The SAS System

The ARIMA Procedure

Preliminary Estimation

Initial Autoregressive Estimates	
	Estimate
1	0.94798

Constant Term Estimate	258.5452
White Noise Variance Est	2252756

Conditional Least Squares Estimation							
Iteration	SSE	MU	AR1,1	NUM1	Constant	Lambda	R Crit
0	43363080	4970.093	0.94798	367.2167	258.5452	0.00001	1
1	7173872	-505.130	0.99741	473.8579	-1.30857	1E-6	0.936082
2	7114193	-223.143	0.96843	202.3528	-7.04539	0.01	0.61034
3	6537278	-240.460	0.97759	221.1745	-5.38933	0.01	0.452833
4	6224782	-254.688	0.98483	239.0095	-3.86349	0.01	0.35003
5	6064632	-266.529	0.99017	255.3449	-2.61987	0.01	0.258453
6	5987829	-275.988	0.99349	269.2948	-1.7957	0.01	0.18112
7	5924025	-302.621	0.99856	311.5691	-0.43433	0.001	0.122559
8	5892730	-298.277	0.99021	304.3263	-2.92045	0.1	0.12706
9	5887481	-295.191	0.98234	299.7692	-5.21422	0.01	0.041095
10	5887224	-315.347	0.98740	310.5056	-3.97338	0.001	0.032087
11	5884600	-311.592	0.98521	307.8546	-4.60861	0.1	0.037013
12	5884466	-306.516	0.98252	304.4225	-5.35815	0.01	0.014543
13	5884298	-312.040	0.98452	307.7373	-4.82919	0.01	0.012616
14	5884243	-308.081	0.98276	305.1654	-5.31021	0.01	0.010046
15	5884172	-311.664	0.98419	307.3958	-4.92669	0.01	0.008646
16	5884143	-308.811	0.98299	305.5911	-5.2534	0.01	0.006982
17	5884111	-311.249	0.98398	307.1220	-4.98577	0.01	0.005946
18	5884096	-309.259	0.98315	305.8685	-5.21066	0.01	0.004845
19	5884082	-310.937	0.98384	306.9238	-5.02514	0.01	0.004096
20	5884074	-309.556	0.98327	306.0550	-5.18038	0.01	0.003359

21	5884068	-310.714	0.98374	306.7834	-5.05195	0.01	0.002825
22	5884064	-309.758	0.98334	306.1819	-5.15919	0.01	0.002327
23	5884061	-310.558	0.98367	306.6849	-5.07032	0.01	0.00195
24	5884059	-309.896	0.98340	306.2686	-5.14443	0.01	0.001611
25	5884058	-310.448	0.98363	306.6162	-5.08295	0.01	0.001347
26	5884057	-309.991	0.98344	306.3281	-5.13417	0.01	0.001115
27	5884056	-310.372	0.98360	306.5683	-5.09165	0.01	0.000931
28	5884056	-310.056	0.98346	306.3690	-5.12705	0.01	0.000772
29	5884055	-310.320	0.98357	306.5350	-5.09764	0.01	0.000643

ARIMA Estimation Optimization Summary	
Estimation Method	Conditional Least Squares
Parameters Estimated	3
Termination Criteria	Maximum Relative Change in Estimates
Iteration Stopping Value	0.001
Criteria Value	0.000851
Alternate Criteria	Relative Change in Objective Function
Alternate Criteria Value	5.418E-8
Maximum Absolute Value of Gradient	8563.866
R-Square Change from Last Iteration	0.000643
Objective Function	Sum of Squared Residuals
Objective Function Value	5884055
Marquardt's Lambda Coefficient	0.01
Numerical Derivative Perturbation Delta	0.001
Iterations	29

Conditional Least Squares Estimation							
Parameter	**Estimate**	**Standard Error**	**t Value**	**Approx Pr > |t|**	**Lag**	**Variable**	**Shift**
MU	-310.31956	392.16476	-0.79	0.4334	0	y	0
AR1,1	0.98357	0.03841	25.61	<.0001	1	y	0
NUM1	306.53502	58.74259	5.22	<.0001	0	time	0

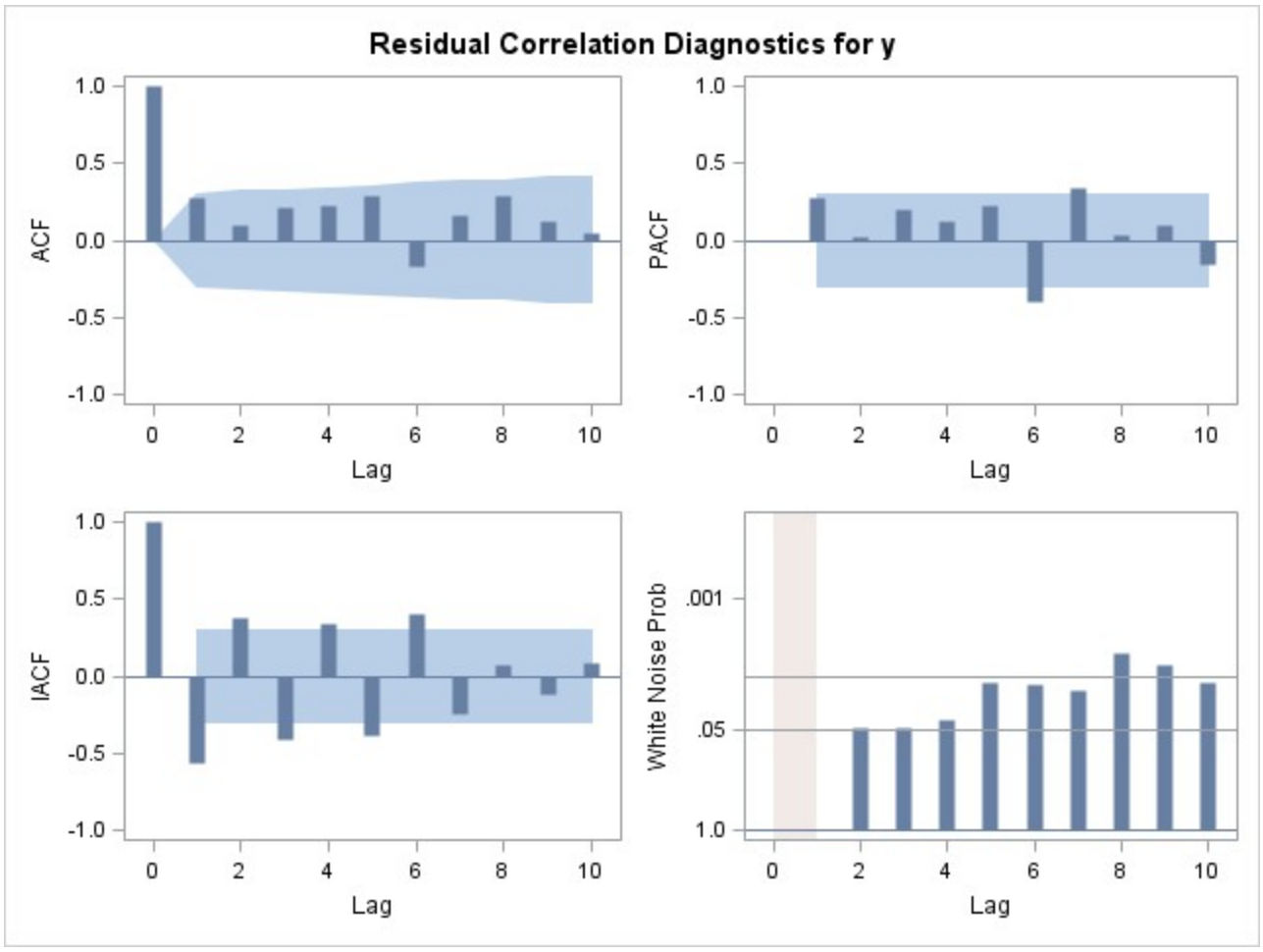
Constant Estimate	-5.09764
Variance Estimate	147101.4
Std Error Estimate	383.538

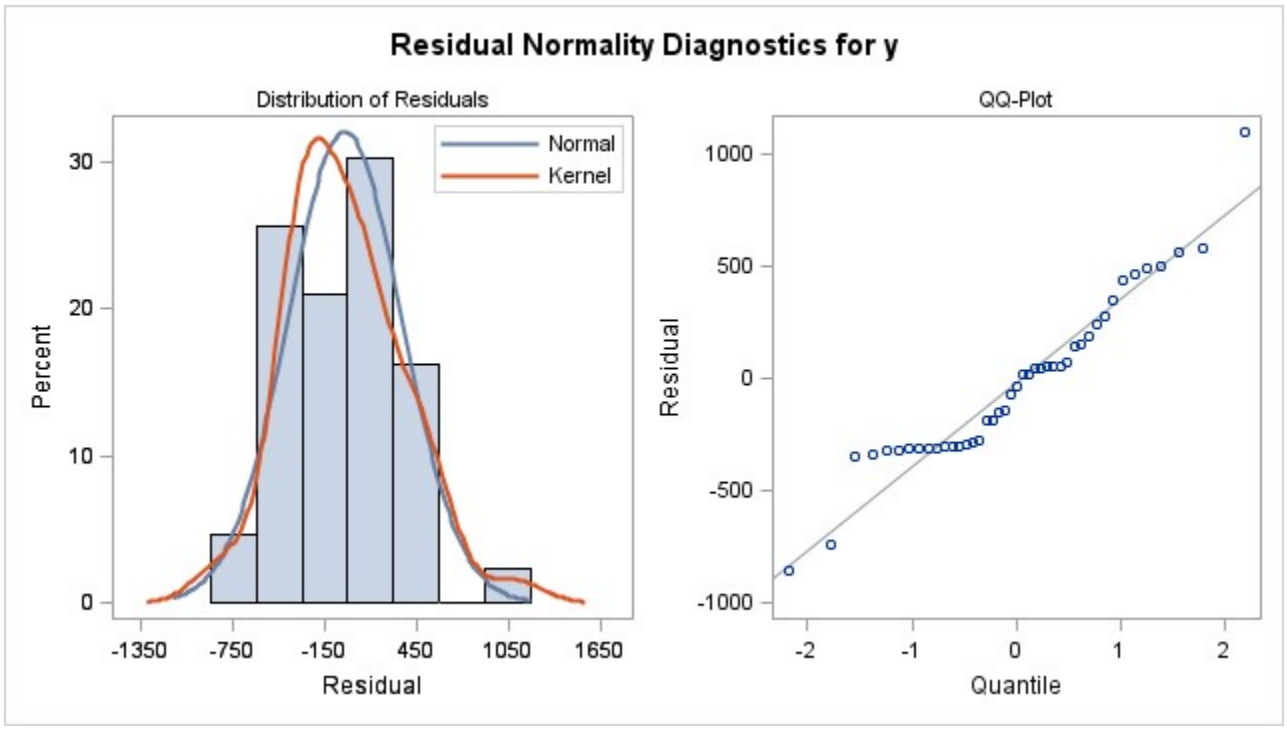
AIC	636.5706
SBC	641.8542
Number of Residuals	43

*** AIC and SBC do not include log determinant.**

Correlations of Parameter Estimates			
Variable Parameter	**y MU**	**y AR1,1**	**time NUM1**
y MU	1.000	-0.090	-0.221
y AR1,1	-0.090	1.000	0.663
time NUM1	-0.221	0.663	1.000

Autocorrelation Check of Residuals									
To Lag	**Chi-Square**	**DF**	**Pr > ChiSq**	**Autocorrelations**					
6	14.45	5	0.0130	0.278	0.098	0.210	0.216	0.291	-0.177
12	22.24	11	0.0226	0.155	0.276	0.112	0.037	-0.097	0.121
18	31.40	17	0.0179	-0.021	-0.219	-0.179	-0.083	-0.083	-0.188
24	40.70	23	0.0128	-0.188	-0.163	-0.122	-0.124	-0.105	-0.064





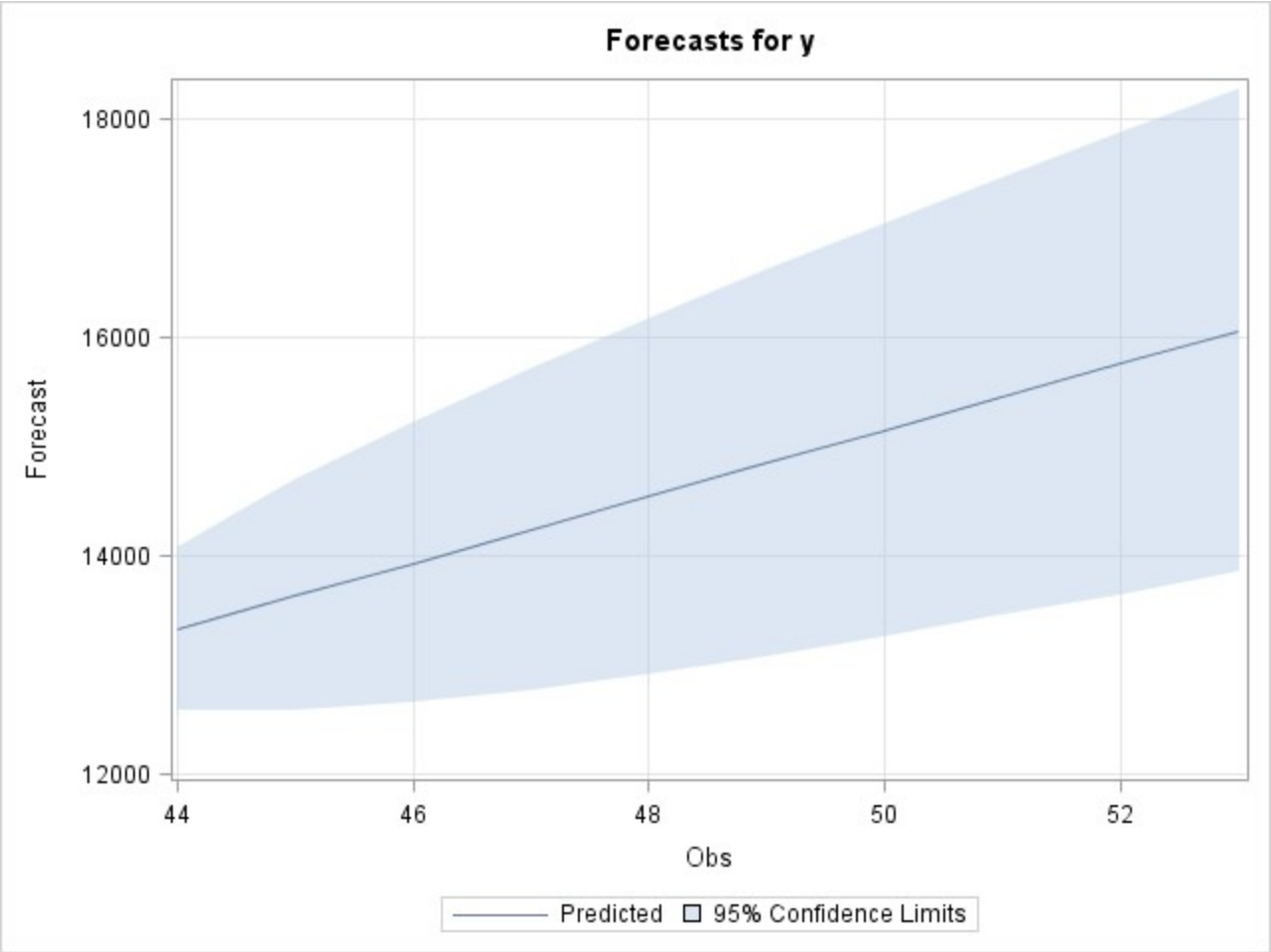
Model for variable y

Estimated Intercept	-310.32

Autoregressive Factors	
Factor 1:	1 - 0.98357 B**(1)

Input Number 1	
Input Variable	time
Overall Regression Factor	306.535

Forecasts for variable y				
Obs	Forecast	Std Error	95% Confidence Limits	
44	13329.9837	383.5380	12578.2630	14081.7043
45	13634.0092	537.9680	12579.6113	14688.4071
46	13938.0760	653.5141	12657.2119	15218.9402
47	14242.1834	748.5092	12775.1324	15709.2344
48	14546.3306	830.1274	12919.3108	16173.3504
49	14850.5171	902.0857	13082.4615	16618.5726
50	15154.7421	966.6148	13260.2118	17049.2724
51	15459.0051	1025.1832	13449.6828	17468.3273
52	15763.3054	1078.8215	13648.8540	17877.7567
53	16067.6424	1128.2880	13856.2385	18279.0463


Forecasts for y
Forecast
18000
16000
14000
12000
44
46
48
50
52
Obs
Predicted
95% Confidence Limits

The SAS System

The ARIMA Procedure

Preliminary Estimation

Initial Autoregressive Estimates	
	Estimate
1	1.00239
2	-0.05740

Constant Term Estimate	273.3855
White Noise Variance Est	2245334

Conditional Least Squares Estimation								
Iteration	SSE	MU	AR1,1	AR1,2	NUM1	Constant	Lambda	R Crit
0	43736127	4970.093	1.00239	-0.05740	367.2167	273.3855	0.00001	1
1	6695813	-481.946	1.10782	-0.11922	451.7552	-5.4941	1E-6	0.940219
2	6499215	-224.837	1.09827	-0.13919	215.0412	-9.20147	0.01	0.566241
3	5528931	-267.124	1.18722	-0.19359	275.1478	-1.70144	0.001	0.428828
4	5411674	-232.171	1.26512	-0.28196	294.5248	-3.90831	0.0001	0.131386
5	5405764	-223.436	1.26634	-0.28748	297.2439	-4.72155	0.00001	0.030466
6	5405436	-230.469	1.26621	-0.28672	300.6292	-4.72749	1E-6	0.009476
7	5405415	-228.603	1.26631	-0.28821	298.7472	-5.00476	1E-7	0.006316
8	5405394	-231.615	1.26601	-0.28679	300.8258	-4.81265	1E-8	0.005937
9	5405391	-229.128	1.26625	-0.28812	298.9563	-5.01074	1E-9	0.005386
10	5405376	-231.549	1.26602	-0.28687	300.7347	-4.82934	1E-10	0.0052
11	5405373	-229.302	1.26623	-0.28804	299.0777	-5.00074	1E-11	0.004745
12	5405362	-231.418	1.26603	-0.28695	300.6392	-4.84041	1E-12	0.004567
13	5405359	-229.437	1.26622	-0.28798	299.1801	-4.99105	1E-12	0.004182
14	5405352	-231.299	1.26605	-0.28701	300.5537	-4.84991	1E-12	0.004013
15	5405349	-229.555	1.26621	-0.28792	299.2693	-4.98247	1E-12	0.003685
16	5405343	-231.194	1.26606	-0.28707	300.4780	-4.85824	1E-12	0.003527
17	5405341	-229.659	1.26621	-0.28787	299.3473	-4.9749	1E-12	0.003247
18	5405337	-231.101	1.26607	-0.28712	300.4110	-4.86555	1E-12	0.003101

19	5405335	-229.749	1.26620	-0.28782	299.4155	-4.96823	1E-12	0.002861
20	5405332	-231.018	1.26608	-0.28717	300.3517	-4.87196	1E-12	0.002726
21	5405330	-229.829	1.26619	-0.28778	299.4753	-4.96235	1E-12	0.002521
22	5405328	-230.946	1.26609	-0.28721	300.2994	-4.8776	1E-12	0.002398
23	5405327	-229.899	1.26619	-0.28775	299.5277	-4.95717	1E-12	0.002221
24	5405325	-230.882	1.26609	-0.28724	300.2531	-4.88256	1E-12	0.002109
25	5405324	-229.960	1.26618	-0.28772	299.5736	-4.95261	1E-12	0.001957
26	5405322	-230.826	1.26610	-0.28727	300.2122	-4.88691	1E-12	0.001856
27	5405322	-230.014	1.26618	-0.28769	299.6139	-4.94858	1E-12	0.001724
28	5405321	-230.777	1.26610	-0.28730	300.1761	-4.89074	1E-12	0.001633
29	5405320	-230.062	1.26617	-0.28767	299.6493	-4.94504	1E-12	0.001519
30	5405319	-230.733	1.26611	-0.28732	300.1442	-4.89411	1E-12	0.001437
31	5405319	-230.103	1.26617	-0.28765	299.6804	-4.94192	1E-12	0.001338
32	5405318	-230.694	1.26611	-0.28734	300.1161	-4.89708	1E-12	0.001265
33	5405318	-230.140	1.26617	-0.28763	299.7077	-4.93917	1E-12	0.001179
34	5405317	-230.660	1.26612	-0.28736	300.0913	-4.89969	1E-12	0.001113
35	5405317	-230.172	1.26616	-0.28761	299.7316	-4.93675	1E-12	0.001038
36	5405316	-230.630	1.26612	-0.28737	300.0694	-4.90198	1E-12	0.00098
37	5405316	-230.201	1.26616	-0.28760	299.7527	-4.93461	1E-12	0.000914
38	5405316	-230.604	1.26612	-0.28739	300.0501	-4.904	1E-12	0.000862
39	5405316	-230.226	1.26616	-0.28758	299.7712	-4.93273	1E-12	0.000805
40	5405316	-230.581	1.26612	-0.28740	300.0331	-4.90578	1E-12	0.000759
41	5405315	-230.248	1.26616	-0.28757	299.7875	-4.93107	1E-12	0.000709
42	5405315	-230.560	1.26613	-0.28741	300.0181	-4.90734	1E-12	0.000668
43	5405315	-230.267	1.26615	-0.28756	299.8019	-4.92962	1E-12	0.000625
44	5405315	-230.542	1.26613	-0.28742	300.0049	-4.90872	1E-12	0.000588
45	5405315	-230.284	1.26615	-0.28755	299.8145	-4.92833	1E-12	0.00055
46	5405315	-230.527	1.26613	-0.28743	299.9932	-4.90993	1E-12	0.000518
47	5405315	-230.299	1.26615	-0.28755	299.8256	-4.9272	1E-12	0.000485

ARIMA Estimation Optimization Summary	
Estimation Method	Conditional Least Squares
Parameters Estimated	4
Termination Criteria	Maximum Relative Change in Estimates
Iteration Stopping Value	0.001

Criteria Value	0.000987
Alternate Criteria	Relative Change in Objective Function
Alternate Criteria Value	1.365E-8
Maximum Absolute Value of Gradient	6609.704
R-Square Change from Last Iteration	0.000485
Objective Function	Sum of Squared Residuals
Objective Function Value	5405315
Marquardt's Lambda Coefficient	1E-12
Numerical Derivative Perturbation Delta	0.001
Iterations	47

Conditional Least Squares Estimation

Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag	Variable	Shift
MU	-230.29915	366.67058	-0.63	0.5336	0	y	0
AR1,1	1.26615	0.15360	8.24	<.0001	1	y	0
AR1,2	-0.28755	0.15631	-1.84	0.0734	2	y	0
NUM1	299.82557	61.74581	4.86	<.0001	0	time	0

Constant Estimate	-4.9272
Variance Estimate	138597.8
Std Error Estimate	372.2873
AIC	634.9215
SBC	641.9663
Number of Residuals	43

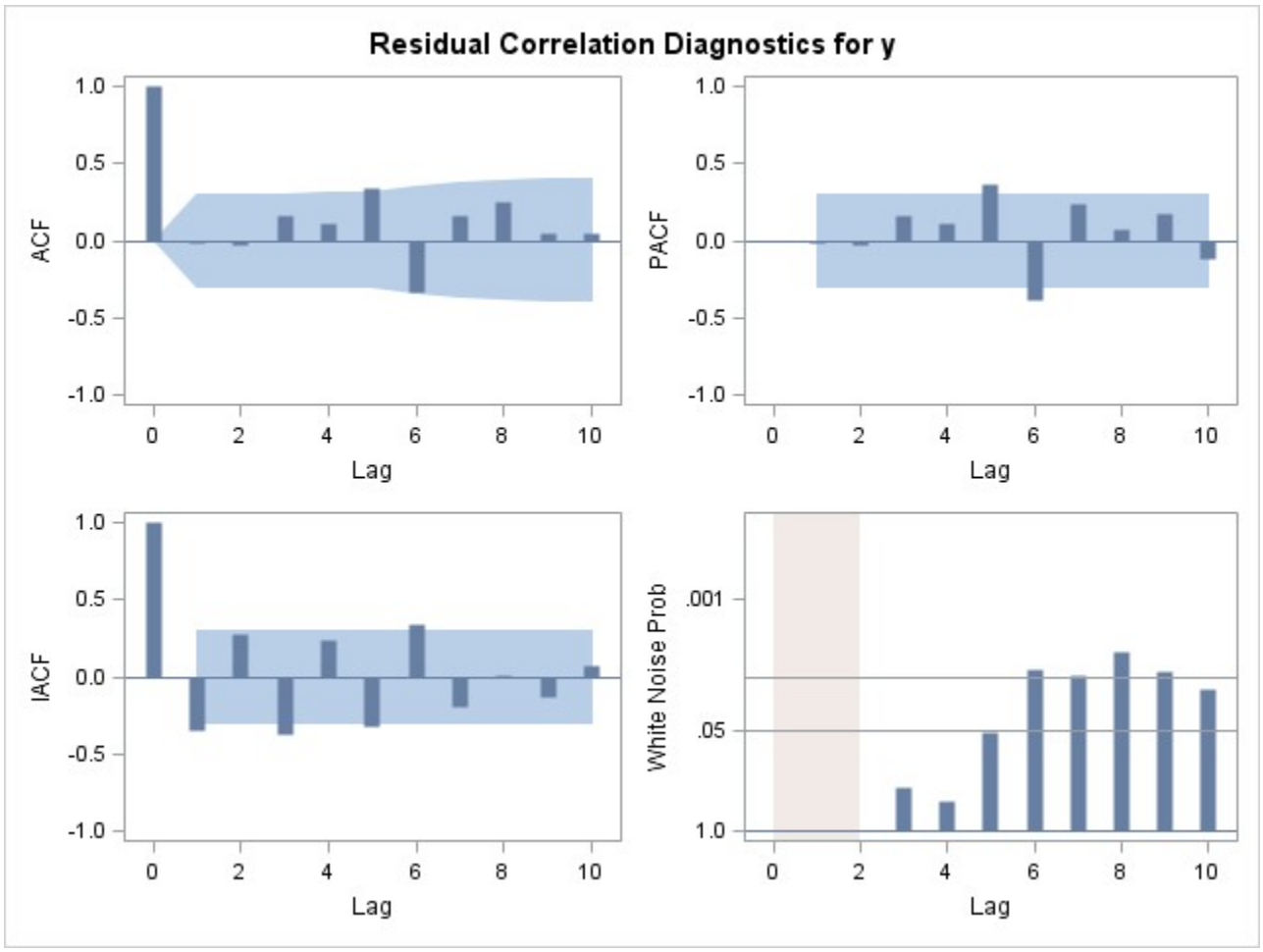
*** AIC and SBC do not include log determinant.**

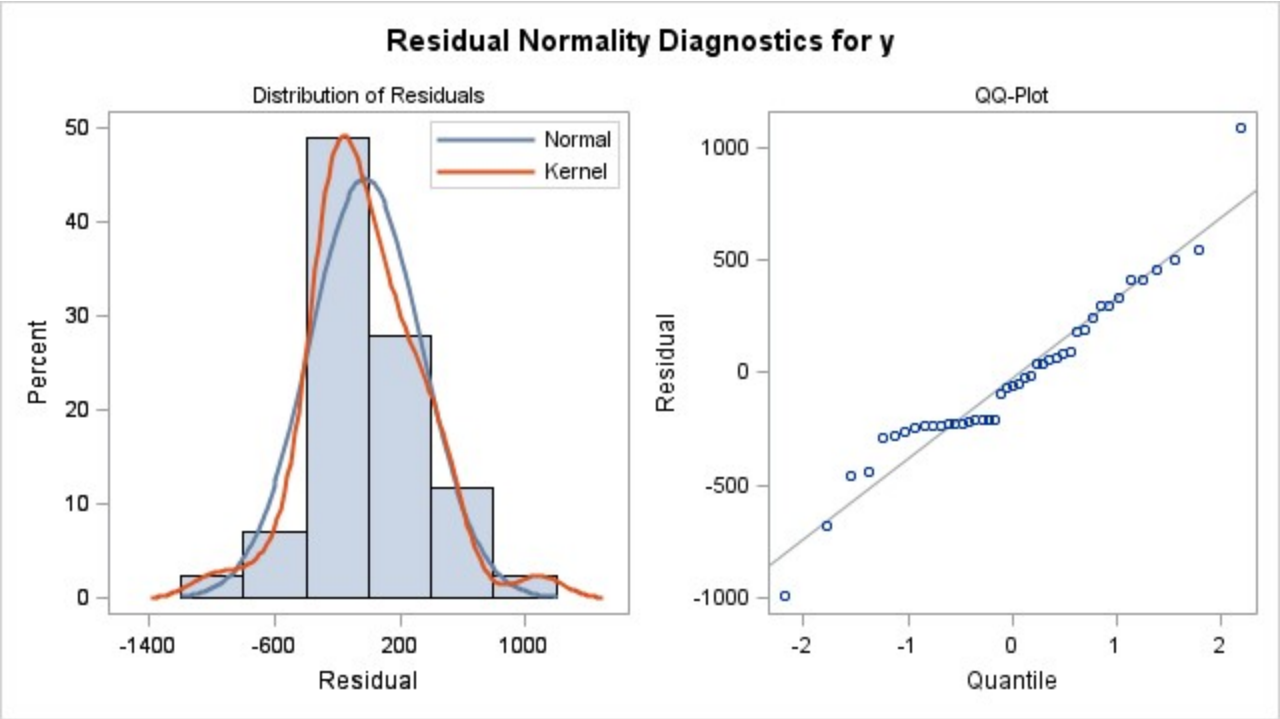
Correlations of Parameter Estimates

Variable Parameter	y MU	y AR1,1	y AR1,2	time NUM1
y MU	1.000	0.010	-0.023	-0.213
y AR1,1	0.010	1.000	-0.974	-0.053
y AR1,2	-0.023	-0.974	1.000	0.190
time NUM1	-0.213	-0.053	0.190	1.000

Autocorrelation Check of Residuals

To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	13.68	4	0.0084	-0.010	-0.028	0.158	0.106	0.341	-0.337
12	22.35	10	0.0134	0.161	0.249	0.043	0.048	-0.153	0.187
18	26.86	16	0.0431	0.012	-0.189	-0.109	-0.011	-0.010	-0.129
24	29.90	22	0.1210	-0.107	-0.097	-0.058	-0.076	-0.068	-0.019





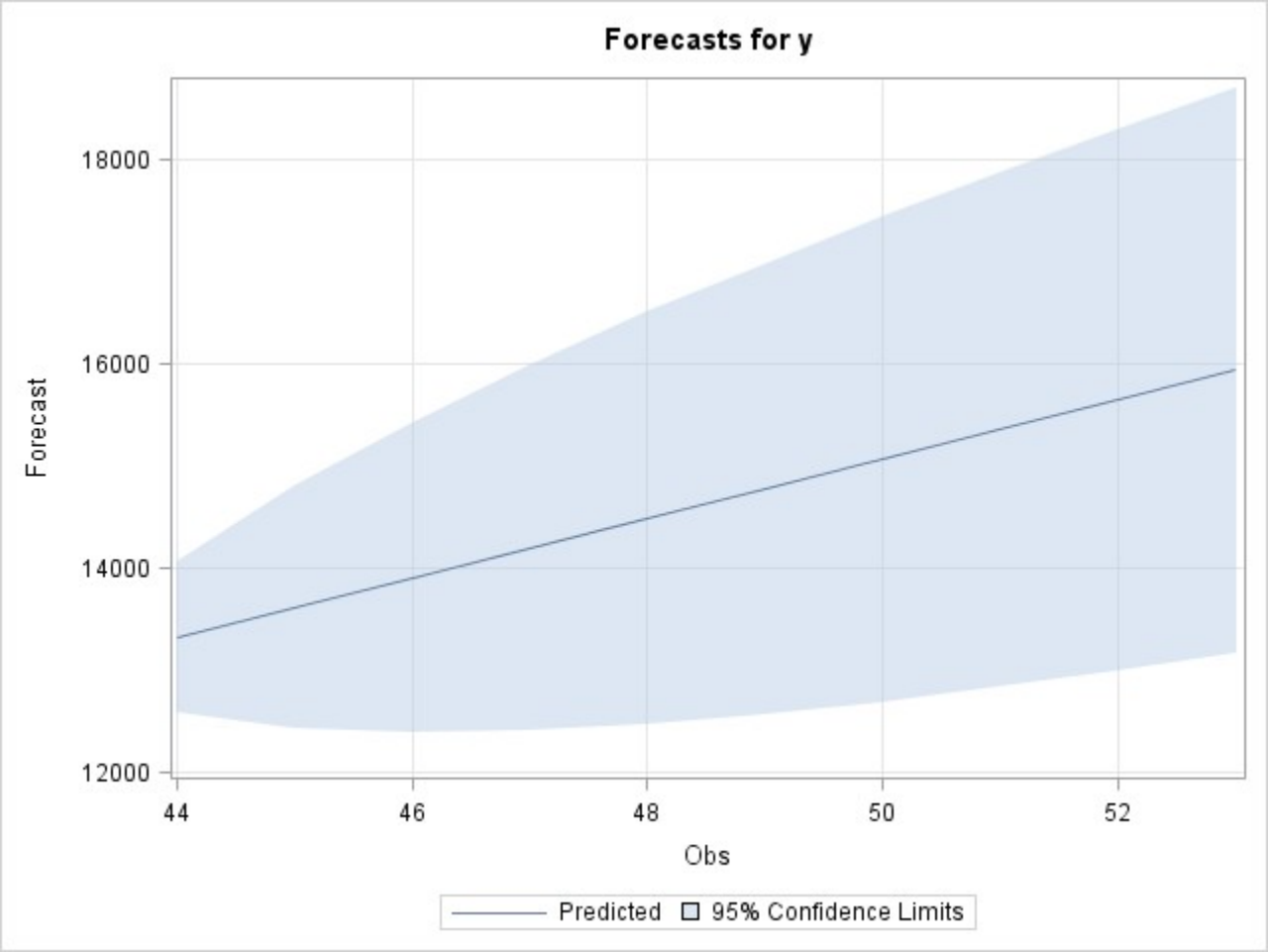
Model for variable y	
Estimated Intercept	-230.299

Autoregressive Factors	
Factor 1:	1 - 1.26615 B**(1) + 0.28755 B**(2)

Input Number 1	
Input Variable	time
Overall Regression Factor	299.8256

Forecasts for variable y				
Obs	Forecast	Std Error	95% Confidence Limits	
44	13325.5685	372.2873	12595.8989	14055.2382
45	13617.5423	600.6576	12440.2750	14794.8095
46	13907.5001	775.0308	12388.4677	15426.5326
47	14197.0895	914.0585	12405.5677	15988.6112
48	14486.7918	1029.0676	12469.8563	16503.7273
49	14776.7433	1126.8779	12568.1031	16985.3834
50	15066.9776	1211.7429	12692.0052	17441.9500
51	15357.4985	1286.4539	12836.0952	17878.9018
52	15648.3008	1352.9392	12996.5888	18300.0129

53	15939.3771	1412.5928	13170.7461	18708.0081



The SAS System

The ARIMA Procedure

Preliminary Estimation

Initial Autoregressive Estimates	
	Estimate
1	0.94184

Initial Moving Average Estimates	
	Estimate
1	-0.06053

Constant Term Estimate	289.0401
White Noise Variance Est	2245367

Conditional Least Squares Estimation								
Iteration	SSE	MU	MA1,1	AR1,1	NUM1	Constant	Lambda	R Crit
0	43715879	4970.093	-0.06053	0.94184	367.2167	289.0401	0.00001	1
1	6841013	-485.712	-0.11950	0.98577	454.6825	-6.91131	1E-6	0.939992
2	5550518	-266.029	-0.27673	0.96245	264.3086	-9.98851	0.01	0.576606
3	5443163	-256.750	-0.27823	0.98761	301.9812	-3.18101	0.001	0.172187
4	5432937	-226.685	-0.29464	0.97156	290.0329	-6.44751	0.01	0.069179
5	5427784	-247.701	-0.29246	0.98028	305.9542	-4.88567	0.001	0.049536
6	5426186	-234.366	-0.29743	0.97205	296.4786	-6.55071	0.01	0.036462
7	5425430	-246.263	-0.29496	0.97765	304.7926	-5.5052	0.001	0.025393
8	5424786	-237.957	-0.29748	0.97304	299.0762	-6.41569	0.01	0.021298
9	5424647	-244.476	-0.29598	0.97628	303.6234	-5.79884	0.001	0.013717
10	5424408	-239.664	-0.29736	0.97369	300.3267	-6.30465	0.01	0.01225
11	5424381	-243.266	-0.29650	0.97553	302.8293	-5.95281	0.001	0.007511
12	5424299	-240.542	-0.29726	0.97409	300.9652	-6.23333	0.01	0.006933
13	5424293	-242.530	-0.29678	0.97511	302.3434	-6.03563	0.001	0.00413
14	5424292	-240.604	-0.29738	0.97411	301.0369	-6.2281	0.001	0.00388
15	5424291	-242.496	-0.29680	0.97509	302.3285	-6.03943	0.0001	0.003799

16	5424289	-240.635	-0.29737	0.97413	301.0587	-6.22553	0.001	0.003762
17	5424289	-242.468	-0.29681	0.97508	302.3099	-6.04245	0.0001	0.003681
18	5424287	-240.664	-0.29736	0.97414	301.0787	-6.22281	0.001	0.003648
19	5424286	-242.440	-0.29682	0.97506	302.2915	-6.04531	0.0001	0.003568
20	5424285	-240.691	-0.29736	0.97416	301.0980	-6.22015	0.001	0.003537
21	5424284	-242.413	-0.29683	0.97505	302.2737	-6.04808	0.0001	0.003457
22	5424283	-240.718	-0.29735	0.97417	301.1168	-6.21756	0.001	0.00343
23	5424283	-242.388	-0.29684	0.97504	302.2565	-6.05076	0.0001	0.003351
24	5424281	-240.744	-0.29734	0.97418	301.1349	-6.21506	0.001	0.003326
25	5424281	-242.362	-0.29685	0.97502	302.2397	-6.05336	0.0001	0.003247
26	5424280	-240.769	-0.29733	0.97420	301.1524	-6.21264	0.001	0.003225
27	5424279	-242.338	-0.29686	0.97501	302.2234	-6.05588	0.0001	0.003147
28	5424278	-240.793	-0.29733	0.97421	301.1694	-6.21028	0.001	0.003127
29	5424278	-242.314	-0.29686	0.97500	302.2076	-6.05832	0.0001	0.00305
30	5424276	-240.817	-0.29732	0.97422	301.1858	-6.208	0.001	0.003032
31	5424276	-242.291	-0.29687	0.97499	302.1923	-6.06068	0.0001	0.002956
32	5424275	-240.840	-0.29731	0.97423	301.2017	-6.20579	0.001	0.00294
33	5424275	-242.269	-0.29688	0.97497	302.1774	-6.06297	0.0001	0.002865
34	5424274	-240.862	-0.29731	0.97424	301.2171	-6.20364	0.001	0.002851
35	5424273	-242.247	-0.29689	0.97496	302.1630	-6.06519	0.0001	0.002777
36	5424272	-240.883	-0.29730	0.97425	301.2320	-6.20156	0.001	0.002765
37	5424272	-242.226	-0.29689	0.97495	302.1490	-6.06734	0.0001	0.002692
38	5424271	-240.904	-0.29730	0.97427	301.2464	-6.19955	0.001	0.002681
39	5424271	-242.206	-0.29690	0.97494	302.1354	-6.06942	0.0001	0.002609
40	5424270	-240.924	-0.29729	0.97428	301.2604	-6.19759	0.001	0.002599
41	5424270	-242.186	-0.29691	0.97493	302.1222	-6.07144	0.0001	0.002528
42	5424269	-240.944	-0.29728	0.97429	301.2739	-6.19569	0.001	0.00252
43	5424267	-242.135	-0.29693	0.97491	302.0890	-6.07635	0.001	0.002451
44	5424266	-240.990	-0.29727	0.97431	301.3074	-6.19092	0.001	0.002324
45	5424265	-242.090	-0.29694	0.97488	302.0587	-6.08096	0.001	0.002258
46	5424264	-241.035	-0.29726	0.97433	301.3383	-6.18658	0.001	0.002143
47	5424263	-242.048	-0.29695	0.97486	302.0307	-6.08522	0.001	0.00208
48	5424263	-241.076	-0.29725	0.97435	301.3666	-6.18257	0.001	0.001976
49	5424262	-242.010	-0.29697	0.97484	302.0049	-6.08915	0.001	0.001916
50	5424261	-241.114	-0.29724	0.97437	301.3927	-6.17888	0.001	0.001822

The estimation algorithm did not converge after 50 iterations.

ARIMA Estimation Optimization Summary	
Estimation Method	Conditional Least Squares
Parameters Estimated	4
Termination Criteria	Maximum Relative Change in Estimates
Iteration Stopping Value	0.001
Criteria Value	0.003704
Alternate Criteria	Relative Change in Objective Function
Alternate Criteria Value	1.286E-7
Maximum Absolute Value of Gradient	19255.53
R-Square Change from Last Iteration	0.001822
Objective Function	Sum of Squared Residuals
Objective Function Value	5424261
Marquardt's Lambda Coefficient	0.001
Numerical Derivative Perturbation Delta	0.001
Iterations	50
Warning Message	The estimation algorithm did not converge.

The SAS System

The ARIMA Procedure

Preliminary Estimation

Initial Moving Average Estimates	
	Estimate
1	-0.94798

Constant Term Estimate	4970.093
White Noise Variance Est	11708715

Conditional Least Squares Estimation							
Iteration	SSE	MU	MA1,1	NUM1	Constant	Lambda	R Crit
0	8.2875E8	4970.093	-0.94798	367.2167	4970.093	0.00001	1
1	44455319	-2262.19	-0.97787	342.8055	-2262.19	1E-6	0.985714
2	29656307	-1897.16	-0.94031	325.9140	-1897.16	1E-7	0.61916
3	26455525	-2233.41	-0.87404	337.6136	-2233.41	1E-8	0.334391
4	25909257	-2494.56	-0.81321	346.6014	-2494.56	1E-9	0.149015
5	25890462	-2565.45	-0.82162	349.0323	-2565.45	1E-10	0.034343
6	25886067	-2569.29	-0.80969	349.1528	-2569.29	1E-11	0.021025
7	25885716	-2575.14	-0.81806	349.3581	-2575.14	1E-12	0.014714
8	25884280	-2572.04	-0.81125	349.2476	-2572.04	1E-12	0.01238
9	25884212	-2574.80	-0.81652	349.3457	-2574.8	1E-12	0.00922
10	25883604	-2572.75	-0.81232	349.2726	-2572.75	1E-12	0.007589
11	25883504	-2574.02	-0.81533	349.3137	-2574.02	0.01	0.005784
12	25883293	-2573.25	-0.81324	349.2905	-2573.25	0.001	0.003742
13	25883226	-2573.56	-0.81406	349.2959	-2573.56	0.1	0.002837
14	25883226	-2573.56	-0.81406	349.2959	-2573.56	1E8	0.000284

ARIMA Estimation Optimization Summary	
Estimation Method	Conditional Least Squares
Parameters Estimated	3
Termination Criteria	Maximum Relative Change in Estimates
Iteration Stopping Value	0.001

Criteria Value	1.82E-13
Maximum Absolute Value of Gradient	11235.84
R-Square Change from Last Iteration	0.000284
Objective Function	Sum of Squared Residuals
Objective Function Value	25883226
Marquardt's Lambda Coefficient	1E8
Numerical Derivative Perturbation Delta	0.001
Iterations	14

Conditional Least Squares Estimation

Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag	Variable	Shift
MU	-2573.6	426.20549	-6.04	<.0001	0	y	0
MA1,1	-0.81406	0.09672	-8.42	<.0001	1	y	0
NUM1	349.29589	16.92721	20.64	<.0001	0	time	0

Constant Estimate	-2573.56
Variance Estimate	647080.6
Std Error Estimate	804.4132
AIC	700.2687
SBC	705.5523
Number of Residuals	43

*** AIC and SBC do not include log determinant.**

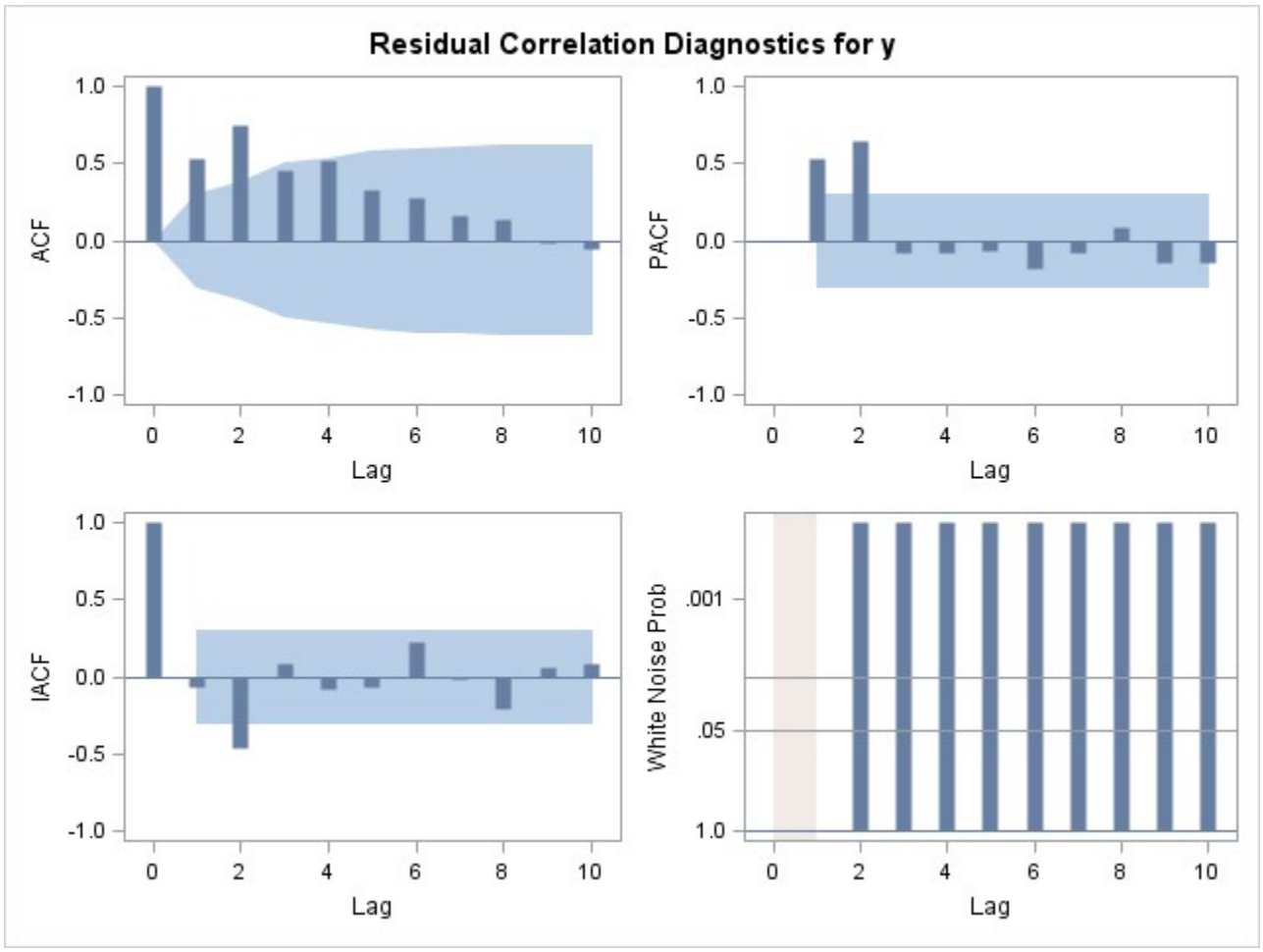
Correlations of Parameter Estimates

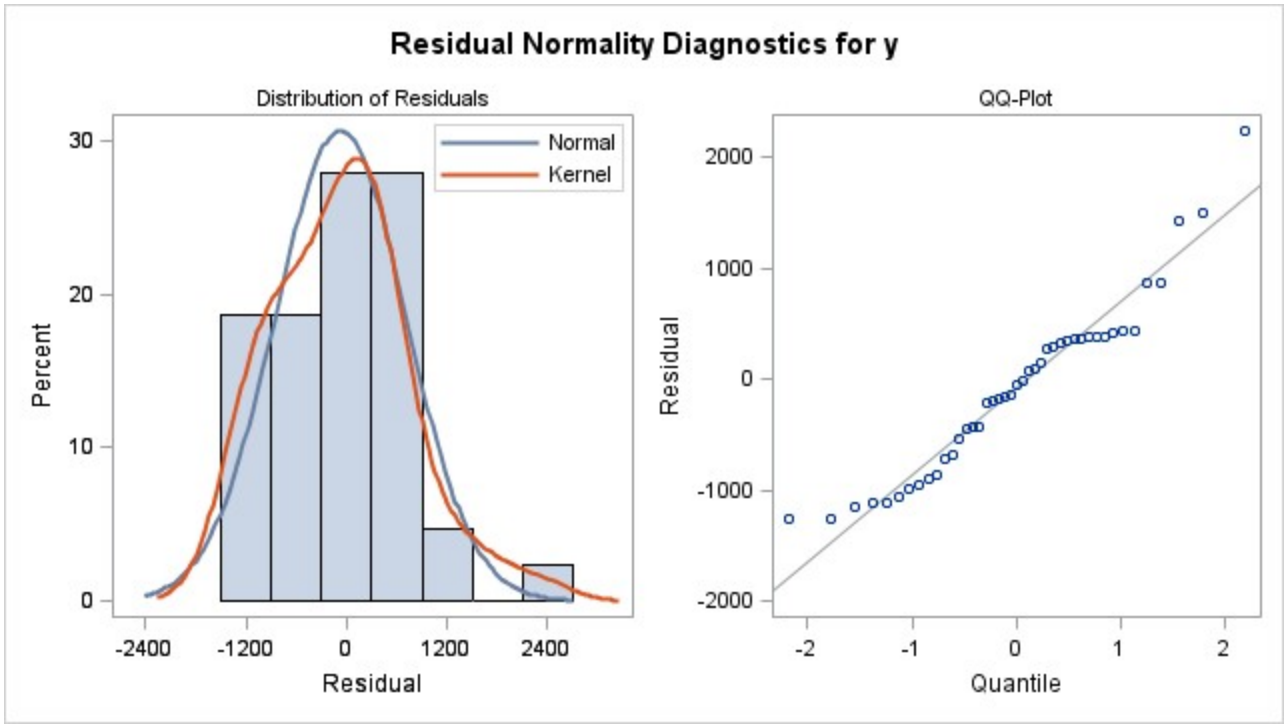
Variable Parameter	y MU	y MA1,1	time NUM1
y MU	1.000	-0.293	-0.859
y MA1,1	-0.293	1.000	0.246
time NUM1	-0.859	0.246	1.000

Autocorrelation Check of Residuals

To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	76.81	5	<.0001	0.545	0.754	0.470	0.539	0.353	0.303
12	83.52	11	<.0001	0.190	0.163	0.017	-0.018	-0.168	-0.158
18	130.89	17	<.0001	-0.276	-0.288	-0.356	-0.338	-0.361	-0.364

24	171.95	23	<.0001	-0.352	-0.309	-0.292	-0.255	-0.254	-0.180



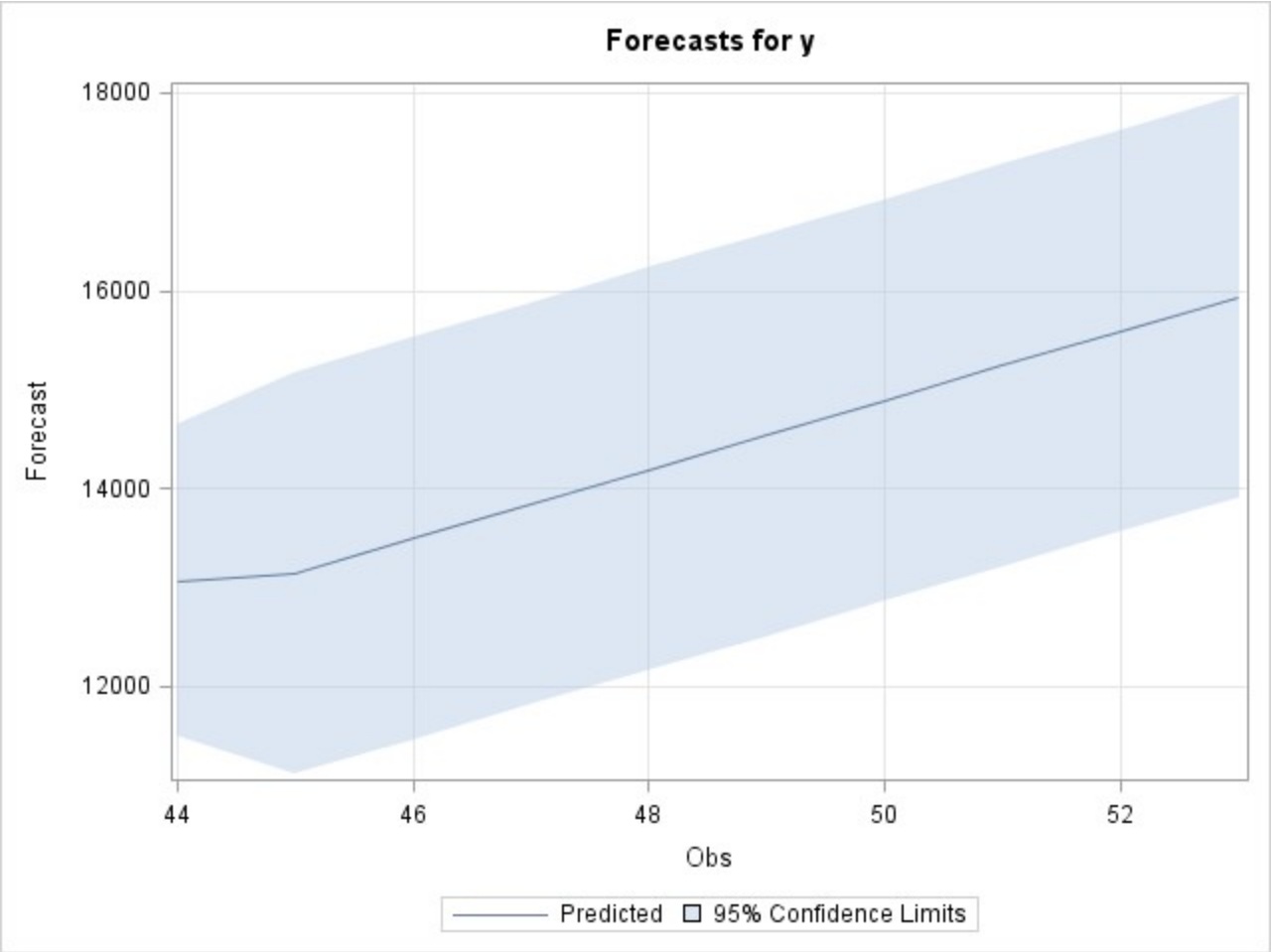


Model for variable y	
Estimated Intercept	-2573.56

Moving Average Factors	
Factor 1:	1 + 0.81406 B**(1)

Input Number 1	
Input Variable	time
Overall Regression Factor	349.2959

Forecasts for variable y				
Obs	Forecast	Std Error	95% Confidence Limits	
44	13071.3845	804.4132	11494.7636	14648.0055
45	13144.7526	1037.2552	11111.7698	15177.7354
46	13494.0485	1037.2552	11461.0657	15527.0313
47	13843.3444	1037.2552	11810.3616	15876.3272
48	14192.6403	1037.2552	12159.6575	16225.6231
49	14541.9362	1037.2552	12508.9534	16574.9190
50	14891.2321	1037.2552	12858.2492	16924.2149
51	15240.5279	1037.2552	13207.5451	17273.5108
52	15589.8238	1037.2552	13556.8410	17622.8067
53	15939.1197	1037.2552	13906.1369	17972.1025


Forecasts for y
18000
16000
14000
12000
Forecast
44
46
48
50
52
Obs
Predicted
95% Confidence Limits

The SAS System

The ARIMA Procedure

Preliminary Estimation

Initial Moving Average Estimates	
	Estimate
1	-1.00239
2	-0.94739

Constant Term Estimate	4970.093
White Noise Variance Est	7659648

Conditional Least Squares Estimation								
Iteration	SSE	MU	MA1,1	MA1,2	NUM1	Constant	Lambda	R Crit
0	4.5632E8	4970.093	-1.00239	-0.94739	367.2167	4970.093	0.00001	1
1	22449951	-1427.89	-1.02380	-0.96313	314.6194	-1427.89	1E-6	0.982726
2	18075032	-1307.63	-0.96552	-0.89021	307.5417	-1307.63	1E-7	0.494862
3	17416273	-1619.80	-0.91715	-0.80599	317.9620	-1619.8	1E-8	0.179731
4	17137861	-1833.81	-0.93349	-0.77288	325.0679	-1833.81	1E-9	0.10172
5	17019613	-1908.84	-0.93885	-0.74031	327.5390	-1908.84	1E-10	0.06532
6	16947499	-1949.29	-0.95952	-0.72956	328.8689	-1949.29	1E-11	0.050222
7	16910687	-1961.98	-0.96869	-0.71541	329.2659	-1961.98	1E-12	0.035864
8	16889652	-1972.52	-0.98158	-0.71116	329.6017	-1972.52	1E-12	0.027125
9	16879220	-1975.78	-0.98681	-0.70375	329.6908	-1975.78	1E-12	0.019246
10	16873687	-1980.39	-0.99373	-0.70194	329.8352	-1980.39	1E-12	0.013961
11	16871090	-1981.73	-0.99612	-0.69794	329.8681	-1981.73	1E-12	0.009723
12	16869745	-1984.20	-0.99965	-0.69726	329.9456	-1984.2	1E-12	0.006865
13	16869154	-1984.80	-1.00059	-0.69512	329.9592	-1984.8	1E-12	0.004738
14	16868830	-1986.14	-1.00238	-0.69494	330.0017	-1986.14	1E-12	0.003308
15	16868704	-1986.37	-1.00270	-0.69380	330.0061	-1986.37	1E-12	0.002284
16	16868620	-1987.08	-1.00362	-0.69382	330.0290	-1987.08	1E-12	0.001595
17	16868597	-1987.14	-1.00369	-0.69320	330.0294	-1987.14	1E-12	0.00111
18	16868571	-1987.52	-1.00417	-0.69327	330.0417	-1987.52	1E-12	0.000783

ARIMA Estimation Optimization Summary	
Estimation Method	Conditional Least Squares
Parameters Estimated	4
Termination Criteria	Maximum Relative Change in Estimates
Iteration Stopping Value	0.001
Criteria Value	0.000476
Alternate Criteria	Relative Change in Objective Function
Alternate Criteria Value	1.537E-6
Maximum Absolute Value of Gradient	21756.98
R-Square Change from Last Iteration	0.000783
Objective Function	Sum of Squared Residuals
Objective Function Value	16868571
Marquardt's Lambda Coefficient	1E-12
Numerical Derivative Perturbation Delta	0.001
Iterations	18

Conditional Least Squares Estimation							
Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag	Variable	Shift
MU	-1987.5	463.00216	-4.29	0.0001	0	y	0
MA1,1	-1.00417	0.12268	-8.19	<.0001	1	y	0
MA1,2	-0.69327	0.12654	-5.48	<.0001	2	y	0
NUM1	330.04174	18.75014	17.60	<.0001	0	time	0

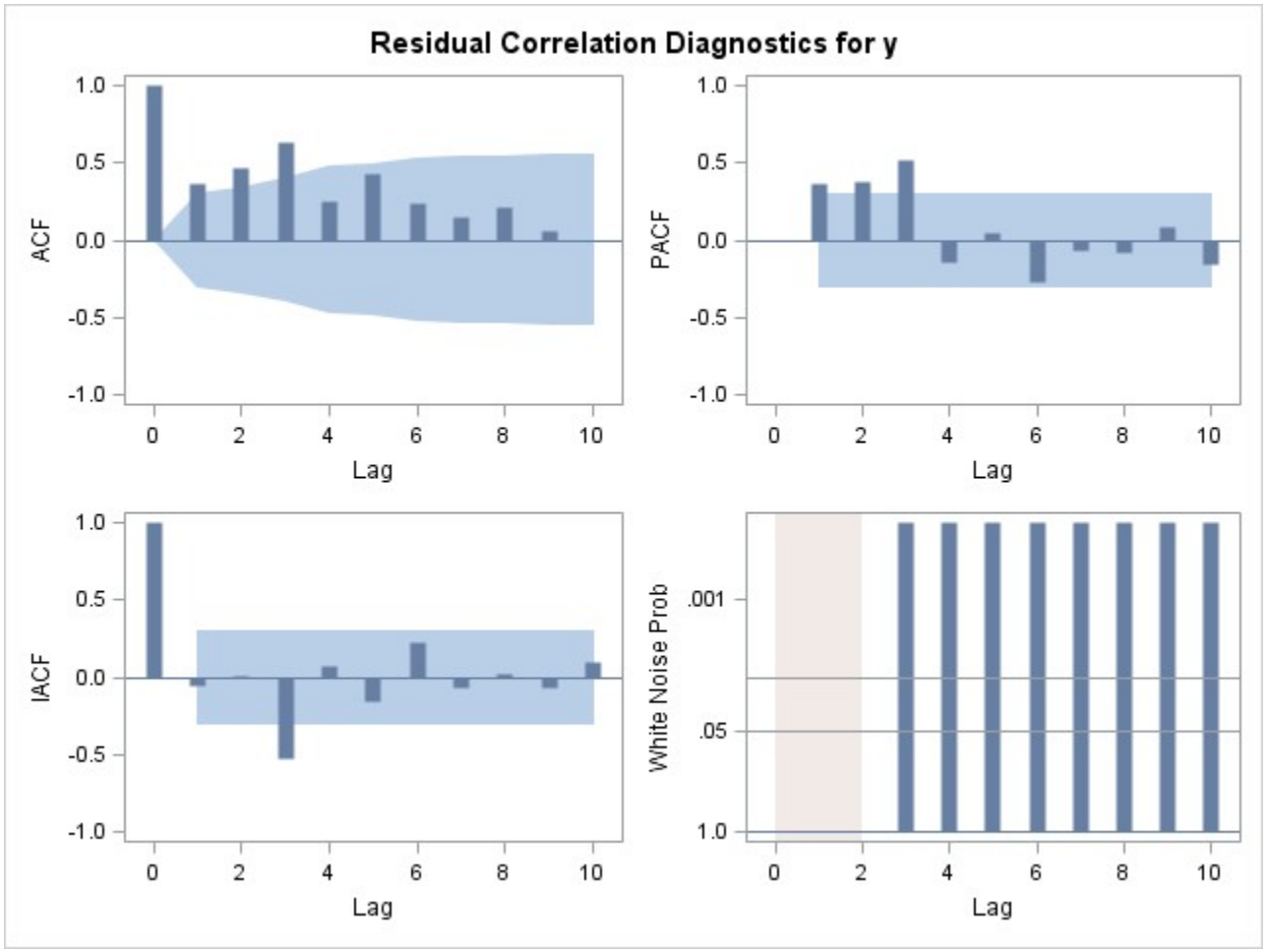
Constant Estimate	-1987.52
Variance Estimate	432527.5
Std Error Estimate	657.6682
AIC	683.8585
SBC	690.9033
Number of Residuals	43

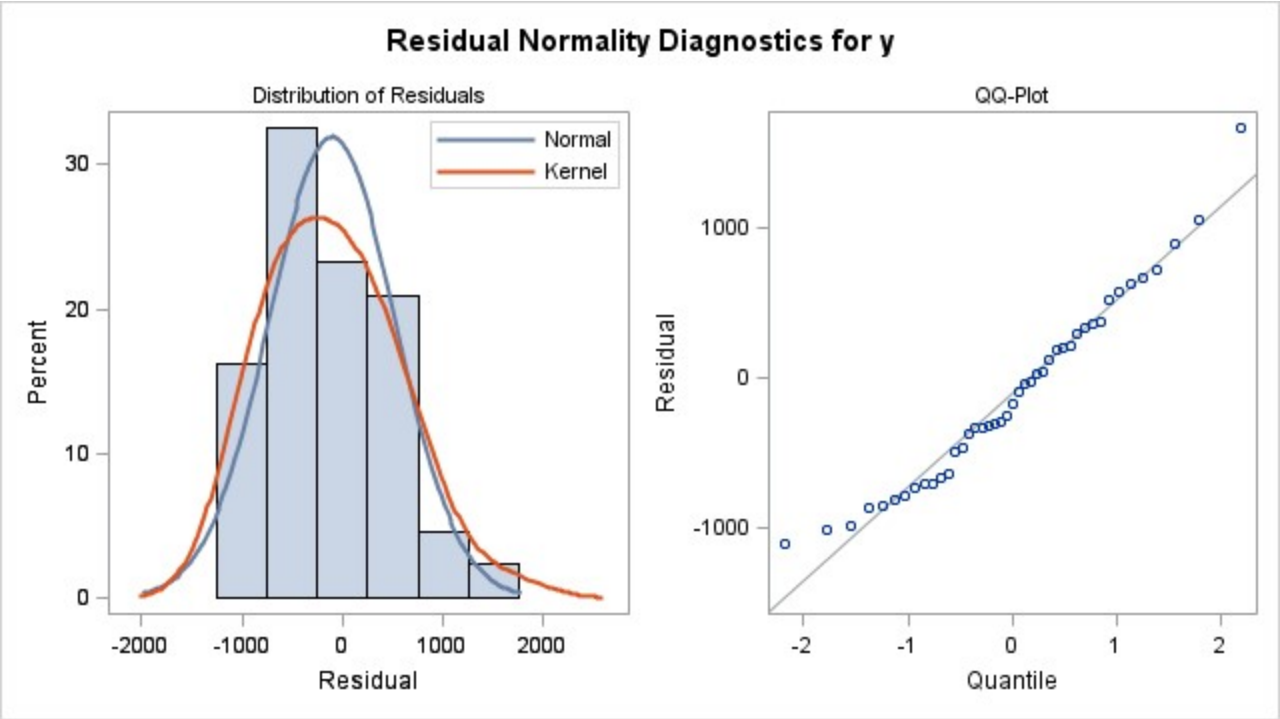
*** AIC and SBC do not include log determinant.**

Correlations of Parameter Estimates				
Variable Parameter	y MU	y MA1,1	y MA1,2	time NUM1

y MU	1.000	-0.309	-0.362	-0.832
y MA1,1	-0.309	1.000	0.637	0.254
y MA1,2	-0.362	0.637	1.000	0.288
time NUM1	-0.832	0.254	0.288	1.000

Autocorrelation Check of Residuals									
To Lag	**Chi-Square**	**DF**	**Pr > ChiSq**	**Autocorrelations**					
6	59.60	4	<.0001	0.400	0.496	0.652	0.301	0.471	0.285
12	66.80	10	<.0001	0.208	0.260	0.115	0.057	-0.027	-0.049
18	86.61	16	<.0001	-0.123	-0.170	-0.222	-0.238	-0.194	-0.294
24	119.04	22	<.0001	-0.289	-0.203	-0.266	-0.265	-0.167	-0.260





Model for variable y	
Estimated Intercept	-1987.52

Moving Average Factors	
Factor 1:	1 + 1.00417 B**(1) + 0.69327 B**(2)

Input Number 1	
Input Variable	time
Overall Regression Factor	330.0417

Forecasts for variable y				
Obs	Forecast	Std Error	95% Confidence Limits	
44	13184.6499	657.6682	11895.6439	14473.6559
45	13013.4140	932.0245	11186.6795	14840.1485
46	13194.4022	1037.5713	11160.7998	15228.0045
47	13524.4439	1037.5713	11490.8415	15558.0463
48	13854.4856	1037.5713	11820.8833	15888.0880
49	14184.5274	1037.5713	12150.9250	16218.1297
50	14514.5691	1037.5713	12480.9668	16548.1715
51	14844.6108	1037.5713	12811.0085	16878.2132
52	15174.6526	1037.5713	13141.0502	17208.2549

53	15504.6943	1037.5713	13471.0920	17538.2967