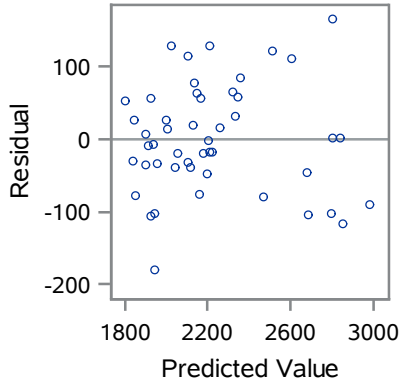
Observations	48
Parameters	9
Error DF	39
MSE	6870.4
R-Square	0.9469
Adj R-Square	0.936

Marketing Effectiveness Analysis
Summary measures of raw variables
Naive Linear Regression Model

The REG Procedure
Model: MODEL1
Dependent Variable: Sales

Residual by Regressors for Sales

Marketing Effectiveness Analysis
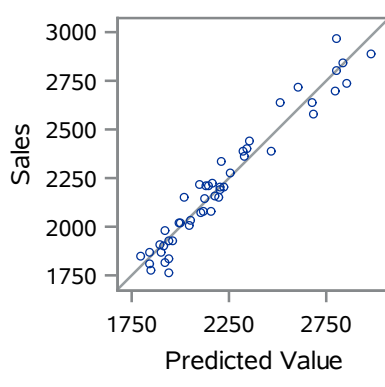**Summary measures of raw variables**
Naive Linear Regression Model

The REG Procedure
Model: MODEL1
Dependent Variable: Sales

Residual by Regressors for Sales

Marketing Effectiveness Analysis
Summary measures of raw variables
Naive Linear Regression Model

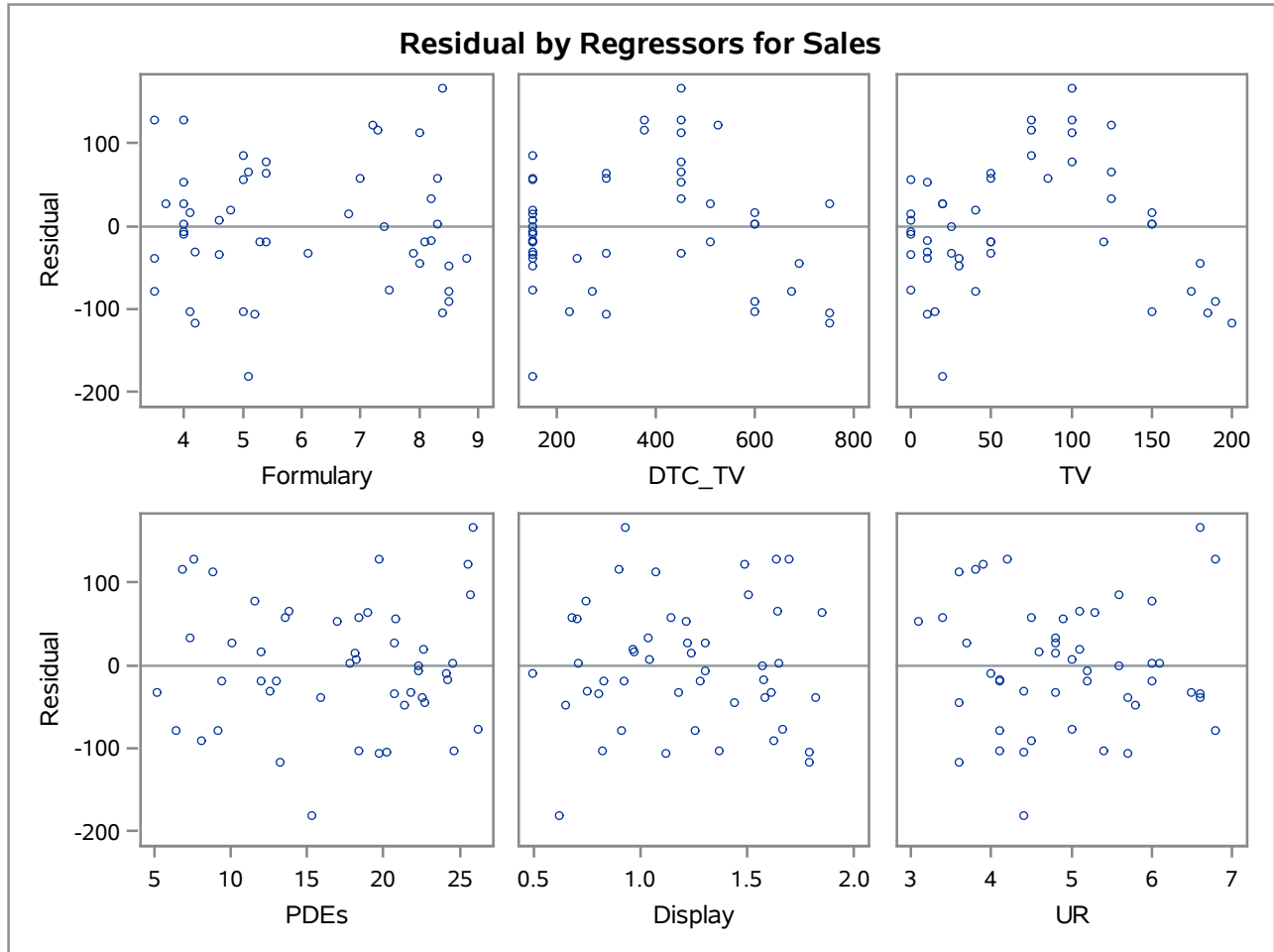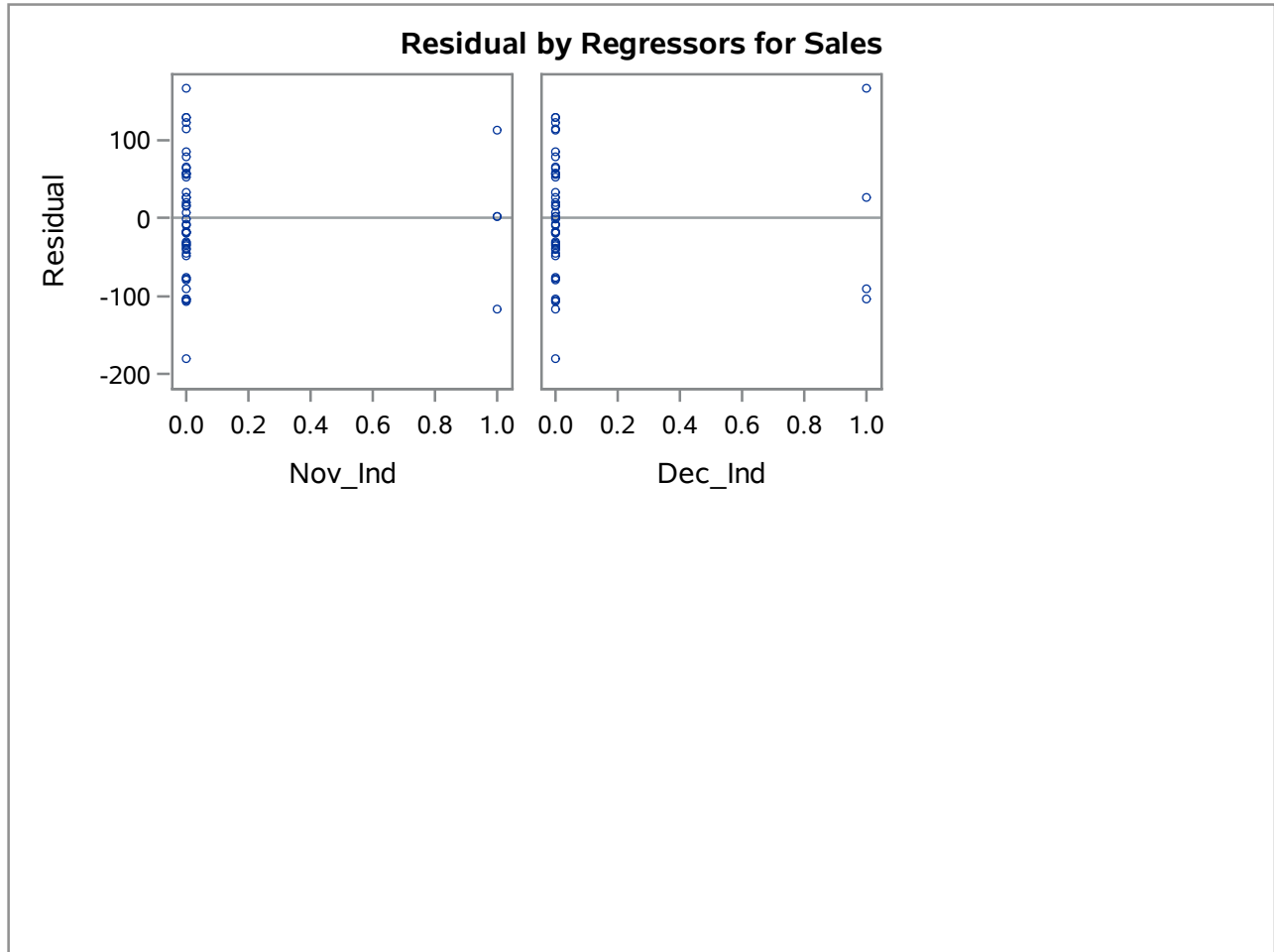| Obs	Month	Formulary	DTC_TV	Nov_Ind	Dec_Ind	TV	PDEs	Display	UR	Sales	yhat	resid
1	.	5.0	150	0	0	75	25.7	1.50559	5.6	2442.0	2356.72	85.281
2	.	5.1	450	0	0	125	13.8	1.64575	5.1	2385.6	2320.95	64.655
3	.	5.1	150	0	0	20	15.3	0.61682	4.4	1764.9	1945.70	-180.798
4	.	5.2	300	0	0	10	19.7	1.12207	5.7	1817.7	1924.13	-106.434
5	.	5.4	510	0	0	120	12.0	0.92603	4.1	2203.8	2222.11	-18.308
6	.	5.4	450	0	0	100	11.6	0.74263	6.0	2210.1	2132.54	77.563
7	.	5.3	150	0	0	50	9.4	1.27815	5.2	2033.1	2052.85	-19.747
8	.	5.0	225	0	0	15	18.4	0.82091	4.1	1838.7	1941.69	-102.995
9	.	4.8	150	0	0	40	22.6	0.96451	5.1	2145.9	2126.49	19.413
10	.	4.6	150	0	0	0	18.2	1.04043	5.0	1906.5	1898.93	7.568
11	.	4.2	750	1	0	200	13.2	1.79174	3.6	2735.4	2851.92	-116.521
12	.	4.1	600	0	1	150	24.6	1.36636	5.4	2694.6	2797.56	-102.960
13	.	4.0	150	0	0	0	22.3	1.30200	5.2	1932.3	1939.74	-7.438
14	.	4.0	375	0	0	75	7.6	1.63492	4.2	2149.5	2021.07	128.428
15	.	4.0	450	0	0	10	17.0	1.21344	3.1	1853.1	1800.60	52.502
16	.	3.5	450	0	0	100	19.7	1.69737	6.8	2339.1	2210.80	128.296
17	.	3.7	510	0	0	20	20.7	1.30634	4.8	1873.2	1846.92	26.284
18	.	3.5	270	0	0	40	6.4	1.25502	4.1	1775.4	1853.45	-78.049
19	.	4.6	150	0	0	0	20.7	0.80468	6.6	1868.7	1903.46	-34.761
20	.	4.2	150	0	0	10	12.6	0.75021	4.4	1811.1	1841.72	-30.620
21	.	4.1	600	0	0	150	12.0	0.97295	4.6	2275.8	2259.67	16.125
22	.	4.0	150	0	0	0	24.1	0.49454	4.0	1903.8	1913.22	-9.423
23	.	4.0	600	1	0	150	24.5	1.64592	6.0	2805.0	2802.38	2.620
24	.	4.0	750	0	1	20	10.1	1.21758	3.7	2024.4	1997.24	27.158
25	.	3.5	240	0	0	30	22.5	1.82384	5.7	2006.1	2045.60	-39.504
26	.	5.0	150	0	0	0	20.8	0.70199	4.9	1980.3	1924.34	55.961
27	.	5.4	300	0	0	50	19.0	1.85149	5.3	2212.5	2148.41	64.087
28	.	6.1	300	0	0	50	5.2	1.18135	6.5	1926.0	1959.26	-33.260
29	.	6.8	150	0	0	0	18.1	1.23580	4.8	2019.0	2004.27	14.731
30	.	7.0	150	0	0	85	18.4	0.67831	4.5	2403.3	2345.74	57.563
31	.	7.4	150	0	0	25	22.3	1.57081	5.6	2204.4	2205.56	-1.163
32	.	7.3	375	0	0	75	6.8	0.90226	3.8	2216.7	2101.80	114.896
33	.	7.5	150	0	0	0	26.2	1.66731	5.0	2082.6	2159.07	-76.466
34	.	7.2	525	0	0	125	25.5	1.48885	3.9	2635.8	2514.32	121.482
35	.	8.0	450	1	0	100	8.8	1.06920	3.6	2715.0	2603.15	111.849
36	.	8.4	450	0	1	100	25.9	0.93187	6.6	2969.7	2803.54	166.164

Marketing Effectiveness Analysis
Summary measures of raw variables
Naive Linear Regression Model

Obs	Month	Formulary	DTC_TV	Nov_Ind	Dec_Ind	TV	PDEs	Display	UR	Sales	yhat	resid
37	.	8.3	300	0	0	50	13.6	1.14217	3.4	2224.8	2167.59	57.213
38	.	8.5	150	0	0	30	21.4	0.64697	5.8	2150.4	2198.02	-47.619
39	.	8.8	150	0	0	10	15.9	1.58122	6.6	2078.4	2117.60	-39.203
40	.	8.5	675	0	0	175	9.2	0.91301	6.8	2390.4	2469.51	-79.115
41	.	8.2	150	0	0	10	24.2	1.57721	4.1	2188.8	2206.50	-17.699
42	.	8.0	690	0	0	180	22.7	1.43884	3.6	2635.2	2680.57	-45.372
43	.	8.1	150	0	0	50	13.0	0.82513	6.0	2157.9	2177.54	-19.643
44	.	7.9	450	0	0	25	21.8	1.61588	4.8	2071.2	2103.42	-32.219
45	.	8.2	450	0	0	125	7.3	1.03363	4.8	2365.2	2332.55	32.653
46	.	8.4	750	0	0	185	20.2	1.79313	4.4	2578.5	2683.36	-104.864
47	.	8.3	600	1	0	150	17.8	0.70757	6.1	2839.2	2837.15	2.052
48	.	8.5	600	0	1	190	8.1	1.62655	4.5	2888.4	2978.76	-90.362

The NLIN Procedure

**Listing of Compiled Program Code**
Stmt	**Line:Col**	**Statement as Parsed**
1	106:2	MODEL.Sales = B_Int + B_Formulary * Formulary + B_UR * UR + B_Nov_Ind * Nov_Ind + B_Dec_Ind * Dec_Ind + B_DTC_TV * LOG(DTC_TV) + B1_TV * EXP(- B2_TV * EXP(- B3_TV * TV)) + B_Display * LOG(Display) + B_PDEs * LOG(PDEs);
1	106:2	@MODEL.Sales/@B_DTC_TV = LOG(DTC_TV);
1	106:2	@MODEL.Sales/@B1_TV = EXP(- B2_TV * EXP(- B3_TV * TV));
1	106:2	@MODEL.Sales/@B2_TV = B1_TV * - EXP(- B3_TV * TV) * EXP(- B2_TV * EXP(- B3_TV * TV));
1	106:2	@MODEL.Sales/@B3_TV = B1_TV * - B2_TV * - TV * EXP(- B3_TV * TV) * EXP(- B2_TV * EXP(- B3_TV * TV));
1	106:2	@MODEL.Sales/@B_PDEs = LOG(PDEs);
1	106:2	@MODEL.Sales/@B_Display = LOG(Display);

Marketing Effectiveness Analysis
Summary measures of raw variables
Naive Linear Regression Model

The NLIN Procedure
Dependent Variable Sales

Grid Search										
B_Int	B_Formulary	B_UR	B_Nov_Ind	B_Dec_Ind	B_DTC_TV	B1_TV	B2_TV	B3_TV	B_PDEs	B_Display	Sum of Squares
1508.7	41.8277	-5.8593	359.1	364.5	-0.4161	700.0	0.4300	0.0100	12.0021	68.3012	2393077

Marketing Effectiveness Analysis
Summary measures of raw variables
Naive Linear Regression Model

The NLIN Procedure
Dependent Variable Sales
Method: Gauss-Newton

					Iterative Phase								
Iter	B_Int	B_Formulary	B_UR	B_Nov_Ind	B_Dec_Ind	B_DTC_TV	B1_TV	B2_TV	B3_TV	B_PDEs	B_Display	Sum of Squares
0	1508.7	41.8277	-5.8593	359.1	364.5	-0.4161	700.0	0.4300	0.0100	12.0021	68.3012	2393077
1	1517.2	41.8288	-5.8614	359.1	364.5	-0.4408	691.4	0.4364	0.0100	12.0427	68.3155	2392523
2	1527.4	41.8301	-5.8641	359.1	364.5	-0.4718	681.0	0.4444	0.0101	12.0933	68.3334	2391963
3	1539.5	41.8318	-5.8674	359.1	364.5	-0.5104	668.6	0.4542	0.0101	12.1564	68.3557	2391447
4	1553.9	41.8339	-5.8716	359.1	364.5	-0.5585	654.0	0.4663	0.0102	12.2353	68.3836	2391046
5	1570.5	41.8365	-5.8767	359.1	364.5	-0.6184	637.1	0.4813	0.0103	12.3337	68.4183	2390858
6	1580.1	41.8381	-5.8799	359.1	364.5	-0.6557	627.3	0.4904	0.0103	12.3950	68.4399	2390053
7	1591.4	41.8401	-5.8839	359.1	364.5	-0.7023	615.7	0.5017	0.0104	12.4716	68.4669	2389235
8	1604.7	41.8427	-5.8889	359.1	364.5	-0.7603	602.1	0.5157	0.0105	12.5671	68.5006	2388462
9	1620.1	41.8458	-5.8952	359.1	364.5	-0.8325	586.3	0.5328	0.0106	12.6863	68.5426	2387807
10	1637.7	41.8498	-5.9029	359.1	364.5	-0.9224	568.3	0.5538	0.0107	12.8348	68.5948	2387355
11	1657.5	41.8547	-5.9125	359.2	364.5	-1.0341	548.0	0.5793	0.0108	13.0197	68.6598	2387183
12	1668.3	41.8578	-5.9185	359.2	364.5	-1.1034	536.8	0.5947	0.0109	13.1347	68.7002	2385646
13	1680.9	41.8617	-5.9259	359.2	364.5	-1.1896	523.9	0.6137	0.0110	13.2782	68.7505	2384000
14	1695.2	41.8664	-5.9351	359.2	364.5	-1.2969	509.1	0.6369	0.0112	13.4569	68.8131	2382268
15	1711.3	41.8724	-5.9466	359.2	364.5	-1.4300	492.5	0.6651	0.0113	13.6793	68.8910	2380452
16	1729.0	41.8798	-5.9608	359.2	364.6	-1.5951	474.2	0.6993	0.0115	13.9560	68.9876	2378503
17	1748.0	41.8891	-5.9783	359.2	364.6	-1.7993	454.5	0.7404	0.0118	14.2994	69.1074	2376278
18	1767.9	41.9006	-6.0000	359.2	364.6	-2.0513	433.7	0.7894	0.0121	14.7252	69.2556	2373487
19	1788.3	41.9148	-6.0267	359.3	364.6	-2.3612	412.4	0.8477	0.0124	15.2518	69.4383	2369637
20	1808.5	41.9325	-6.0593	359.3	364.6	-2.7412	391.1	0.9162	0.0129	15.9017	69.6631	2363990
21	1828.1	41.9543	-6.0992	359.4	364.6	-3.2051	370.5	0.9961	0.0134	16.7016	69.9385	2355548
22	1846.4	41.9811	-6.1476	359.4	364.7	-3.7690	351.0	1.0887	0.0139	17.6831	70.2747	2343061
23	1879.8	42.0470	-6.2645	359.5	364.8	-5.1327	315.5	1.3015	0.0153	20.0833	71.0919	2334551
24	1920.5	42.2028	-6.5310	359.8	364.9	-8.2515	271.6	1.7461	0.0181	25.7198	72.9818	2318236
25	1958.3	42.8826	-7.6071	361.0	365.6	-20.9602	228.9	3.3596	0.0281	50.0516	80.8567	2184430
26	1795.0	44.8111	-9.9537	364.8	366.9	-49.8245	375.4	6.8478	0.0449	119.1	100.0	783473
27	1555.7	46.6728	-11.6199	369.9	368.0	-72.6858	559.2	7.4009	0.0421	190.4	115.4	88040.8
28	1552.6	46.6538	-11.8815	369.7	368.1	-76.7432	579.5	6.8452	0.0418	195.0	116.4	85500.1
29	1549.2	46.7071	-11.8233	369.8	368.0	-76.0982	577.3	7.0806	0.0424	195.1	116.6	85461.0
30	1549.4	46.6972	-11.8374	369.8	368.1	-76.1872	577.7	7.0450	0.0423	195.1	116.5	85460.3
31	1549.3	46.6985	-11.8352	369.8	368.1	-76.1764	577.7	7.0510	0.0423	195.1	116.5	85460.2

Marketing Effectiveness Analysis
Summary measures of raw variables
Naive Linear Regression Model

The NLIN Procedure
Dependent Variable Sales
Method: Gauss-Newton

						Iterative Phase						
Iter	B_Int	B_Formulary	B_UR	B_Nov_Ind	B_Dec_Ind	B_DTC_TV	B1_TV	B2_TV	B3_TV	B_PDEs	B_Display	Sum of Squares
32	1549.4	46.6982	-11.8356	369.8	368.1	-76.1792	577.7	7.0498	0.0423	195.1	116.5	85460.2
33	1549.4	46.6983	-11.8355	369.8	368.1	-76.1788	577.7	7.0500	0.0423	195.1	116.5	85460.2
34	1549.4	46.6983	-11.8355	369.8	368.1	-76.1788	577.7	7.0500	0.0423	195.1	116.5	85460.2

NOTE: Convergence criterion met.

Estimation Summary	
Method	Gauss-Newton
Iterations	34
Subiterations	58
Average Subiterations	1.705882
R	5.522E-7
PPC(B2_TV)	9.621E-7
RPC(B2_TV)	5.329E-6
Object	7.56E-12
Objective	85460.24
Observations Read	48
Observations Used	48
Observations Missing	0

Source	DF	Sum of Squares	Mean Square	F Value	Approx Pr > F
Model	10	4959508	495951	214.72	<.0001
Error	37	85460.2	2309.7		
Corrected Total	47	5044968			

Parameter	Estimate	Approx Std Error	Approximate 90% Confidence Limits	
B_Int	1549.4	158.6	1281.8	1816.9
B_Formulary	46.6983	4.0501	39.8653	53.5312
B_UR	-11.8355	7.4890	-24.4701	0.7990
B_Nov_Ind	369.8	28.3399	322.0	417.6
B_Dec_Ind	368.1	27.7505	321.2	414.9

Marketing Effectiveness Analysis
## Summary measures of raw variables
### Naive Linear Regression Model

The NLIN Procedure

Parameter	Estimate	Approx Std Error	Approximate 90% Confidence Limits	
B_DTC_TV	-76.1788	22.6251	-114.3	-38.0082
B1_TV	577.7	39.5460	511.0	644.4
B2_TV	7.0500	2.2062	3.3279	10.7721
B3_TV	0.0423	0.00662	0.0311	0.0535
B_PDEs	195.1	19.1765	162.8	227.5
B_Display	116.5	22.4503	78.6698	154.4

Approximate Correlation Matrix							
	B_Int	B_Formulary	B_UR	B_Nov_Ind	B_Dec_Ind	B_DTC_TV	B1_TV
B_Int	1.0000000	-0.2932010	-0.3462857	0.0694551	0.2468363	-0.9174111	0.5958391
B_Formulary	-0.2932010	1.0000000	-0.0228644	0.0419088	-0.0443872	0.1983466	-0.2906002
B_UR	-0.3462857	-0.0228644	1.0000000	0.0079806	-0.0990733	0.2304863	-0.1938978
B_Nov_Ind	0.0694551	0.0419088	0.0079806	1.0000000	0.2306213	-0.0893527	-0.1893478
B_Dec_Ind	0.2468363	-0.0443872	-0.0990733	0.2306213	1.0000000	-0.2794882	0.0320623
B_DTC_TV	-0.9174111	0.1983466	0.2304863	-0.0893527	-0.2794882	1.0000000	-0.7149868
B1_TV	0.5958391	-0.2906002	-0.1938978	-0.1893478	0.0320623	-0.7149868	1.0000000
B2_TV	-0.2911092	0.1591480	0.0909128	0.0625253	-0.0075639	0.3815953	-0.7212669
B3_TV	-0.4406633	0.1747533	0.0718564	0.1090217	0.0078707	0.4934290	-0.7726579
B_PDEs	-0.5484054	0.0461398	-0.1363400	-0.0264191	-0.0427386	0.2871072	-0.0820995
B_Display	0.2959654	0.0174936	-0.0140077	0.0399897	0.0448499	-0.2879687	0.0328295

Approximate Correlation Matrix				
	B2_TV	B3_TV	B_PDEs	B_Display
B_Int	-0.2911092	-0.4406633	-0.5484054	0.2959654
B_Formulary	0.1591480	0.1747533	0.0461398	0.0174936
B_UR	0.0909128	0.0718564	-0.1363400	-0.0140077
B_Nov_Ind	0.0625253	0.1090217	-0.0264191	0.0399897
B_Dec_Ind	-0.0075639	0.0078707	-0.0427386	0.0448499
B_DTC_TV	0.3815953	0.4934290	0.2871072	-0.2879687
B1_TV	-0.7212669	-0.7726579	-0.0820995	0.0328295
B2_TV	1.0000000	0.9362844	0.0560817	0.0729590
B3_TV	0.9362844	1.0000000	0.2045448	-0.0004750
B_PDEs	0.0560817	0.2045448	1.0000000	-0.2269803
B_Display	0.0729590	-0.0004750	-0.2269803	1.0000000
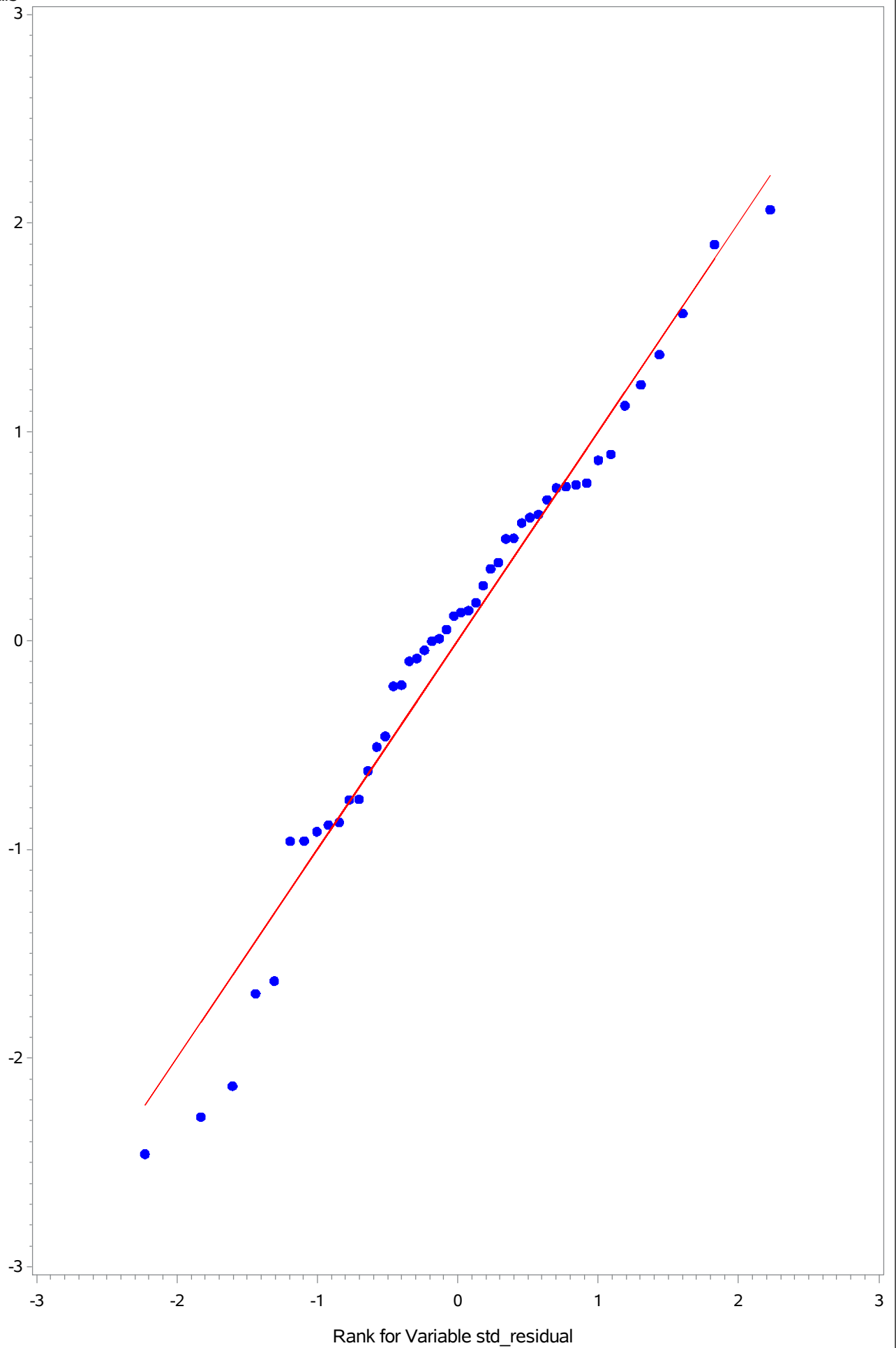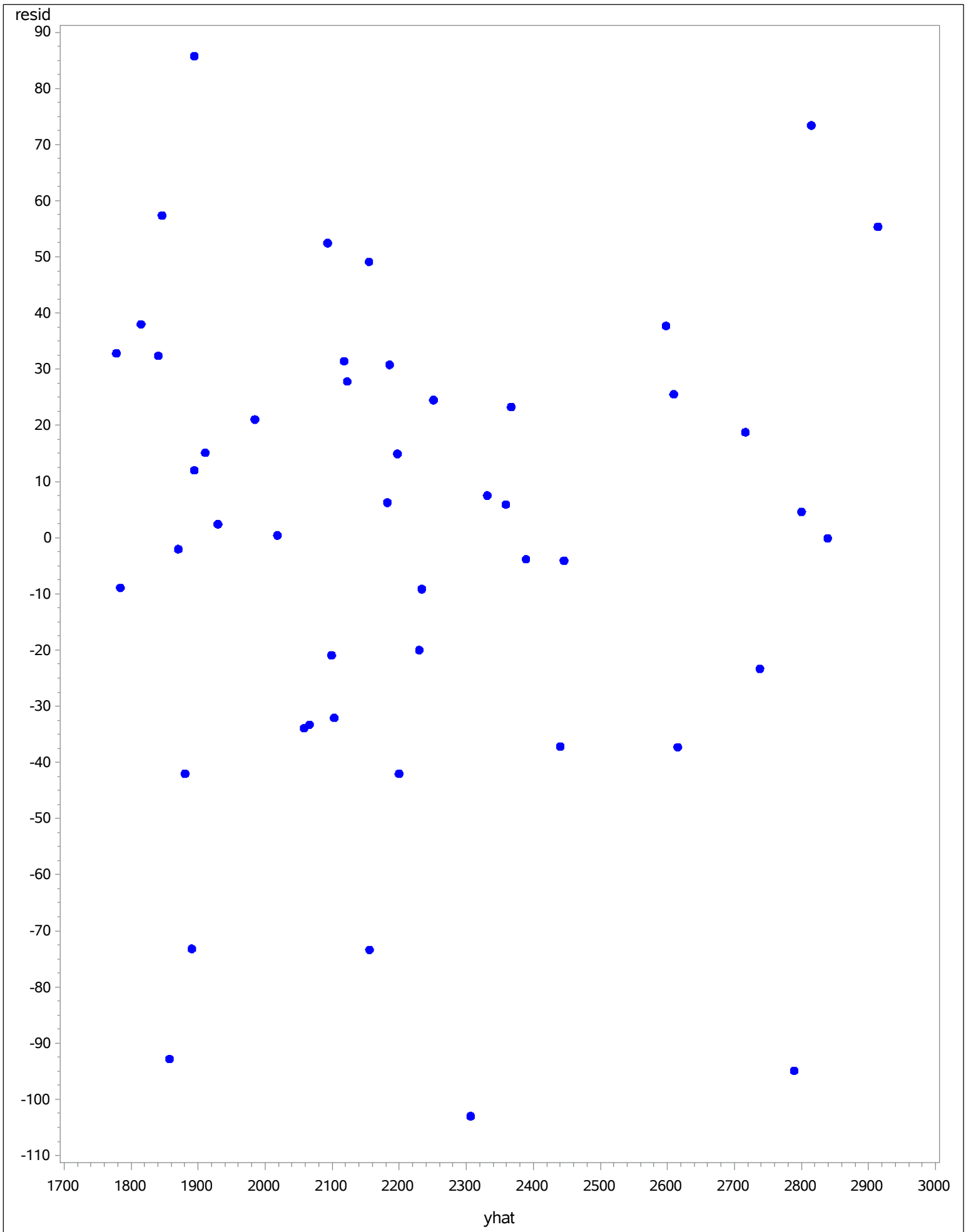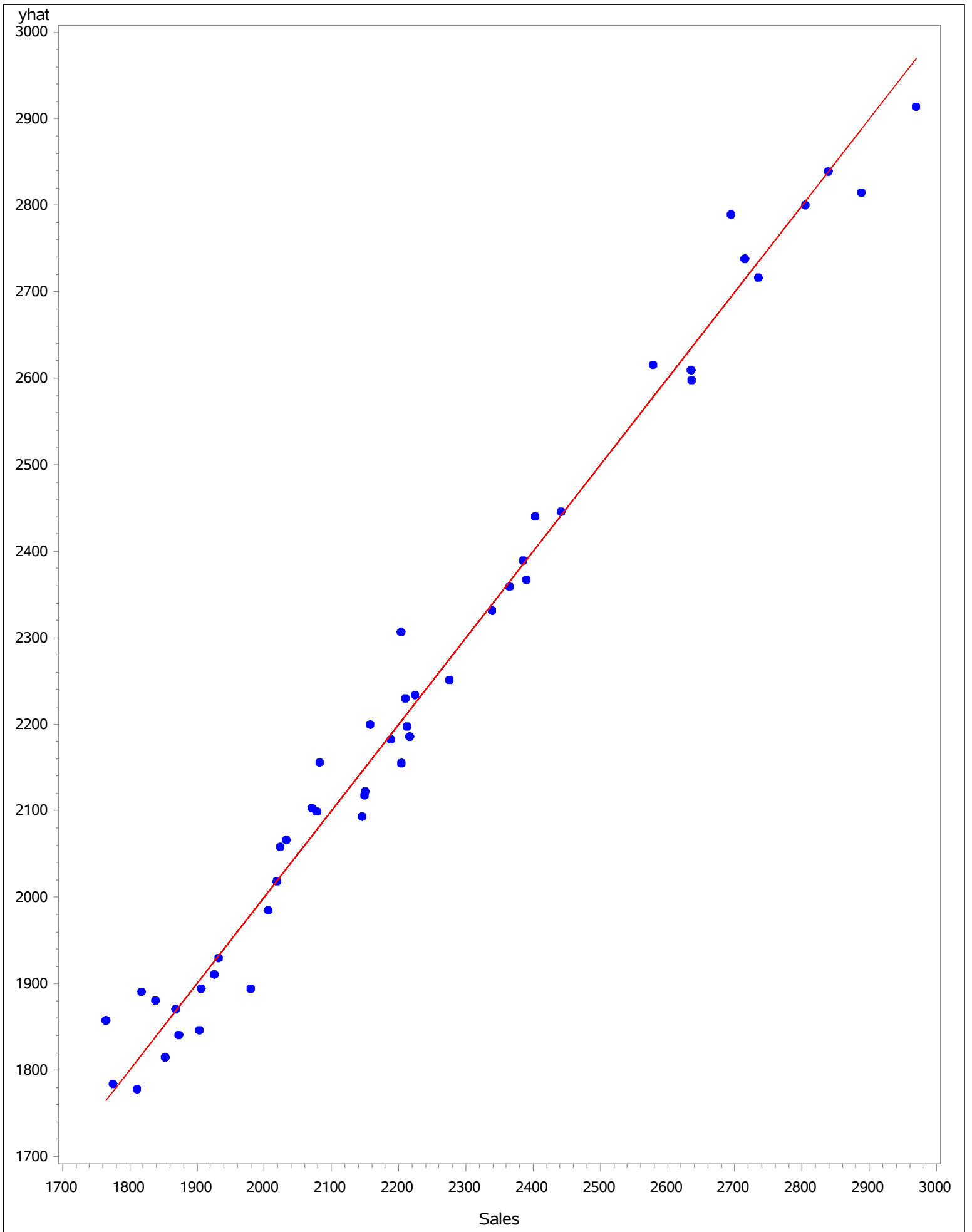
The REG Procedure
Model: MODEL1
Dependent Variable: resid

Number of Observations Read	48
Number of Observations Used	48

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	0	0	.	.	.
Error	47	85460	1818.30296		
Corrected Total	47	85460			

Root MSE	42.64156	R-Square	0.0000
Dependent Mean	-1.21904E-9	Adj R-Sq	0.0000
Coeff Var	-3.49798E12		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	-1.21904E-9	6.15478	-0.00	1.0000

The REG Procedure
Model: MODEL1
Dependent Variable: resid

Durbin-Watson D	1.640
Pr < DW	0.1033
Pr > DW	0.8967
Number of Observations	48
1st Order Autocorrelation	0.148

Note: Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

The REG Procedure
Model: MODEL1
Dependent Variable: resid

Fit Diagnostics for resid

Observations	48
Parameters	1
Error DF	47
MSE	1818.3
R-Square	0
Adj R-Square	0
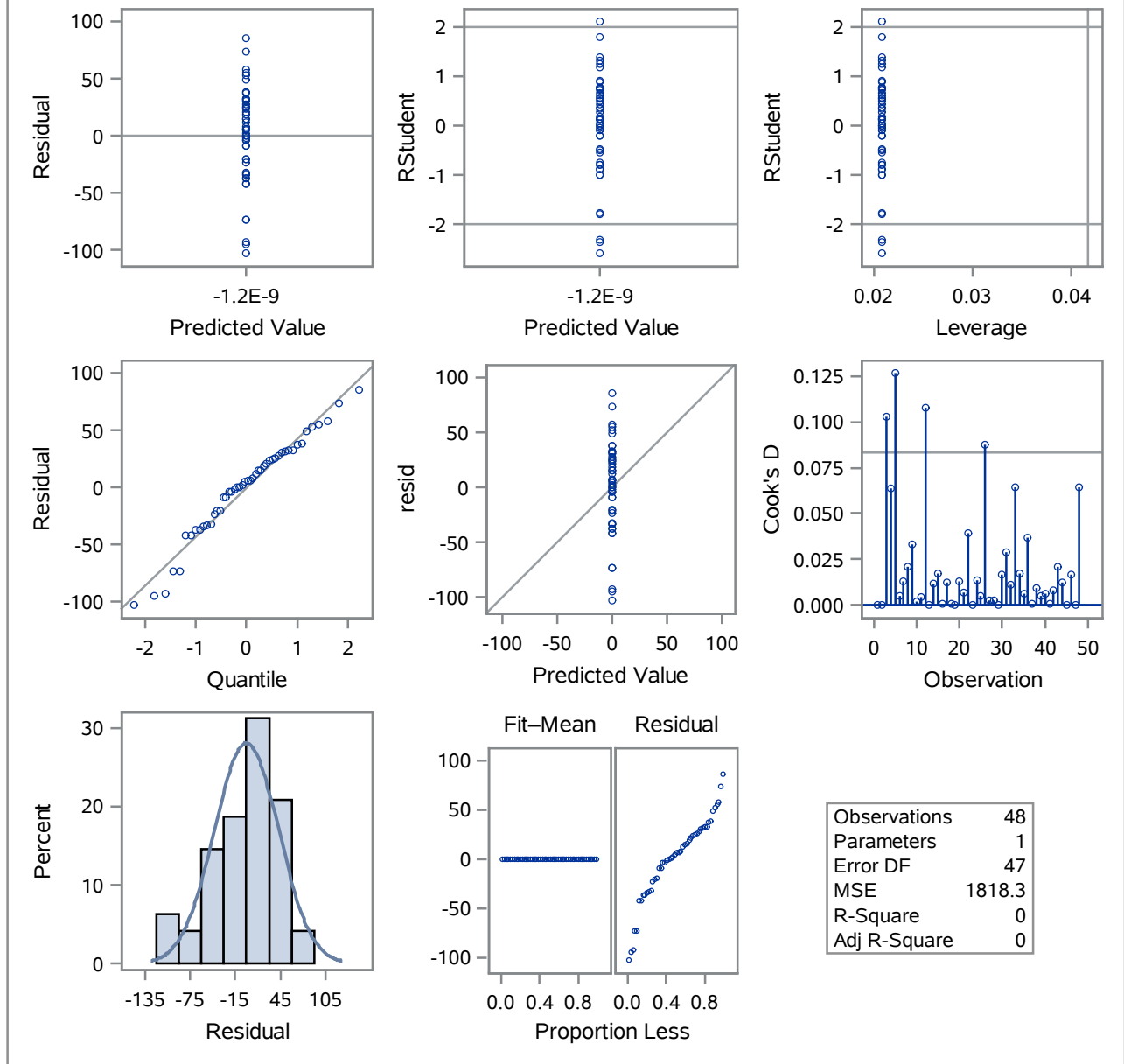
The REG Procedure
Model: MODEL1
Dependent Variable: resid

Residual by Regressors for resid

The NLIN Procedure

Listing of Compiled Program Code		
Stmt	**Line:Col**	**Statement as Parsed**
1	239:1	MODEL.Sales = B_Int + B_Formulary * Formulary + B_UR * UR + B_Nov_Ind * Nov_Ind + B_Dec_Ind * Dec_Ind + B_DTC_TV * LOG(DTC_TV) + B1_TV * EXP(- B2_TV * EXP(- B3_TV * TV)) + B_Display * LOG(Display) + B_PDEs * LOG(PDEs);
1	239:1	@MODEL.Sales/@B_DTC_TV = LOG(DTC_TV);
1	239:1	@MODEL.Sales/@B1_TV = EXP(- B2_TV * EXP(- B3_TV * TV));
1	239:1	@MODEL.Sales/@B2_TV = B1_TV * - EXP(- B3_TV * TV) * EXP(- B2_TV * EXP(- B3_TV * TV));
1	239:1	@MODEL.Sales/@B3_TV = B1_TV * - B2_TV * - TV * EXP(- B3_TV * TV) * EXP(- B2_TV * EXP(- B3_TV * TV));
1	239:1	@MODEL.Sales/@B_PDEs = LOG(PDEs);
1	239:1	@MODEL.Sales/@B_Display = LOG(Display);

The NLIN Procedure
Dependent Variable Sales

					Grid Search						
B_Int	**B_Formulary**	**B_UR**	**B_Nov_Ind**	**B_Dec_Ind**	**B_DTC_TV**	**B1_TV**	**B2_TV**	**B3_TV**	**B_PDEs**	**B_Display**	**Sum of Squares**
1508.7	41.8277	-5.8593	359.1	364.5	-0.4161	700.0	0.4300	0.0100	12.0021	68.3012	2028904

The NLIN Procedure
Dependent Variable Sales
Method: Gauss-Newton

												Sum of
Iter	B_Int	B_Formulary	B_UR	B_Nov_Ind	B_Dec_Ind	B_DTC_TV	B1_TV	B2_TV	B3_TV	B_PDEs	B_Display	Squares
0	1508.7	41.8277	-5.8593	359.1	364.5	-0.4161	700.0	0.4300	0.0100	12.0021	68.3012	2028904
1	1517.6	41.8292	-5.8604	359.1	364.5	-0.4359	690.8	0.4367	0.0100	12.0464	68.3138	2028467
2	1528.3	41.8311	-5.8618	359.1	364.5	-0.4608	679.9	0.4450	0.0101	12.1016	68.3296	2028039
3	1541.1	41.8334	-5.8636	359.1	364.4	-0.4917	666.8	0.4553	0.0101	12.1706	68.3493	2027668
4	1556.0	41.8363	-5.8658	359.1	364.4	-0.5303	651.4	0.4680	0.0102	12.2567	68.3739	2027420
5	1573.4	41.8399	-5.8685	359.2	364.4	-0.5783	633.5	0.4836	0.0103	12.3642	68.4046	2027385
6	1583.3	41.8421	-5.8703	359.2	364.4	-0.6083	623.2	0.4932	0.0104	12.4312	68.4237	2026744
7	1595.0	41.8449	-5.8724	359.2	364.4	-0.6456	611.1	0.5050	0.0104	12.5149	68.4475	2026109
8	1608.8	41.8483	-5.8751	359.2	364.4	-0.6921	596.8	0.5196	0.0105	12.6193	68.4773	2025534
9	1624.7	41.8526	-5.8785	359.2	364.4	-0.7499	580.3	0.5375	0.0106	12.7496	68.5144	2025086
10	1642.7	41.8578	-5.8828	359.3	364.3	-0.8219	561.5	0.5594	0.0108	12.9119	68.5607	2024842
11	1652.8	41.8610	-5.8855	359.3	364.3	-0.8667	550.9	0.5728	0.0109	13.0131	68.5895	2023776
12	1664.6	41.8650	-5.8888	359.3	364.3	-0.9223	538.6	0.5892	0.0110	13.1393	68.6254	2022649
13	1678.2	41.8700	-5.8930	359.3	364.3	-0.9917	524.3	0.6094	0.0111	13.2967	68.6702	2021491
14	1693.6	41.8760	-5.8983	359.4	364.2	-1.0778	508.0	0.6340	0.0112	13.4929	68.7260	2020335
15	1710.8	41.8835	-5.9049	359.4	364.2	-1.1847	489.8	0.6640	0.0114	13.7372	68.7954	2019193
16	1729.5	41.8927	-5.9132	359.5	364.2	-1.3171	469.9	0.7002	0.0117	14.0410	68.8816	2018027
17	1749.5	41.9038	-5.9236	359.5	364.1	-1.4807	448.5	0.7438	0.0119	14.4186	68.9885	2016713
18	1770.2	41.9172	-5.9367	359.6	364.0	-1.6823	426.2	0.7960	0.0123	14.8868	69.1209	2014992
19	1791.1	41.9334	-5.9531	359.7	364.0	-1.9298	403.3	0.8579	0.0127	15.4665	69.2844	2012427
20	1811.6	41.9526	-5.9737	359.9	363.8	-2.2324	380.6	0.9309	0.0132	16.1827	69.4857	2008370
21	1831.1	41.9751	-5.9996	360.0	363.7	-2.6007	358.5	1.0163	0.0137	17.0655	69.7327	2001950
22	1849.0	42.0013	-6.0321	360.2	363.6	-3.0465	337.8	1.1157	0.0144	18.1508	70.0344	1992092
23	1880.8	42.0613	-6.1133	360.7	363.2	-4.1183	299.7	1.3454	0.0160	20.8117	70.7679	1987629
24	1916.3	42.1821	-6.3129	361.9	362.3	-6.5287	251.7	1.8343	0.0194	27.0970	72.4602	1980453
25	1928.4	42.5611	-7.2269	367.0	358.7	-15.8654	196.2	3.7019	0.0324	54.6200	79.3715	1890993
26	1659.5	43.4648	-9.7676	378.3	347.0	-30.9790	320.9	8.9489	0.0607	137.2	92.5070	737662
27	1289.4	45.4979	-11.6544	388.4	333.2	-40.2750	503.0	10.1773	0.0524	227.0	97.4948	71241.9
28	1295.9	45.9660	-11.5682	386.1	332.1	-46.3551	529.6	8.4842	0.0521	229.8	99.5380	65061.5
29	1283.6	45.7231	-11.6260	387.4	332.4	-44.2220	523.1	9.7534	0.0550	231.2	99.6452	64788.8
30	1289.0	45.8435	-11.5901	386.9	332.1	-45.3471	526.8	9.2721	0.0537	230.7	99.3905	64752.1
31	1287.7	45.8042	-11.5896	387.1	332.2	-45.0624	525.8	9.4846	0.0542	230.8	99.5256	64748.6
32	1288.5	45.8248	-11.5871	387.0	332.2	-45.2324	526.3	9.3879	0.0539	230.7	99.4793	64748.1
33	1288.2	45.8158	-11.5876	387.0	332.2	-45.1632	526.1	9.4315	0.0540	230.7	99.5030	64748.0

Iterative Phase

The NLIN Procedure
Dependent Variable Sales
Method: Gauss-Newton

							Iterative Phase						
Iter	B_Int	B_Formulary	B_UR	B_Nov_Ind	B_Dec_Ind	B_DTC_TV	B1_TV	B2_TV	B3_TV	B_PDEs	B_Display	Sum of Squares
34	1288.4	45.8199	-11.5872	387.0	332.2	-45.1960	526.2	9.4118	0.0540	230.7	99.4928	64747.9
35	1288.3	45.8181	-11.5874	387.0	332.2	-45.1815	526.2	9.4207	0.0540	230.7	99.4976	64747.9
36	1288.3	45.8189	-11.5873	387.0	332.2	-45.1881	526.2	9.4167	0.0540	230.7	99.4954	64747.9
37	1288.3	45.8185	-11.5873	387.0	332.2	-45.1851	526.2	9.4185	0.0540	230.7	99.4964	64747.9
38	1288.3	45.8187	-11.5873	387.0	332.2	-45.1865	526.2	9.4177	0.0540	230.7	99.4960	64747.9
39	1288.3	45.8186	-11.5873	387.0	332.2	-45.1859	526.2	9.4181	0.0540	230.7	99.4962	64747.9
40	1288.3	45.8187	-11.5873	387.0	332.2	-45.1862	526.2	9.4179	0.0540	230.7	99.4961	64747.9
41	1288.3	45.8187	-11.5873	387.0	332.2	-45.1860	526.2	9.4180	0.0540	230.7	99.4961	64747.9
42	1288.3	45.8187	-11.5873	387.0	332.2	-45.1861	526.2	9.4179	0.0540	230.7	99.4961	64747.9

NOTE: Convergence criterion met.

Estimation Summary	
Method	Gauss-Newton
Iterations	42
Subiterations	58
Average Subiterations	1.380952
R	6.389E-7
PPC(B2_TV)	1.651E-6
RPC(B2_TV)	3.652E-6
Object	1.1E-12
Objective	64747.93
Observations Read	48
Observations Used	36
Observations Missing	12

Source	DF	Sum of Squares	Mean Square	F Value	Approx Pr > F
Model	10	3661793	366179	141.39	<.0001
Error	25	64747.9	2589.9		
Corrected Total	35	3726541			

The NLIN Procedure

Parameter	Estimate	Approx Std Error	Approximate 90% Confidence Limits	
B_Int	1288.3	230.0	895.5	1681.1
B_Formulary	45.8187	6.9058	34.0225	57.6148
B_UR	-11.5873	10.5560	-29.6185	6.4438
B_Nov_Ind	387.0	37.0819	323.7	450.4
B_Dec_Ind	332.2	37.6624	267.8	396.5
B_DTC_TV	-45.1861	30.4623	-97.2200	6.8478
B1_TV	526.2	42.0169	454.4	597.9
B2_TV	9.4179	4.9375	0.9839	17.8520
B3_TV	0.0540	0.0130	0.0318	0.0762
B_PDEs	230.7	28.3365	182.3	279.1
B_Display	99.4961	31.9627	44.8992	154.1

The NLIN Procedure

Approximate Correlation Matrix						
	B_Int	**B_Formulary**	**B_UR**	**B_Nov_Ind**	**B_Dec_Ind**	**B_DTC_TV**	**B1_TV**
B_Int	1.0000000	-0.3596987	-0.2676239	-0.0091312	0.4743597	-0.9421431	0.5875453
B_Formulary	-0.3596987	1.0000000	0.0919700	-0.0990802	-0.2217583	0.2659498	-0.1602742
B_UR	-0.2676239	0.0919700	1.0000000	0.1115369	-0.1584541	0.1836048	-0.1536390
B_Nov_Ind	-0.0091312	-0.0990802	0.1115369	1.0000000	0.2123480	-0.0428463	-0.2587911
B_Dec_Ind	0.4743597	-0.2217583	-0.1584541	0.2123480	1.0000000	-0.4753382	0.1188842
B_DTC_TV	-0.9421431	0.2659498	0.1836048	-0.0428463	-0.4753382	1.0000000	-0.6709438
B1_TV	0.5875453	-0.1602742	-0.1536390	-0.2587911	0.1188842	-0.6709438	1.0000000
B2_TV	-0.2663031	-0.1407670	-0.0287563	0.1556135	0.0385710	0.3411680	-0.6896253
B3_TV	-0.4262675	-0.1167580	-0.0682084	0.2187611	-0.0025614	0.4681553	-0.7403757
B_PDEs	-0.6323932	0.0055717	-0.2558973	0.0850026	-0.2169515	0.4678880	-0.2700478
B_Display	0.4669140	0.0028230	-0.1596099	-0.1776431	0.2078972	-0.4290375	0.1363874

Approximate Correlation Matrix				
	B2_TV	**B3_TV**	**B_PDEs**	**B_Display**
B_Int	-0.2663031	-0.4262675	-0.6323932	0.4669140
B_Formulary	-0.1407670	-0.1167580	0.0055717	0.0028230
B_UR	-0.0287563	-0.0682084	-0.2558973	-0.1596099
B_Nov_Ind	0.1556135	0.2187611	0.0850026	-0.1776431
B_Dec_Ind	0.0385710	-0.0025614	-0.2169515	0.2078972
B_DTC_TV	0.3411680	0.4681553	0.4678880	-0.4290375
B1_TV	-0.6896253	-0.7403757	-0.2700478	0.1363874
B2_TV	1.0000000	0.9439215	0.2469798	0.0047326
B3_TV	0.9439215	1.0000000	0.4310194	-0.1432687
B_PDEs	0.2469798	0.4310194	1.0000000	-0.3532315
B_Display	0.0047326	-0.1432687	-0.3532315	1.0000000

Obs	Month	Formulary	DTC_TV	Nov_Ind	Dec_Ind	TV	PDEs	Display	UR	Sales	yhat	resid	std_dev_r
1	.	5.0	150	0	0	75	25.7	1.50559	5.6	2442.0	2462.48	-20.4756	41.8393
2	.	5.1	450	0	0	125	13.8	1.64575	5.1	2385.6	2362.38	23.2231	44.2962
3	.	5.1	150	0	0	20	15.3	0.61682	4.4	1764.9	1847.39	-82.4896	44.1813
4	.	5.2	300	0	0	10	19.7	1.12207	5.7	1817.7	1904.11	-86.4094	45.7139
5	.	5.4	510	0	0	120	12.0	0.92603	4.1	2203.8	2290.82	-87.0216	45.7135
6	.	5.4	450	0	0	100	11.6	0.74263	6.0	2210.1	2230.34	-20.2350	43.4168
7	.	5.3	150	0	0	50	9.4	1.27815	5.2	2033.1	2065.43	-32.3336	44.9735
8	.	5.0	225	0	0	15	18.4	0.82091	4.1	1838.7	1885.44	-46.7423	48.1965
9	.	4.8	150	0	0	40	22.6	0.96451	5.1	2145.9	2116.23	29.6741	41.2520
10	.	4.6	150	0	0	0	18.2	1.04043	5.0	1906.5	1888.13	18.3736	47.4463
11	.	4.2	750	1	0	200	13.2	1.79174	3.6	2735.4	2706.31	29.0852	39.4659
12	.	4.1	600	0	1	150	24.6	1.36636	5.4	2694.6	2751.38	-56.7824	37.3671
13	.	4.0	150	0	0	0	22.3	1.30200	5.2	1932.3	1927.50	4.7952	46.0831
14	.	4.0	375	0	0	75	7.6	1.63492	4.2	2149.5	2118.58	30.9153	42.3073
15	.	4.0	450	0	0	10	17.0	1.21344	3.1	1853.1	1834.71	18.3873	42.0194
16	.	3.5	450	0	0	100	19.7	1.69737	6.8	2339.1	2338.45	0.6540	42.9801
17	.	3.7	510	0	0	20	20.7	1.30634	4.8	1873.2	1867.71	5.4853	43.0360
18	.	3.5	270	0	0	40	6.4	1.25502	4.1	1775.4	1776.80	-1.4031	42.6566
19	.	4.6	150	0	0	0	20.7	0.80468	6.6	1868.7	1873.72	-5.0176	44.2176
20	.	4.2	150	0	0	10	12.6	0.75021	4.4	1811.1	1761.51	49.5919	46.0146
21	.	4.1	600	0	0	150	12.0	0.97295	4.6	2275.8	2229.07	46.7286	44.1705
22	.	4.0	150	0	0	0	24.1	0.49454	4.0	1903.8	1863.00	40.7961	41.6179
23	.	4.0	600	1	0	150	24.5	1.64592	6.0	2805.0	2812.27	-7.2680	36.8296
24	.	4.0	750	0	1	20	10.1	1.21758	3.7	2024.4	2036.40	-11.9966	33.9927
25	.	3.5	240	0	0	30	22.5	1.82384	5.7	2006.1	1994.79	11.3099	43.2960
26	.	5.0	150	0	0	0	20.8	0.70199	4.9	1980.3	1899.27	81.0277	47.5049
27	.	5.4	300	0	0	50	19.0	1.85149	5.3	2212.5	2236.77	-24.2679	40.4050
28	.	6.1	300	0	0	50	5.2	1.18135	6.5	1926.0	1911.27	14.7267	37.6054
29	.	6.8	150	0	0	0	18.1	1.23580	4.8	2019.0	2007.10	11.9044	45.5840
30	.	7.0	150	0	0	85	18.4	0.67831	4.5	2403.3	2442.05	-38.7522	43.1777
31	.	7.4	150	0	0	25	22.3	1.57081	5.6	2204.4	2143.12	61.2767	38.5241
32	.	7.3	375	0	0	75	6.8	0.90226	3.8	2216.7	2189.61	27.0854	43.0813
33	.	7.5	150	0	0	0	26.2	1.66731	5.0	2082.6	2151.98	-69.3793	42.0118
34	.	7.2	525	0	0	125	25.5	1.48885	3.9	2635.8	2597.23	38.5719	40.2200
35	.	8.0	450	1	0	100	8.8	1.06920	3.6	2715.0	2736.82	-21.8172	36.1749
36	.	8.4	450	0	1	100	25.9	0.93187	6.6	2969.7	2900.92	68.7790	33.9000
37	.	8.3	300	0	0	50	13.6	1.14217	3.4	.	2266.45	.	.
38	.	8.5	150	0	0	30	21.4	0.64697	5.8	.	2129.28	.	.

Obs	Month	Formulary	DTC_TV	Nov_Ind	Dec_Ind	TV	PDEs	Display	UR	Sales	yhat	resid	std_dev_r
39	.	8.8	150	0	0	10	15.9	1.58122	6.6	.	2074.64	.	.
40	.	8.5	675	0	0	175	9.2	0.91301	6.8	.	2333.34	.	.
41	.	8.2	150	0	0	10	24.2	1.57721	4.1	.	2172.77	.	.
42	.	8.0	690	0	0	180	22.7	1.43884	3.6	.	2600.24	.	.
43	.	8.1	150	0	0	50	13.0	0.82513	6.0	.	2215.72	.	.
44	.	7.9	450	0	0	25	21.8	1.61588	4.8	.	2123.24	.	.
45	.	8.2	450	0	0	125	7.3	1.03363	4.8	.	2314.70	.	.
46	.	8.4	750	0	0	185	20.2	1.79313	4.4	.	2600.58	.	.
47	.	8.3	600	1	0	150	17.8	0.70757	6.1	.	2850.43	.	.
48	.	8.5	600	0	1	190	8.1	1.62655	4.5	.	2725.78	.	.