**Project**

**The plot of time series for the row (w14)**

**This plot has seasonality every 6 period and there is an outlier at 80 observation.**

**The plot of ACF & PACF**

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**These plot are decays exponentially each 6 period**

**The box-cox**

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**I will cut the observation 80 from the data**

**Then I will take the difference (lag=2)**

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**The ACF & PACF:**

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**Diagnosis checking**

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Modified Box-Pierce (Ljung-Box) Chi-Square statistic

Lag 12 24 36 48

Chi-Square 2.1 7.2 11.6 15.1

DF 4 16 28 40

P-Value 0.719 0.970 0.997 1.000

**Fitting model:**

Type Coef SECoef T P

MA 1 -0.3790 0.1173 -3.23 0.002

MA 2 0.5644 0.1118 5.05 0.000

MA 3 -0.0143 0.1260 -0.11 0.910

SMA 6 0.4671 0.1291 3.62 0.001

SMA 12 -1.1431 0.2570 -4.45 0.000

SMA 18 0.3666 0.2223 1.65 0.103

SMA 24 -0.6799 0.2700 -2.52 0.014

Constant -25.4 590.7 -0.04 0.966

Mean -25.4 590.7

**The equations:**

ARIMA(0,0,3) where $=z\_{t}z\_{t-2}$

MA(3)

$w\_{t}$**=(1-**$θ\_{1}B^{1}$**-**$θ\_{2}B^{2}$**-**$θ\_{3}B^{3}$**)**$a\_{t}$

$w\_{t}$**=(1+**$0.3790B^{1}$**-**$0.5644 B^{2}$**+**$0.0143 B^{3}$**)**$a\_{t}$

And seasonal ARIMA(0,0,4) with period 6

MA(4) seasonal with period 6

$w\_{t}$**=(1-**$θ\_{1}B^{1}$**-**$θ\_{2}B^{2}$**-**$θ\_{3}B^{3}$**-**$θ\_{4}B^{4}$**)**$a\_{t}$

$w\_{t}$**=(1-**$0.4671 B^{1}$**+**$1.1431B^{2}$**-**$0.3666B^{3}$**+**$0.6799B^{4}$**)**$a\_{t}$

ARIMA(0,0,3)\*$(0,0,4)\_{6}$:

$w\_{t}$**=(1+**$0.3790B^{1}$**-**$0.5644 B^{2}$**+**$0.0143 B^{3}$**)(1-**$0.4671B^{s1}$**+**$1.1431B^{s2}$**-**$0.3666B^{s3}$**+**$0.6799B^{s4}$**)**$a\_{t}$

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