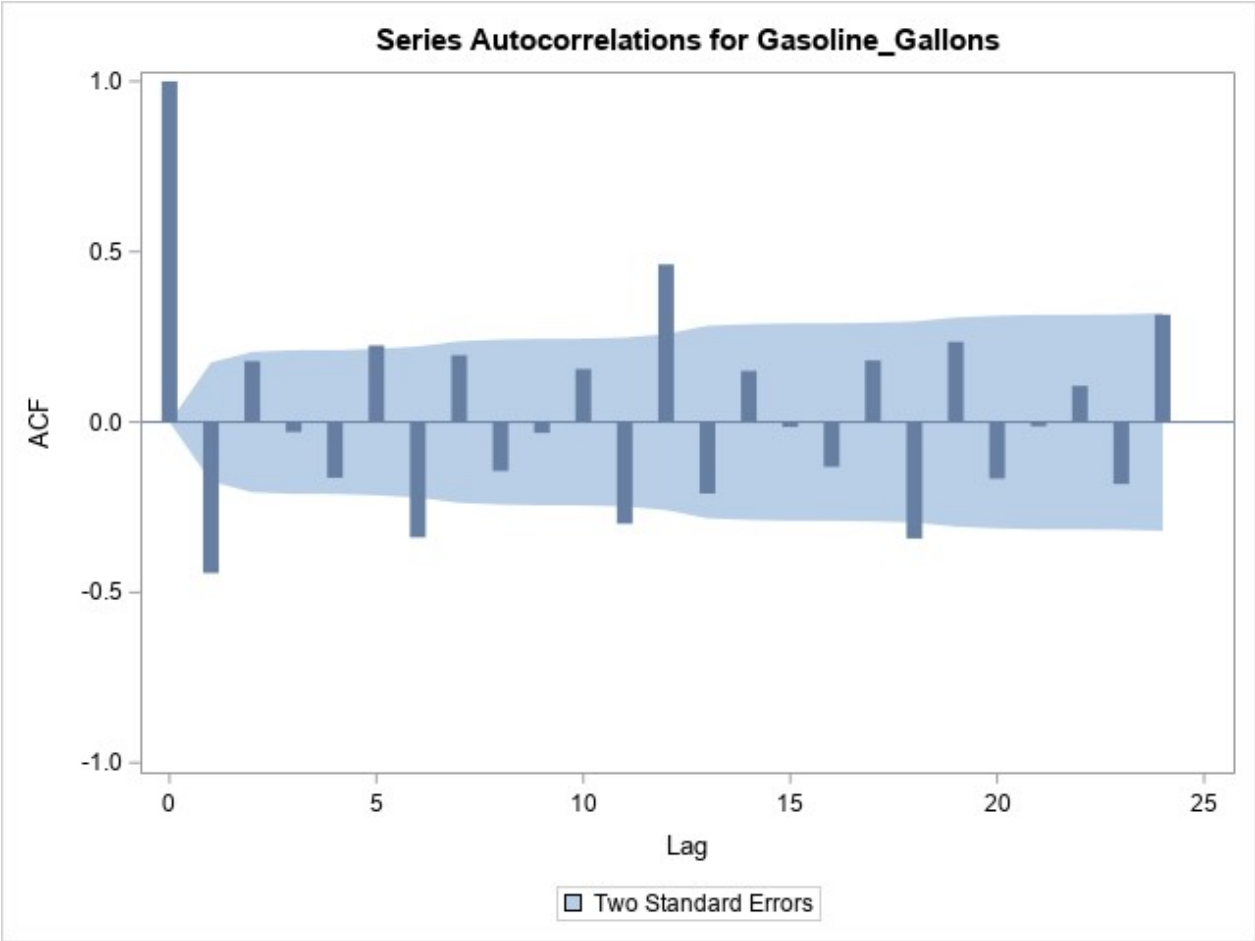
The SAS System

The ARIMA Procedure

Name of Variable = Gasoline_Gallons	
Mean of Working Series	0
Standard Deviation	29950643
Number of Observations	131

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	57.36	6	<.0001	-0.443	0.179	-0.029	-0.163	0.225	-0.338
12	113.58	12	<.0001	0.196	-0.144	-0.032	0.156	-0.298	0.463
18	149.11	18	<.0001	-0.210	0.150	-0.014	-0.132	0.181	-0.342
24	185.40	24	<.0001	0.235	-0.166	-0.012	0.106	-0.182	0.315



Conditional Least Squares Estimation					
Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag
AR1,1	-0.46104	0.07981	-5.78	<.0001	1

Variance Estimate	7.193E14

Std Error Estimate	26819587
AIC	4854.175
SBC	4857.05
Number of Residuals	131

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

Autocorrelation Check of Residuals									
To Lag	**Chi-Square**	**DF**	**Pr > ChiSq**	**Autocorrelations**					
6	12.45	5	0.0292	0.002	0.041	-0.015	-0.126	0.049	-0.264
12	41.89	11	<.0001	0.024	-0.125	-0.032	0.043	-0.098	0.416
18	56.01	17	<.0001	0.022	0.089	-0.023	-0.094	0.000	-0.272
24	73.81	23	<.0001	0.070	-0.131	-0.048	0.050	-0.029	0.287

Model for variable Gasoline_Gallons	
Data have been centered by subtracting the value	-723803

No mean term in this model.

Autoregressive Factors	
Factor 1:	1 + 0.46104 B**(1)

Forecasts for variable Gasoline_Gallons				
Obs	**Forecast**	**Std Error**	**95% Confidence Limits**	
132	-31932553.6	26819587	-84497978.4	20632871.2
133	13664806.2	29532758	-44218335.1	71547947.5
134	-7357586.8	30077950	-66309285.4	51594111.8
135	2334663.2	30192568	-56841683.2	61511009.5
136	-2133891.3	30216876	-61357879.4	57090096.7

The SAS System

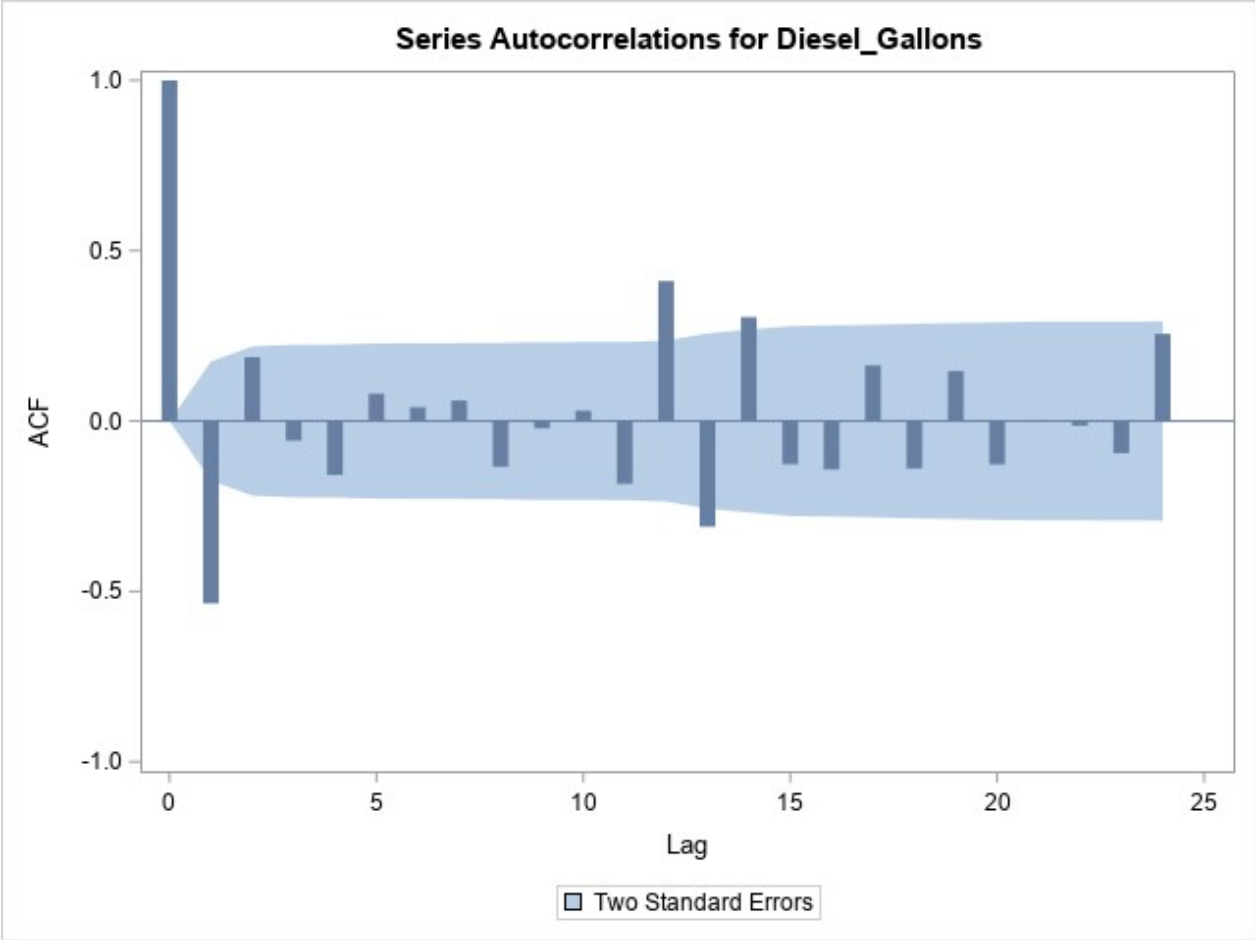
Obs	LAG	VAR	N	COV	CORR	STDERR	INVCORR	PARTCORR
1	0	Gasoline_Gallons	131	8.97041E14	1.00000	0.00000	1.00000	1.00000
2	1	Gasoline_Gallons	130	-3.9745E14	-0.44307	0.08737	0.38685	-0.44307
3	2	Gasoline_Gallons	129	1.60365E14	0.17877	0.10311	0.12211	-0.02182
4	3	Gasoline_Gallons	128	-2.6126E13	-0.02912	0.10544	0.09004	0.05246
5	4	Gasoline_Gallons	127	-1.4645E14	-0.16325	0.10551	0.07207	-0.19162
6	5	Gasoline_Gallons	126	2.01735E14	0.22489	0.10742	0.00498	0.09598
7	6	Gasoline_Gallons	125	-3.0362E14	-0.33846	0.11095	0.05464	-0.22782
8	7	Gasoline_Gallons	124	1.75886E14	0.19607	0.11857	0.09628	-0.06263
9	8	Gasoline_Gallons	123	-1.2876E14	-0.14354	0.12102	0.05786	-0.09323
10	9	Gasoline_Gallons	122	-2.8635E13	-0.03192	0.12232	0.06198	-0.13189
11	10	Gasoline_Gallons	121	1.3975E14	0.15579	0.12238	0.06251	0.03109
12	11	Gasoline_Gallons	120	-2.6759E14	-0.29830	0.12388	0.04916	-0.21680
13	12	Gasoline_Gallons	119	4.1504E14	0.46268	0.12925	-0.19306	0.24422
14	13	Gasoline_Gallons	118	-1.8814E14	-0.20974	0.14133	-0.12222	0.12289
15	14	Gasoline_Gallons	117	1.34743E14	0.15021	0.14369	-0.02280	0.09063
16	15	Gasoline_Gallons	116	-1.2924E13	-0.01441	0.14488	0.02489	0.01548
17	16	Gasoline_Gallons	115	-1.1796E14	-0.13150	0.14489	0.05295	-0.01085
18	17	Gasoline_Gallons	114	1.62256E14	0.18088	0.14580	0.10041	-0.00349
19	18	Gasoline_Gallons	113	-3.0665E14	-0.34184	0.14750	0.12364	-0.16832
20	19	Gasoline_Gallons	112	2.11216E14	0.23546	0.15343	0.02076	0.01551
21	20	Gasoline_Gallons	111	-1.4907E14	-0.16618	0.15616	0.04743	-0.03555
22	21	Gasoline_Gallons	110	-1.117E13	-0.01245	0.15751	0.04472	-0.04531
23	22	Gasoline_Gallons	109	9.51509E13	0.10607	0.15752	0.00759	-0.04291
24	23	Gasoline_Gallons	108	-1.6304E14	-0.18176	0.15806	-0.04816	0.00977
25	24	Gasoline_Gallons	107	2.82764E14	0.31522	0.15965	-0.04971	0.06863

The SAS System

The ARIMA Procedure

Name of Variable = Diesel_Gallons	
Mean of Working Series	0
Standard Deviation	8340140
Number of Observations	131

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	48.12	6	<.0001	-0.535	0.187	-0.057	-0.158	0.080	0.041
12	81.00	12	<.0001	0.060	-0.134	-0.021	0.030	-0.184	0.411
18	121.57	18	<.0001	-0.310	0.305	-0.127	-0.142	0.163	-0.139
24	139.57	24	<.0001	0.147	-0.127	0.003	-0.014	-0.094	0.256



Conditional Least Squares Estimation					
Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag
AR1,1	-0.53553	0.07412	-7.23	<.0001	1

Variance Estimate	5.001E13
Std Error Estimate	7071734
AIC	4504.922
SBC	4507.797
Number of Residuals	131

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

Autocorrelation Check of Residuals									
To Lag	**Chi-Square**	**DF**	**Pr > ChiSq**	**Autocorrelations**					
6	17.71	5	0.0033	-0.074	-0.104	-0.078	-0.266	0.056	0.180
12	47.88	11	<.0001	0.040	-0.213	-0.116	-0.100	-0.001	0.371
18	66.11	17	<.0001	-0.023	0.221	-0.111	-0.227	0.087	-0.018
24	85.36	23	<.0001	0.068	-0.121	-0.101	-0.094	0.013	0.284

Model for variable Diesel_Gallons	
Data have been centered by subtracting the value	-33238.4

No mean term in this model.

Autoregressive Factors	
Factor 1:	1 + 0.53553 B**(1)

Forecasts for variable Diesel_Gallons				
Obs	**Forecast**	**Std Error**	**95% Confidence Limits**	
132	-1574958.2	7071734	-15435302.9	12285386.6
133	792392.9	8021942	-14930323.9	16515109.7
134	-475385.7	8274340	-16692793.9	15742022.6
135	203543.0	8345316	-16152976.5	16560062.5
136	-160041.1	8365560	-16556238.4	16236156.1

The SAS System

The ARIMA Procedure

Preliminary Estimation

Initial Autoregressive Estimates	
	Estimate
1	-0.44307

Constant Term Estimate	-1044497
White Noise Variance Est	7.209E14

Conditional Least Squares Estimation						
Iteration	SSE	MU	AR1,1	Constant	Lambda	R Crit
0	9.354E16	-723803	-0.44307	-1044497	0.00001	1
1	9.35E16	-901109	-0.46120	-1316698	1E-6	0.021942
2	9.35E16	-899247	-0.46121	-1313984	1E-7	0.000102
3	9.35E16	-899247	-0.46121	-1313985	1E-8	9.063E-8

Unconditional Least Squares Estimation						
Iteration	SSE	MU	AR1,1	Constant	Lambda	R Crit
0	9.349E16	-899247	-0.46121	-1313985	0.00001	1
1	9.349E16	-904827	-0.46142	-1322334	1E-6	0.000384
2	9.349E16	-904832	-0.46142	-1322341	1E-7	6.008E-7

ARIMA Estimation Optimization Summary	
Estimation Method	Unconditional Least Squares
Parameters Estimated	2
Termination Criteria	Maximum Relative Change in Estimates
Iteration Stopping Value	0.001
Criteria Value	5.513E-6
Alternate Criteria	Relative Change in Objective Function
Alternate Criteria Value	7.11E-13
Maximum Absolute Value of Gradient	5.504E10
R-Square Change from Last Iteration	6.008E-7
Objective Function	Sum of Squared Residuals
Objective Function Value	9.349E16
Marquardt's Lambda Coefficient	1E-7
Numerical Derivative Perturbation Delta	0.001

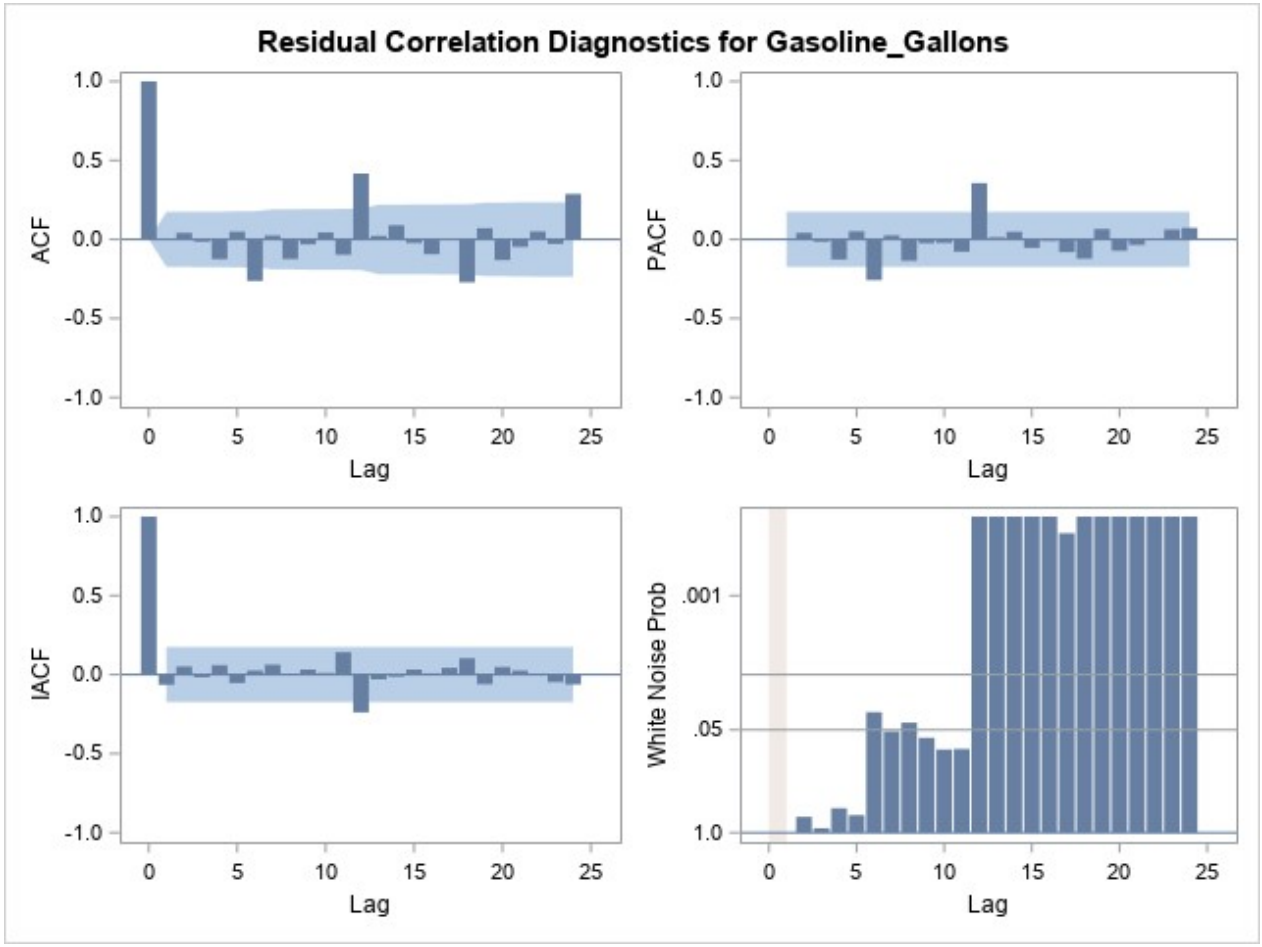
Iterations	2

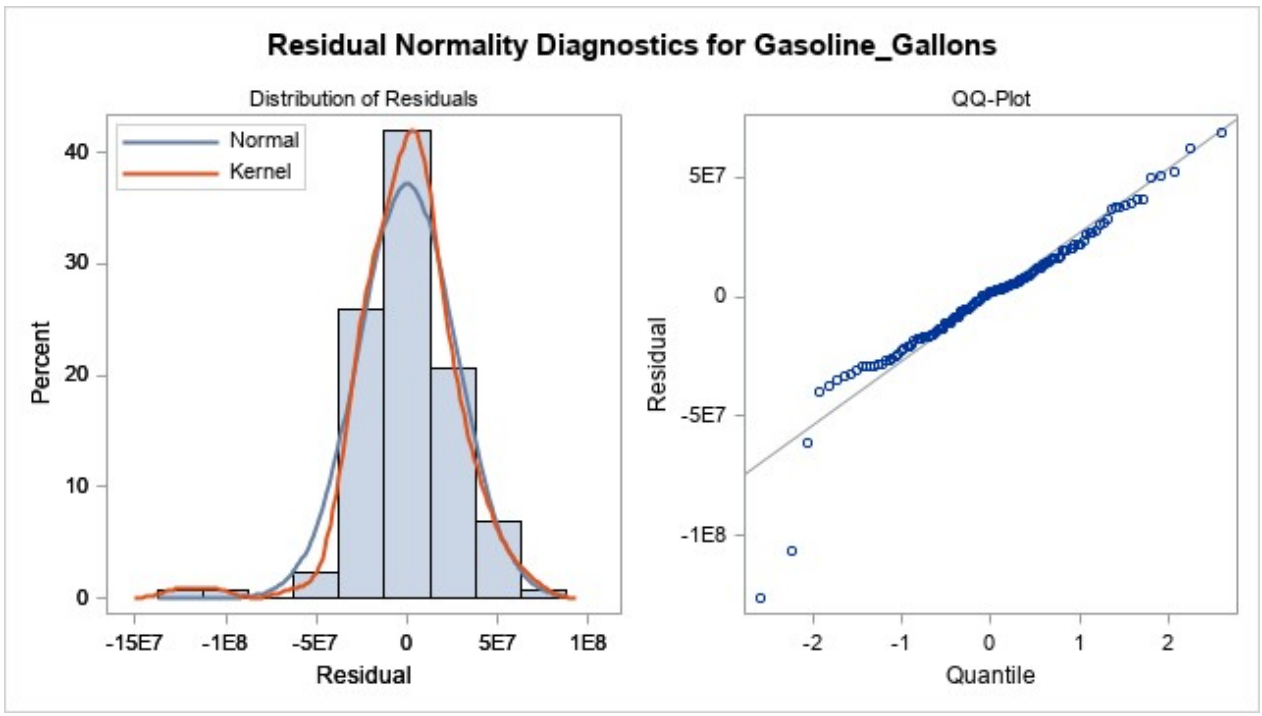
Unconditional Least Squares Estimation					
Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag
MU	-904831.6	1613440.3	-0.56	0.5759	0
AR1,1	-0.46142	0.08012	-5.76	<.0001	1

Constant Estimate	-1322341
Variance Estimate	7.247E14
Std Error Estimate	26920501
AIC	4856.386
SBC	4862.137
Number of Residuals	131

Correlations of Parameter Estimates		
Parameter	MU	AR1,1
MU	1.000	0.012
AR1,1	0.012	1.000

Autocorrelation Check of Residuals										
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations						
6	12.38	5	0.0299	0.002	0.041	-0.014	-0.125	0.049	-0.263	
12	41.87	11	<.0001	0.025	-0.124	-0.031	0.044	-0.097	0.417	
18	55.93	17	<.0001	0.022	0.090	-0.023	-0.094	0.000	-0.272	
24	73.77	23	<.0001	0.071	-0.131	-0.047	0.050	-0.028	0.288	





Model for variable Gasoline_Gallons	
Estimated Mean	-904832

Autoregressive Factors	
Factor 1:	1 + 0.46142 B**(1)

The SAS System

The ARIMA Procedure

Preliminary Estimation

Initial Autoregressive Estimates	
	Estimate
1	-0.53504

Constant Term Estimate	-51022.3
White Noise Variance Est	4.965E13

Conditional Least Squares Estimation						
Iteration	SSE	MU	AR1,1	Constant	Lambda	R Crit
0	6.501E15	-33238.4	-0.53504	-51022.3	0.00001	1
1	6.501E15	-34540.5	-0.53553	-53037.9	1E-6	0.000642
2	6.501E15	-34536.3	-0.53553	-53031.4	1E-7	9.968E-7

Unconditional Least Squares Estimation						
Iteration	SSE	MU	AR1,1	Constant	Lambda	R Crit
0	6.497E15	-34536.3	-0.53553	-53031.4	0.00001	1
1	6.497E15	-31112.5	-0.53632	-47798.7	1E-6	0.001198
2	6.497E15	-31104.8	-0.53632	-47786.9	1E-7	3.965E-6

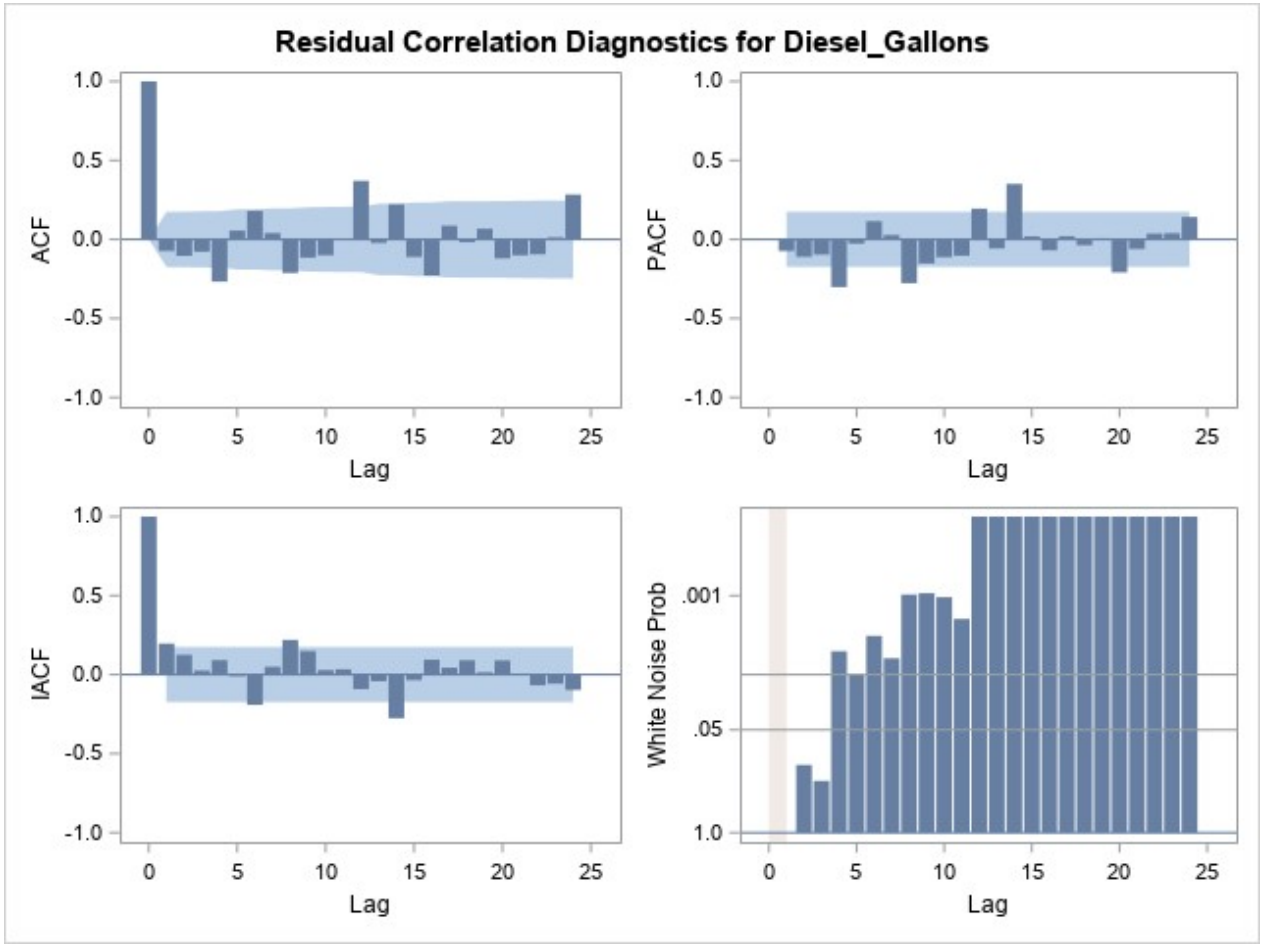
ARIMA Estimation Optimization Summary	
Estimation Method	Unconditional Least Squares
Parameters Estimated	2
Termination Criteria	Maximum Relative Change in Estimates
Iteration Stopping Value	0.001
Criteria Value	0.000248
Alternate Criteria	Relative Change in Objective Function
Alternate Criteria Value	2.46E-11
Maximum Absolute Value of Gradient	2.762E10
R-Square Change from Last Iteration	3.965E-6
Objective Function	Sum of Squared Residuals
Objective Function Value	6.497E15
Marquardt's Lambda Coefficient	1E-7
Numerical Derivative Perturbation Delta	0.001
Iterations	2

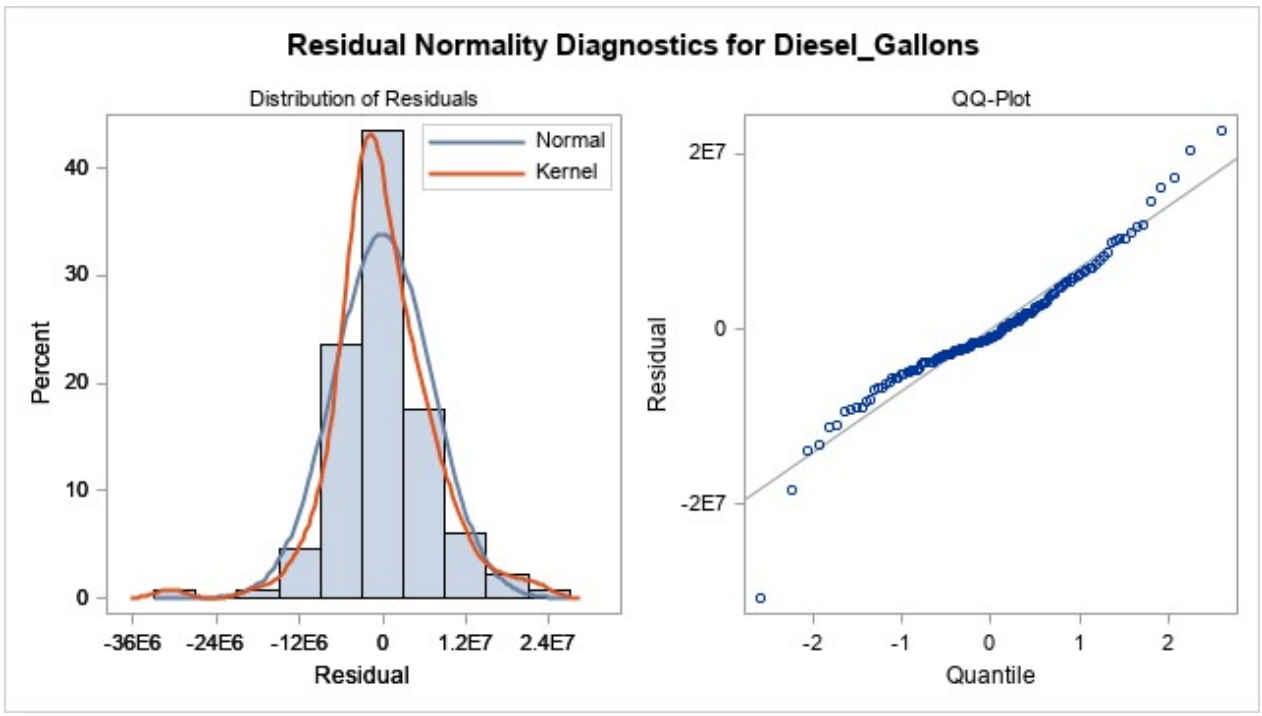
Unconditional Least Squares Estimation					
Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag
MU	-31104.8	404685.2	-0.08	0.9389	0
AR1,1	-0.53632	0.07436	-7.21	<.0001	1

Constant Estimate	-47786.9
Variance Estimate	5.037E13
Std Error Estimate	7096972
AIC	4507.182
SBC	4512.933
Number of Residuals	131

Correlations of Parameter Estimates		
Parameter	MU	AR1,1
MU	1.000	0.002
AR1,1	0.002	1.000

Autocorrelation Check of Residuals										
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations						
6	17.78	5	0.0032	-0.073	-0.104	-0.078	-0.267	0.056	0.180
12	47.89	11	<.0001	0.040	-0.212	-0.116	-0.101	-0.000	0.371
18	66.25	17	<.0001	-0.023	0.222	-0.111	-0.228	0.087	-0.018
24	85.42	23	<.0001	0.067	-0.120	-0.101	-0.094	0.013	0.284





Model for variable Diesel_Gallons	
Estimated Mean	-31104.8

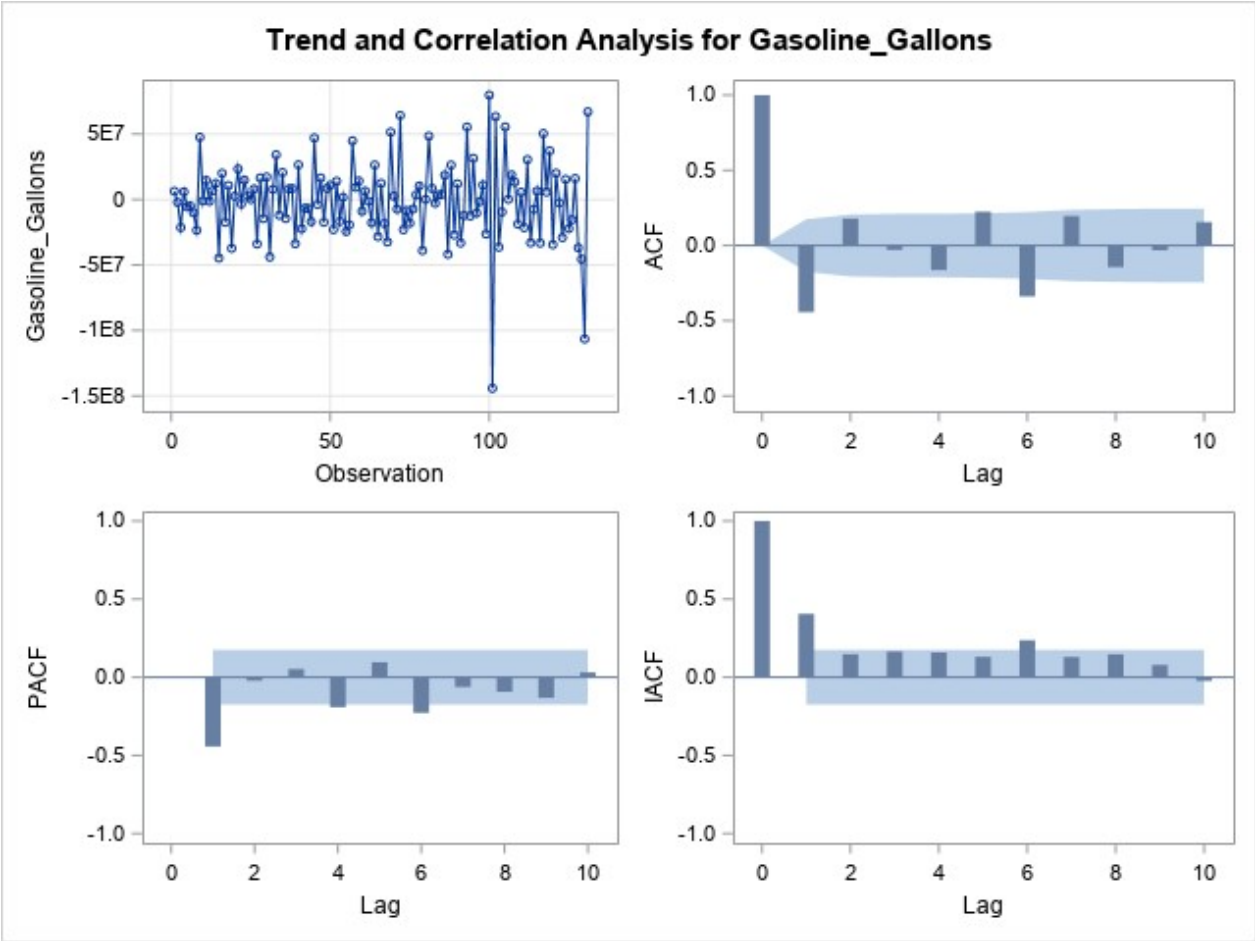
Autoregressive Factors	
Factor 1:	1 + 0.53632 B**(1)

The SAS System

The ARIMA Procedure

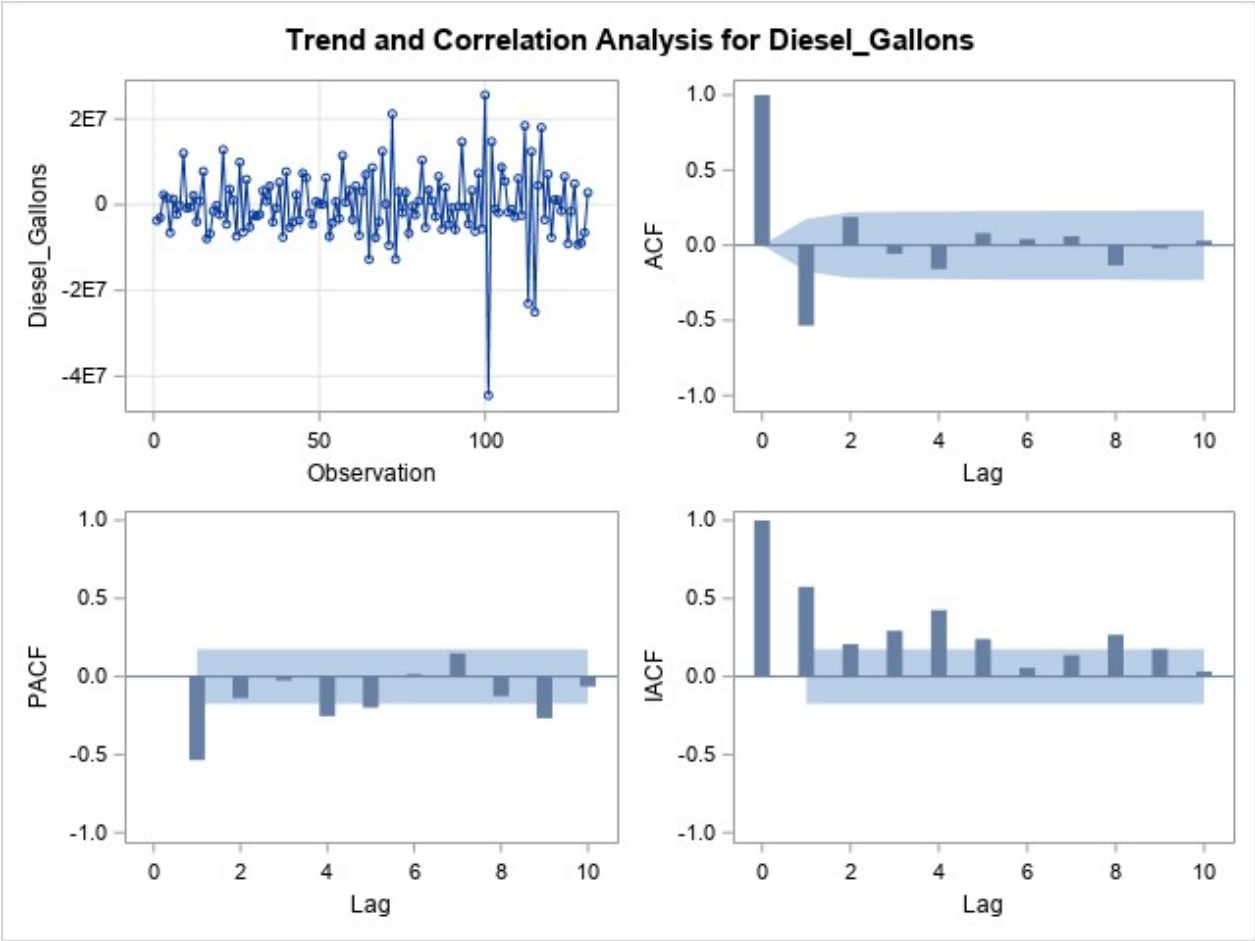
Name of Variable = Gasoline_Gallons	
Mean of Working Series	-723803
Standard Deviation	29950643
Number of Observations	131

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	57.36	6	<.0001	-0.443	0.179	-0.029	-0.163	0.225	-0.338



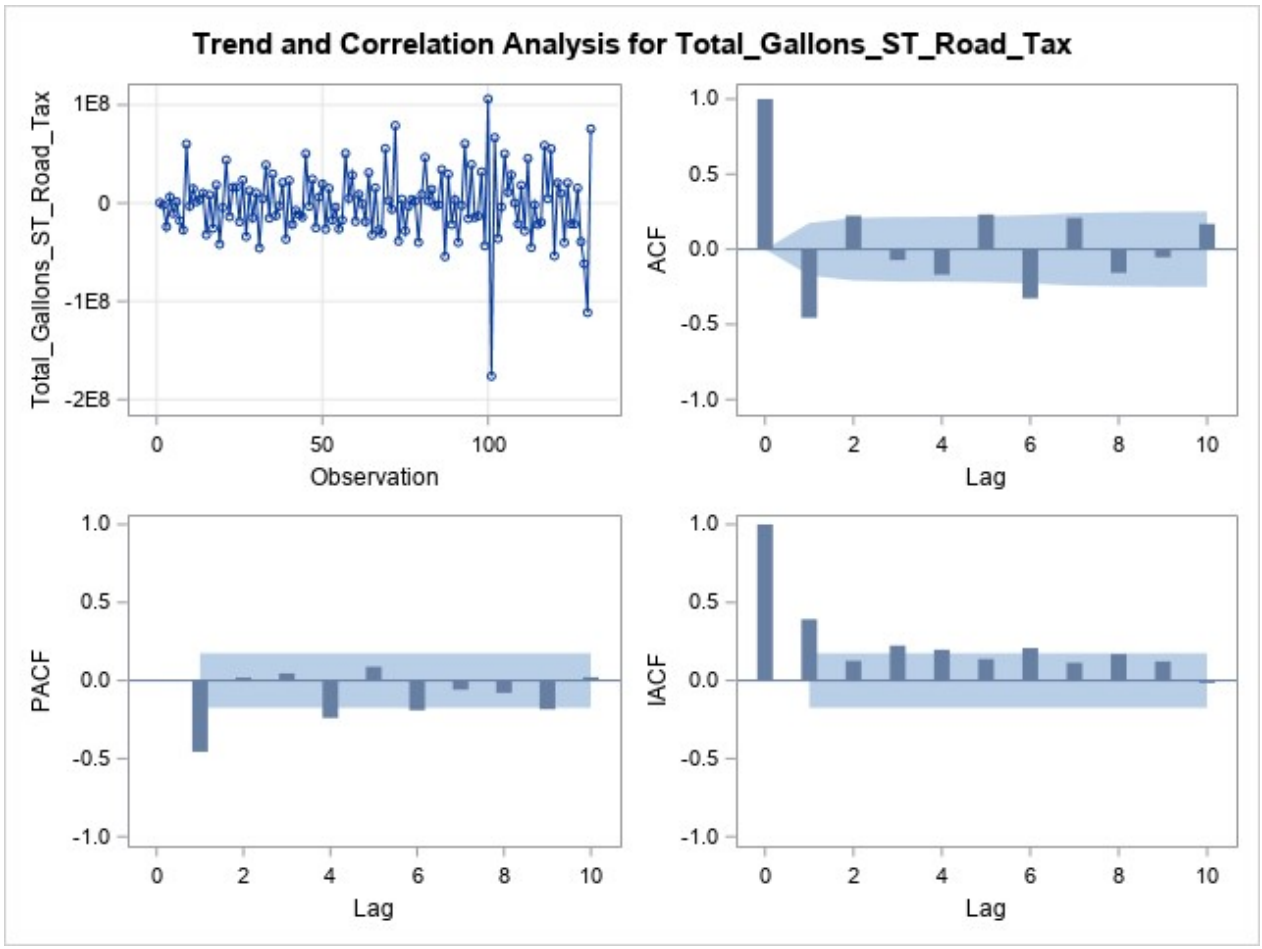
Name of Variable = Diesel_Gallons	
Mean of Working Series	-33238.4
Standard Deviation	8340140
Number of Observations	131

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	48.12	6	<.0001	-0.535	0.187	-0.057	-0.158	0.080	0.041



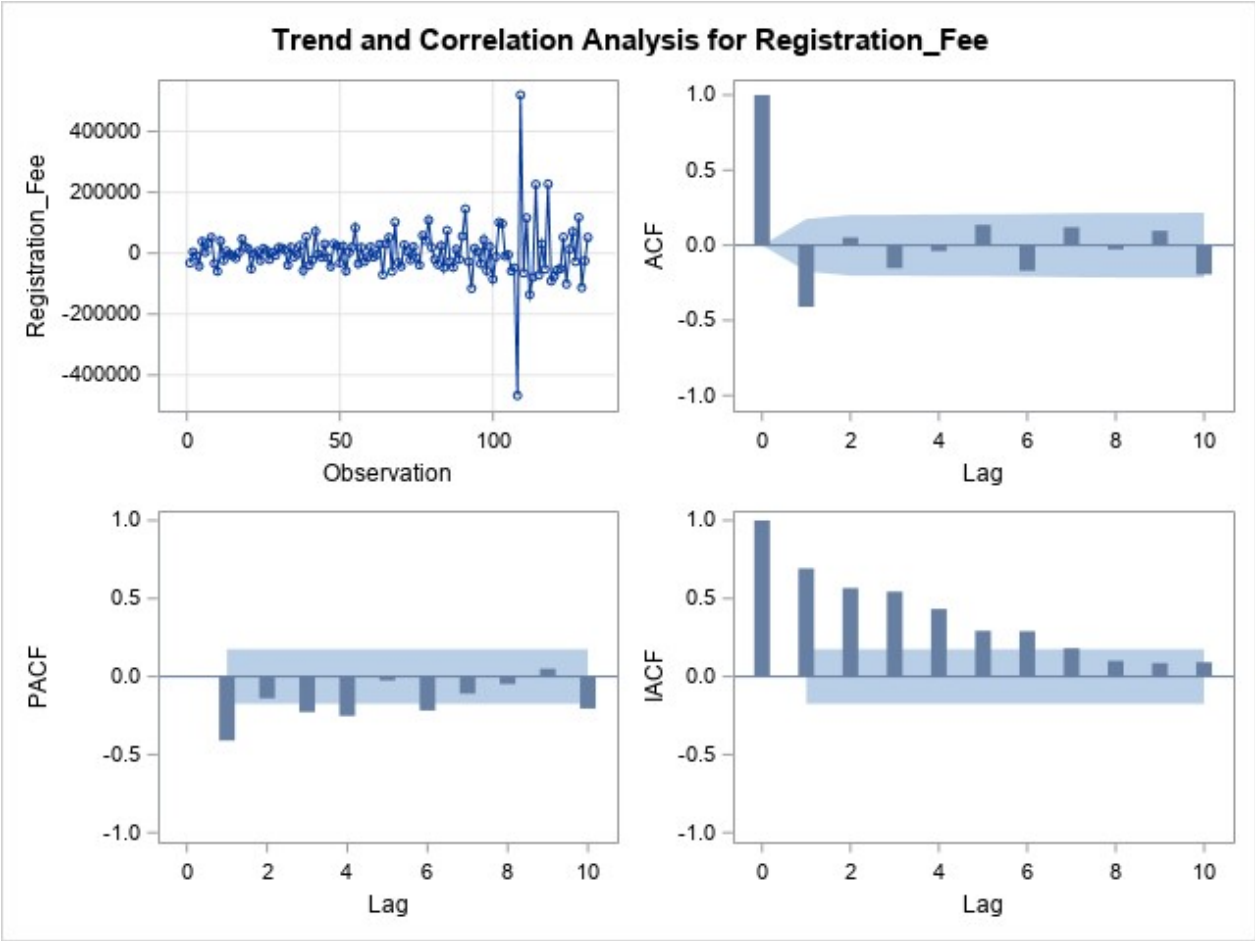
Name of Variable = Total_Gallons_ST_Road_Tax	
Mean of Working Series	-765596
Standard Deviation	35353525
Number of Observations	131

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	61.63	6	<.0001	-0.457	0.223	-0.072	-0.169	0.232	-0.327



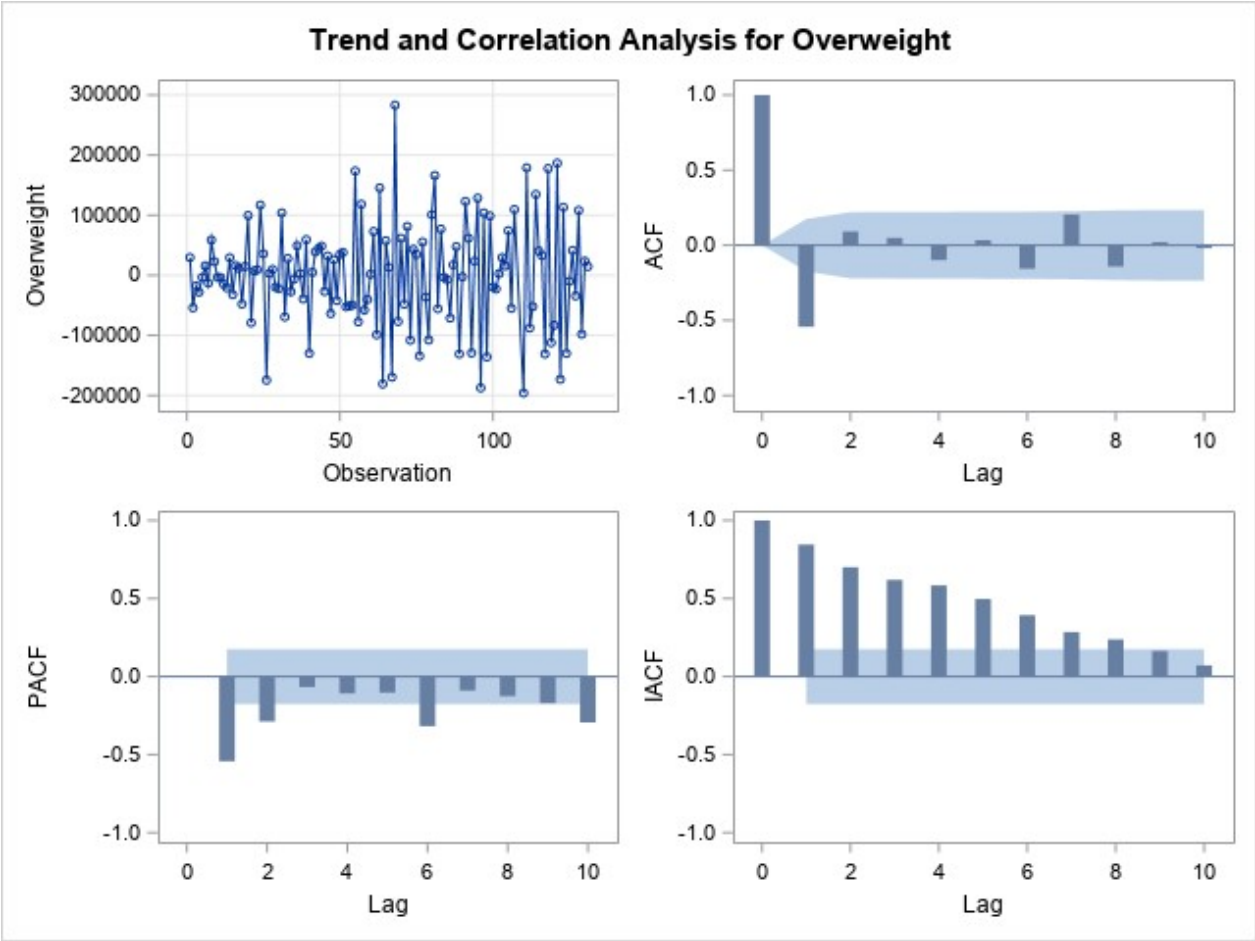
Name of Variable = Registration_Fee	
Mean of Working Series	1319.92
Standard Deviation	83223.72
Number of Observations	131

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	32.79	6	<.0001	-0.410	0.052	-0.153	-0.039	0.136	-0.170



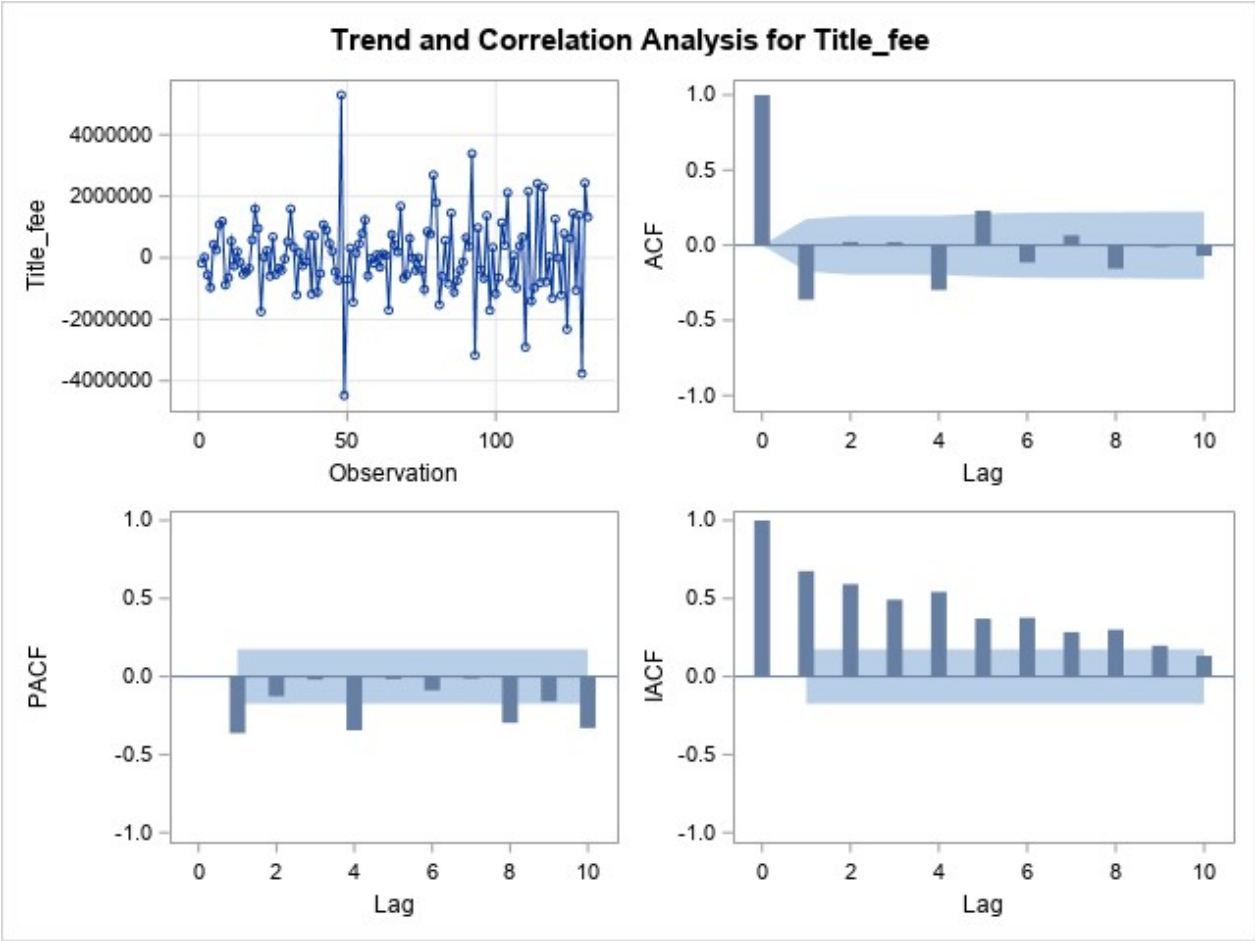
Name of Variable = Overweight	
Mean of Working Series	1600.631
Standard Deviation	86139.08
Number of Observations	131
Embedded missing values in working series	2

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	43.08	6	<.0001	-0.543	0.092	0.049	-0.099	0.033	-0.156



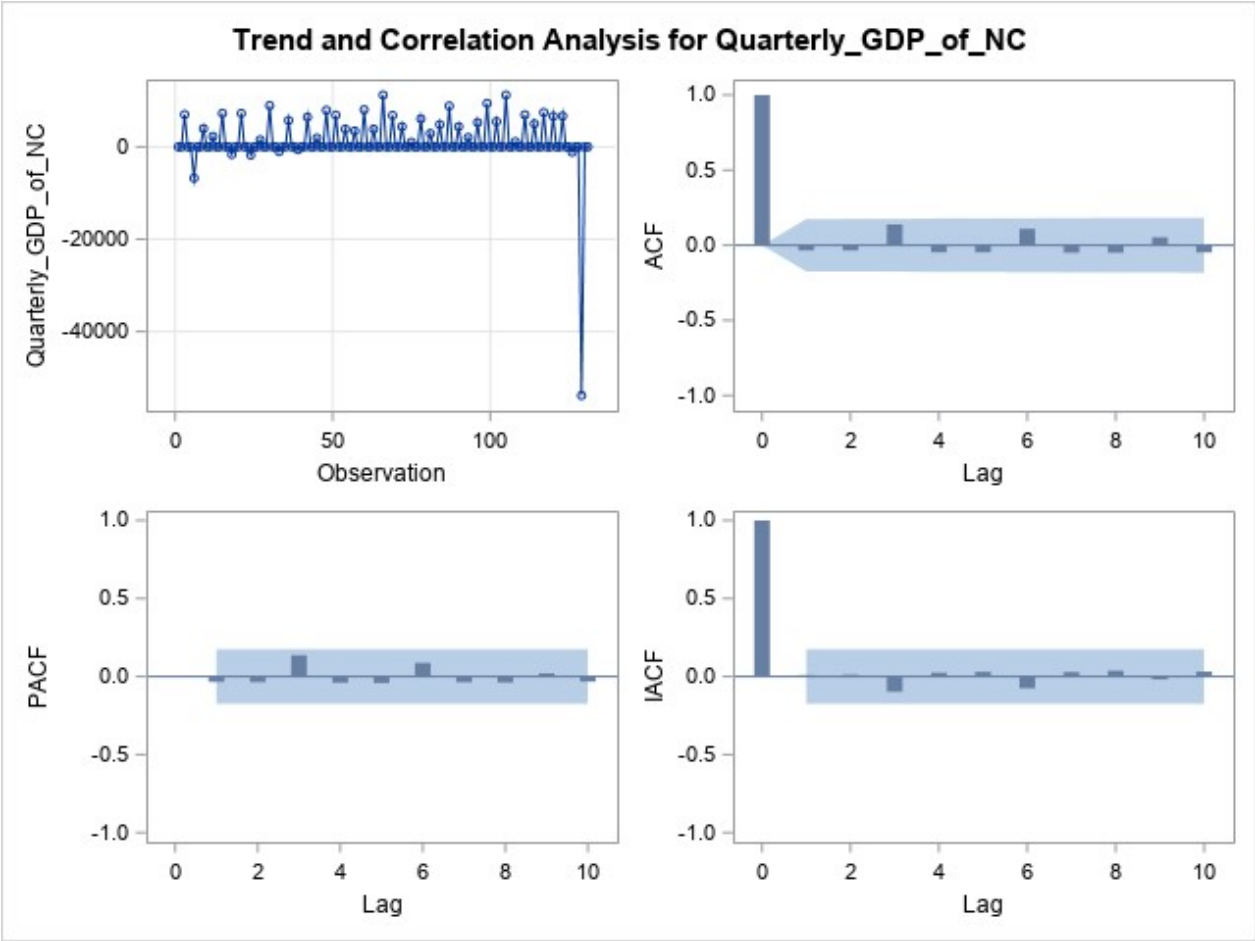
Name of Variable = Title_fee	
Mean of Working Series	34973.89
Standard Deviation	1275155
Number of Observations	131

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	39.09	6	<.0001	-0.363	0.022	0.020	-0.298	0.230	-0.115



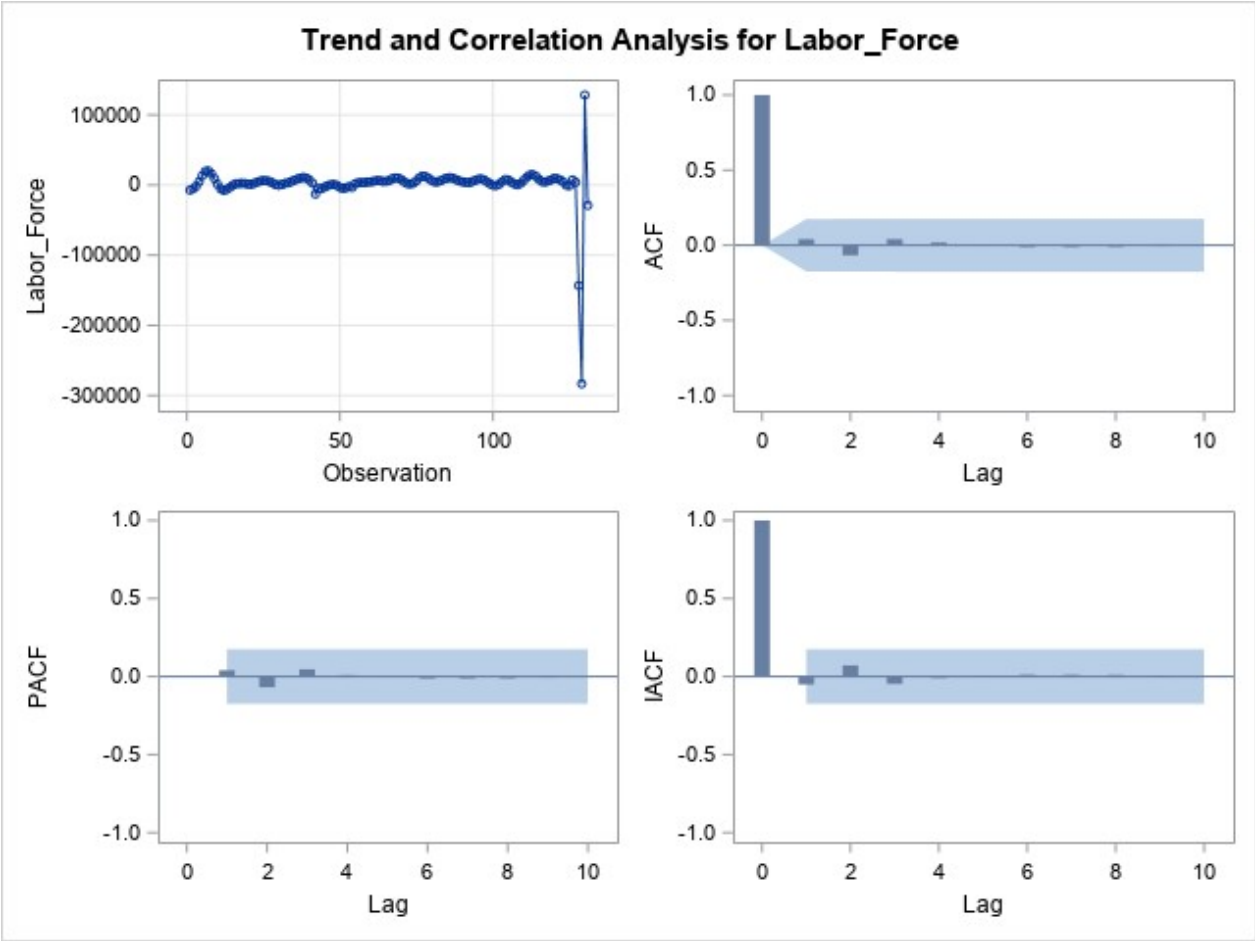
Name of Variable = Quarterly_GDP_of_NC	
Mean of Working Series	1047.517
Standard Deviation	5673.763
Number of Observations	131

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	5.20	6	0.5189	-0.034	-0.035	0.138	-0.047	-0.047	0.109



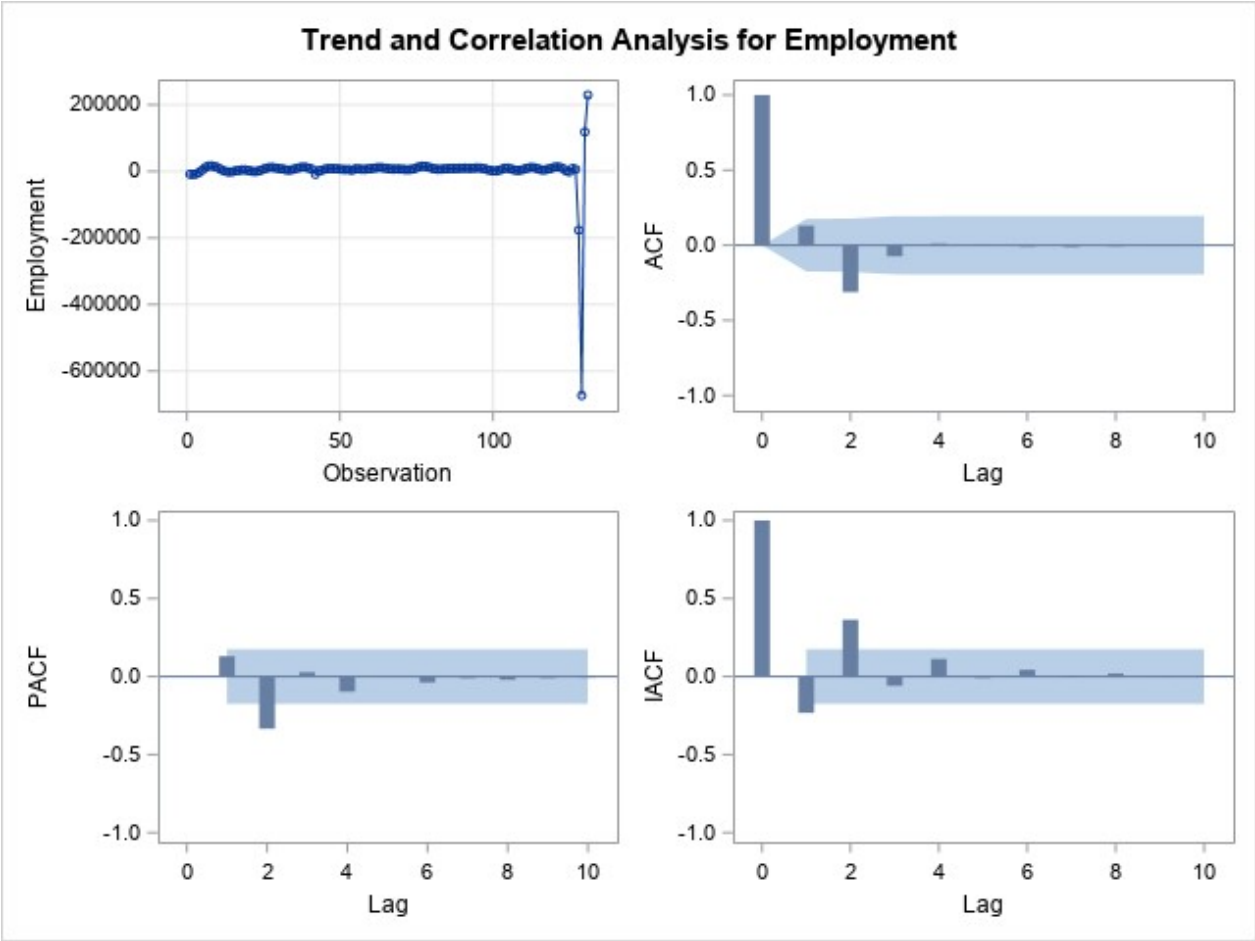
Name of Variable = Labor_Force	
Mean of Working Series	1711.496
Standard Deviation	30747.08
Number of Observations	131

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	1.11	6	0.9810	0.040	-0.067	0.041	0.018	-0.001	-0.012



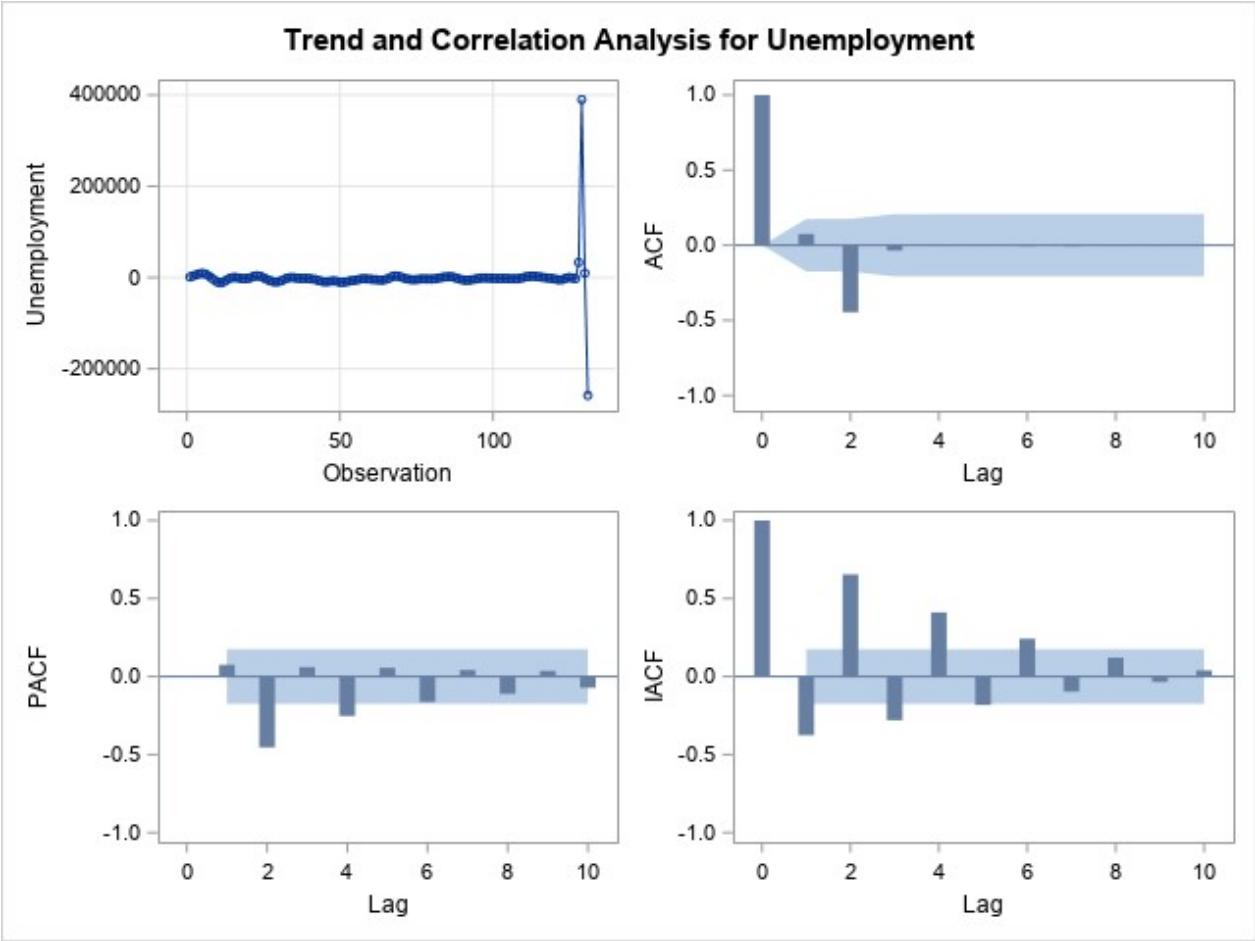
Name of Variable = Employment	
Mean of Working Series	2686.473
Standard Deviation	65313.9
Number of Observations	131

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	16.16	6	0.0129	0.130	-0.312	-0.074	0.011	0.005	-0.009



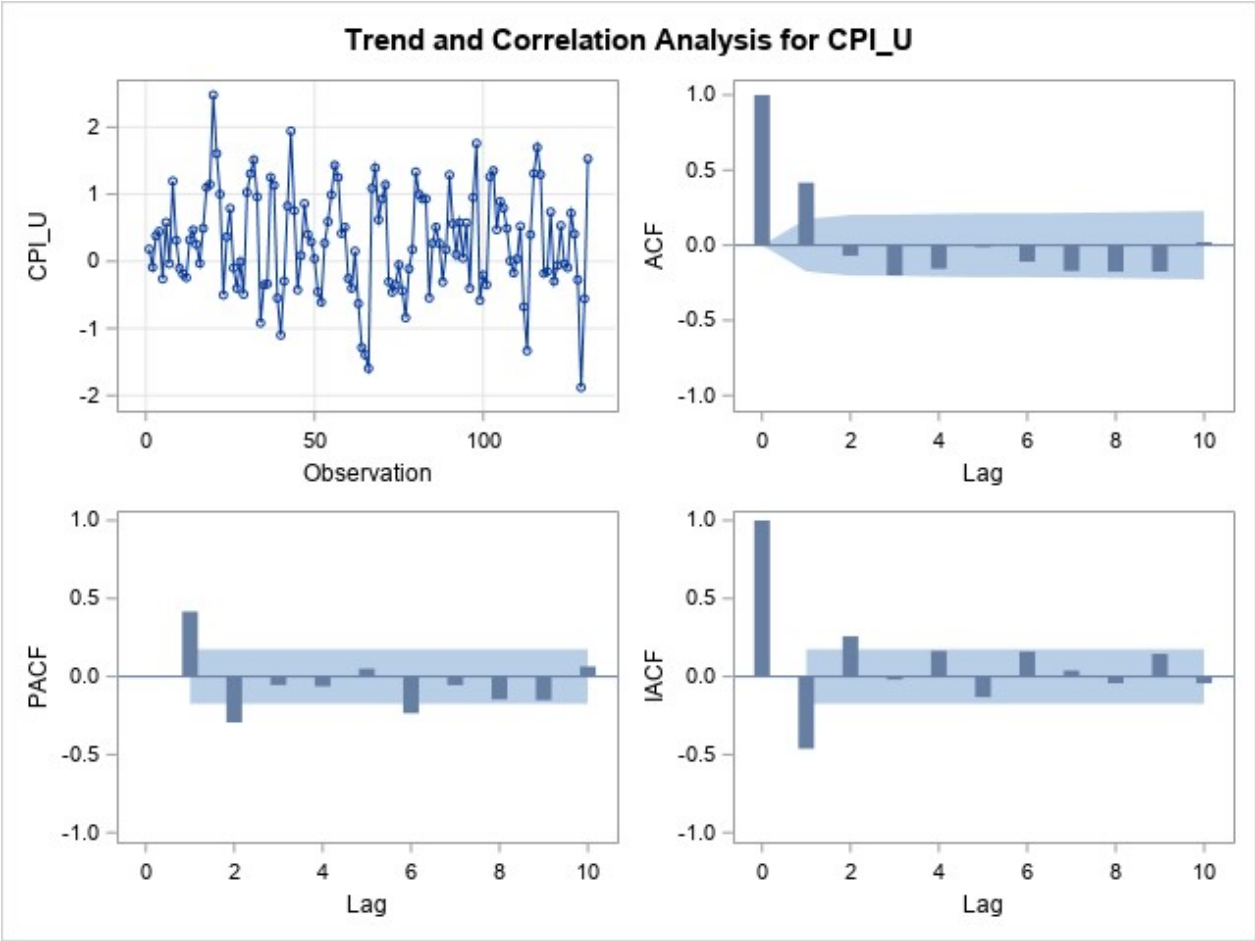
Name of Variable = Unemployment	
Mean of Working Series	-974.977
Standard Deviation	41223.89
Number of Observations	131

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	27.77	6	0.0001	0.075	-0.446	-0.035	0.006	0.001	-0.007



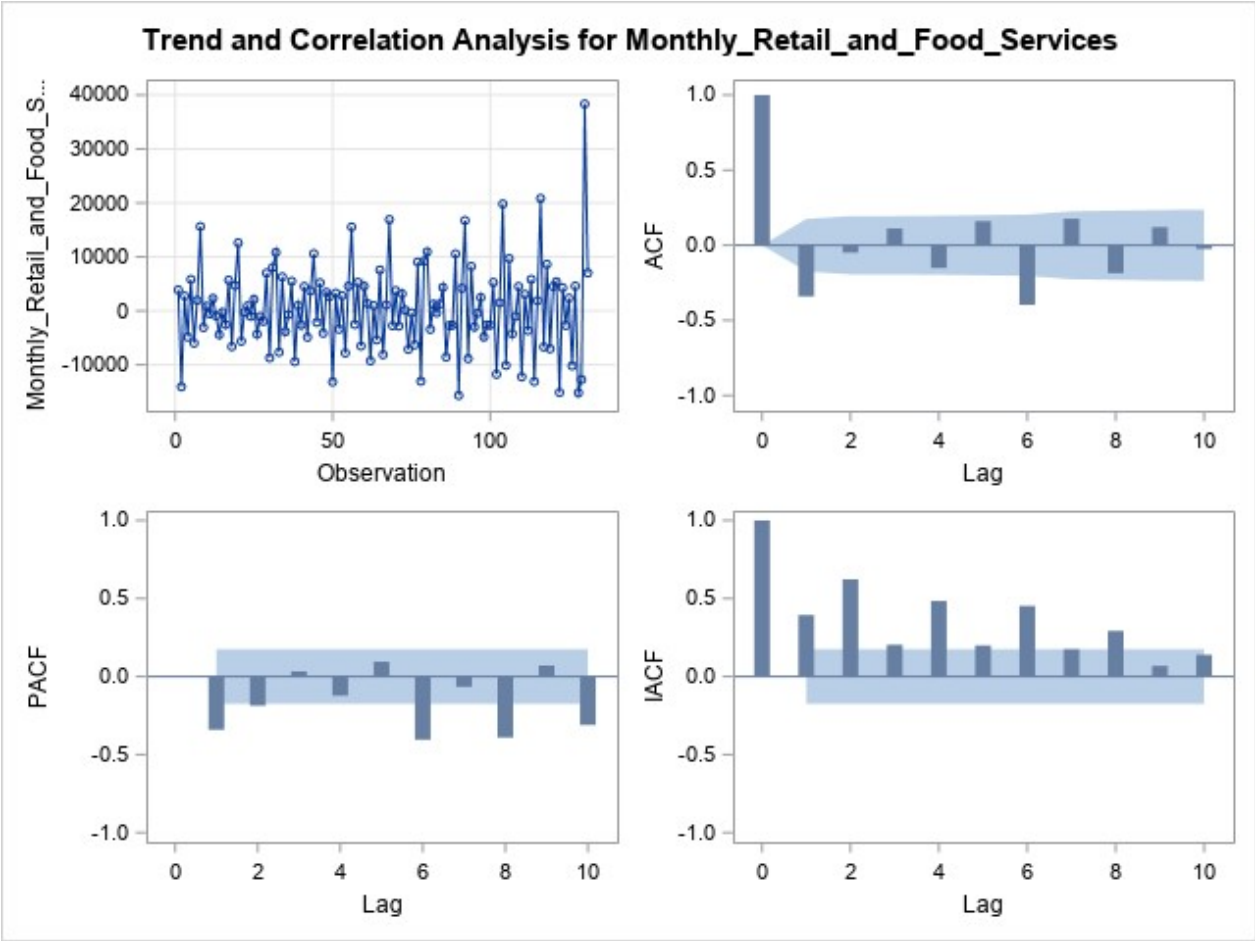
Name of Variable = CPI_U	
Mean of Working Series	0.29316
Standard Deviation	0.770801
Number of Observations	131

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	34.50	6	<.0001	0.417	-0.070	-0.201	-0.157	-0.012	-0.109



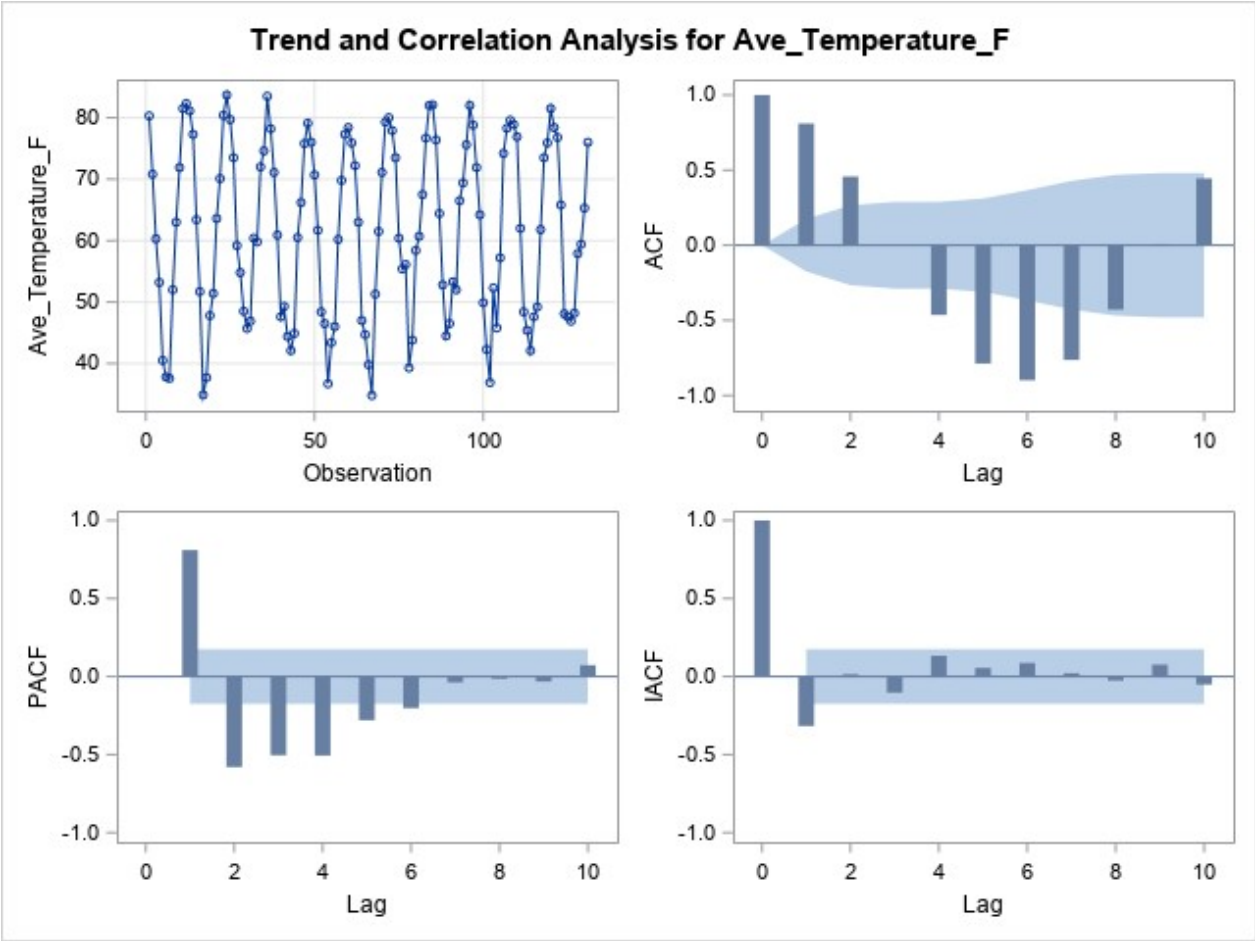
Name of Variable = Monthly_Retail_and_Food_Services	
Mean of Working Series	404.5573
Standard Deviation	8068.251
Number of Observations	131

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	46.20	6	<.0001	-0.341	-0.049	0.111	-0.152	0.160	-0.397



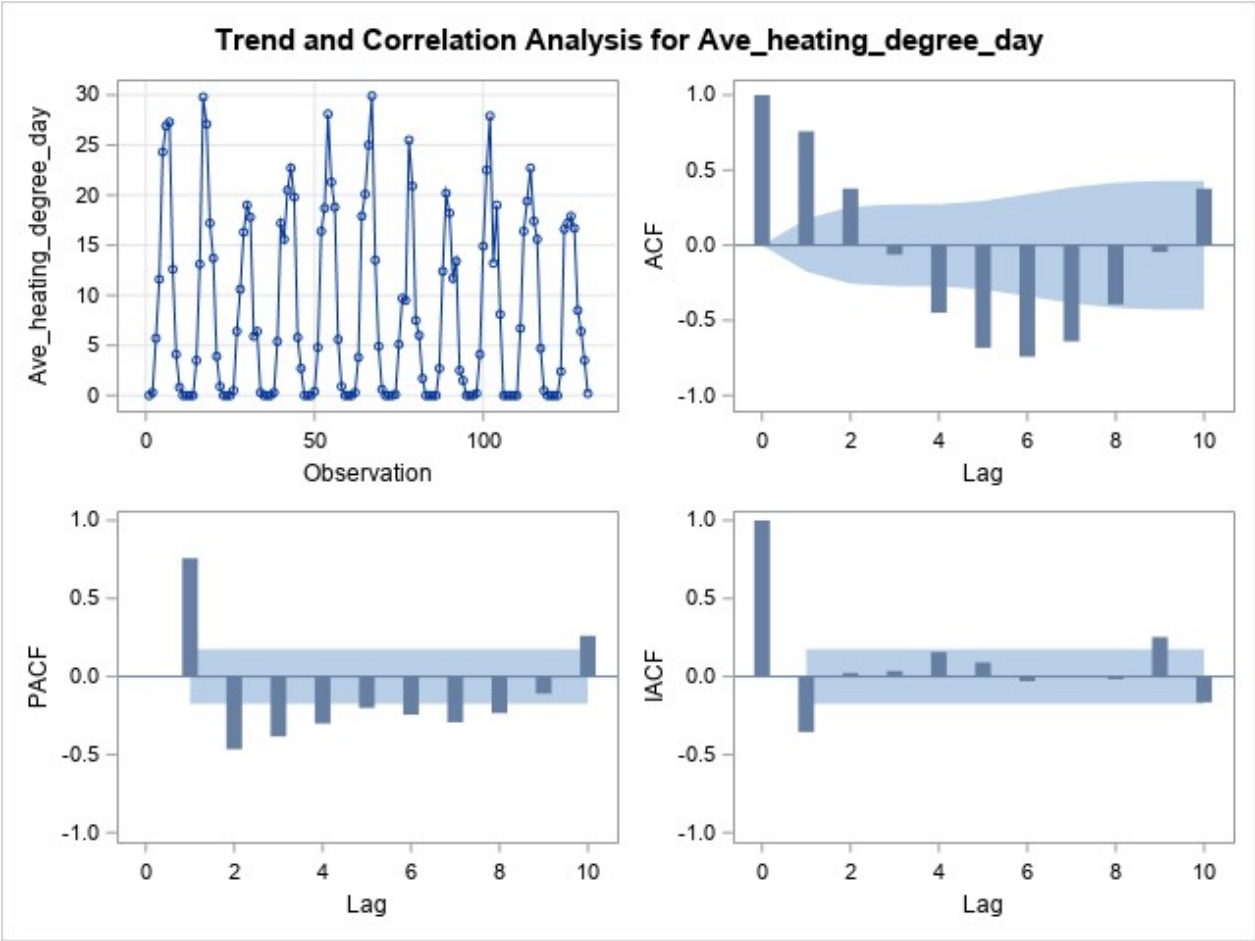
Name of Variable = Ave_Temperature_F	
Mean of Working Series	61.45725
Standard Deviation	14.22928
Number of Observations	131

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	344.03	6	<.0001	0.810	0.457	0.001	-0.464	-0.787	-0.899



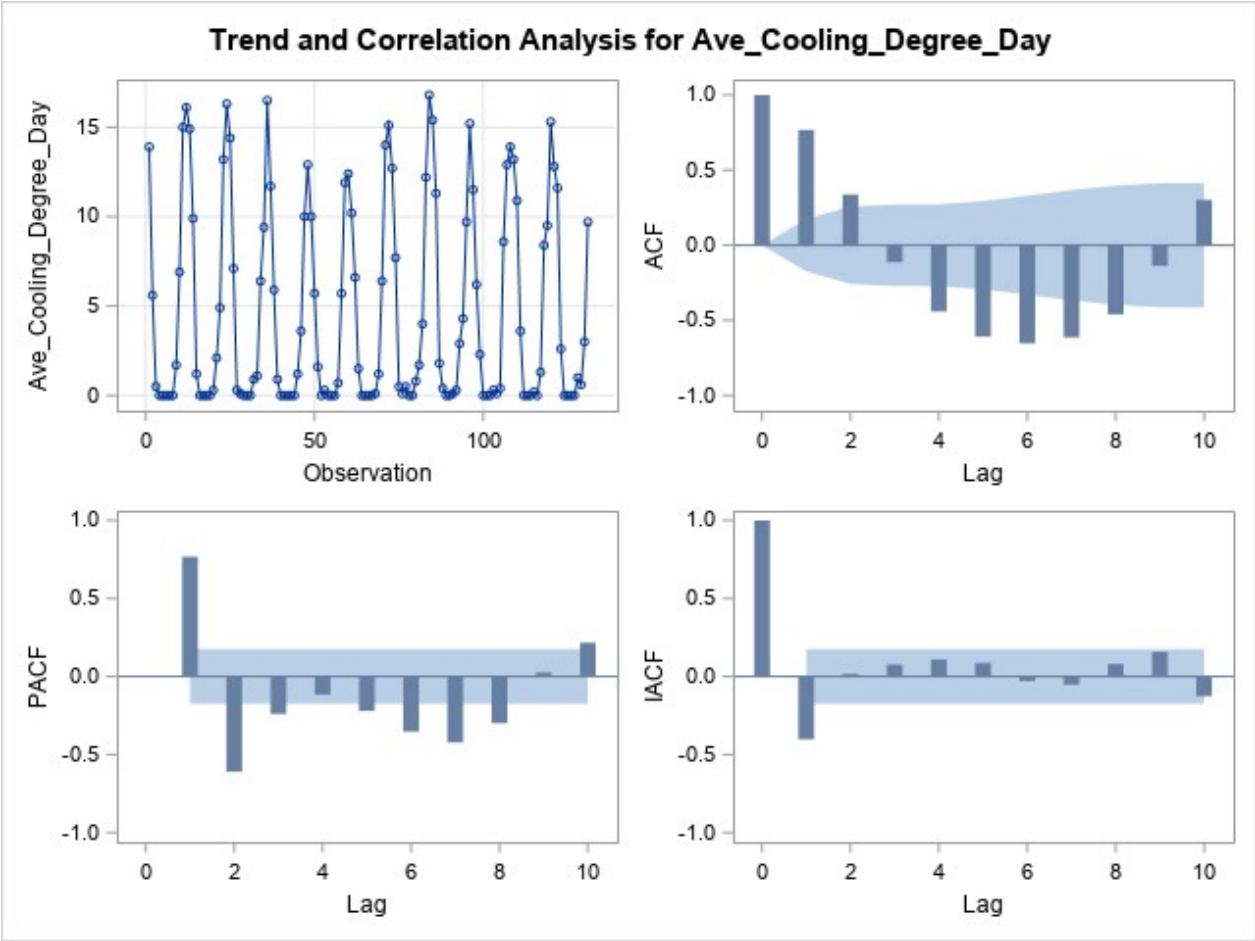
Name of Variable = Ave_heating_degree_day	
Mean of Working Series	8.536641
Standard Deviation	9.090497
Number of Observations	131

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	265.58	6	<.0001	0.758	0.377	-0.062	-0.449	-0.683	-0.742



Name of Variable = Ave_Cooling_Degree_Day	
Mean of Working Series	4.630534
Standard Deviation	5.559695
Number of Observations	131

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	233.25	6	<.0001	0.767	0.338	-0.112	-0.441	-0.608	-0.653


Trend and Correlation Analysis for Ave_Cooling_Degree_Day
Ave_Cooling_Degree_Day
Observation
ACF
Lag
PACF
Lag
IACF
Lag