Name of Variable = IsHoliday	
Mean of Working Series	0.416667
Standard Deviation	0.493007
Number of Observations	48

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	22.74	6	0.0009	-0.093	0.270	0.205	-0.374	0.126	-0.368
12	49.25	12	<.0001	0.046	-0.190	0.038	0.280	-0.092	0.529

Trend and Correlation Analysis for IsHoliday
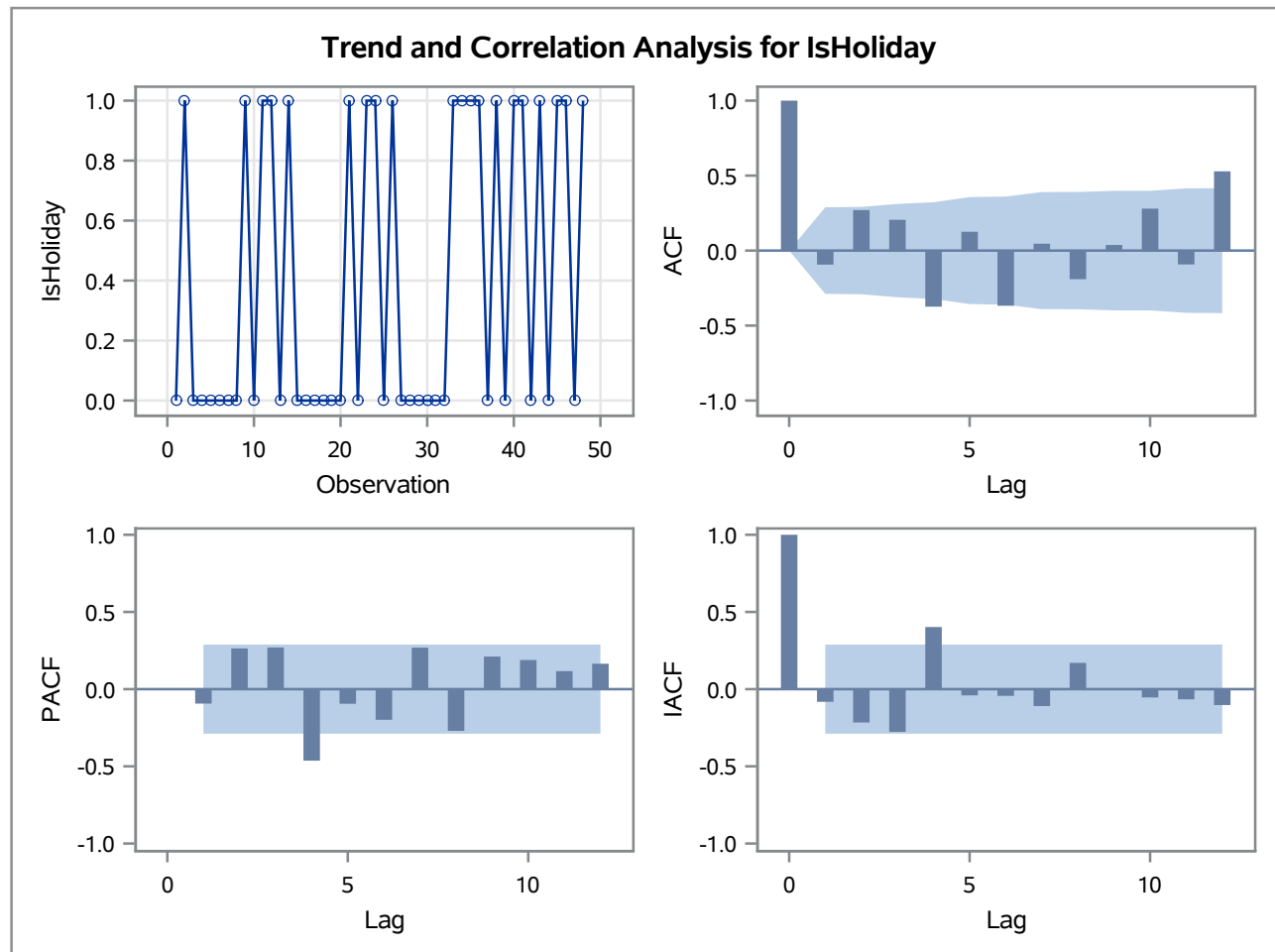
Warning: The model defined by the new estimates is unstable. The iteration process has been terminated.

Warning: Estimates may not have converged.

ARIMA Estimation Optimization Summary	
Estimation Method	Maximum Likelihood
Parameters Estimated	9
Termination Criteria	Maximum Relative Change in Estimates
Iteration Stopping Value	0.001
Criteria Value	0.434871
Maximum Absolute Value of Gradient	0.061908

ARIMA Estimation Optimization Summary	
R-Square Change from Last Iteration	0.276568
Objective Function	Log Gaussian Likelihood
Objective Function Value	-10.5104
Marquardt's Lambda Coefficient	0.01
Numerical Derivative Perturbation Delta	0.001
Iterations	18
Warning Message	Estimates may not have converged.

Maximum Likelihood Estimation					
Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag
MU	0.42315	0.13952	3.03	0.0024	0
MA1,1	-0.81267	1.04118	-0.78	0.4351	1
MA1,2	-0.89520	18.73897	-0.05	0.9619	2
MA1,3	-0.92585	18.40330	-0.05	0.9599	3
MA2,1	-0.07796	0.53723	-0.15	0.8846	12
AR1,1	-0.71877	0.24073	-2.99	0.0028	1
AR1,2	-0.31865	0.22079	-1.44	0.1490	2
AR1,3	-0.10402	0.24834	-0.42	0.6753	3
AR2,1	0.63600	0.30889	2.06	0.0395	12

Constant Estimate	0.329837
Variance Estimate	0.088376
Std Error Estimate	0.297281
AIC	39.02077
SBC	55.86158
Number of Residuals	48

Correlations of Parameter Estimates									
Parameter	MU	MA1,1	MA1,2	MA1,3	MA2,1	AR1,1	AR1,2	AR1,3	AR2,1
MU	1.000	0.011	-0.004	-0.003	0.082	0.079	0.030	0.009	0.126
MA1,1	0.011	1.000	-0.989	-0.988	-0.141	-0.215	-0.200	-0.492	-0.036
MA1,2	-0.004	-0.989	1.000	1.000	0.216	0.323	0.261	0.565	0.097
MA1,3	-0.003	-0.988	1.000	1.000	0.217	0.325	0.259	0.567	0.098
MA2,1	0.082	-0.141	0.216	0.217	1.000	0.552	0.299	0.470	0.890
AR1,1	0.079	-0.215	0.323	0.325	0.552	1.000	0.558	0.629	0.471
AR1,2	0.030	-0.200	0.261	0.259	0.299	0.558	1.000	0.574	0.158

Correlations of Parameter Estimates								
Parameter	MU	MA1,1	MA1,2	MA1,3	MA2,1	AR1,1	AR1,2	AR1,3	AR2,1
AR1,3	0.009	-0.492	0.565	0.567	0.470	0.629	0.574	1.000	0.337
AR2,1	0.126	-0.036	0.097	0.098	0.890	0.471	0.158	0.337	1.000

Autocorrelation Check of Residuals									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	.	0	.	0.005	-0.007	-0.022	-0.005	0.037	-0.096
12	2.61	4	0.6256	0.024	-0.004	-0.093	0.137	0.047	0.036
18	5.80	10	0.8318	-0.194	0.003	0.027	-0.064	0.035	-0.045
24	6.78	16	0.9773	0.026	0.009	-0.047	0.076	-0.037	0.023

Residual Correlation Diagnostics for IsHoliday
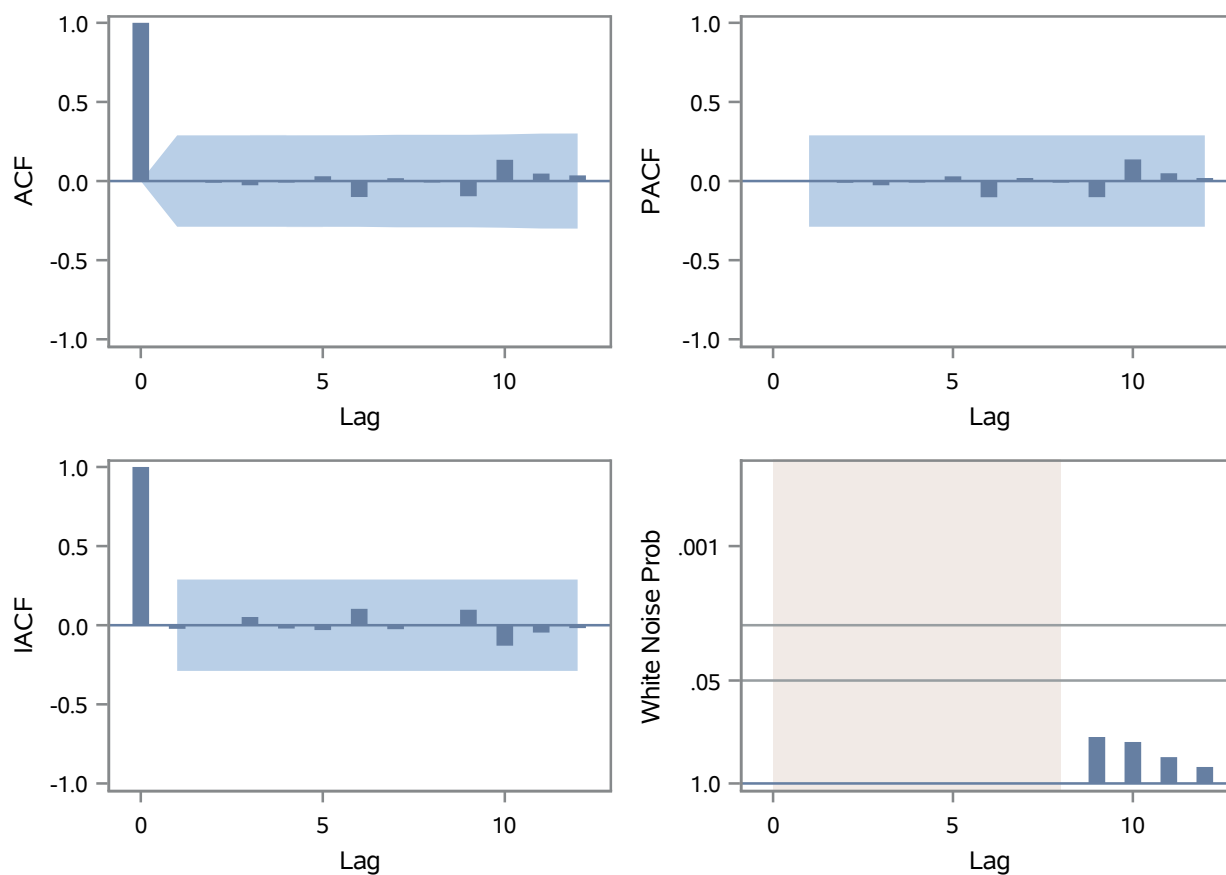
Residual Normality Diagnostics for IsHoliday

Distribution of Residuals

QQ-Plot
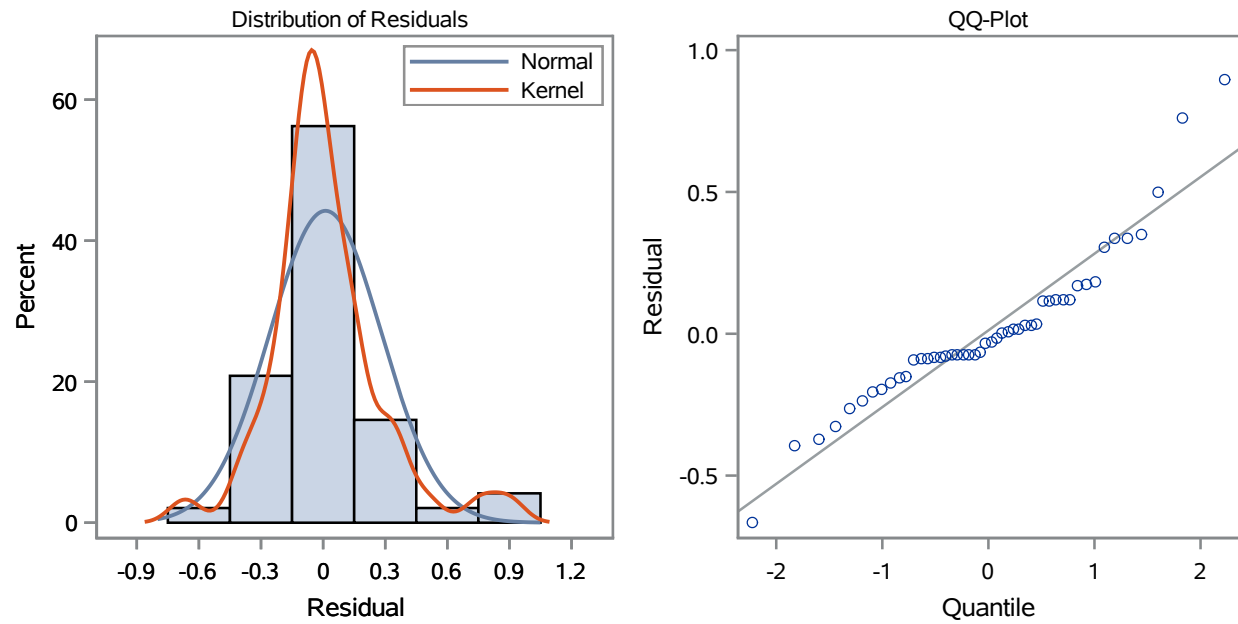
Distribution of Residuals for IsHoliday

Residual Q-Q Plot for IsHoliday
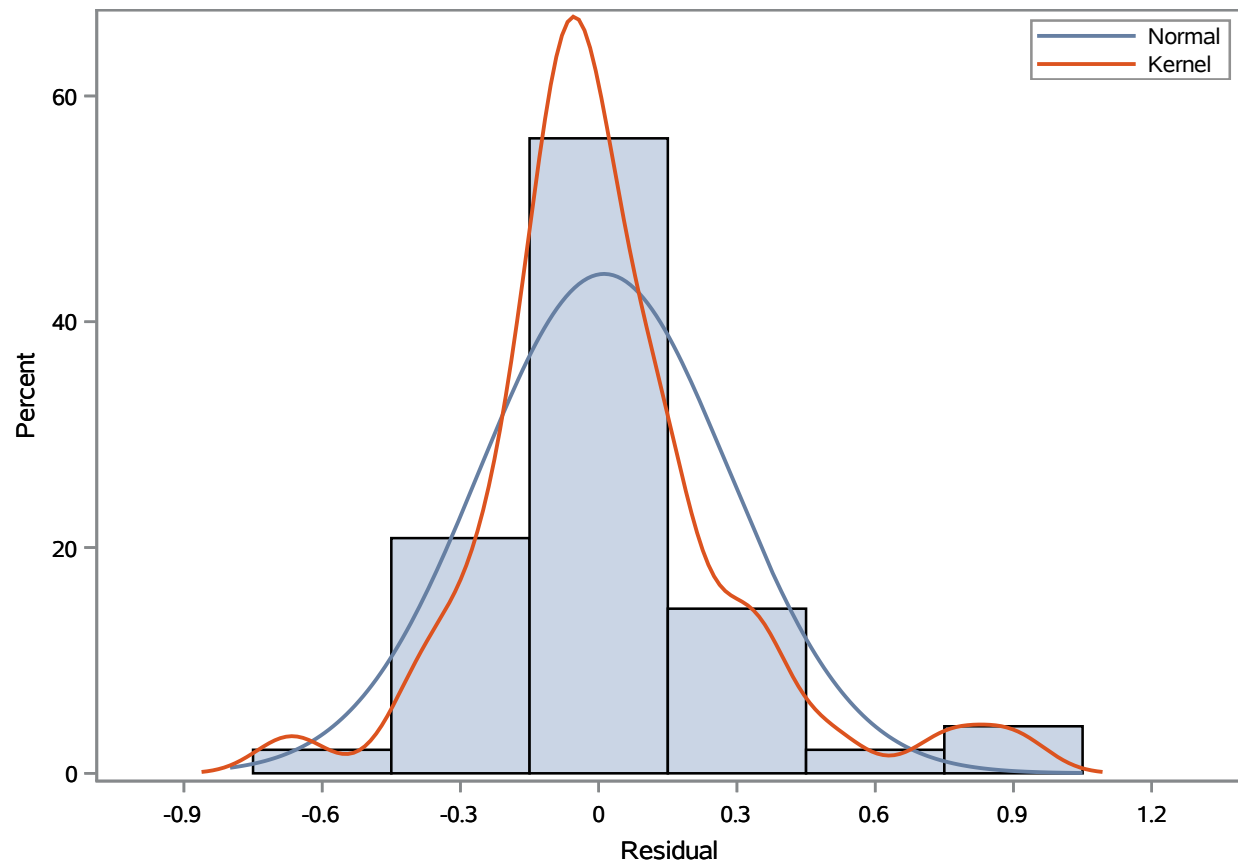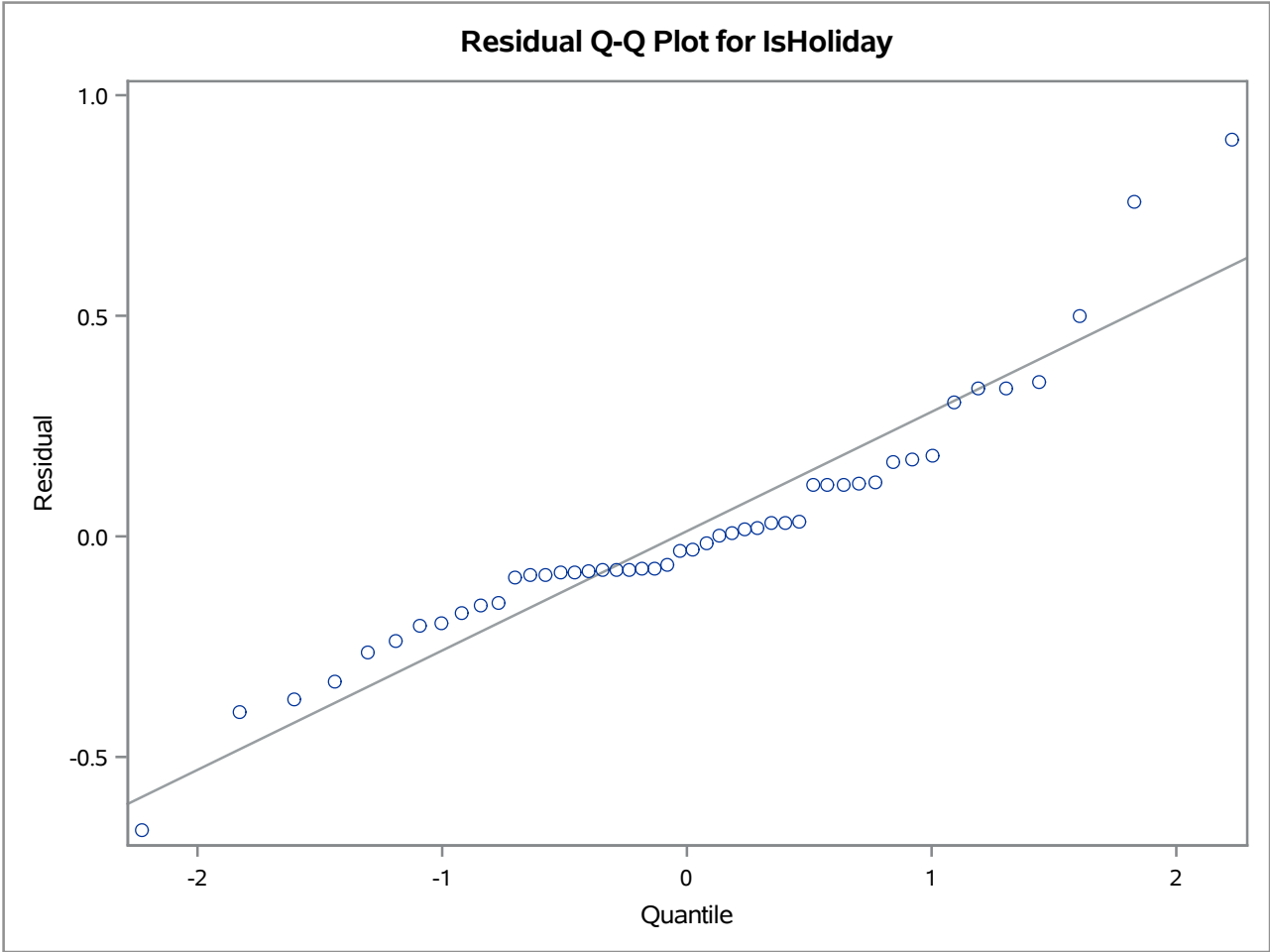
Model for variable IsHoliday	
Estimated Mean	0.423152

Autoregressive Factors	
Factor 1:	1 + 0.71877 B**(1) + 0.31865 B**(2) + 0.10402 B**(3)
Factor 2:	1 - 0.636 B**(12)

Moving Average Factors	
Factor 1:	1 + 0.81267 B**(1) + 0.8952 B**(2) + 0.92585 B**(3)
Factor 2:	1 + 0.07796 B**(12)

Name of Variable = sales	
Mean of Working Series	47858.35
Standard Deviation	24812.49
Number of Observations	48

To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
				Autocorrelation Check for White Noise					
6	11.48	6	0.0745	0.378	0.158	0.190	-0.034	-0.096	0.079
12	38.35	12	0.0001	-0.154	-0.038	0.043	-0.034	0.188	0.587

Correlation of sales and IsHoliday	
Number of Observations	48
Variance of transformed series sales	2.3452E9
Variance of transformed series IsHoliday	0.113015

**Both series have been prewhitened.**

To Lag	Chi-Square	DF	Pr > ChiSq	Crosscorrelations					
				Crosscorrelation Check Between Series					
5	18.38	6	0.0053	-0.013	0.384	0.169	-0.267	-0.213	0.301
11	35.38	12	0.0004	0.195	-0.217	-0.331	0.216	0.295	-0.161

Both variables have been prewhitened by the following filter:

Prewhitening Filter

Autoregressive Factors	
Factor 1:	$1 + 0.71877 B^{**}(1) + 0.31865 B^{**}(2) + 0.10402 B^{**}(3)$
Factor 2:	$1 - 0.636 B^{**}(12)$

Moving Average Factors	
Factor 1:	$1 + 0.81267 B^{**}(1) + 0.8952 B^{**}(2) + 0.92585 B^{**}(3)$
Factor 2:	$1 + 0.07796 B^{**}(12)$

Trend and Correlation Analysis for sales
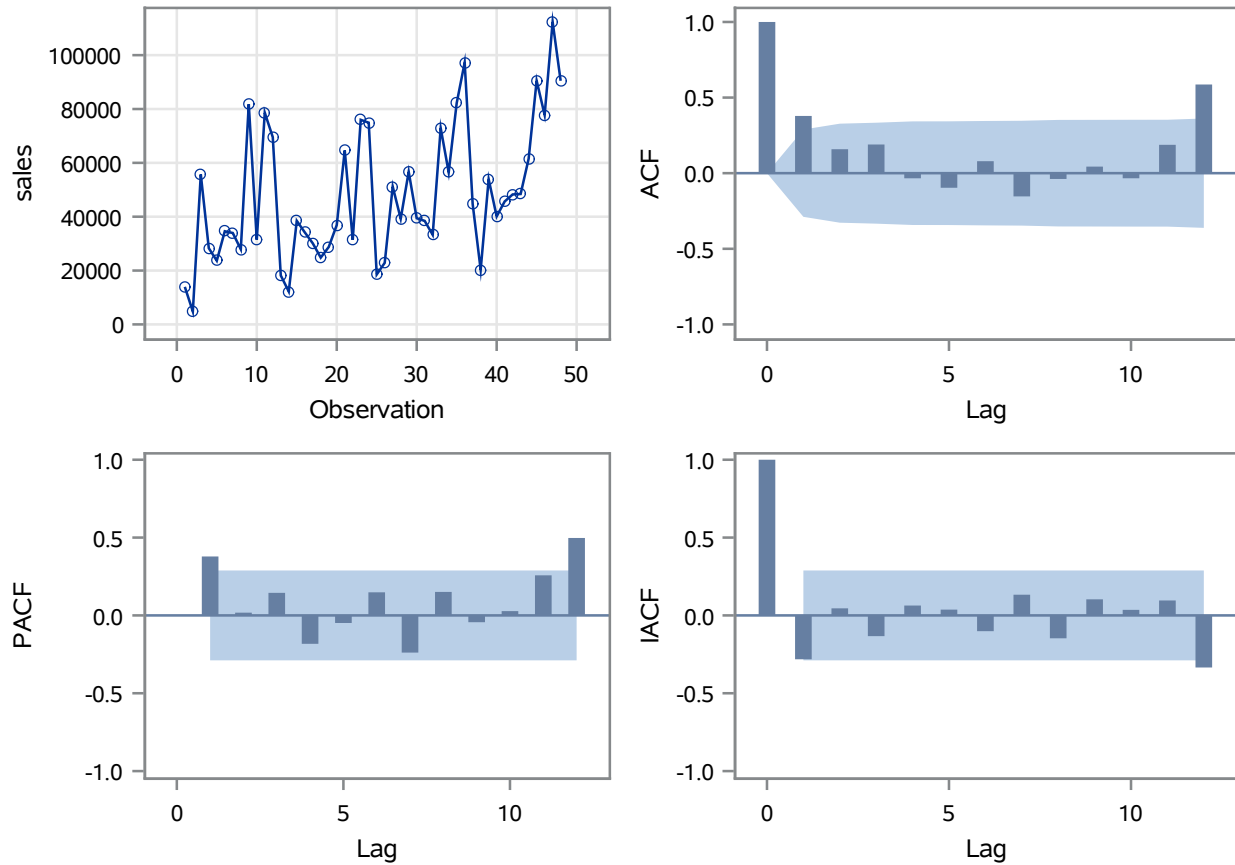
Cross Correlations of sales and IsHoliday
with Two Standard Error Limits
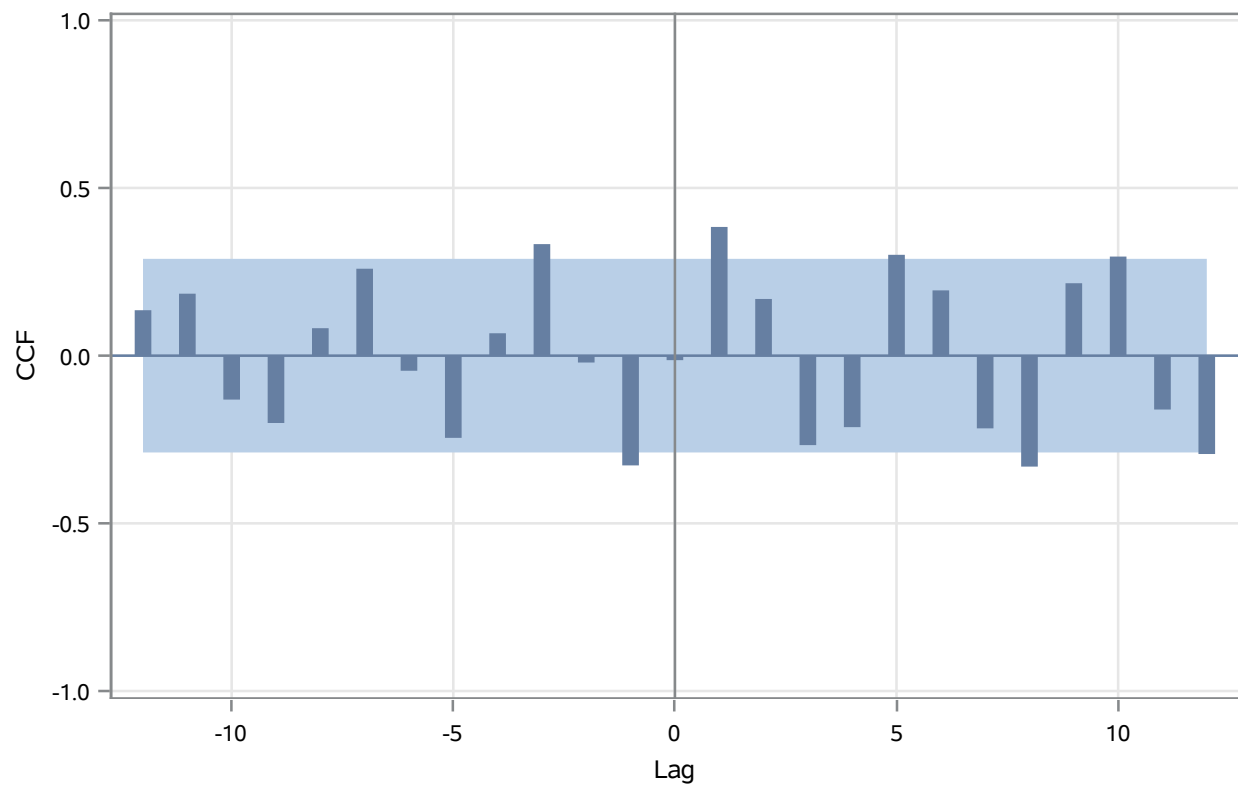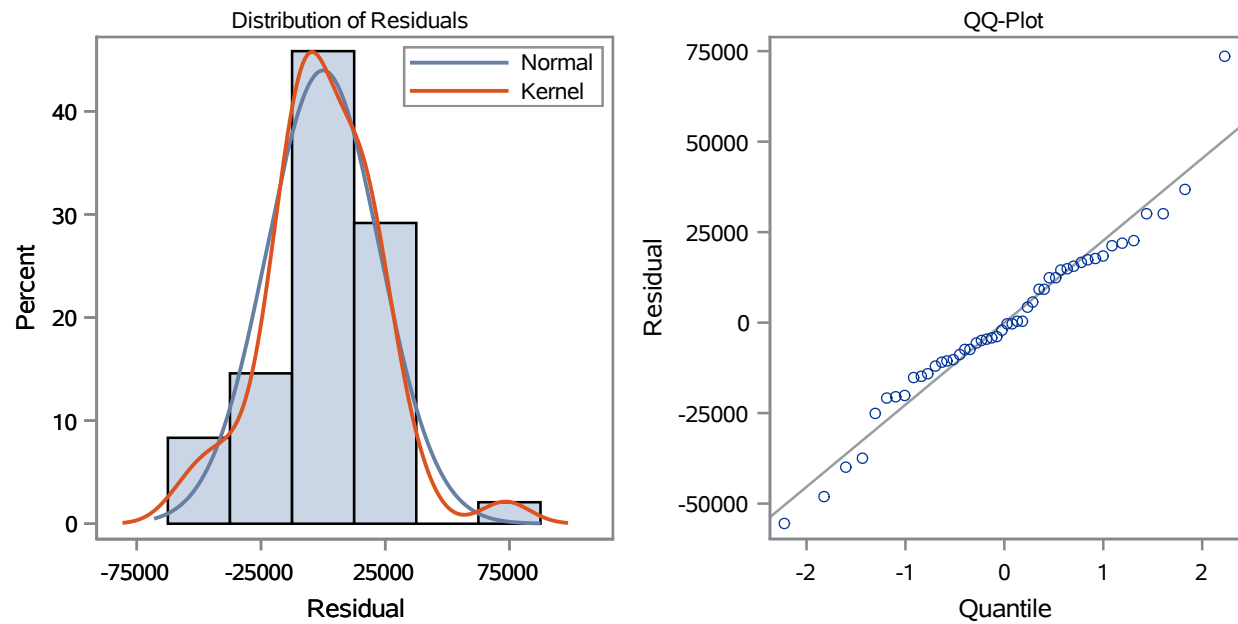
Plot is based on prewhitened series.

Maximum Likelihood Estimation							
Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag	Variable	Shift
MU	38922.8	4333.4	8.98	<.0001	0	sales	0
NUM1	21445.3	6713.2	3.19	0.0014	0	IsHoliday	0

Constant Estimate	38922.8
Variance Estimate	5.2579E8
Std Error Estimate	22930.02
AIC	1102.035
SBC	1105.777
Number of Residuals	48

Correlations of Parameter Estimates		
Variable Parameter	sales MU	IsHoliday NUM1
sales MU	1.000	-0.645
IsHoliday NUM1	-0.645	1.000

Autocorrelation Check of Residuals									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	4.55	6	0.6030	0.233	0.059	0.135	-0.040	-0.077	0.060
12	23.24	12	0.0258	-0.176	0.075	-0.067	-0.124	0.105	0.468
18	24.62	18	0.1356	0.101	-0.009	0.017	0.015	-0.014	0.088
24	39.09	24	0.0267	-0.088	0.039	-0.096	-0.210	-0.014	0.297

Residual Correlation Diagnostics for sales
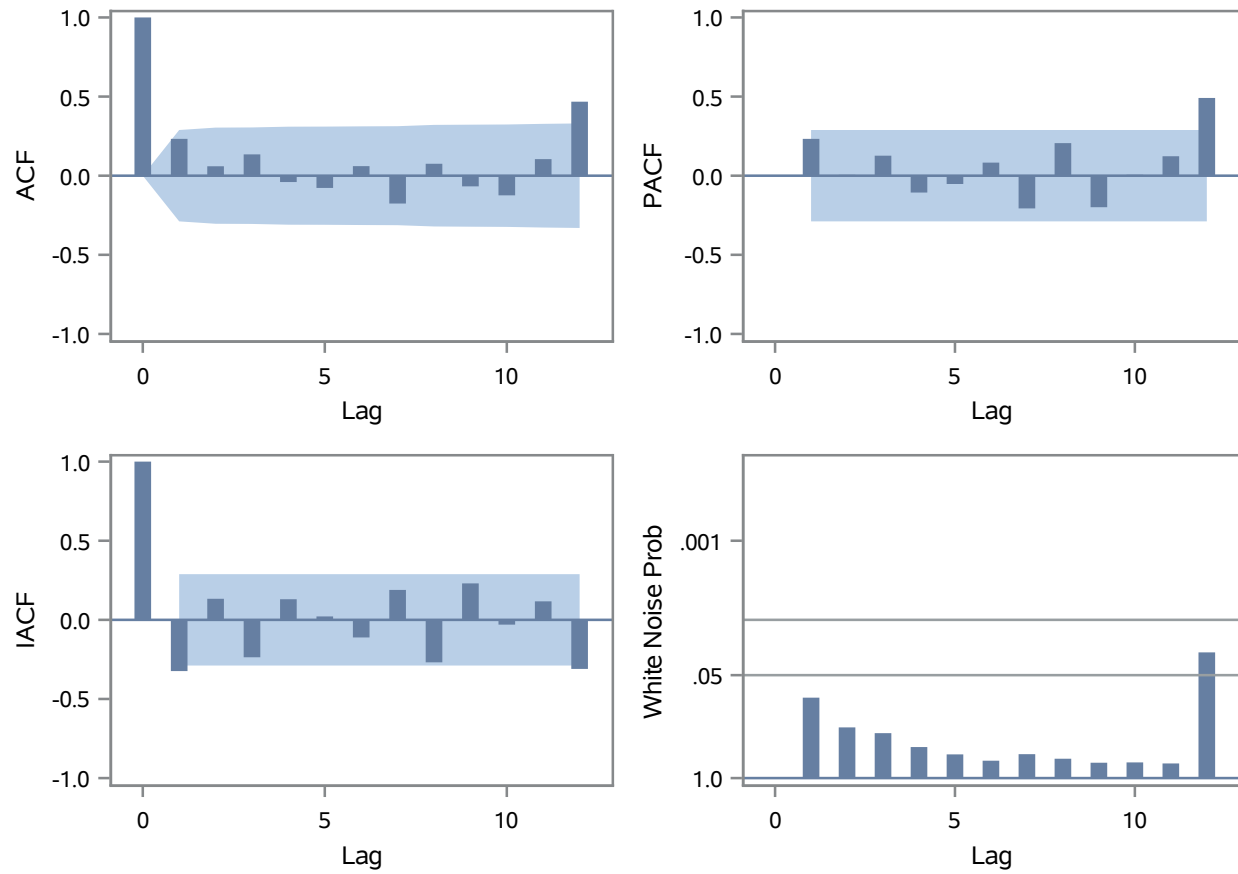
Residual Normality Diagnostics for sales

Distribution of Residuals for sales

Residual Q-Q Plot for sales

To Lag	Chi-Square	DF	Pr > ChiSq	Crosscorrelations					
5	7.99	6	0.2388	-0.338	0.189	0.119	0.025	0.027	0.027
11	13.41	12	0.3401	0.137	0.165	-0.001	0.242	0.089	0.017
17	20.30	18	0.3162	0.069	0.318	0.124	0.001	-0.092	-0.117
23	21.51	24	0.6084	0.006	-0.078	-0.066	0.117	0.021	0.024
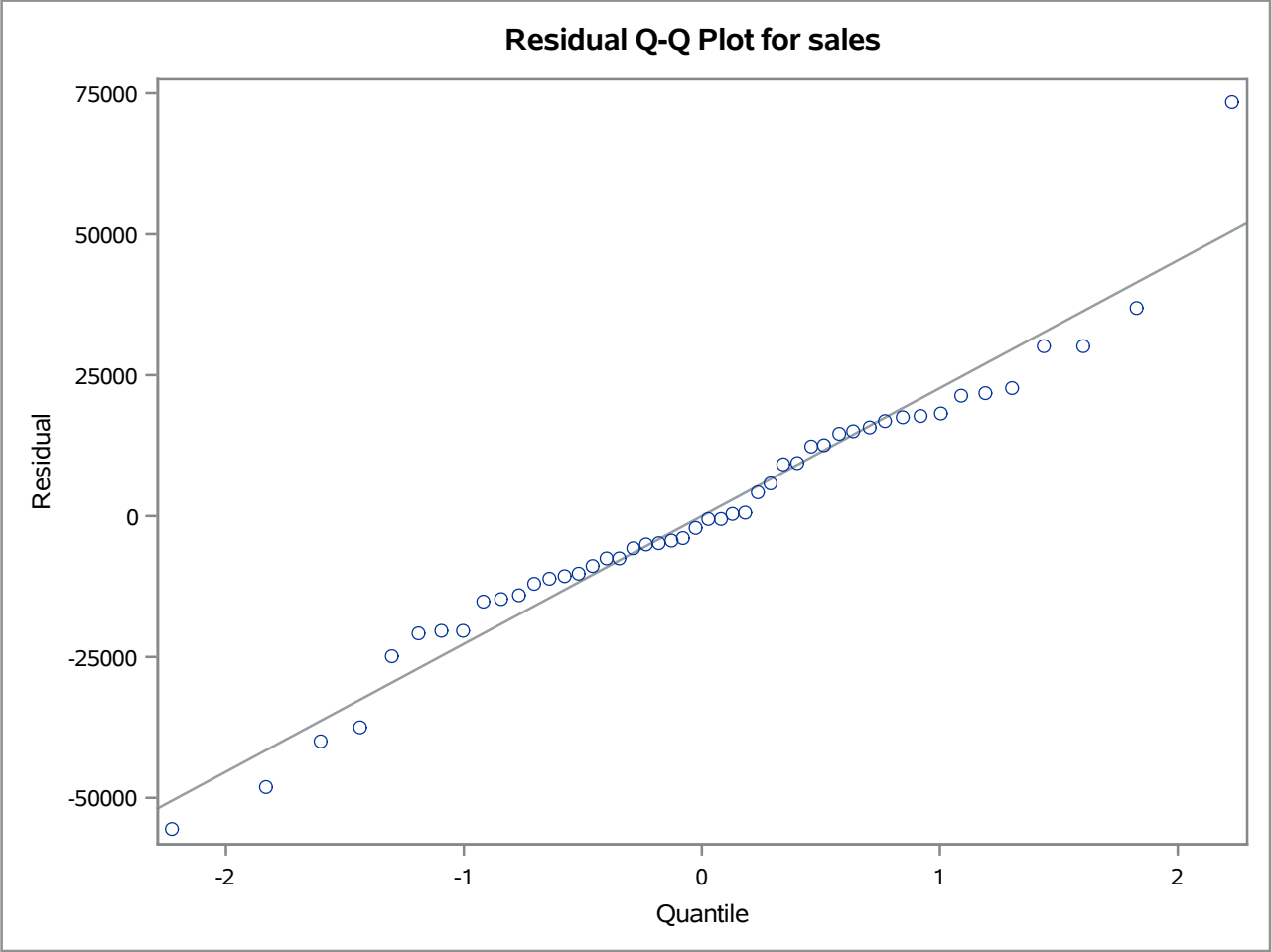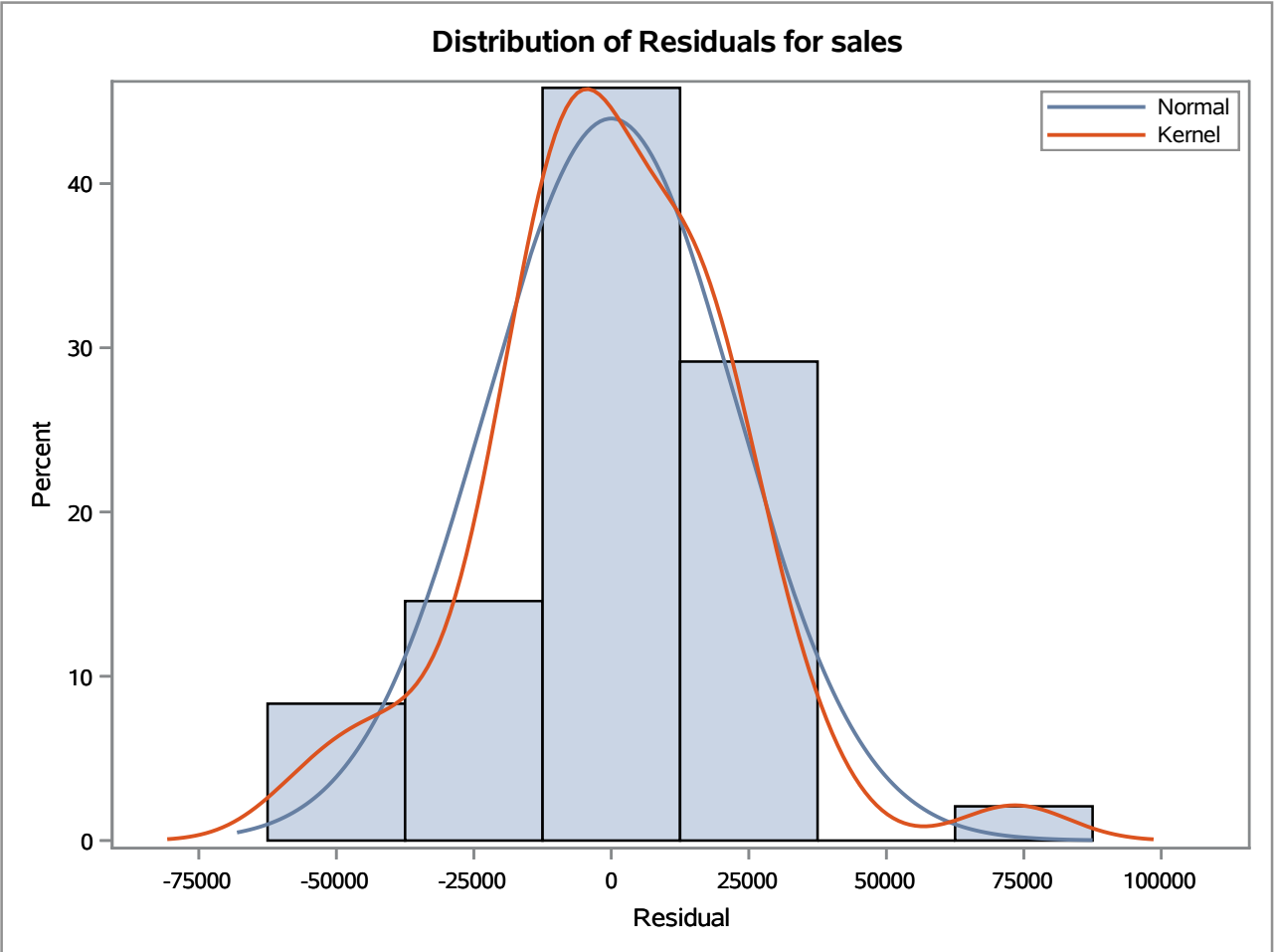
Crosscorrelation Check of Residuals with Input IsHoliday

Model for variable sales	
Estimated Intercept	38922.8

Input Number 1	
Input Variable	IsHoliday
Overall Regression Factor	21445.32