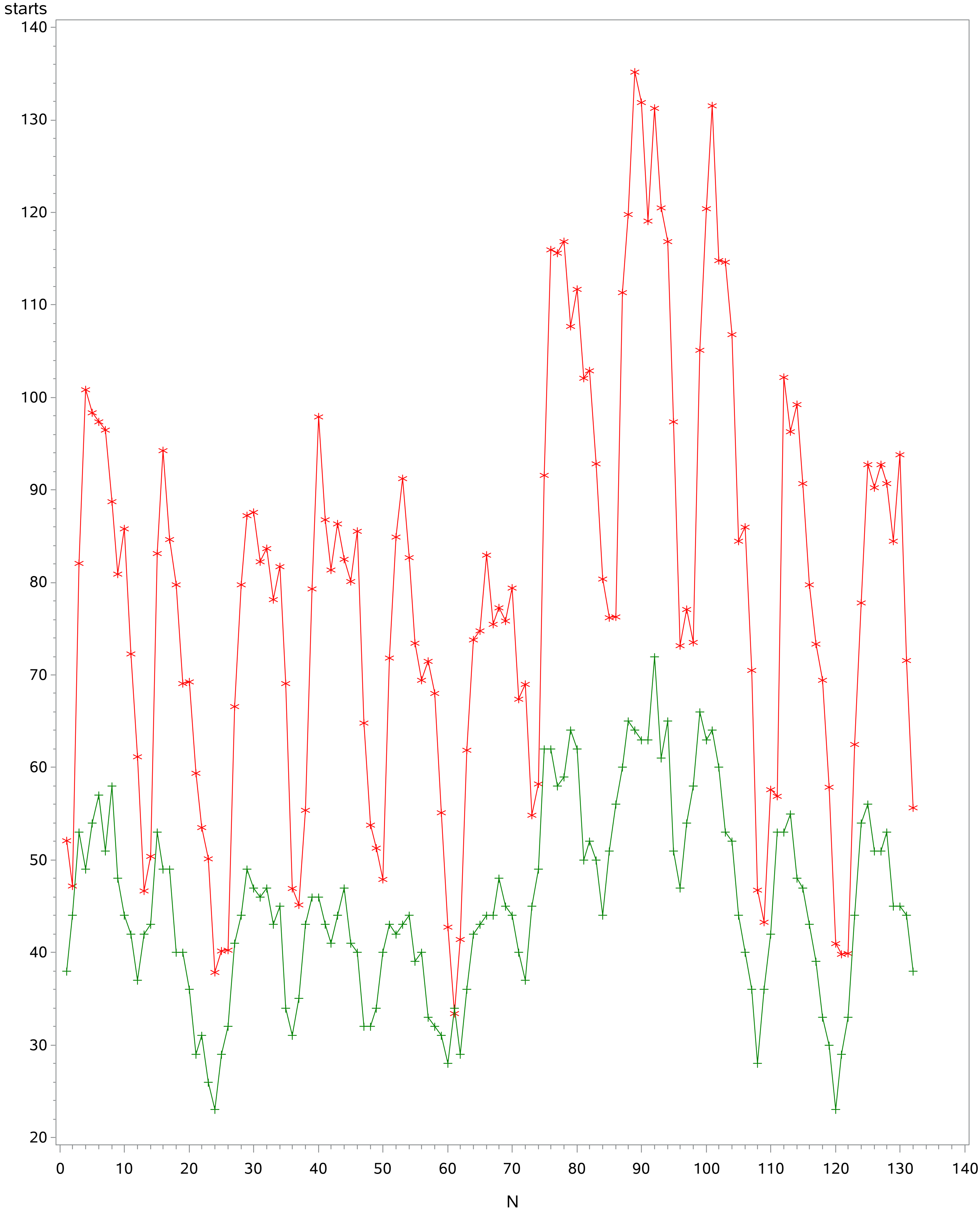
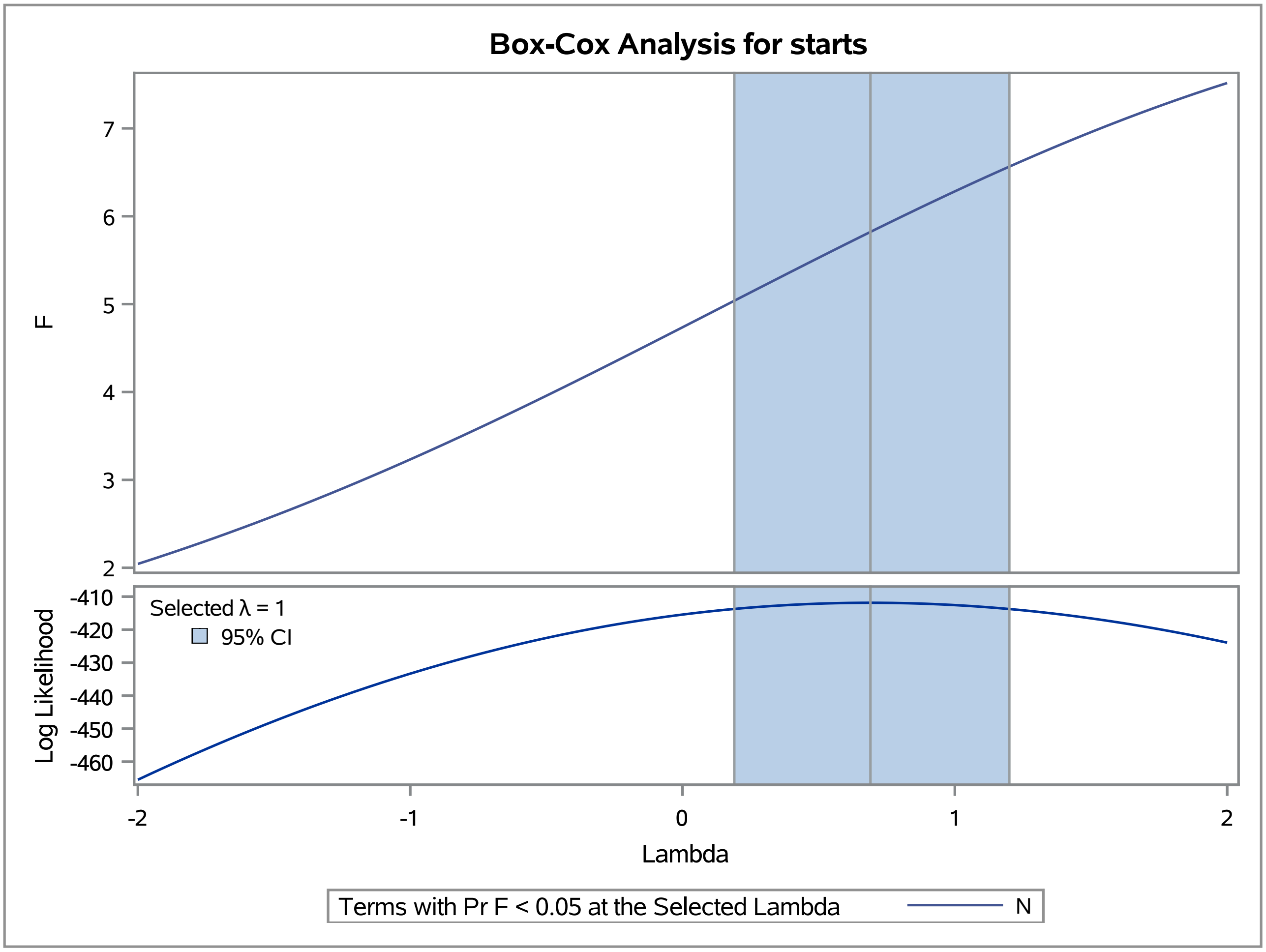
WEI House starts_sales example



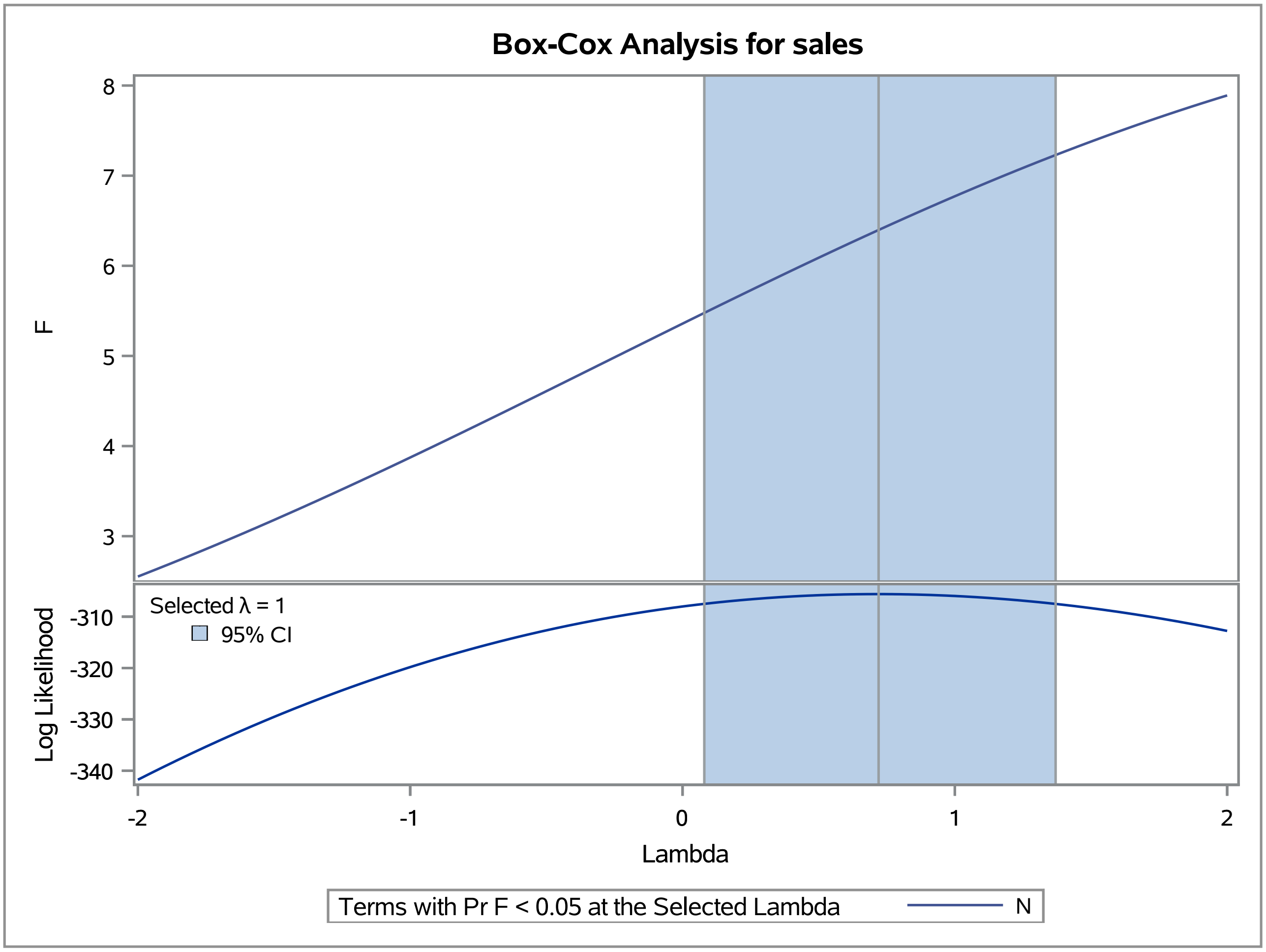
The TRANSREG Procedure



The TRANSREG Procedure

Model Statement Specification Details				
Type	**DF**	**Variable**	**Description**	**Value**
Dep	1	BoxCox(starts)	Lambda Used	1
			Lambda	0.69
			Log Likelihood	-411.9
			Conv. Lambda	1
			Conv. Lambda LL	-412.6
			CI Limit	-413.8
			Alpha	0.05
			Options	Convenient Lambda Used
Ind	1	Identity(N)	DF	1

The TRANSREG Procedure



WEI House starts_sales example
Check for normality
sales

The TRANSREG Procedure

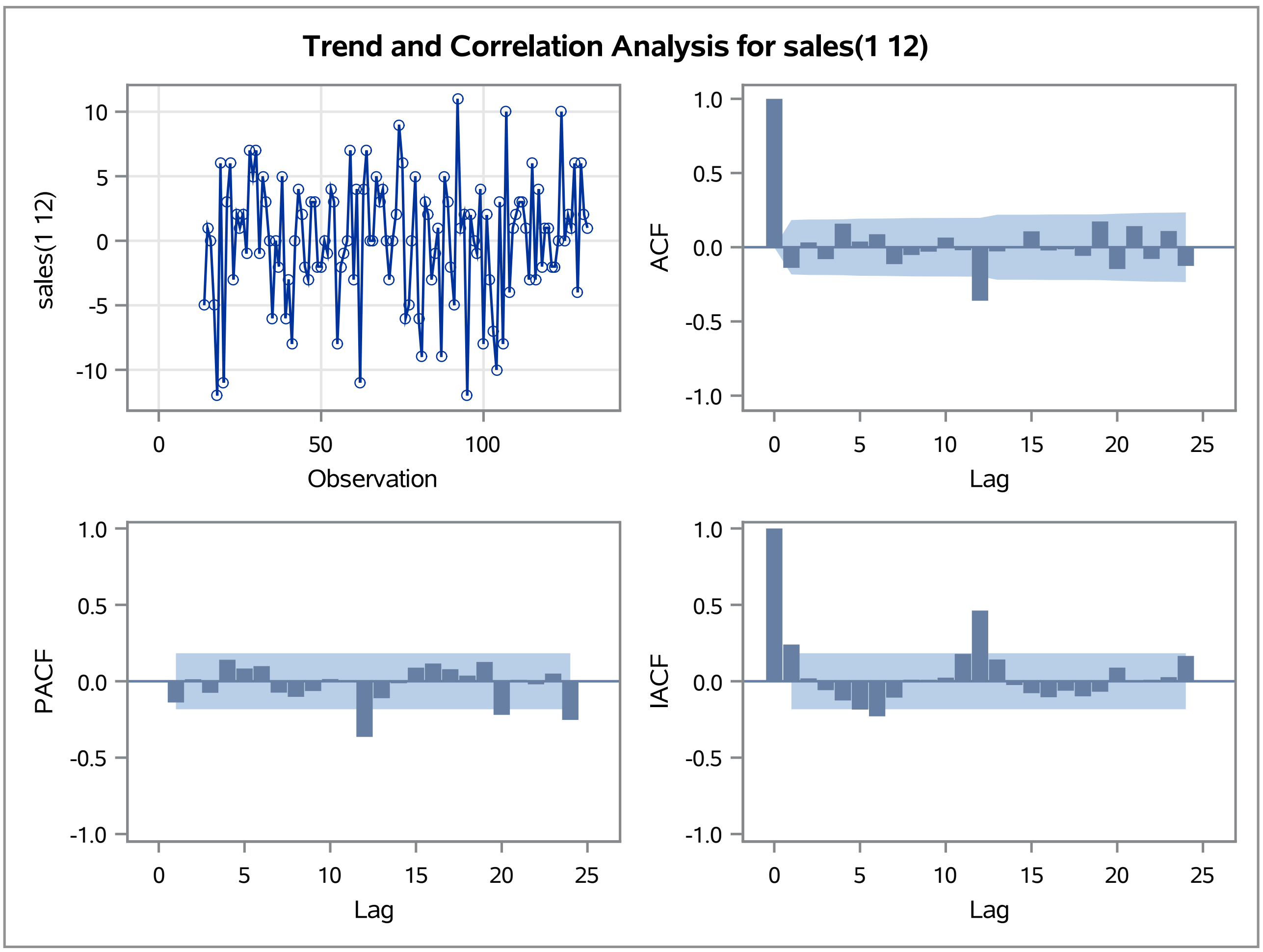
Model Statement Specification Details				
Type	**DF**	**Variable**	**Description**	**Value**
Dep	1	BoxCox(sales)	Lambda Used	1
			Lambda	0.72
			Log Likelihood	-305.6
			Conv. Lambda	1
			Conv. Lambda LL	-306.0
			CI Limit	-307.5
			Alpha	0.05
			Options	Convenient Lambda Used
Ind	1	Identity(N)	DF	1

The ARIMA Procedure

Name of Variable = sales	
Period(s) of Differencing	1,12
Mean of Working Series	0.092437
Standard Deviation	4.784414
Number of Observations	119
Observation(s) eliminated by differencing	13

Autocorrelation Check for White Noise

To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	7.60	6	0.2687	-0.139	0.032	-0.080	0.159	0.038	0.088
12	27.84	12	0.0058	-0.114	-0.052	-0.030	0.065	-0.020	-0.360
18	30.12	18	0.0363	-0.028	0.002	0.107	-0.022	-0.014	-0.058
24	45.68	24	0.0048	0.174	-0.147	0.142	-0.079	0.109	-0.126



The ARIMA Procedure

Conditional Least Squares Estimation					
Parameter	**Estimate**	**Standard Error**	**t Value**	**Approx Pr > |t|**	**Lag**
MA1,1	0.17392	0.06525	2.67	0.0088	1
MA1,2	0.73015	0.07022	10.40	<.0001	12

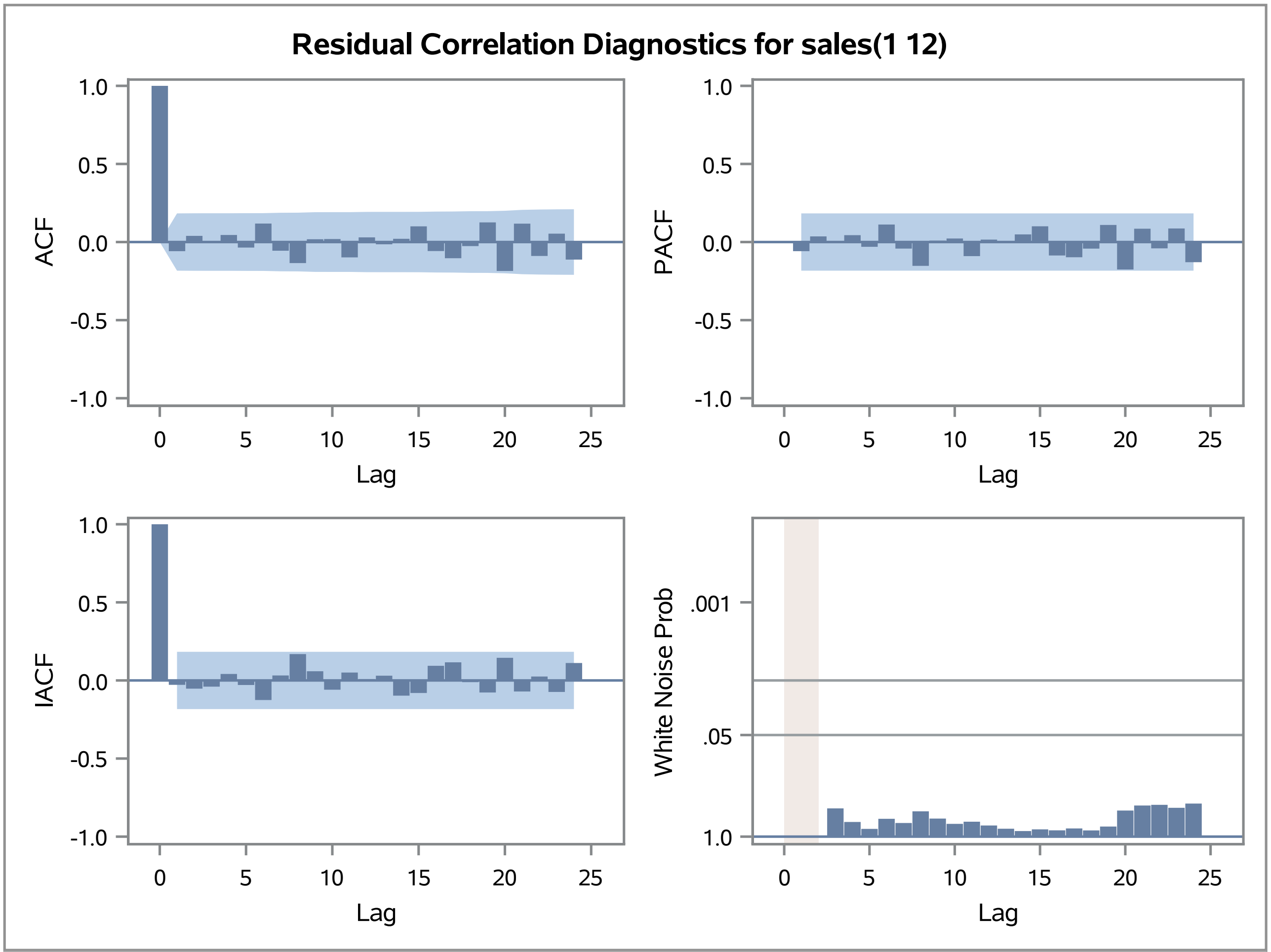
Variance Estimate	15.88194
Std Error Estimate	3.985215
AIC	668.7471
SBC	674.3053
Number of Residuals	119

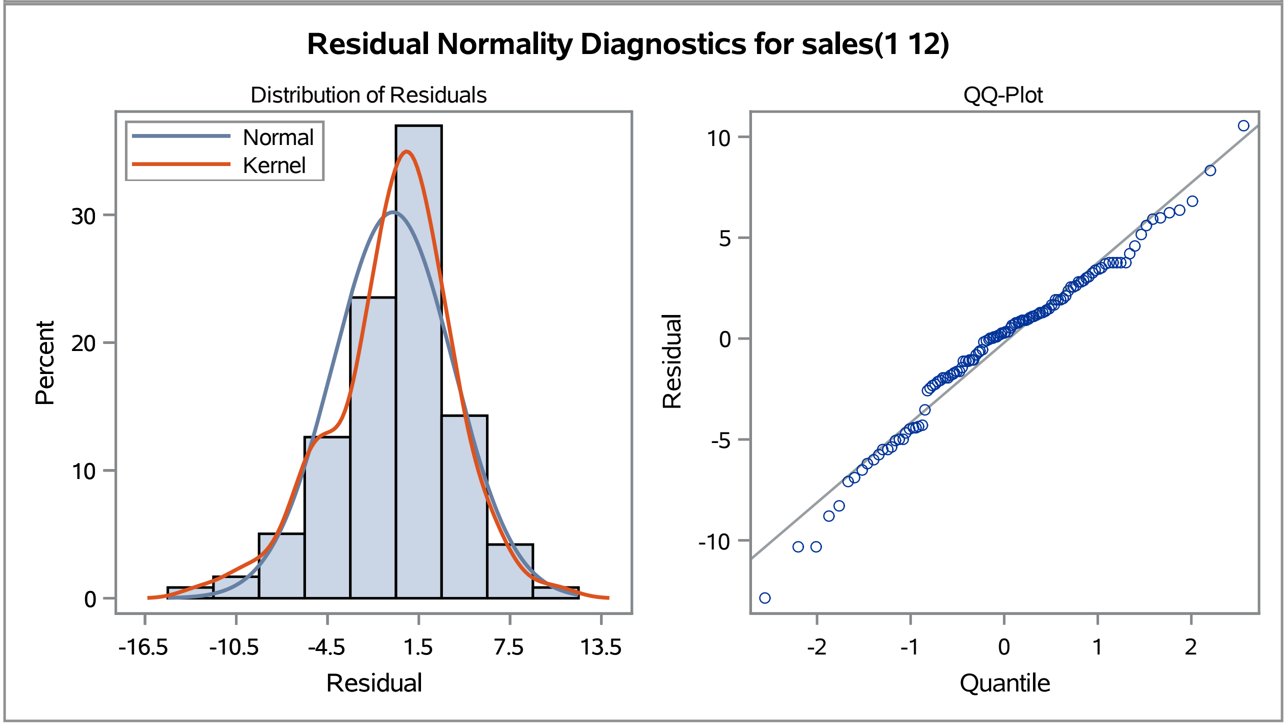
*** AIC and SBC do not include log determinant.**

Correlations of Parameter Estimates		
Parameter	**MA1,1**	**MA1,2**
MA1,1	1.000	-0.061
MA1,2	-0.061	1.000

Autocorrelation Check of Residuals									
To Lag	**Chi-Square**	**DF**	**Pr > ChiSq**	**Autocorrelations**					
6	2.84	4	0.5855	-0.056	0.042	0.000	0.047	-0.034	0.119
12	7.03	10	0.7225	-0.056	-0.134	0.020	0.022	-0.095	0.032
18	10.53	16	0.8377	-0.012	0.023	0.103	-0.054	-0.101	-0.024
24	23.21	22	0.3900	0.127	-0.183	0.120	-0.087	0.056	-0.109

The ARIMA Procedure





The ARIMA Procedure

Model for variable sales	
Period(s) of Differencing	1,12

No mean term in this model.

Moving Average Factors	
Factor 1:	1 - 0.17392 B**(1) - 0.73015 B**(12)

Name of Variable = starts	
Period(s) of Differencing	1,12
Mean of Working Series	0.168908
Standard Deviation	10.41034
Number of Observations	119
Observation(s) eliminated by differencing	13

Autocorrelation Check for White Noise									
To Lag	**Chi-Square**	**DF**	**Pr > ChiSq**	**Autocorrelations**					
6	32.90	6	<.0001	-0.466	0.196	-0.081	0.038	0.071	0.006
12	71.94	12	<.0001	-0.018	-0.109	0.212	-0.139	0.201	-0.419
18	80.86	18	<.0001	0.209	-0.017	0.055	-0.129	0.039	-0.002
24	94.33	24	<.0001	-0.070	0.155	-0.153	-0.058	0.160	-0.100

Variable sales has been differenced.

Correlation of starts and sales	
Period(s) of Differencing	1,12
Number of Observations	119
Observation(s) eliminated by differencing	13
Variance of transformed series starts	62.98702
Variance of transformed series sales	15.5198

Both series have been prewhitened.

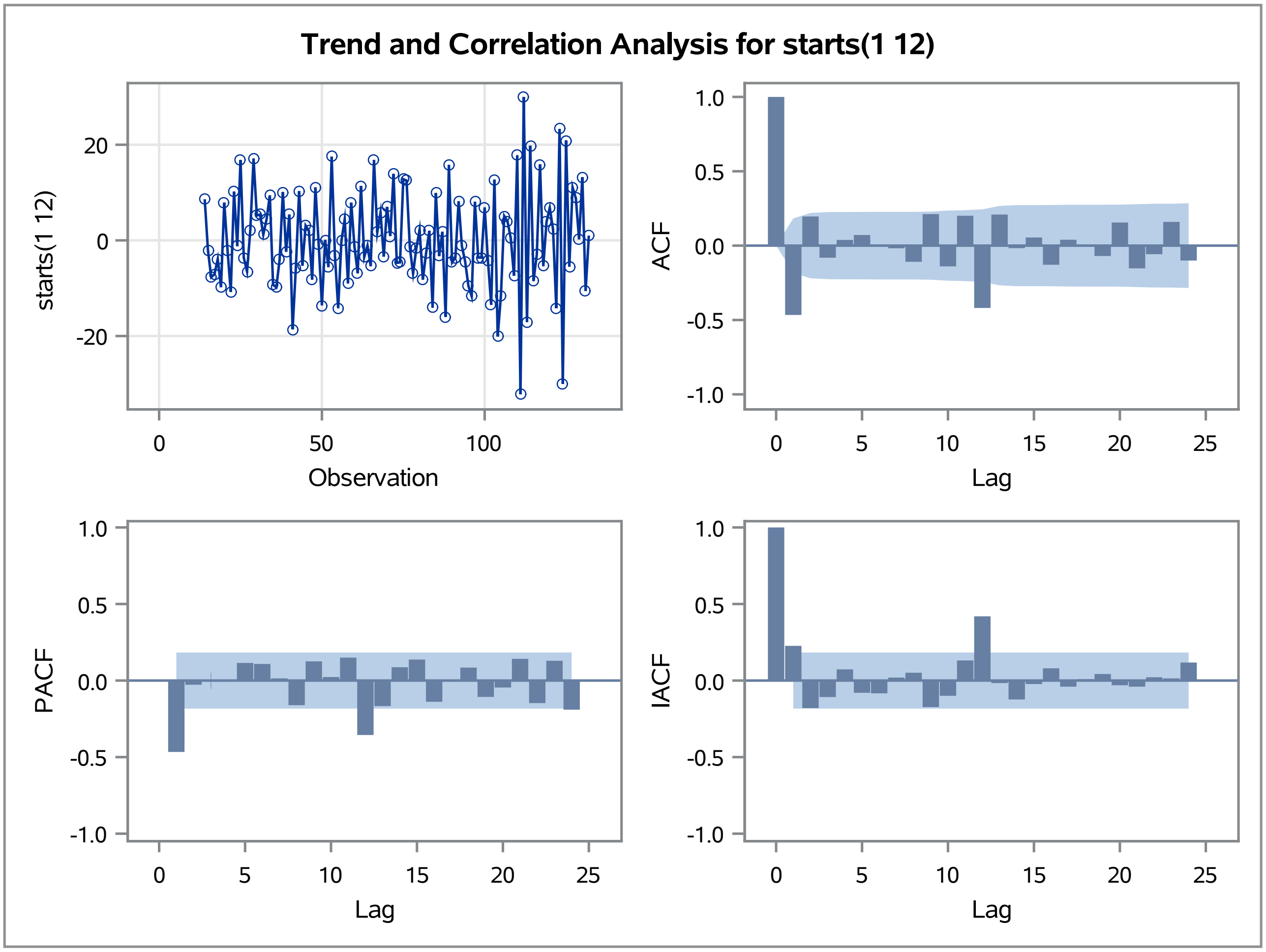
Crosscorrelation Check Between Series									
To Lag	**Chi-Square**	**DF**	**Pr > ChiSq**	**Crosscorrelations**					
5	15.34	6	0.0178	0.074	0.286	0.120	0.116	0.043	0.110
11	16.04	12	0.1894	-0.055	-0.003	-0.044	0.012	0.018	-0.022
17	20.62	18	0.2988	-0.065	-0.004	-0.021	0.054	0.123	-0.125
23	26.84	24	0.3122	0.161	-0.125	-0.045	-0.003	-0.017	-0.091

WEI House starts_sales example
Intervention for Starts
'

The ARIMA Procedure

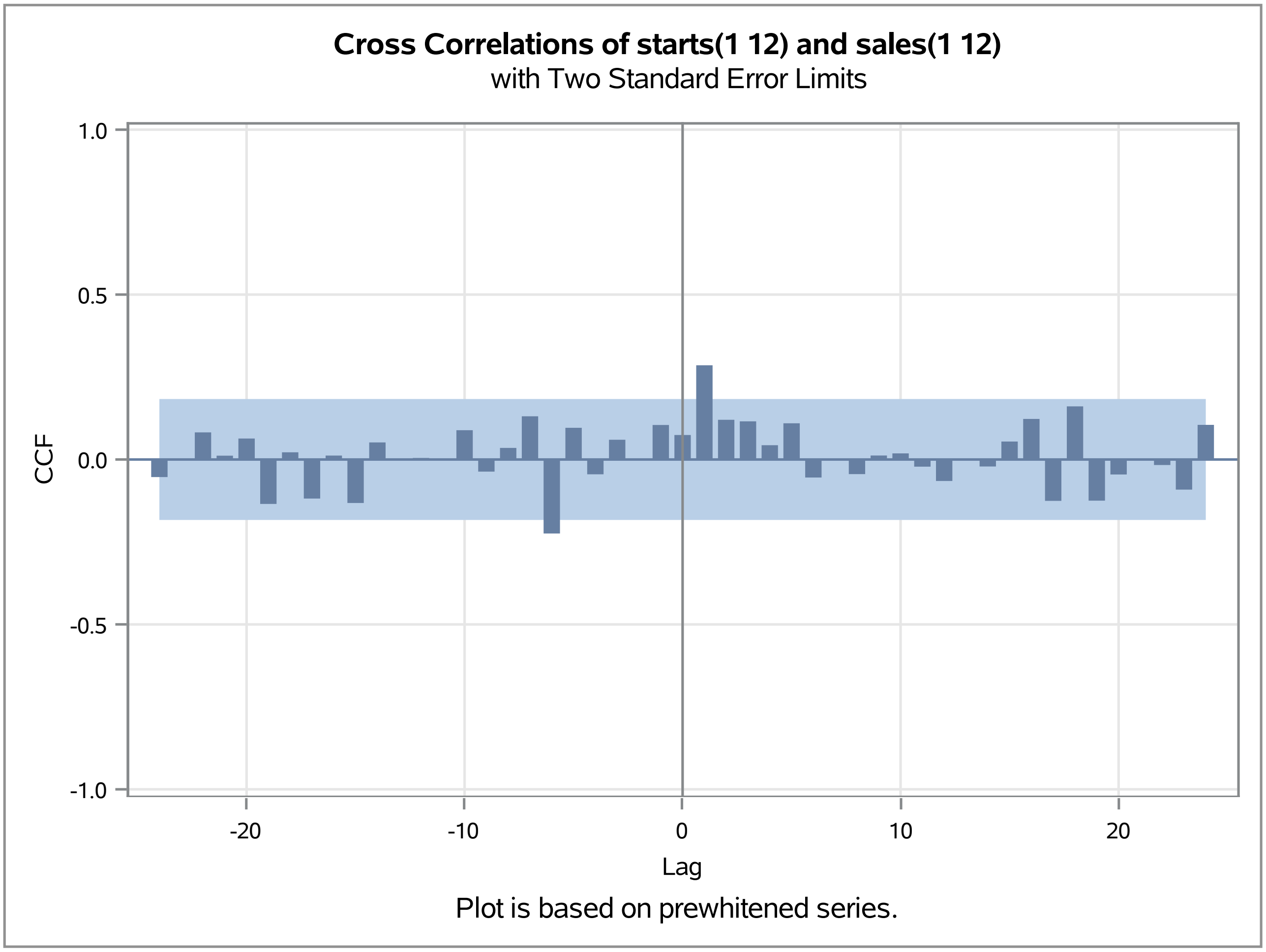
Both variables have been prewhitened by the following filter:
Prewhitening Filter

Moving Average Factors	
Factor 1:	1 - 0.17392 B**(1) - 0.73015 B**(12)



WEI House starts_sales example
Intervention for Starts

The ARIMA Procedure



Conditional Least Squares Estimation							
Parameter	**Estimate**	**Standard Error**	**t Value**	**Approx Pr > |t|**	**Lag**	**Variable**	**Shift**
MA1,1	0.75291	0.07134	10.55	<.0001	12	starts	0
AR1,1	-0.47666	0.08295	-5.75	<.0001	1	starts	0
NUM1	0.70797	0.15878	4.46	<.0001	0	sales	1

Variance Estimate	49.95394
Std Error Estimate	7.06781
AIC	799.3407
SBC	807.6527
Number of Residuals	118

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

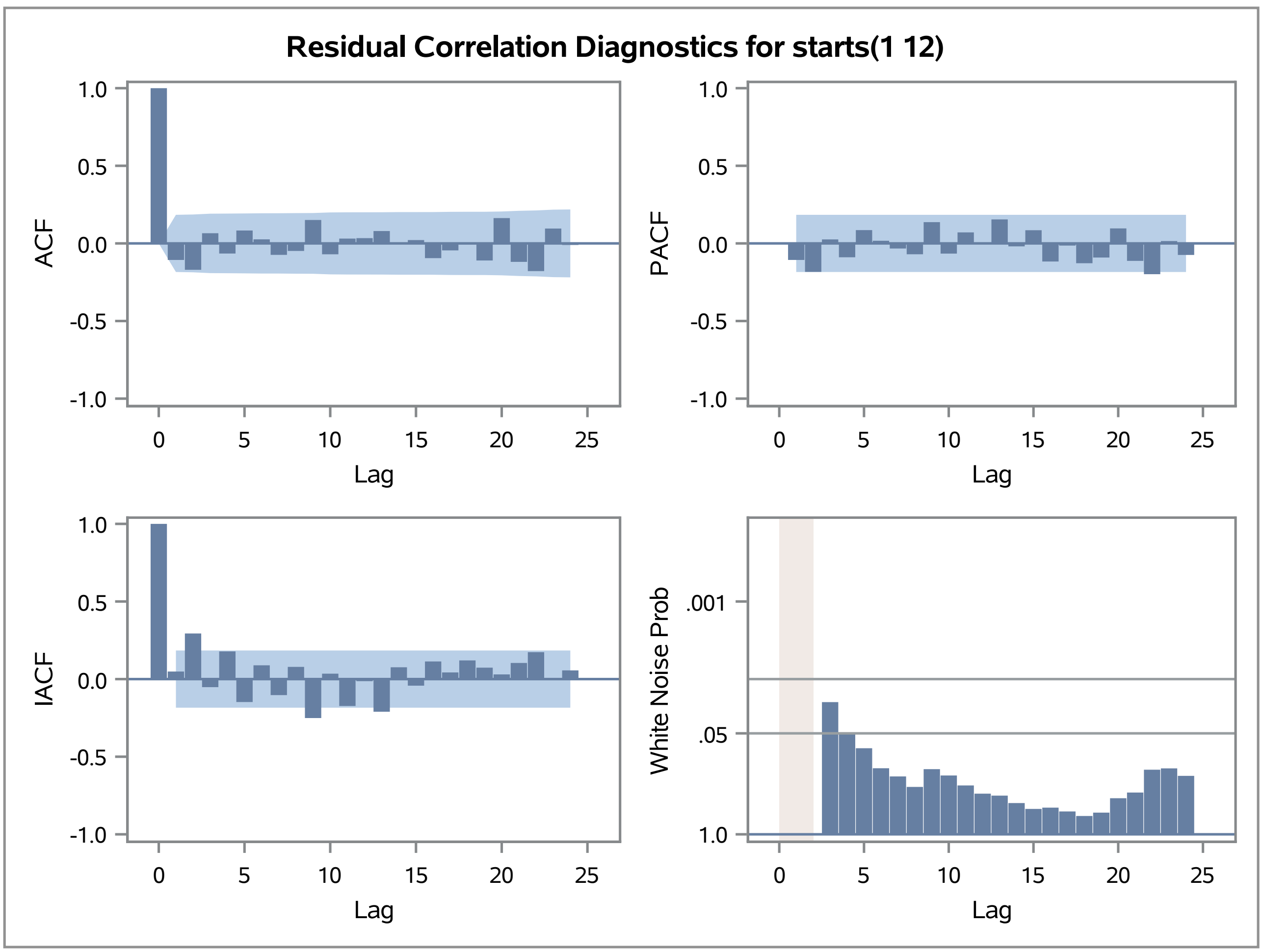
WEI House starts_sales example
Intervention for Starts

'

The ARIMA Procedure

Correlations of Parameter Estimates				
Variable	**Parameter**	**starts MA1,1**	**starts AR1,1**	**sales NUM1**
starts	**MA1,1**	1.000	0.134	0.035
starts	**AR1,1**	0.134	1.000	-0.064
sales	**NUM1**	0.035	-0.064	1.000

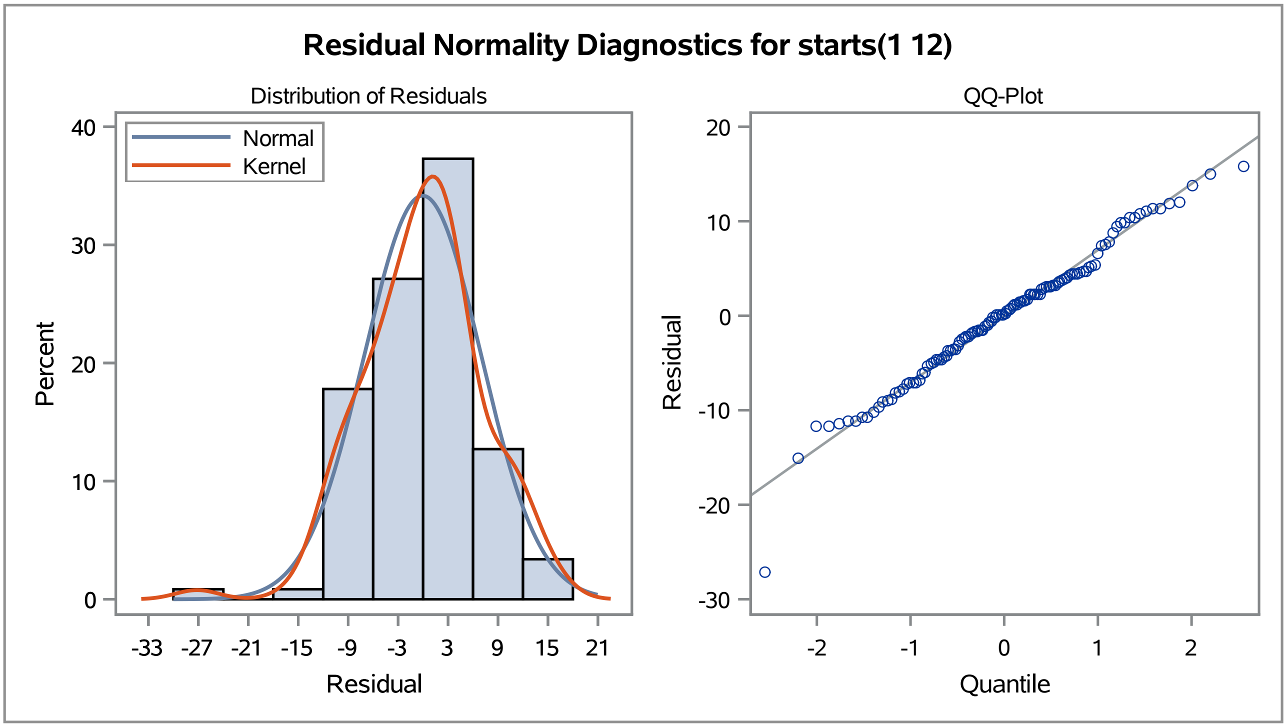
Autocorrelation Check of Residuals									
To Lag	**Chi-Square**	**DF**	**Pr > ChiSq**	**Autocorrelations**					
6	6.91	4	0.1407	-0.106	-0.170	0.065	-0.065	0.083	0.026
12	11.79	10	0.2995	-0.074	-0.049	0.151	-0.070	0.031	0.034
18	14.24	16	0.5806	0.080	-0.002	0.022	-0.095	-0.045	-0.006
24	27.97	22	0.1767	-0.110	0.163	-0.119	-0.179	0.096	-0.010



WEI House starts_sales example
Intervention for Starts

'

The ARIMA Procedure



Crosscorrelation Check of Residuals with Input sales									
To Lag	Chi-Square	DF	Pr > ChiSq	Crosscorrelations					
5	4.65	5	0.4606	-0.040	0.104	0.133	0.040	0.086	-0.025
11	6.30	11	0.8525	-0.046	-0.014	0.090	0.034	-0.015	-0.049
17	13.02	17	0.7345	-0.061	-0.045	0.029	0.085	-0.126	0.167
23	18.14	23	0.7501	-0.031	-0.125	0.069	-0.058	-0.095	0.099

Model for variable starts	
Period(s) of Differencing	1,12

No mean term in this model.

Autoregressive Factors	
Factor 1:	1 + 0.47666 B**(1)

Moving Average Factors	
Factor 1:	1 - 0.75291 B**(12)

WEI House starts_sales example
Intervention for Starts
'

The ARIMA Procedure

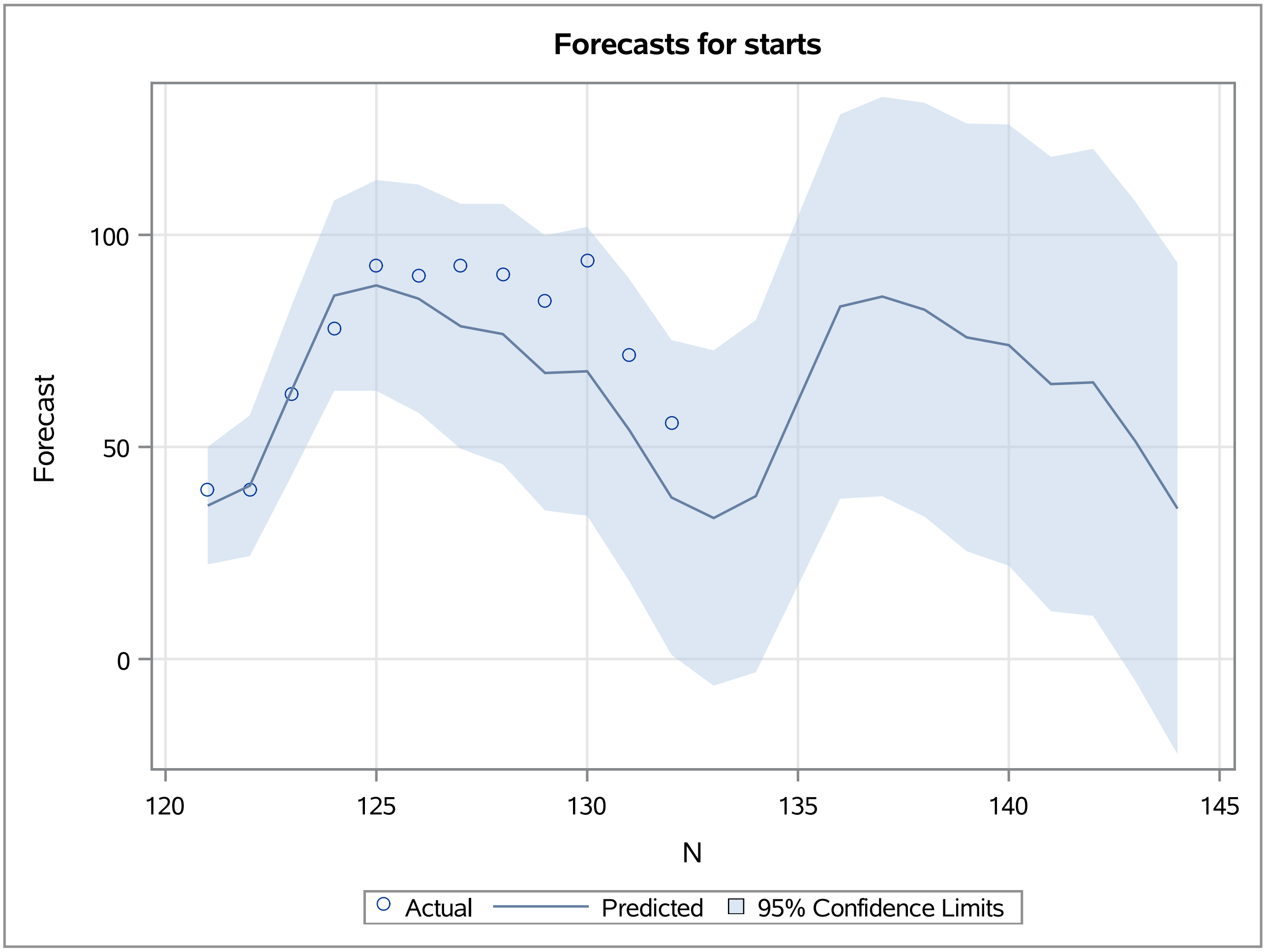
Input Number 1	
Input Variable	sales
Shift	1
Period(s) of Differencing	1,12
Overall Regression Factor	0.707966

Forecasts for variable starts						
Obs	**Forecast**	**Std Error**	**95% Confidence Limits**		**Actual**	**Residual**
121	36.1656	7.0678	22.3129	50.0182	39.8000	3.6344
122	40.8728	8.4614	24.2887	57.4569	39.9000	-0.9728
123	63.5372	10.2551	43.4375	83.6369	62.5000	-1.0372
124	85.6855	11.4545	63.2352	108.1359	77.8000	-7.8855
125	88.0824	12.6763	63.2374	112.9274	92.8000	4.7176
126	84.9659	13.7293	58.0568	111.8749	90.3000	5.3341
127	78.4513	14.7341	49.5731	107.3296	92.8000	14.3487
128	76.6163	15.6624	45.9185	107.3141	90.7000	14.0837
129	67.4369	16.5442	35.0108	99.8630	84.5000	17.0631
130	67.8331	17.3789	33.7711	101.8951	93.8000	25.9669
131	53.9664	18.1764	18.3414	89.5914	71.6000	17.6336
132	38.0898	18.9398	0.9685	75.2111	55.7000	17.6102
133	33.2416	20.1700	-6.2908	72.7741	.	.
134	38.4099	21.1868	-3.1155	79.9353	.	.
135	60.8545	22.1996	17.3441	104.3650	.	.
136	83.1076	23.1191	37.7949	128.4203	.	.
137	85.4546	24.0258	38.3648	132.5443	.	.
138	82.3618	24.8892	33.5800	131.1437	.	.
139	75.8359	25.7283	25.4094	126.2625	.	.
140	74.0063	26.5387	21.9913	126.0213	.	.
141	64.8244	27.3262	11.2660	118.3827	.	.
142	65.2218	28.0911	10.1644	120.2793	.	.
143	51.3545	28.8359	-5.1628	107.8718	.	.
144	35.4782	29.5618	-22.4620	93.4183	.	.

WEI House starts_sales example
Intervention for Starts

'

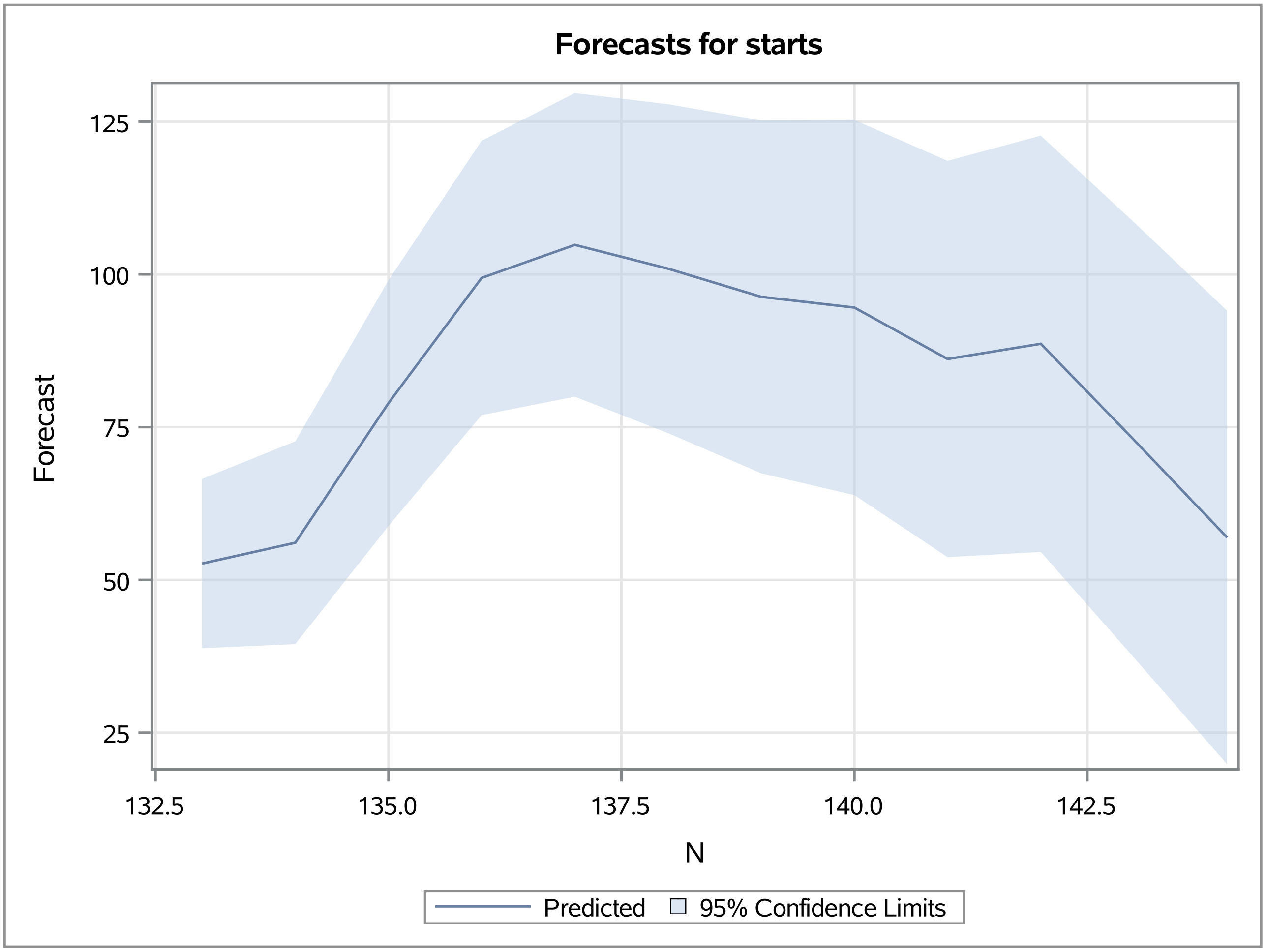
The ARIMA Procedure



Forecasts for variable starts				
Obs	Forecast	Std Error	95% Confidence Limits	
133	52.6699	7.0678	38.8172	66.5225
134	56.0797	8.4614	39.4956	72.6638
135	78.9303	10.2551	58.8306	99.0300
136	99.4243	11.4545	76.9740	121.8747
137	104.8308	12.6763	79.9858	129.6758
138	100.9362	13.7293	74.0272	127.8452
139	96.3223	14.7341	67.4440	125.2005
140	94.5733	15.6624	63.8755	125.2712
141	86.1479	16.5442	53.7218	118.5741
142	88.6408	17.3789	54.5789	122.7028
143	72.9036	18.1764	37.2786	108.5286
144	56.9247	18.9398	19.8035	94.0460

WEI House starts_sales example
Intervention for Starts
'

The ARIMA Procedure



WEI House starts_sales example

Intervention for Starts

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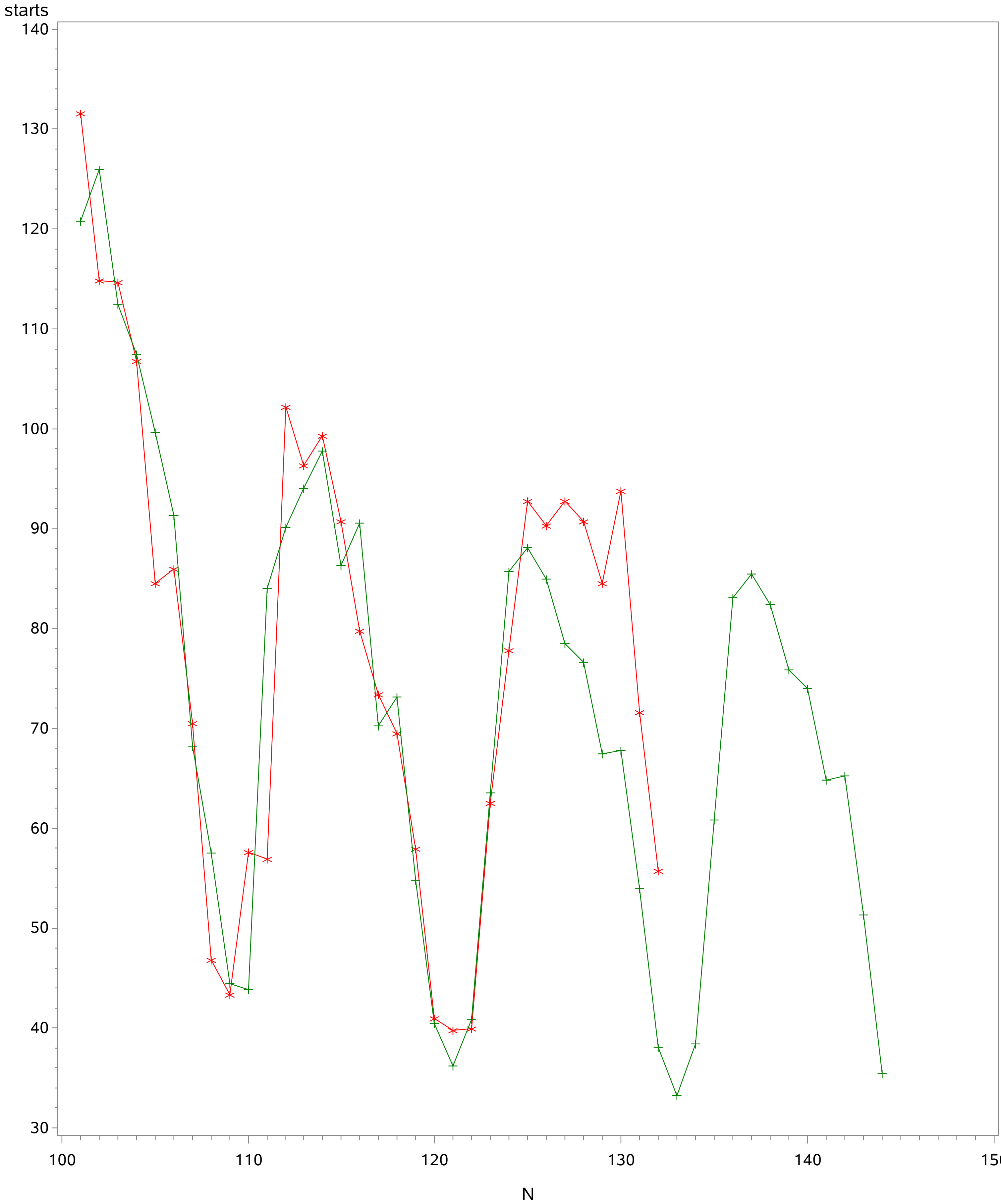

WEI House starts_sales example

Intervention for Starts

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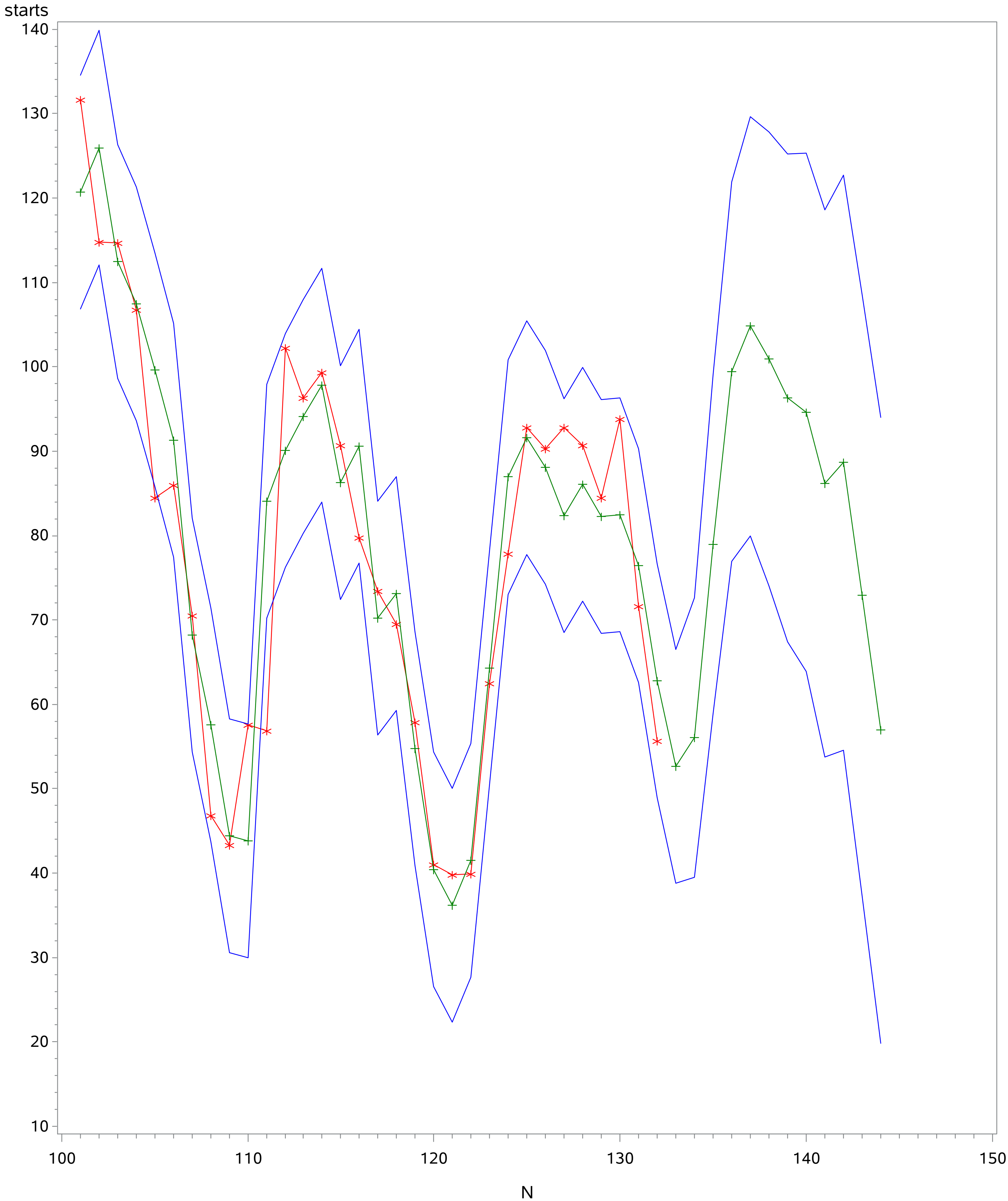

WEI House starts_sales example

Intervention for Starts

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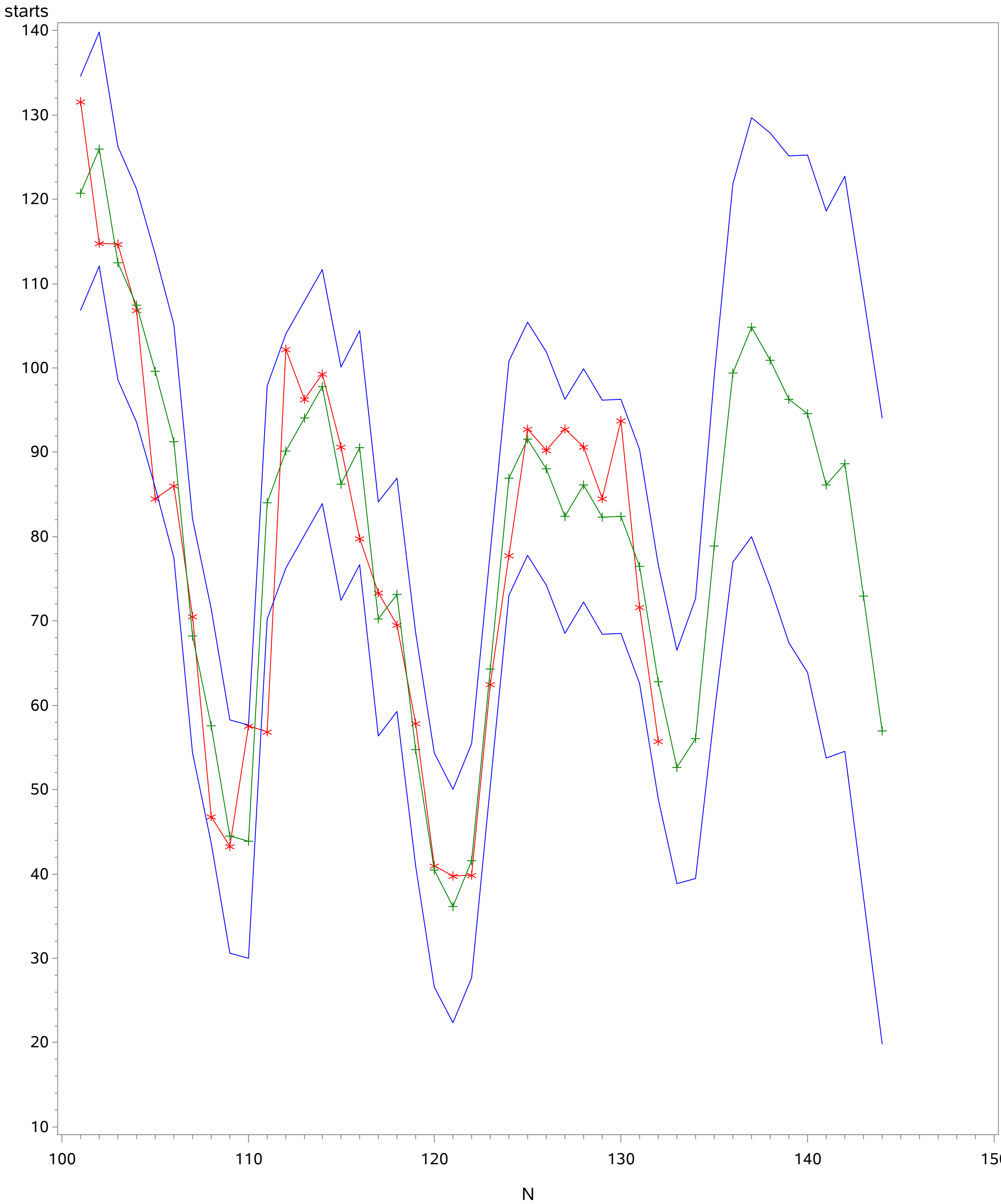

WEI House starts_sales example
Intervention for Starts