SARIMA processes

Quiz, 5 questions

5/5 points (100.00%)

Congratulations! You passed!

Next Item

1 / 1 points

1.
Find the order of the following SARIMA process with the span of the seasonality $S = 12$.

$(1 + 0.1B - 0.2B^2)(1 + 0.25B^{12})X_t = (1 - 0.3B)(1 + 0.5B^{12})Z_t$

- [ ] SARIMA$(2, 0, 1, 12, 0, 12)_{12}$.

Un-selected is correct

- [x] SARIMA$(14, 0, 13, 0, 0, 0)_1$

Correct
Correct!

The total number of parameters in this model is 27+1=28. In modeling, we prefer the simplest possible model to avoid overfitting. Including the span of the seasonality of 12 would give us a simpler model.

- [x] SARIMA$(2, 0, 1, 1, 0, 1)_{12}$.

Correct
Correct!

There is no differencing in the process, thus $d = 0$ and $D = 0$. AR polynomial gives $p = 2$, and seasonal AR polynomial with degree $12 * 1$ gives $P = 1$.

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1 / 1 points

2.
Find the order of the following SARIMA process with the span of the seasonality $S = 12$.

$(1 + 0.1B)(1 + 0.25B^{12} - 0.7B^{24})(1 - B)(1 - B^{12})X_t = Z_t$

- [x] SARIMA$(38, 0, 0, 0, 0, 0)_1$.

Correct

Correct!

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Probably useless, but correct. If we expand the polynomial $(1+0.1B)(1+0.25B^{12}-0.7B^{48})(1-B)(1-B^{12})$, we obtain an AR polynomial with a degree of 38.

- [ ] SARIMA$(1,1,0,2,1,1)_{12}$

Un-selected is correct

- [ ] SARIMA$(2,1,0,1,1,0)_{12}$.

Un-selected is correct

- [x] SARIMA$(1,1,0,2,1,0)_{12}$.

Correct

Correct!

Seasonal AR polynomial has a degree of $24 = 2 * 12$ which gives us $P = 2$.

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1 / 1 points

3.

Let X_t be the process SARIMA$(0,0,2,0,0,1)_{12}$ with MA coefficients $0.2, 0.3$, seasonal MA coefficient 0.5 and $\sigma_Z^2 = 1$. Which of the following equation(s) govern X_t?

- [x] $X_t = (1+0.2B+0.3B^2)(1+0.5B^{12})Z_t$.

Correct

- [x] $X_t = (1+0.2B+0.3B^2+0.5B^{12}+0.1B^{13}+0.15B^{14})Z_t$.

Correct

- [ ] $X_t = -0.2X_{t-1}-0.3X_{t-2}-0.5X_{t-12}-0.1X_{t-13}-0.15X_{t-14}+Z_t$.

Un-selected is correct

- [x] $X_t = Z_t+0.2Z_{t-1}+0.3Z_{t-2}+0.5Z_{t-12}+0.1Z_{t-13}+0.15Z_{t-14}$.

Correct

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1 / 1 points

4.
Continuation of Question 3.

Let X_t be the process SARIMA$(0,0,2,0,0,1)_{12}$ with MA coefficients $0.2, 0.3$, seasonal MA coefficient 0.5 and $\sigma_Z^2 = 1$. Find $\rho(3)$?

- [ ] 0.2134

Un-selected is correct

- [ ] 1

Un-selected is correct

- [x] 0

Correct
Correct!

1 / 1 points

5.
Continuation of Question 3.

Let X_t be the process SARIMA$(0,0,2,0,0,1)_{12}$ with MA coefficients $0.2, 0.3$, seasonal MA coefficient 0.5 and $\sigma_Z^2 = 1$. Find $\lambda(10)$.

- (•) 0.15

Correct
Correct!

Z_{t-12} is common term with coefficinest 0.3 and 0.5 for both equatoins of X_t and X_{t-10}.

- ( ) 0.3
- ( ) 0

SARIMA processes

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