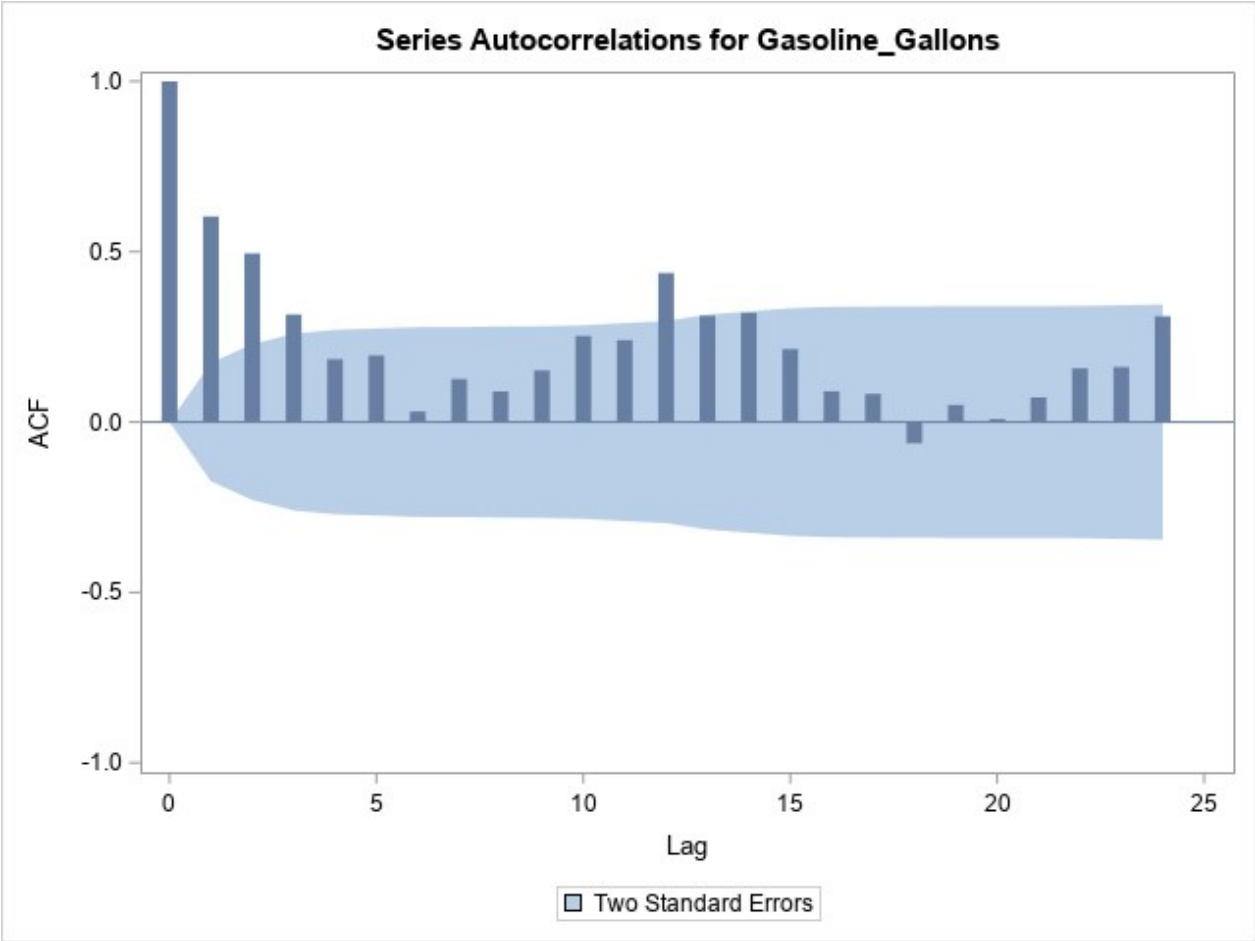
The SAS System

The ARIMA Procedure

Name of Variable = Gasoline_Gallons	
Mean of Working Series	0
Standard Deviation	34680493
Number of Observations	132

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	106.35	6	<.0001	0.603	0.495	0.316	0.185	0.196	0.031
12	158.98	12	<.0001	0.126	0.090	0.151	0.253	0.241	0.437
18	198.67	18	<.0001	0.312	0.320	0.214	0.090	0.083	-0.062
24	223.94	24	<.0001	0.050	0.008	0.072	0.158	0.162	0.311



Conditional Least Squares Estimation					
Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag
AR1,1	0.63686	0.07044	9.04	<.0001	1

Variance Estimate	7.463E14

Std Error Estimate	27317599
AIC	4896.079
SBC	4898.962
Number of Residuals	132

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

Autocorrelation Check of Residuals									
To Lag	**Chi-Square**	**DF**	**Pr > ChiSq**	**Autocorrelations**					
6	30.01	5	<.0001	-0.175	0.254	0.046	-0.092	0.211	-0.259
12	71.25	11	<.0001	0.165	-0.100	-0.005	0.158	-0.187	0.430
18	94.50	17	<.0001	-0.104	0.175	0.036	-0.086	0.152	-0.280
24	120.68	23	<.0001	0.177	-0.131	-0.004	0.106	-0.118	0.297

Model for variable Gasoline_Gallons	
Data have been centered by subtracting the value	3.768E8

No mean term in this model.

Autoregressive Factors	
Factor 1:	1 - 0.63686 B**(1)

Forecasts for variable Gasoline_Gallons				
Obs	**Forecast**	**Std Error**	**95% Confidence Limits**	
133	318581263	27317599	265039753	372122772
134	339724537	32387110	276246968	403202106
135	353189868	34229913	286100471	420279266
136	361765416	34949654	293265353	430265479
137	367226849	35237385	298162844	436290855

The SAS System

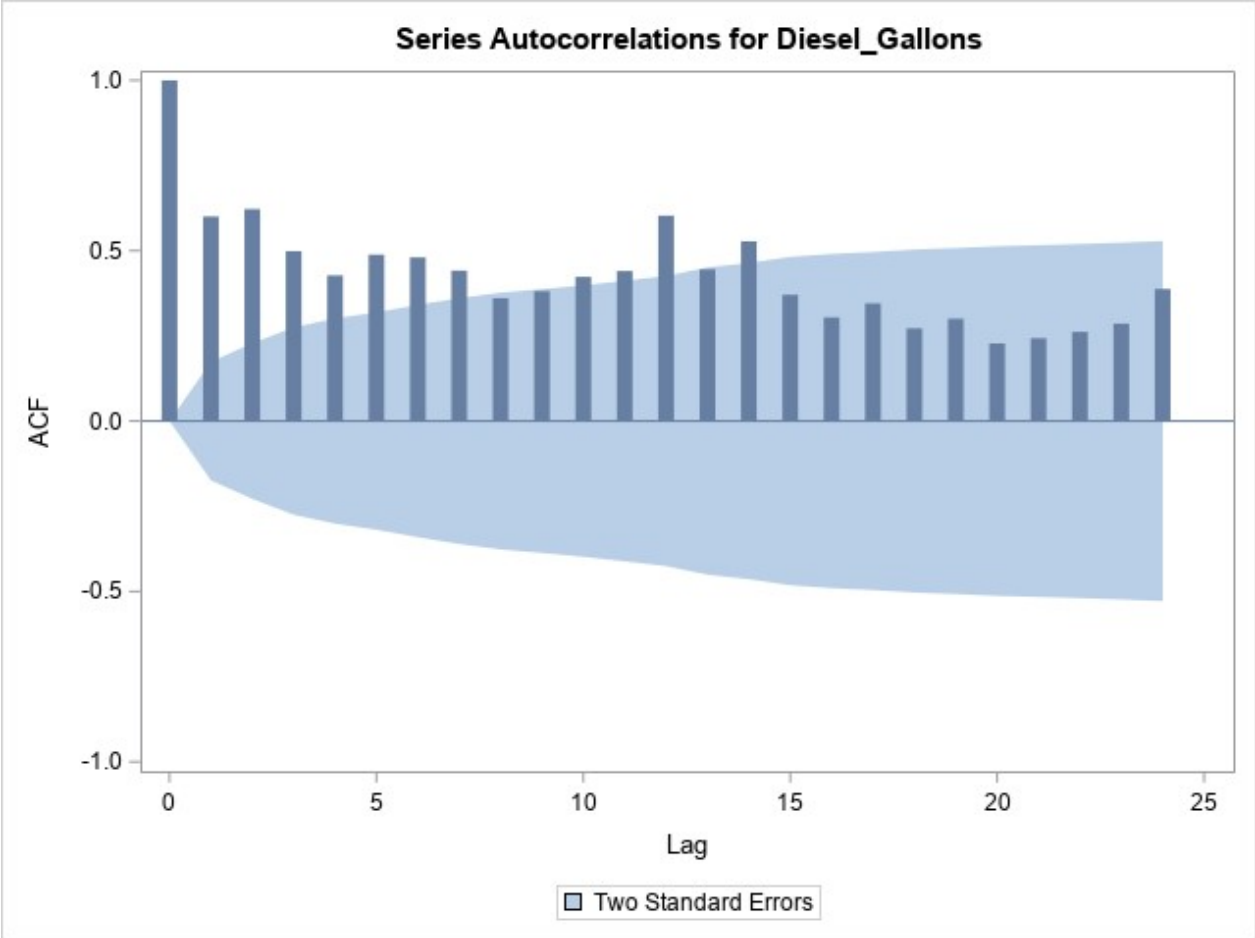
Obs	LAG	VAR	N	COV	CORR	STDERR	INVCORR	PARTCORR
1	0	Gasoline_Gallons	132	1.20274E15	1.00000	0.00000	1.00000	1.00000
2	1	Gasoline_Gallons	131	7.25651E14	0.60333	0.08704	-0.39789	0.60333
3	2	Gasoline_Gallons	130	5.95533E14	0.49515	0.11442	-0.05181	0.20619
4	3	Gasoline_Gallons	129	3.7976E14	0.31575	0.12964	0.01005	-0.07521
5	4	Gasoline_Gallons	128	2.22001E14	0.18458	0.13534	0.04508	-0.07612
6	5	Gasoline_Gallons	127	2.35154E14	0.19552	0.13723	-0.10410	0.14542
7	6	Gasoline_Gallons	126	3.72917E13	0.03101	0.13933	0.03190	-0.18133
8	7	Gasoline_Gallons	125	1.51843E14	0.12625	0.13938	0.04289	0.18134
9	8	Gasoline_Gallons	124	1.0791E14	0.08972	0.14024	-0.05681	0.01642
10	9	Gasoline_Gallons	123	1.82123E14	0.15142	0.14068	0.05121	0.09408
11	10	Gasoline_Gallons	122	3.04011E14	0.25277	0.14191	-0.06139	0.15561
12	11	Gasoline_Gallons	121	2.89352E14	0.24058	0.14528	0.16623	0.05068
13	12	Gasoline_Gallons	120	5.2614E14	0.43745	0.14826	-0.21315	0.27950
14	13	Gasoline_Gallons	119	3.75316E14	0.31205	0.15774	0.05319	-0.11701
15	14	Gasoline_Gallons	118	3.85405E14	0.32044	0.16235	-0.01387	0.02135
16	15	Gasoline_Gallons	117	2.57487E14	0.21408	0.16707	-0.01353	-0.07216
17	16	Gasoline_Gallons	116	1.0862E14	0.09031	0.16914	0.00957	-0.06542
18	17	Gasoline_Gallons	115	9.93834E13	0.08263	0.16950	-0.01339	-0.04216
19	18	Gasoline_Gallons	114	-7.4816E13	-0.06220	0.16981	0.11050	-0.05037
20	19	Gasoline_Gallons	113	6.03398E13	0.05017	0.16998	-0.09934	0.11723
21	20	Gasoline_Gallons	112	1.02092E13	0.00849	0.17009	0.05084	-0.03255
22	21	Gasoline_Gallons	111	8.71107E13	0.07243	0.17009	-0.01923	0.05569
23	22	Gasoline_Gallons	110	1.89652E14	0.15768	0.17033	0.02015	0.03667
24	23	Gasoline_Gallons	109	1.9426E14	0.16151	0.17143	-0.00608	0.06388
25	24	Gasoline_Gallons	108	3.73557E14	0.31059	0.17258	-0.03293	0.04968

The SAS System

The ARIMA Procedure

Name of Variable = Diesel_Gallons	
Mean of Working Series	0
Standard Deviation	9329168
Number of Observations	132

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	226.25	6	<.0001	0.600	0.622	0.499	0.427	0.488	0.480
12	401.17	12	<.0001	0.442	0.361	0.381	0.423	0.440	0.603
18	537.03	18	<.0001	0.445	0.528	0.371	0.304	0.345	0.272
24	617.63	24	<.0001	0.300	0.228	0.243	0.262	0.286	0.388



Conditional Least Squares Estimation					
Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag
AR1,1	0.60346	0.06995	8.63	<.0001	1

Variance Estimate	5.593E13
Std Error Estimate	7478311
AIC	4554.061
SBC	4556.943
Number of Residuals	132

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

Autocorrelation Check of Residuals									
To Lag	**Chi-Square**	**DF**	**Pr > ChiSq**	**Autocorrelations**					
6	28.73	5	<.0001	-0.250	0.296	0.078	-0.017	0.180	0.146
12	65.05	11	<.0001	0.150	-0.015	0.071	0.124	-0.033	0.451
18	93.02	17	<.0001	-0.125	0.355	-0.005	-0.028	0.205	-0.039
24	112.36	23	<.0001	0.177	-0.042	0.055	0.054	-0.004	0.284

Model for variable Diesel_Gallons	
Data have been centered by subtracting the value	80003756

No mean term in this model.

Autoregressive Factors	
Factor 1:	1 - 0.60346 B**(1)

Forecasts for variable Diesel_Gallons				
Obs	**Forecast**	**Std Error**	**95% Confidence Limits**	
133	75365025.8	7478311	60707805.1	90022246.4
134	77204445.6	8734494	60085151.9	94323739.3
135	78314470.8	9149216	60382336.4	96246605.1
136	78984331.9	9295651	60765191.3	97203472.6
137	79388569.6	9348408	61066026.6	97711112.7

The SAS System

The ARIMA Procedure

Preliminary Estimation

Initial Autoregressive Estimates	
	Estimate
1	0.60333

Constant Term Estimate	1.4947E8
White Noise Variance Est	7.649E14

Conditional Least Squares Estimation						
Iteration	SSE	MU	AR1,1	Constant	Lambda	R Crit
0	9.793E16	3.768E8	0.60333	1.4947E8	0.00001	1
1	9.774E16	3.7583E8	0.63710	1.3639E8	1E-6	0.043999
2	9.774E16	3.7577E8	0.63701	1.364E8	1E-7	0.000899

Unconditional Least Squares Estimation						
Iteration	SSE	MU	AR1,1	Constant	Lambda	R Crit
0	9.773E16	3.7577E8	0.63701	1.364E8	0.00001	1
1	9.773E16	3.7566E8	0.63715	1.3631E8	1E-6	0.001373
2	9.773E16	3.7566E8	0.63714	1.3631E8	1E-7	3.778E-6

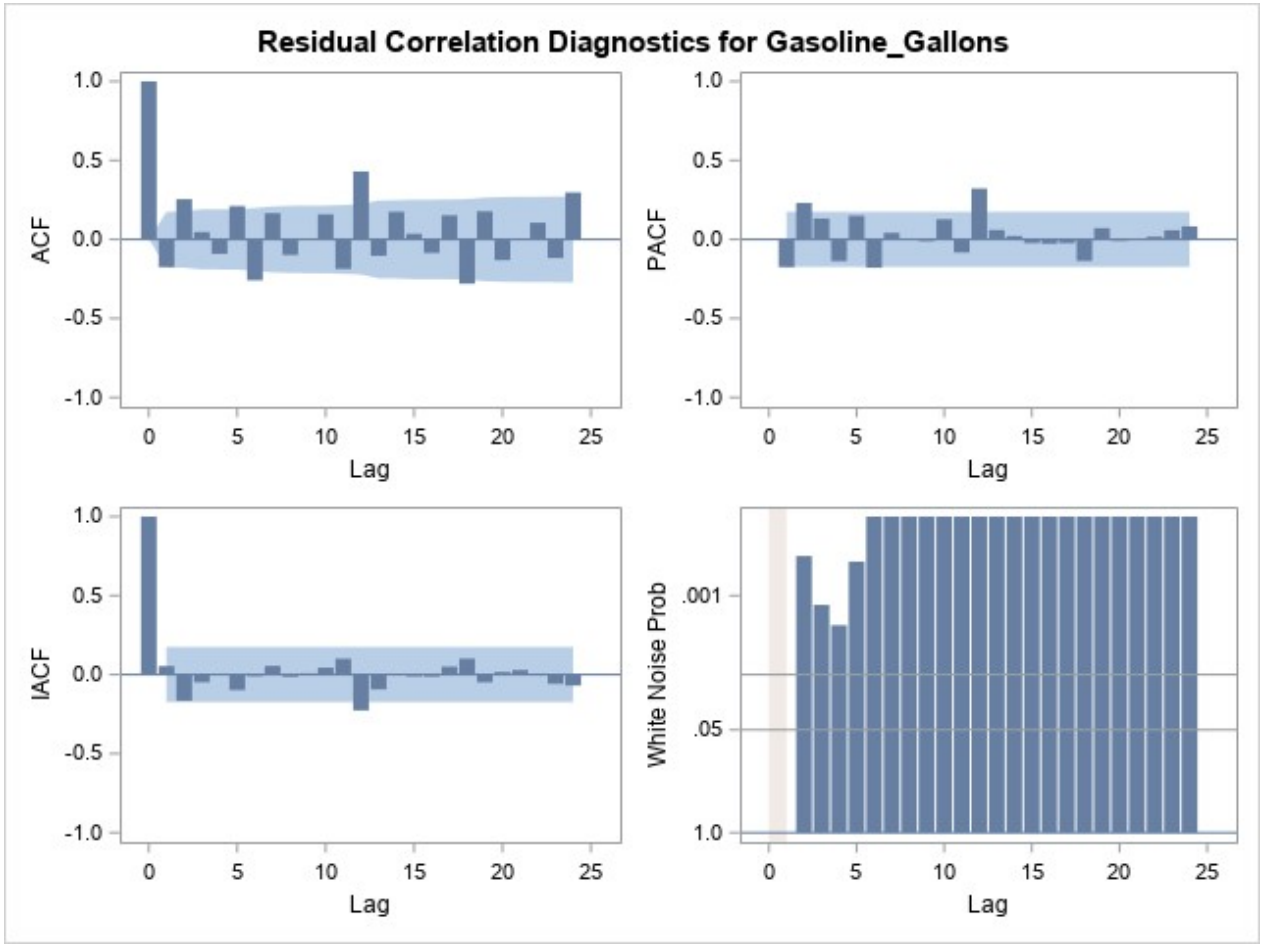
ARIMA Estimation Optimization Summary	
Estimation Method	Unconditional Least Squares
Parameters Estimated	2
Termination Criteria	Maximum Relative Change in Estimates
Iteration Stopping Value	0.001
Criteria Value	4.781E-6
Alternate Criteria	Relative Change in Objective Function
Alternate Criteria Value	1.54E-11
Maximum Absolute Value of Gradient	4.583E11
R-Square Change from Last Iteration	3.778E-6
Objective Function	Sum of Squared Residuals
Objective Function Value	9.773E16
Marquardt's Lambda Coefficient	1E-7
Numerical Derivative Perturbation Delta	0.001
Iterations	2

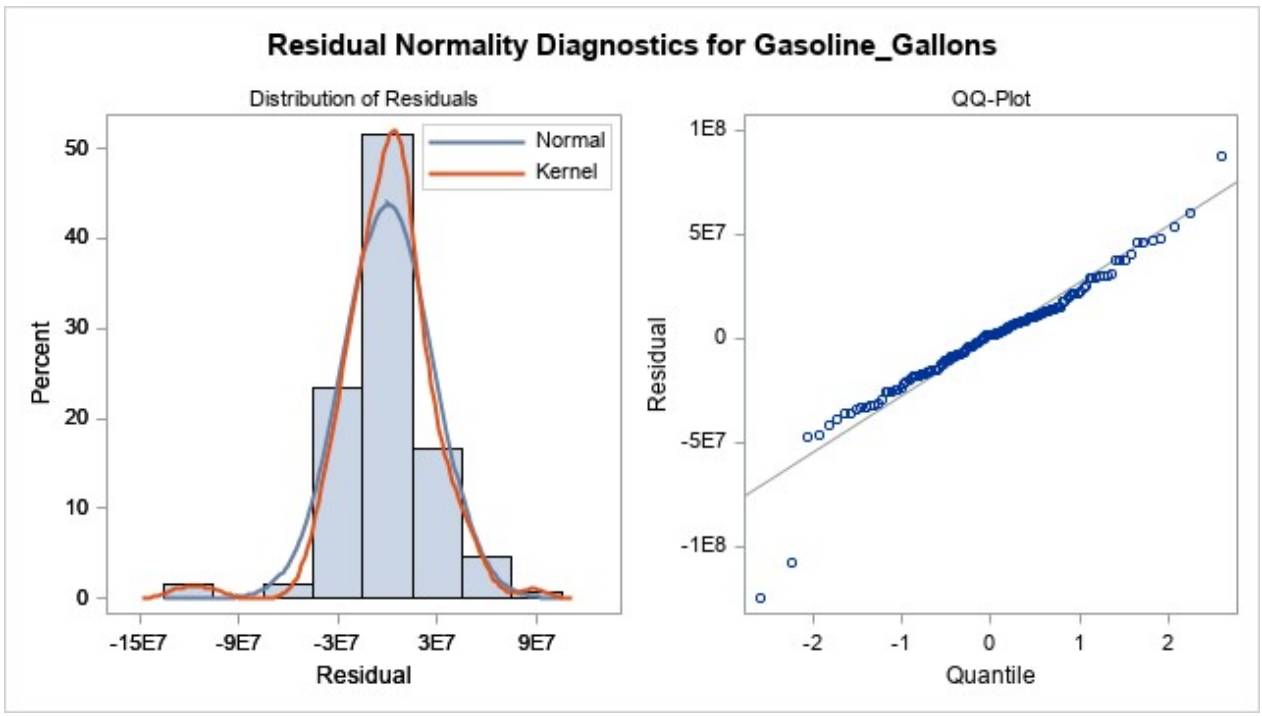
Unconditional Least Squares Estimation					
Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag
MU	375664311	6501055.0	57.79	<.0001	0
AR1,1	0.63714	0.07071	9.01	<.0001	1

Constant Estimate	1.3631E8
Variance Estimate	7.518E14
Std Error Estimate	27418554
AIC	4898.562
SBC	4904.328
Number of Residuals	132

Correlations of Parameter Estimates		
Parameter	MU	AR1,1
MU	1.000	-0.055
AR1,1	-0.055	1.000

Autocorrelation Check of Residuals										
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	30.06	5	<.0001	-0.176	0.254	0.047	-0.092	0.211	-0.259
12	71.39	11	<.0001	0.166	-0.099	-0.005	0.159	-0.187	0.430
18	94.66	17	<.0001	-0.104	0.175	0.036	-0.086	0.152	-0.280
24	120.84	23	<.0001	0.178	-0.131	-0.004	0.105	-0.118	0.297





Model for variable Gasoline_Gallons	
Estimated Mean	3.7566E8

Autoregressive Factors	
Factor 1:	1 - 0.63714 B**(1)

The SAS System

The ARIMA Procedure

Preliminary Estimation

Initial Autoregressive Estimates	
	Estimate
1	0.60036

Constant Term Estimate	31972614
White Noise Variance Est	5.566E13

Conditional Least Squares Estimation						
Iteration	SSE	MU	AR1,1	Constant	Lambda	R Crit
0	7.326E15	80003756	0.60036	31972614	0.00001	1
1	7.326E15	79827922	0.60351	31650807	1E-6	0.01037
2	7.326E15	79825365	0.60363	31639998	1E-7	0.000204

Unconditional Least Squares Estimation						
Iteration	SSE	MU	AR1,1	Constant	Lambda	R Crit
0	7.322E15	79825365	0.60363	31639998	0.00001	1
1	7.322E15	79879254	0.60411	31623149	1E-6	0.002974
2	7.322E15	79879251	0.60410	31624295	1E-7	0.000018

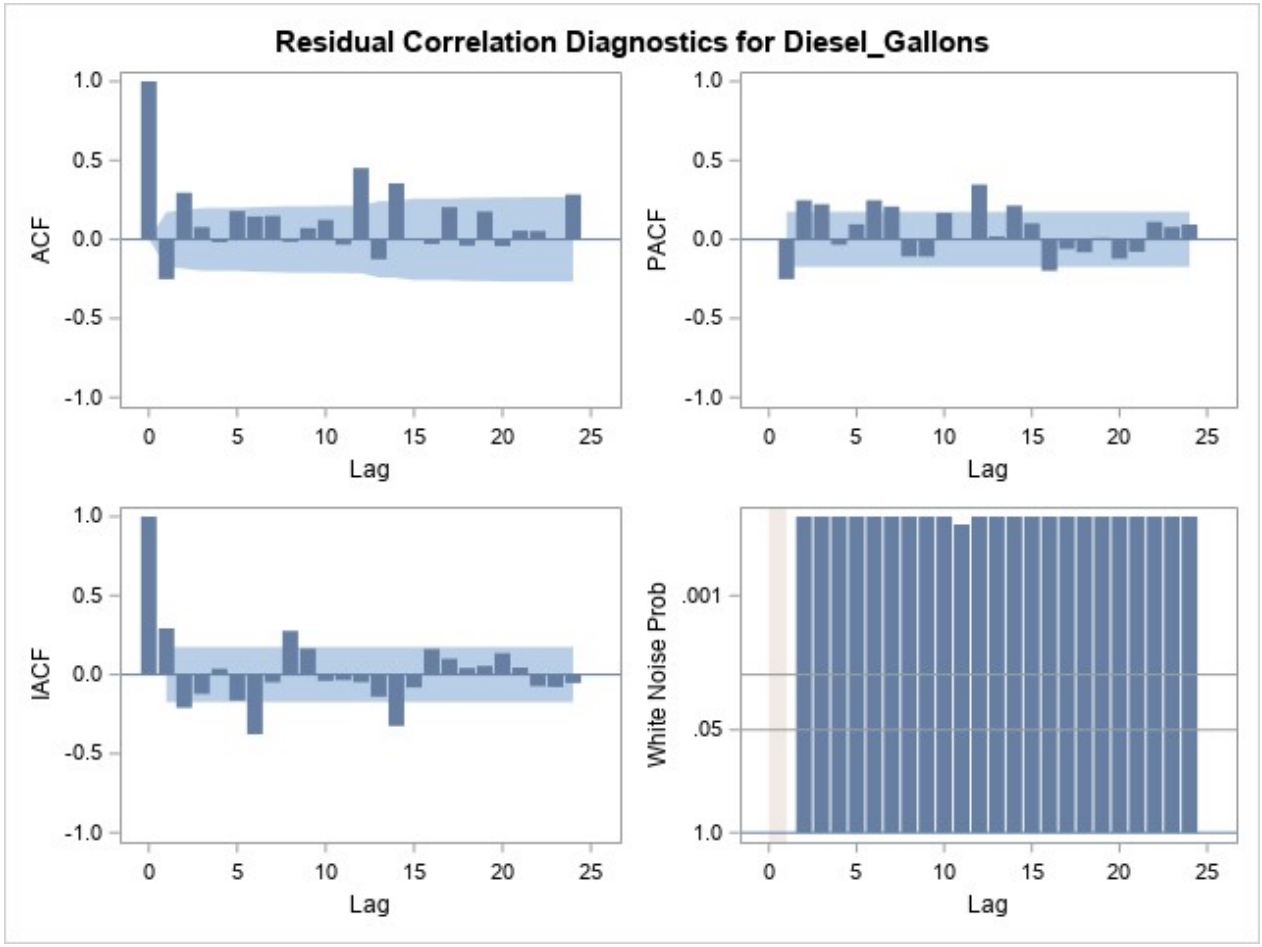
ARIMA Estimation Optimization Summary	
Estimation Method	Unconditional Least Squares
Parameters Estimated	2
Termination Criteria	Maximum Relative Change in Estimates
Iteration Stopping Value	0.001
Criteria Value	0.000024
Alternate Criteria	Relative Change in Objective Function
Alternate Criteria Value	3.54E-10
Maximum Absolute Value of Gradient	1.643E11
R-Square Change from Last Iteration	0.000018
Objective Function	Sum of Squared Residuals
Objective Function Value	7.322E15
Marquardt's Lambda Coefficient	1E-7
Numerical Derivative Perturbation Delta	0.001
Iterations	2

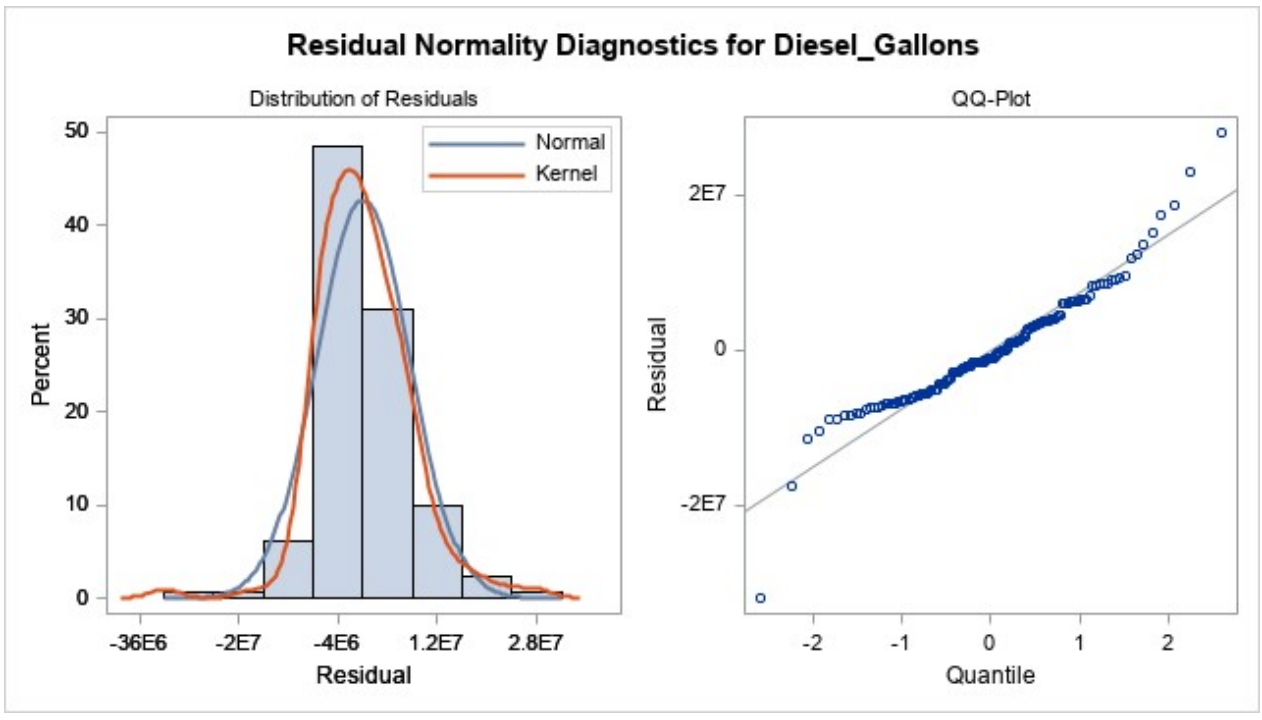
Unconditional Least Squares Estimation					
Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag
MU	79879251	1631426.3	48.96	<.0001	0
AR1,1	0.60410	0.07018	8.61	<.0001	1

Constant Estimate	31624295
Variance Estimate	5.632E13
Std Error Estimate	7504776
AIC	4556.436
SBC	4562.201
Number of Residuals	132

Correlations of Parameter Estimates		
Parameter	MU	AR1,1
MU	1.000	-0.015
AR1,1	-0.015	1.000

Autocorrelation Check of Residuals										
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations						
6	28.71	5	<.0001	-0.251	0.295	0.078	-0.018	0.179	0.145
12	65.06	11	<.0001	0.149	-0.016	0.072	0.124	-0.033	0.452
18	93.04	17	<.0001	-0.126	0.355	-0.005	-0.029	0.204	-0.040
24	112.36	23	<.0001	0.176	-0.043	0.055	0.053	-0.004	0.284





Model for variable Diesel_Gallons	
Estimated Mean	79879251

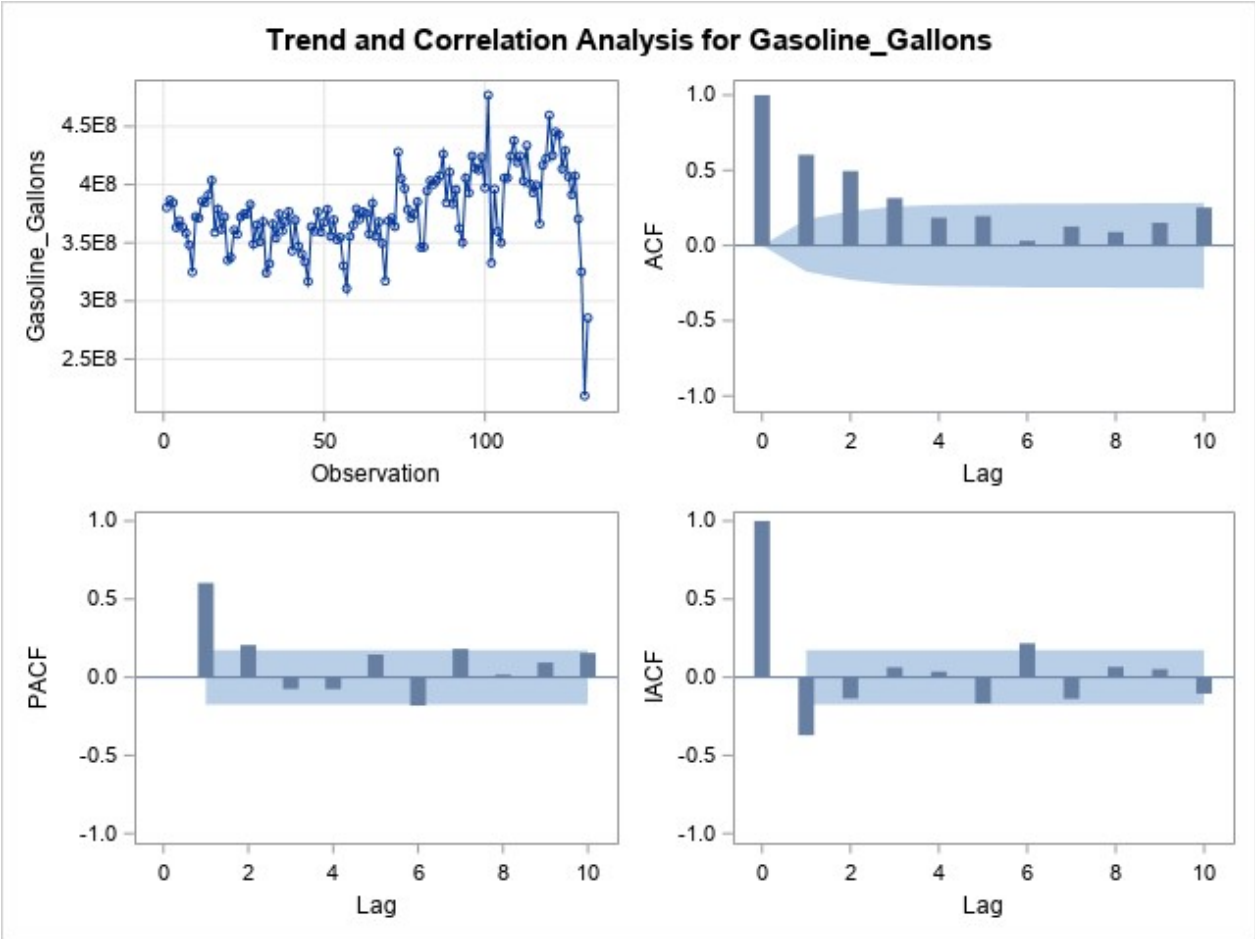
Autoregressive Factors	
Factor 1:	1 - 0.6041 B**(1)

The SAS System

The ARIMA Procedure

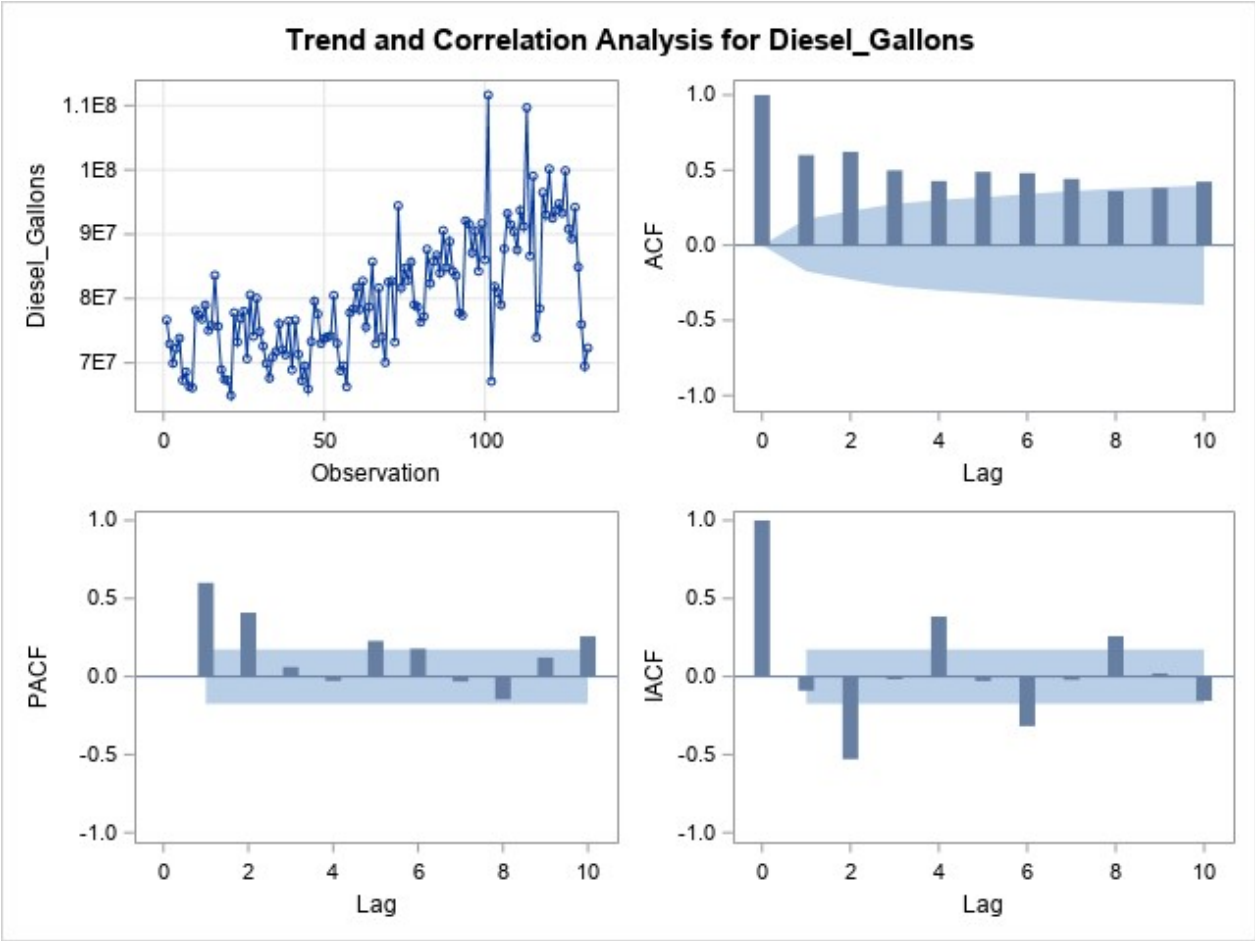
Name of Variable = Gasoline_Gallons	
Mean of Working Series	3.768E8
Standard Deviation	34680493
Number of Observations	132

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	106.35	6	<.0001	0.603	0.495	0.316	0.185	0.196	0.031



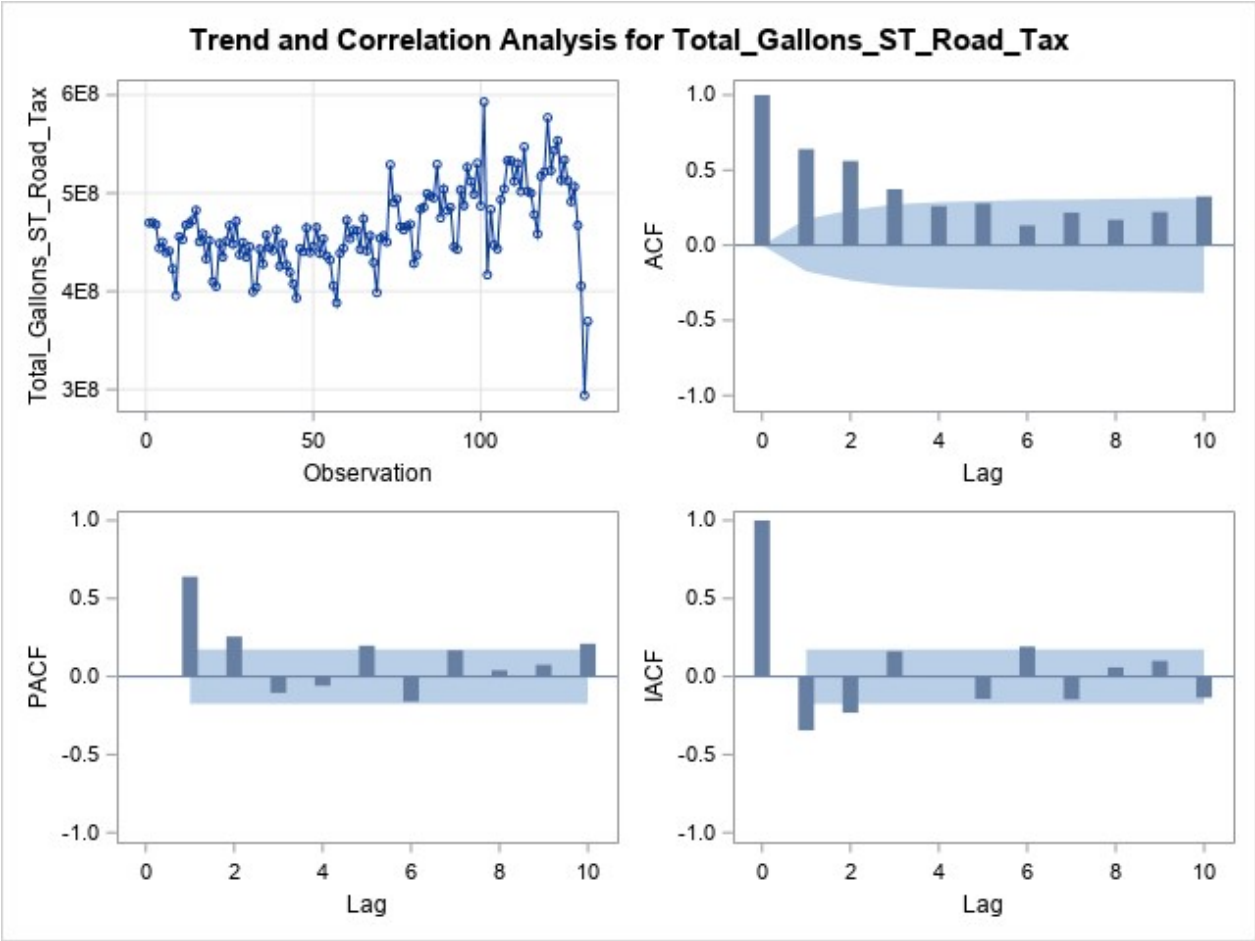
Name of Variable = Diesel_Gallons	
Mean of Working Series	80003756
Standard Deviation	9329168
Number of Observations	132

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	226.25	6	<.0001	0.600	0.622	0.499	0.427	0.488	0.480



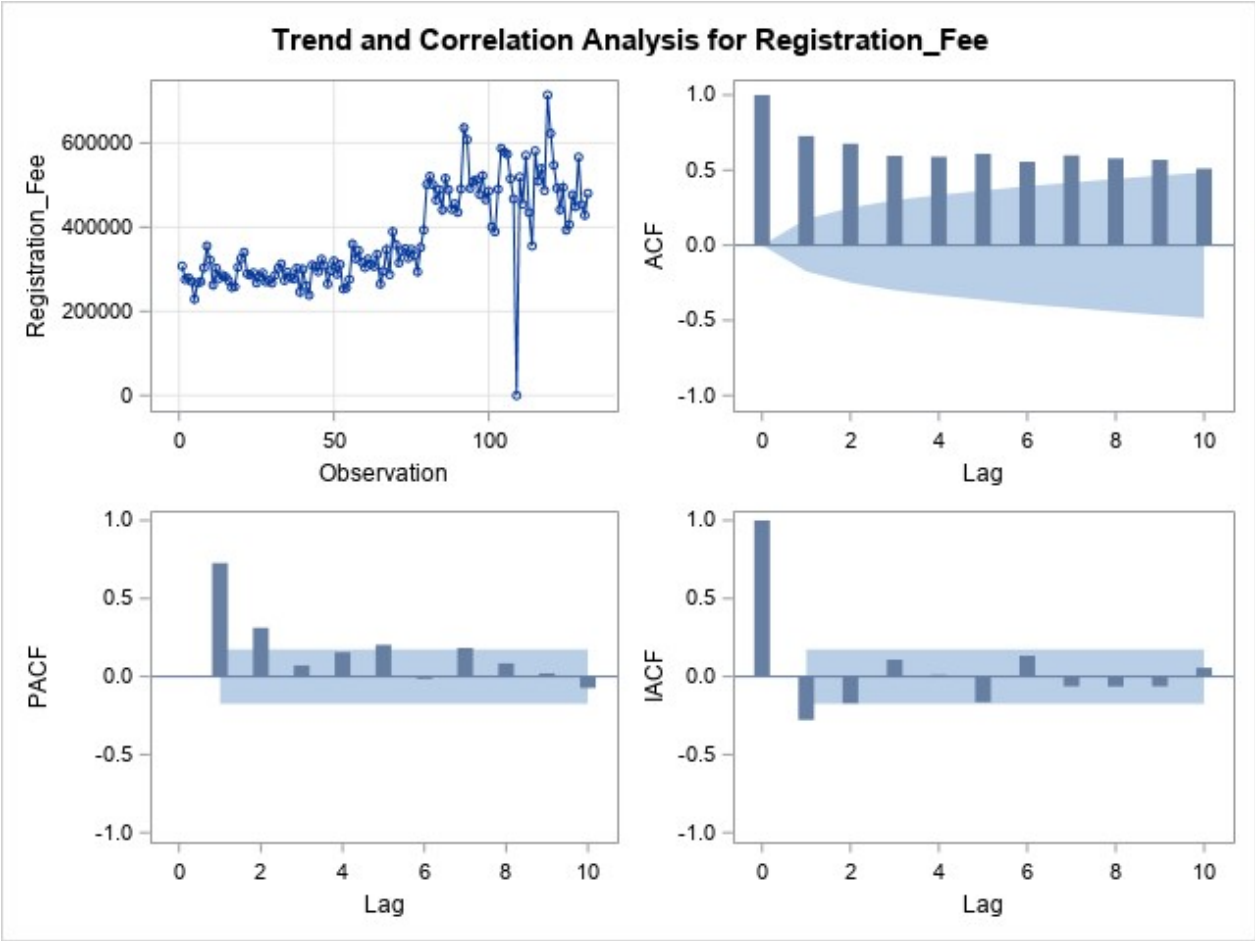
Name of Variable = Total_Gallons_ST_Road_Tax	
Mean of Working Series	4.6444E8
Standard Deviation	42646131
Number of Observations	132

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	139.76	6	<.0001	0.640	0.561	0.373	0.260	0.278	0.132



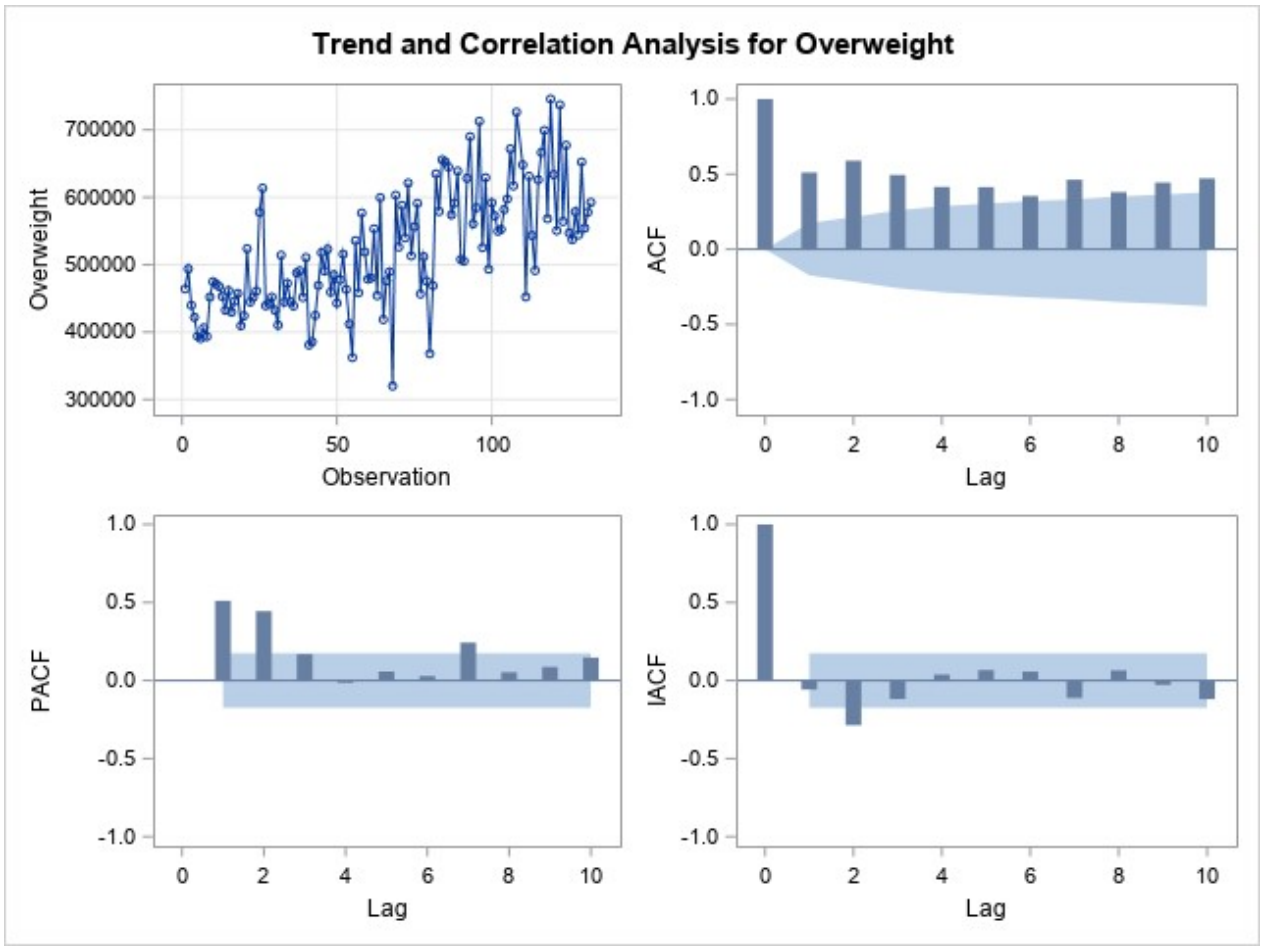
Name of Variable = Registration_Fee	
Mean of Working Series	375308.7
Standard Deviation	113194.7
Number of Observations	132

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	324.99	6	<.0001	0.727	0.676	0.595	0.589	0.609	0.556



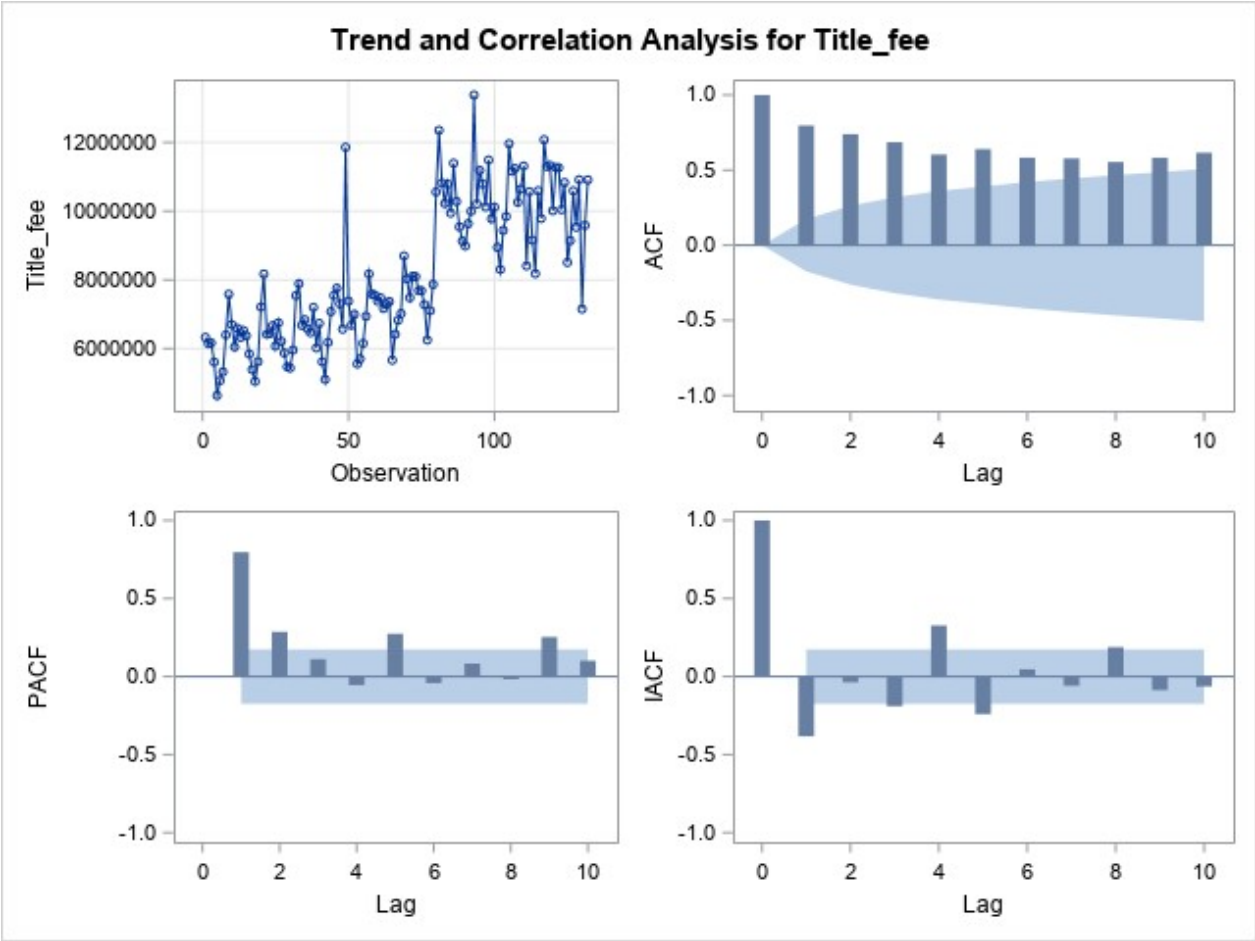
Name of Variable = Overweight	
Mean of Working Series	521834.4
Standard Deviation	88666.52
Number of Observations	132
Embedded missing values in working series	1

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	167.88	6	<.0001	0.511	0.589	0.495	0.415	0.414	0.354



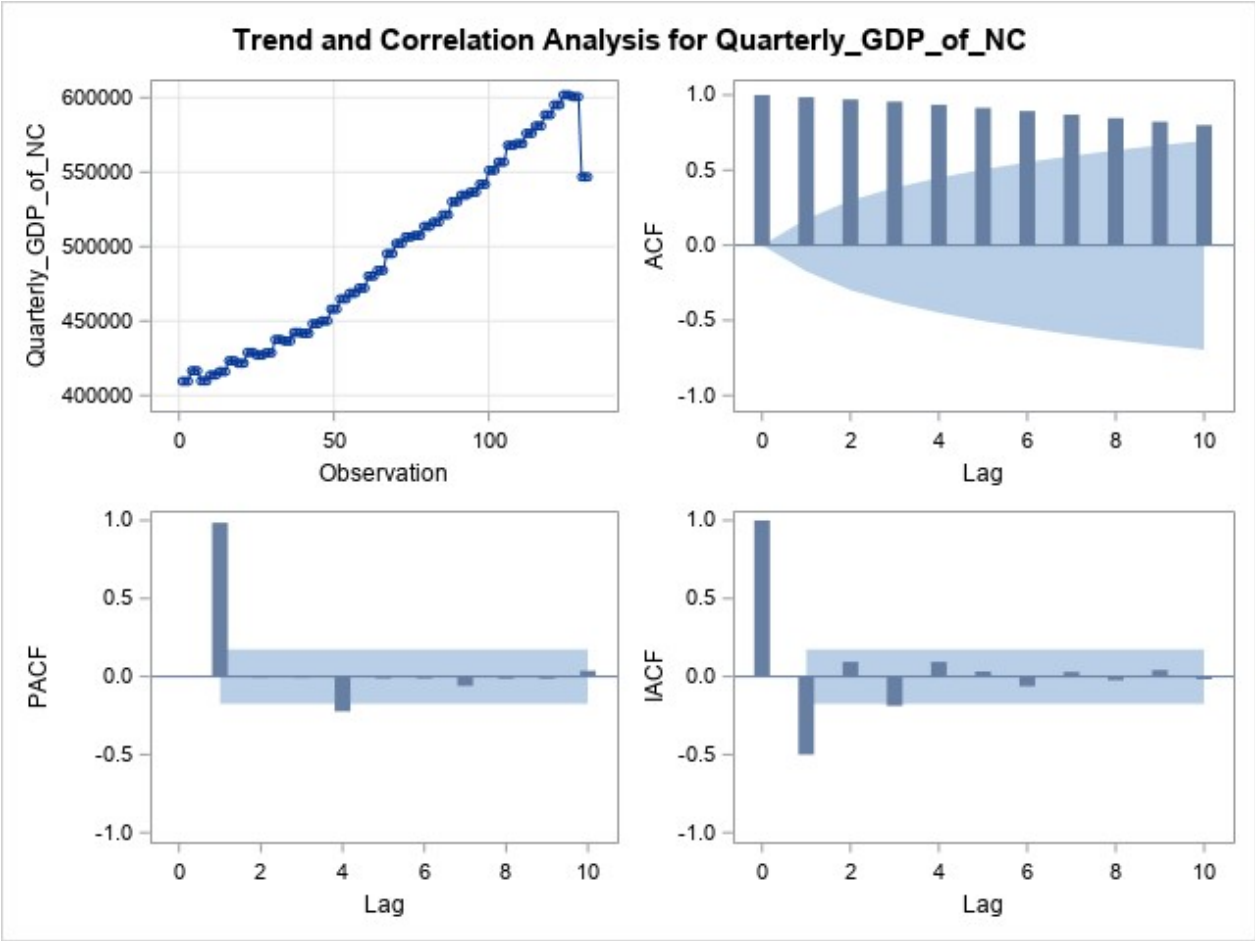
Name of Variable = Title_fee	
Mean of Working Series	8165746
Standard Deviation	2044077
Number of Observations	132

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	379.73	6	<.0001	0.797	0.740	0.686	0.604	0.640	0.583



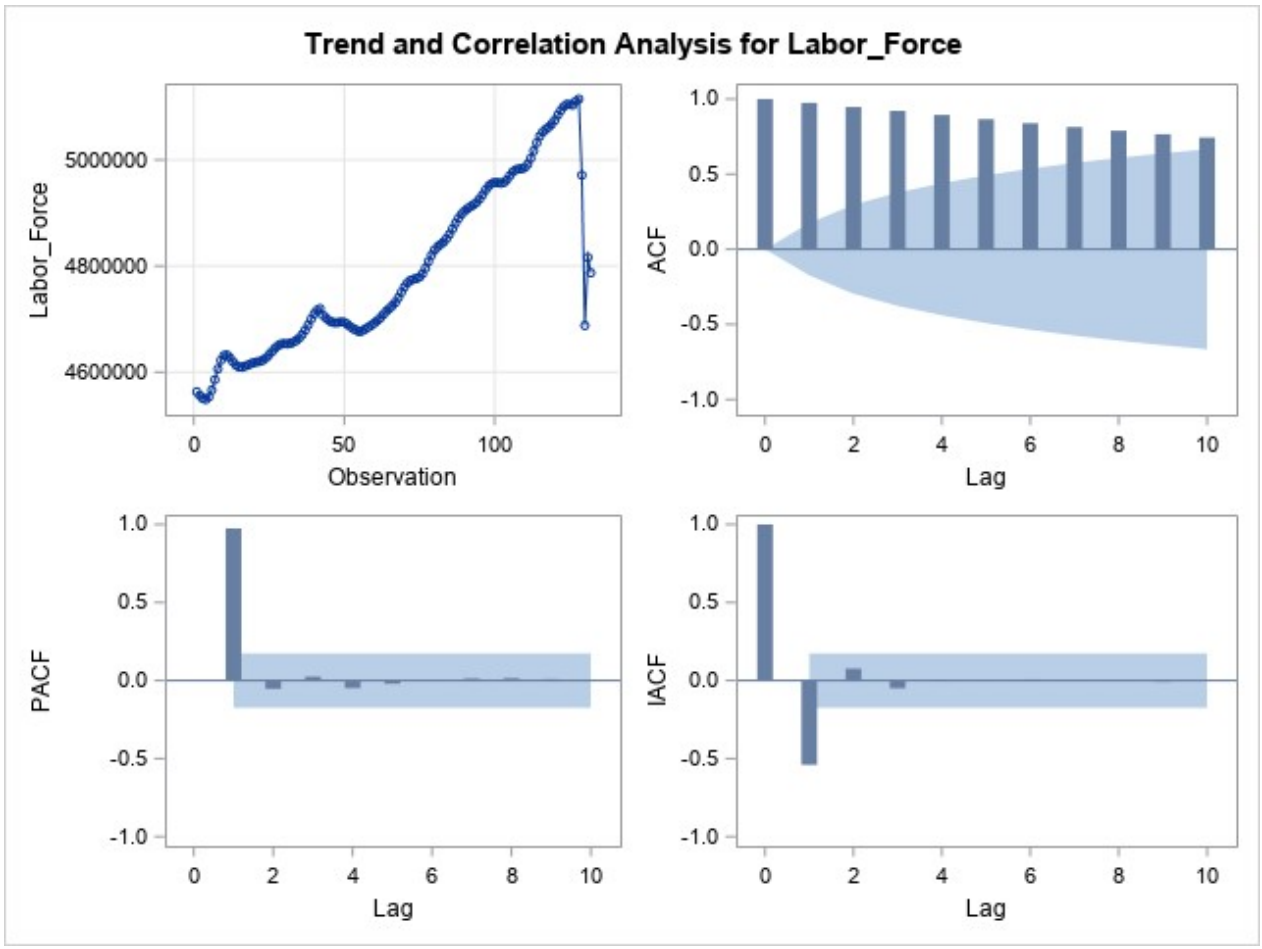
Name of Variable = Quarterly_GDP_of_NC	
Mean of Working Series	493634.9
Standard Deviation	60689.44
Number of Observations	132

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	733.83	6	<.0001	0.985	0.971	0.956	0.935	0.914	0.893



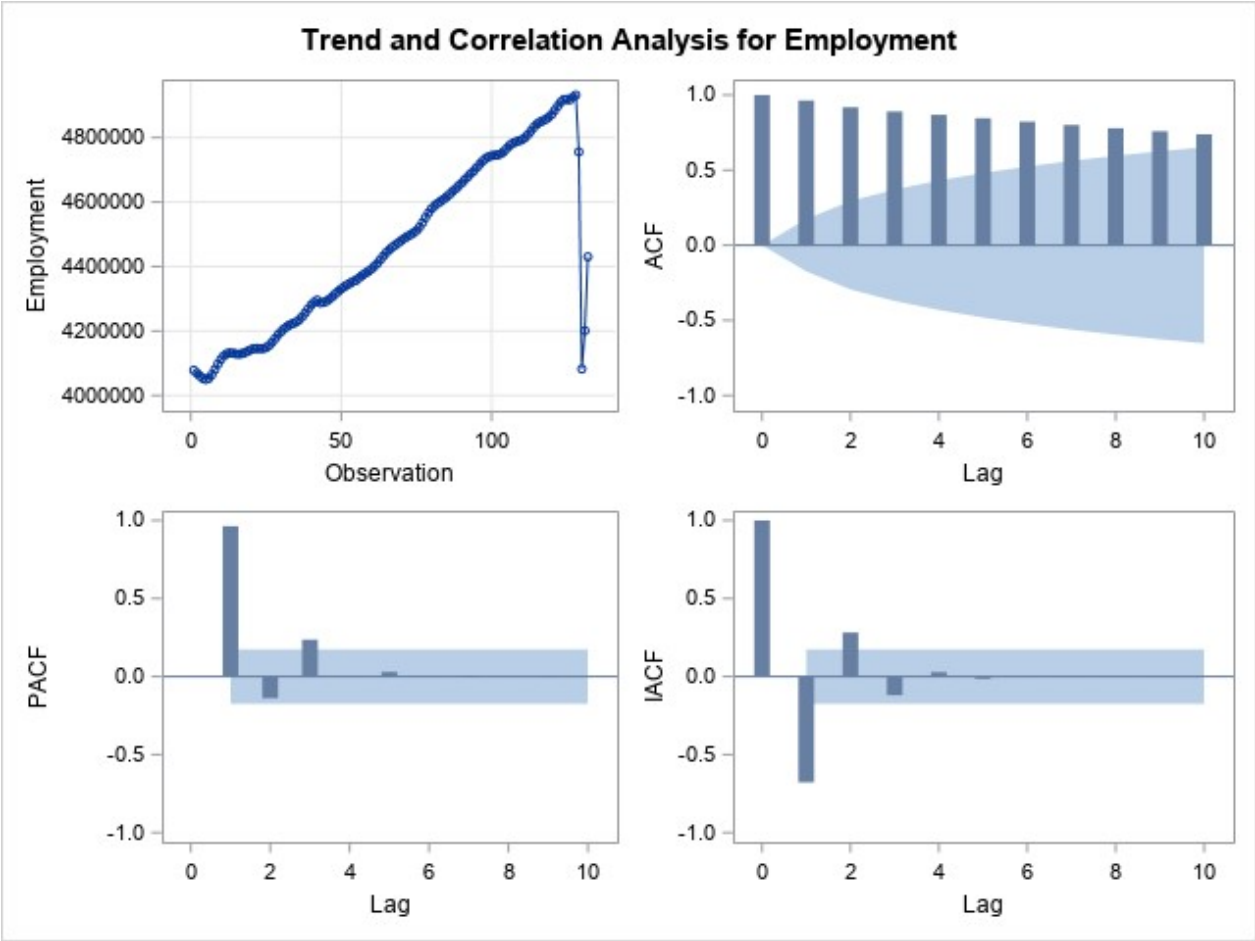
Name of Variable = Labor_Force	
Mean of Working Series	4789807
Standard Deviation	161300.4
Number of Observations	132

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	680.13	6	<.0001	0.974	0.947	0.921	0.894	0.866	0.839



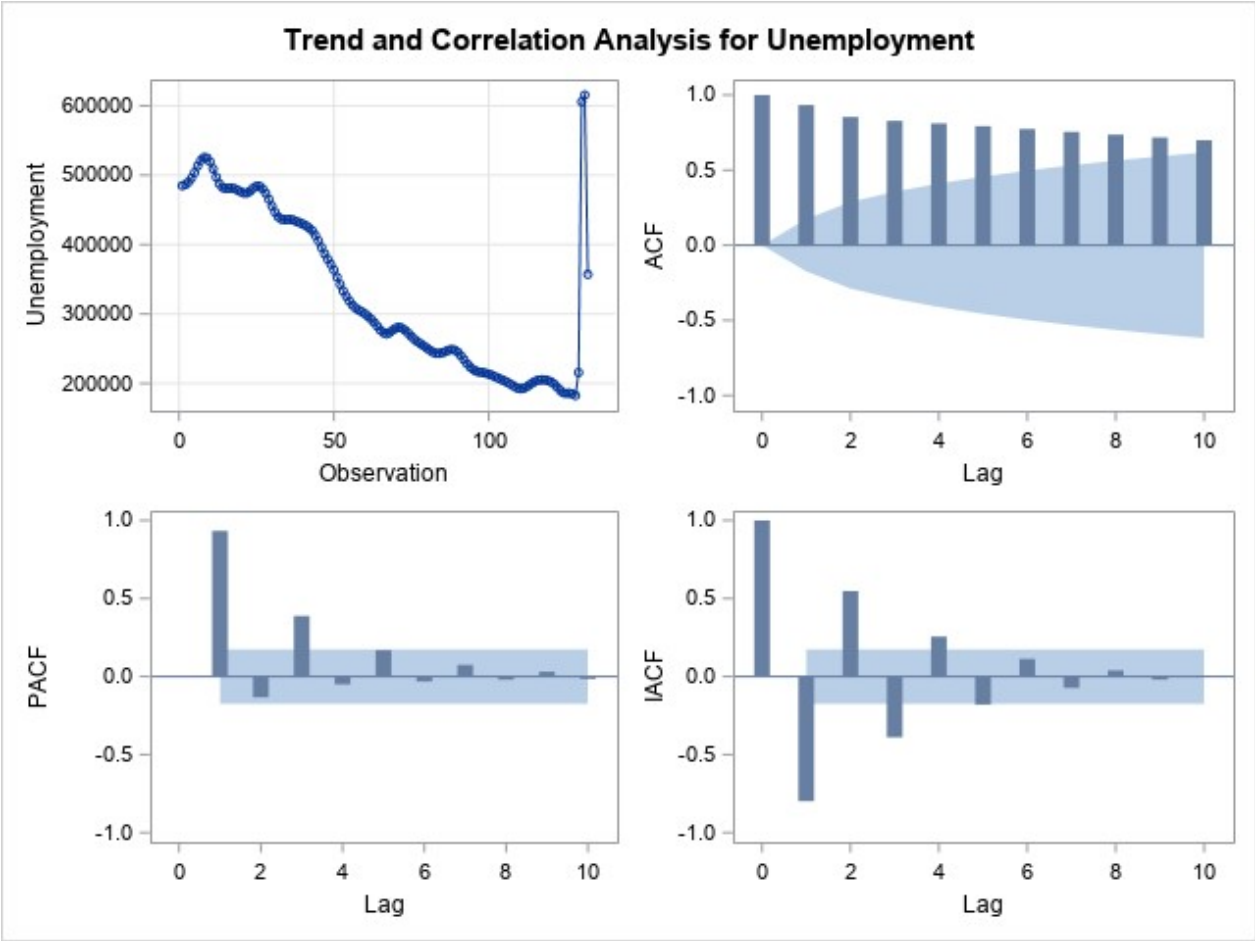
Name of Variable = Employment	
Mean of Working Series	4458659
Standard Deviation	270168.1
Number of Observations	132

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	647.47	6	<.0001	0.963	0.918	0.890	0.868	0.846	0.823



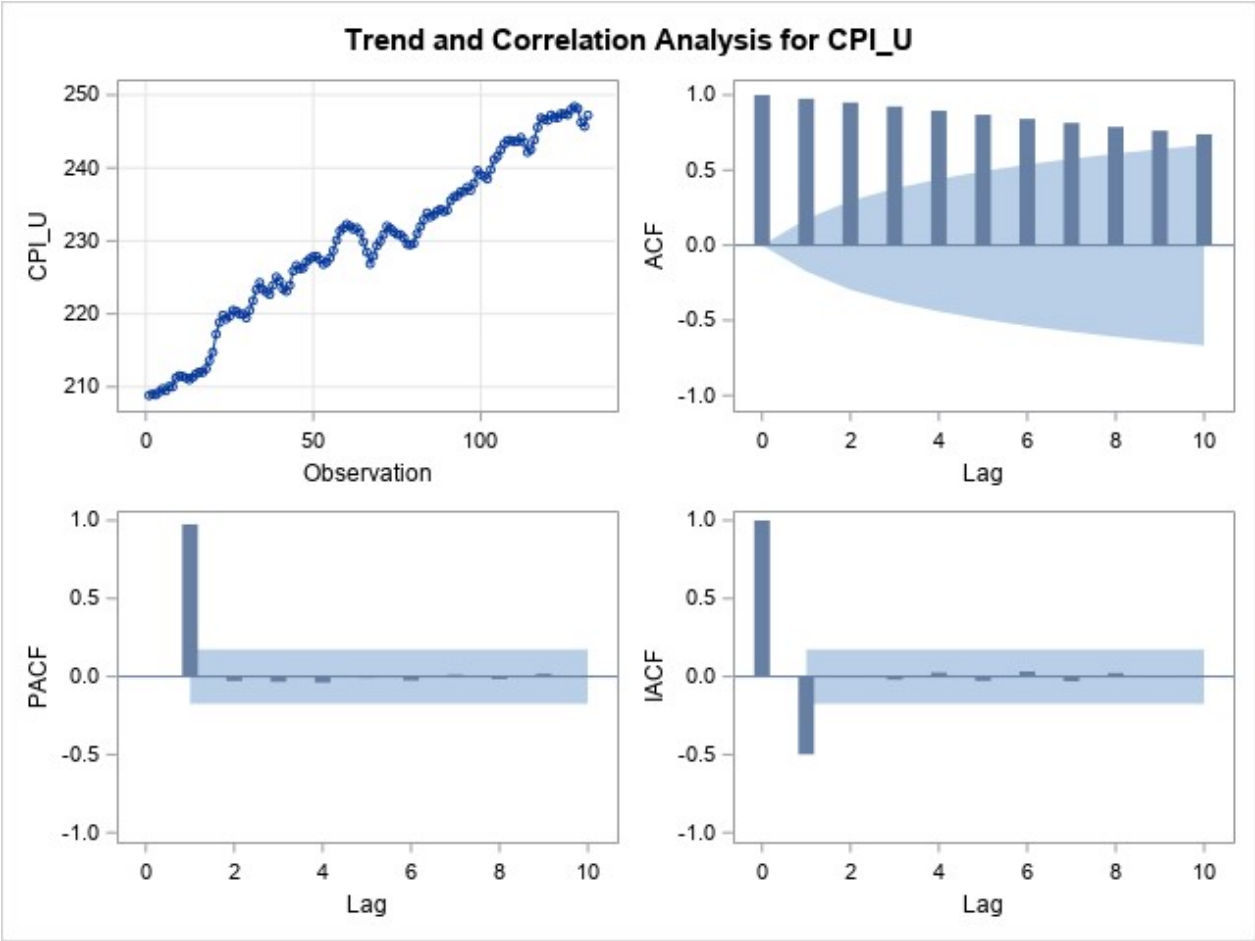
Name of Variable = Unemployment	
Mean of Working Series	331148.5
Standard Deviation	118411.9
Number of Observations	132

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	573.28	6	<.0001	0.933	0.854	0.828	0.811	0.793	0.774



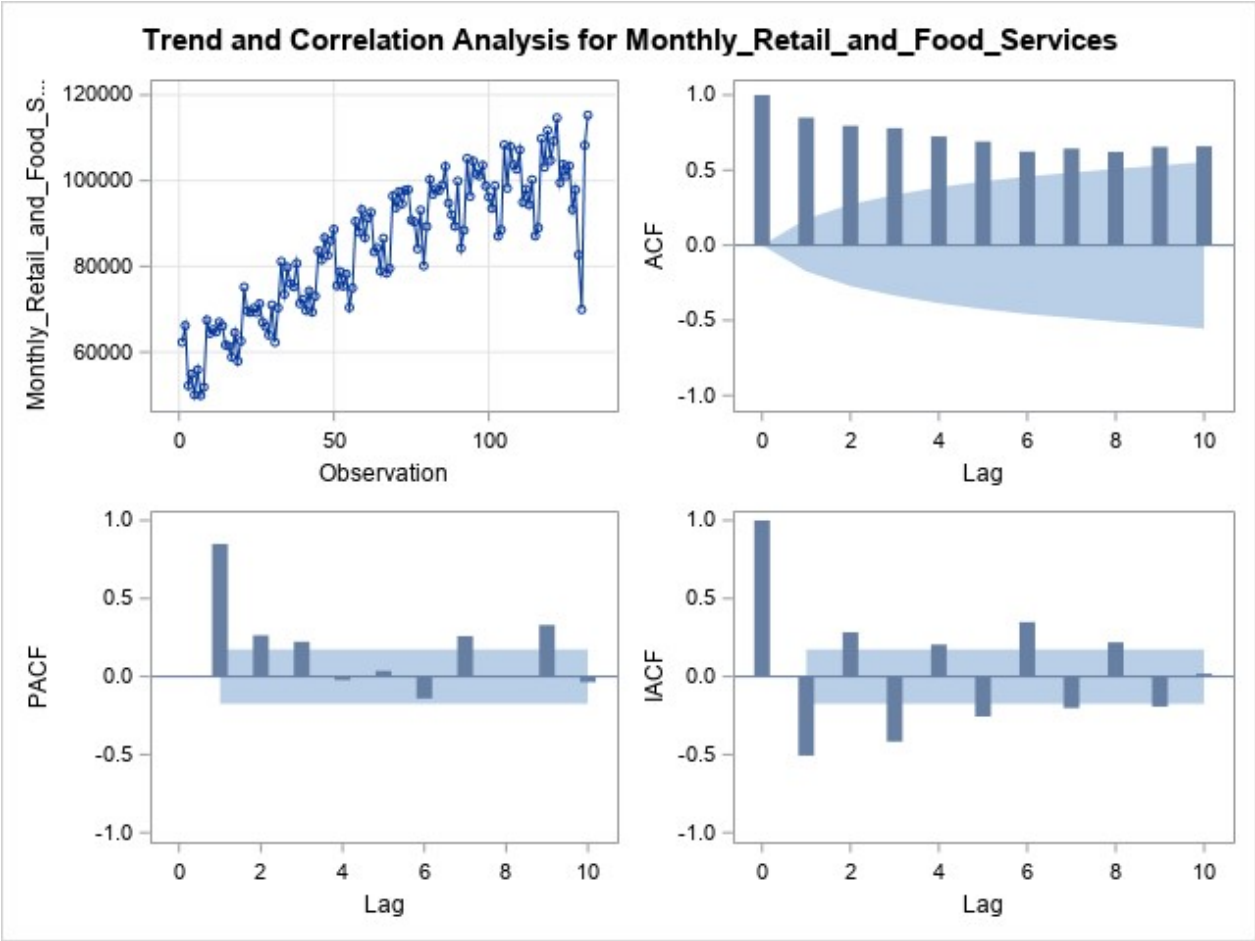
Name of Variable = CPI_U	
Mean of Working Series	229.8194
Standard Deviation	11.32312
Number of Observations	132

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	683.53	6	<.0001	0.975	0.950	0.924	0.896	0.869	0.841



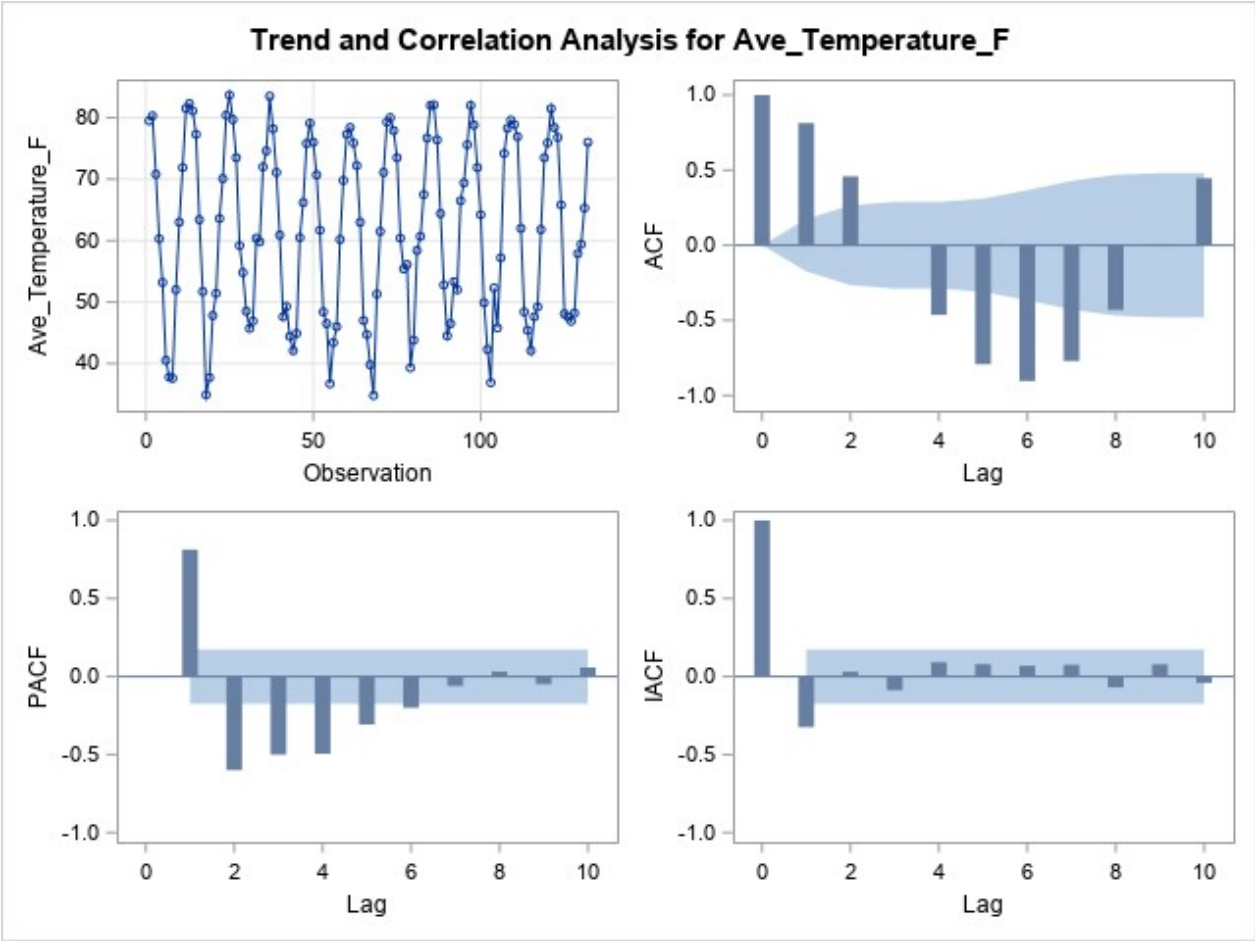
Name of Variable = Monthly_Retail_and_Food_Services	
Mean of Working Series	84598.64
Standard Deviation	15862.76
Number of Observations	132

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	460.33	6	<.0001	0.850	0.795	0.779	0.724	0.691	0.623



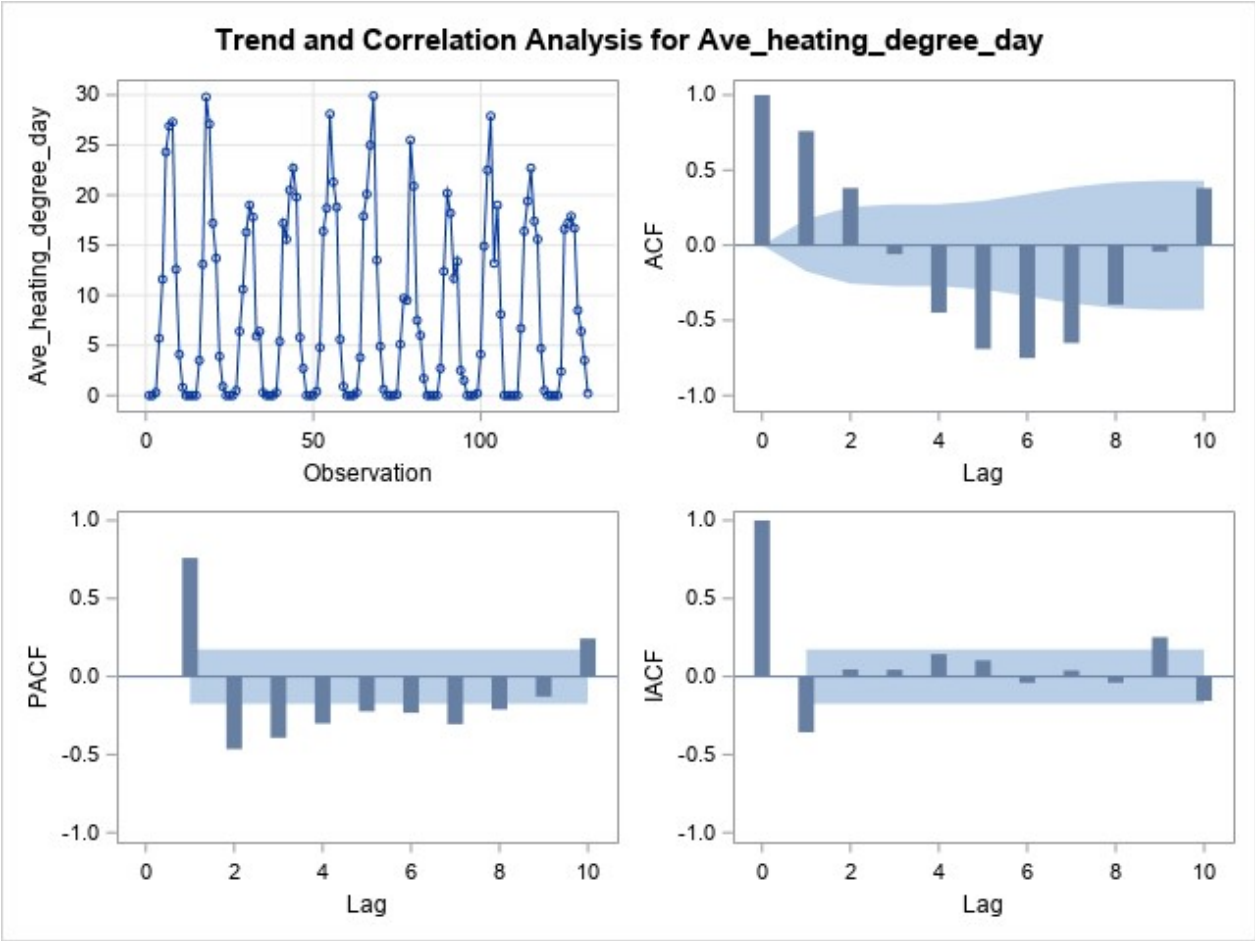
Name of Variable = Ave_Temperature_F	
Mean of Working Series	61.59394
Standard Deviation	14.26135
Number of Observations	132

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	349.58	6	<.0001	0.813	0.458	0.000	-0.464	-0.792	-0.904



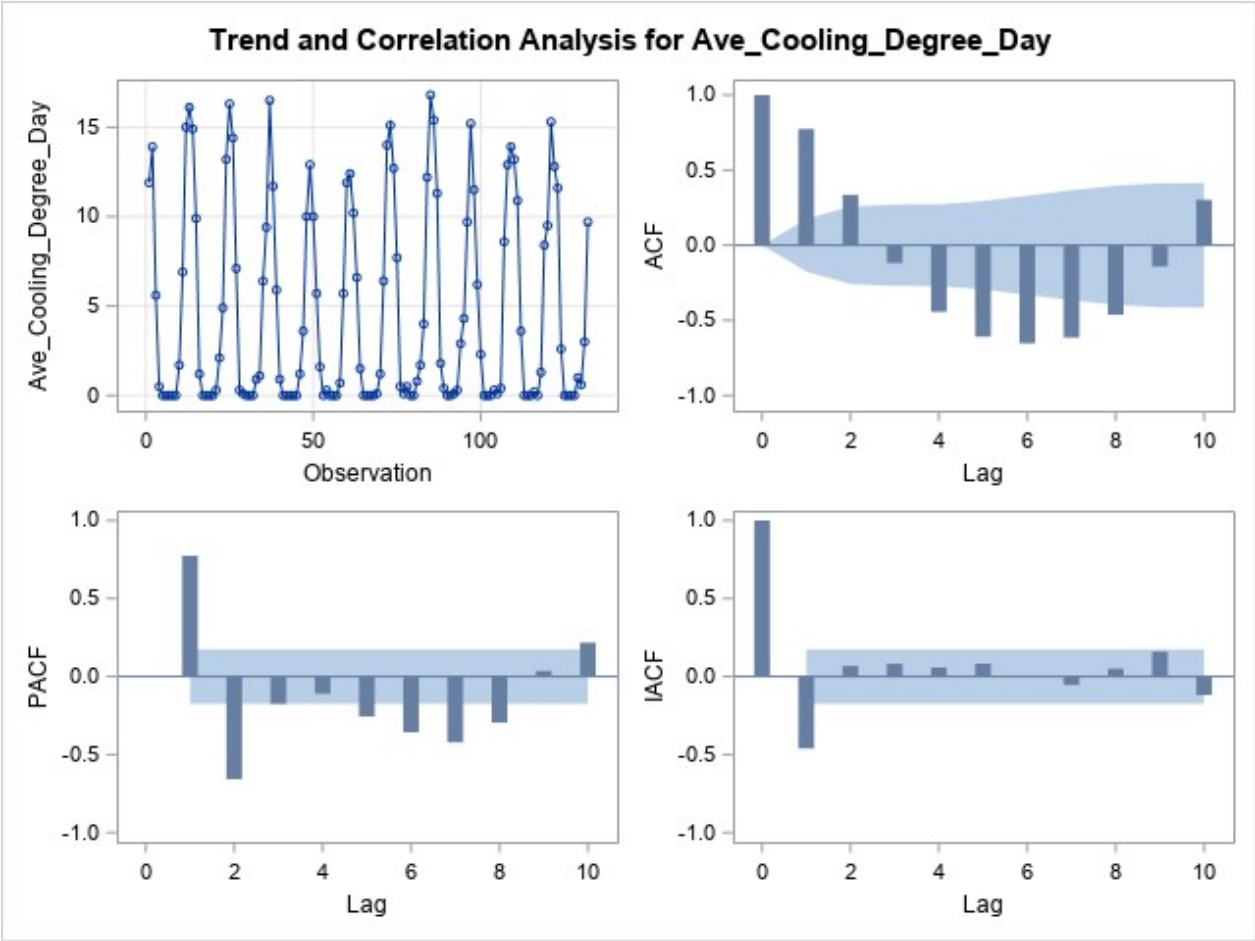
Name of Variable = Ave_heating_degree_day	
Mean of Working Series	8.47197
Standard Deviation	9.086198
Number of Observations	132

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	271.59	6	<.0001	0.760	0.381	-0.059	-0.448	-0.690	-0.751



Name of Variable = Ave_Cooling_Degree_Day	
Mean of Working Series	4.685606
Standard Deviation	5.574348
Number of Observations	132

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	236.72	6	<.0001	0.774	0.335	-0.118	-0.443	-0.609	-0.653


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