



Unemployment  
Trends

Group 4

Outline

Initial Plots

ACF & PACF

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Comparisons

Overview

Seasonal Models

Seasonally Adjusted  
Models

# US Unemployment Trends

## Initial Model Selection

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STAT 626: Time Series Analysis



# Outline

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# Second differences with and without seasonal adjustments

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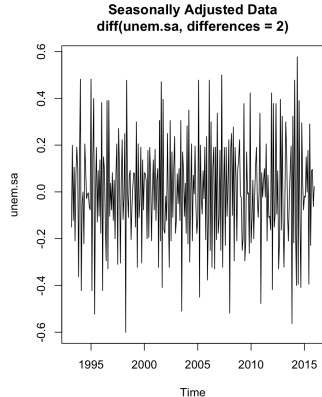
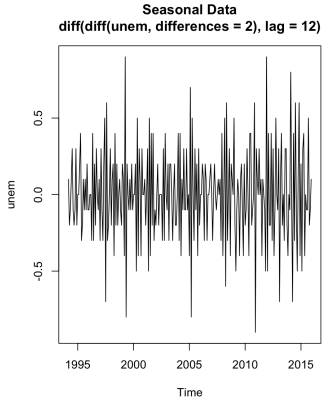
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# ACF & PACF Plots

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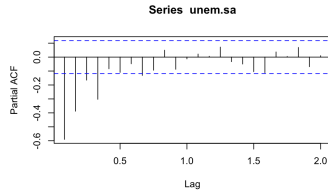
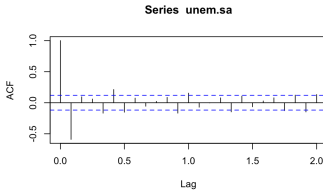
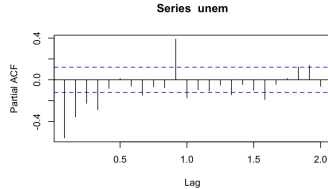
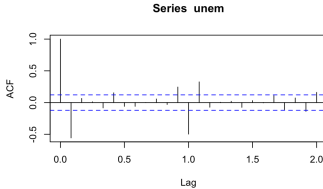
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# Models Considered

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**Table:** Model Summaries

#	Data	Order	Seasonal Order	XRegs	AIC	BIC
1	Unem	0,2,1	1,1,0	N	-2.27	-3.23
2	Unem	0,2,1	3,1,0	N	-2.44	-3.37
3	Unem	4,2,1	3,1,0	N	-2.44	-3.32
4	Unem.sa	0,2,1	1,0,0	N	-2.61	-3.58
5	Unem.sa	1,2,1		N	-2.63	-3.60
6	Unem.sa	0,2,1	1,0,0	Y	-2.58	-3.49
7	Unem.sa	1,2,1		Y	-2.60	-3.49



# Model 1: SARIMA(0, 2, 1) $\times$ (1, 1, 0)<sub>12</sub>

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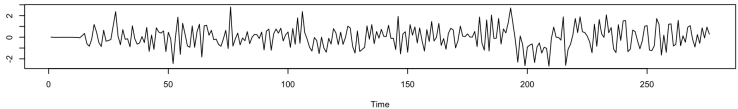
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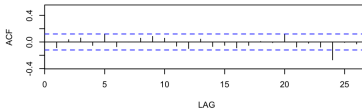
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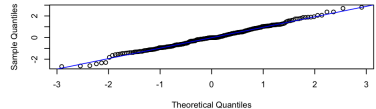
Standardized Residuals



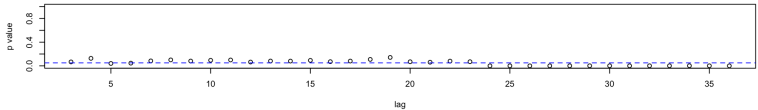
ACF of Residuals



Normal Q-Q Plot of Std Residuals



p values for Ljung-Box statistic





# Model 2: SARIMA(0, 2, 1) $\times$ (3, 1, 0)<sub>12</sub>

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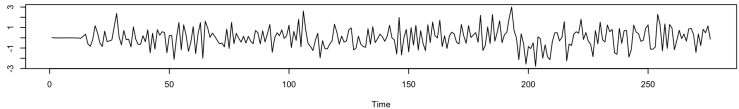
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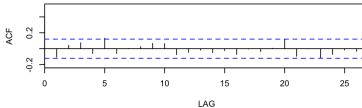
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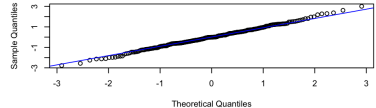
Standardized Residuals



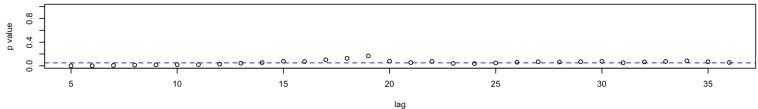
ACF of Residuals



Normal Q-Q Plot of Std Residuals



p values for Ljung-Box statistic





# Model 3: SARIMA(4, 2, 1) $\times$ (3, 1, 0)<sub>12</sub>

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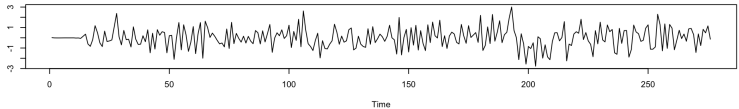
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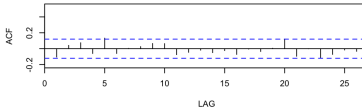
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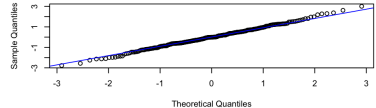
Standardized Residuals



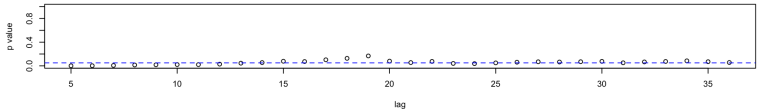
ACF of Residuals



Normal Q-Q Plot of Std Residuals



p values for Ljung-Box statistic







# Model 4: SARIMA(0, 2, 1) $\times$ (1, 0, 0)<sub>12</sub>

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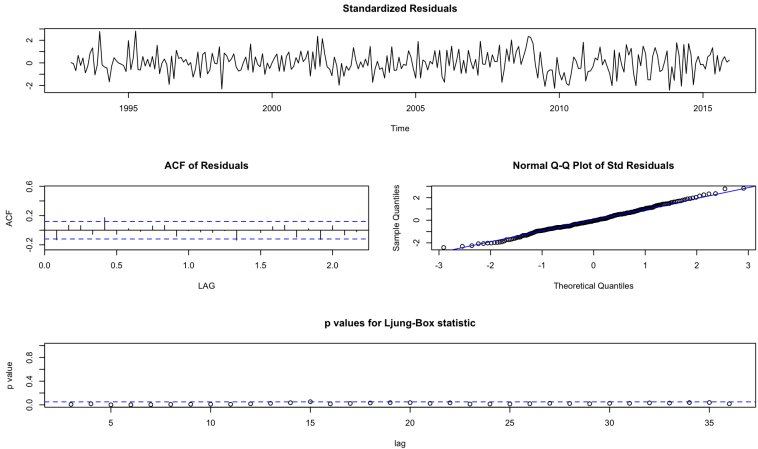
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# Model 5: ARIMA(1, 2, 1)

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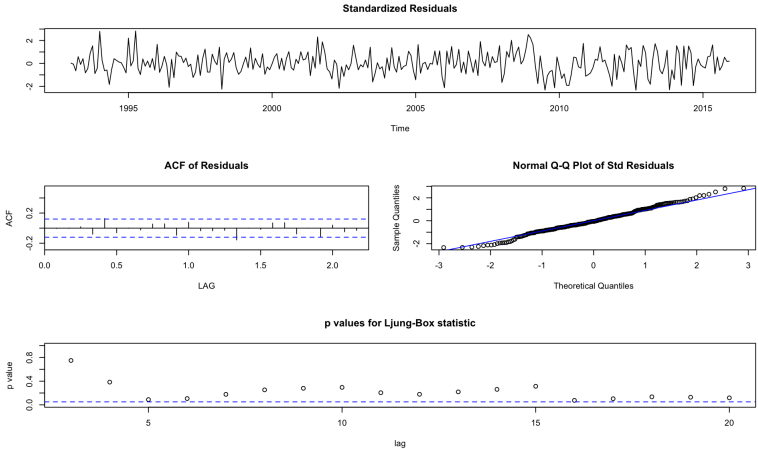
ACF & PACF

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# Model 6: SARIMA(0, 2, 1) $\times$ (1, 0, 0)<sub>12</sub> with Regressors

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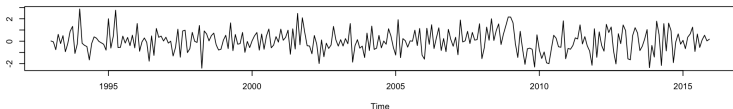
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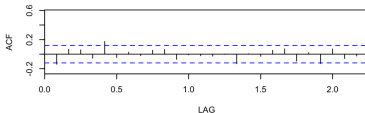
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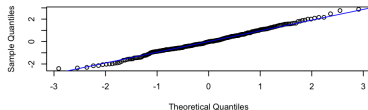
Standardized Residuals



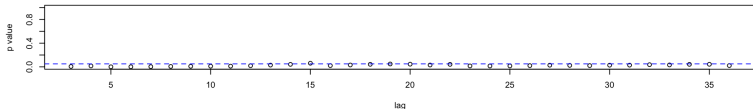
ACF of Residuals



Normal Q-Q Plot of Std Residuals



p values for Ljung-Box statistic





# Model 7: ARIMA(1, 2, 1) with Regressors

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