'USAccDeaths' dataset

Тест, 8 вопроса

1
Баллы

1.
This Quiz has several Questions all of which are related and steps towards modeling the time series titled 'USAccDeaths' in 'dataset' package in R.

Plot the time series titled 'USAccDeaths' in the code block below.

```
1  data <- USAccDeaths
2  plot(data)
3
```

Выполнить

Сбросить

Which of the followings are plausible?

- [x] It is a monthly time series with a span of seasonality 12.
- [ ] Peaks in the series happen every winter around February.
- [x] Time series is not stationary since there is a seasonal trend.
- [ ] There is a clear upward trend.

1
Балл

'USAccDeaths' dataset

Тест, 8 вопроса

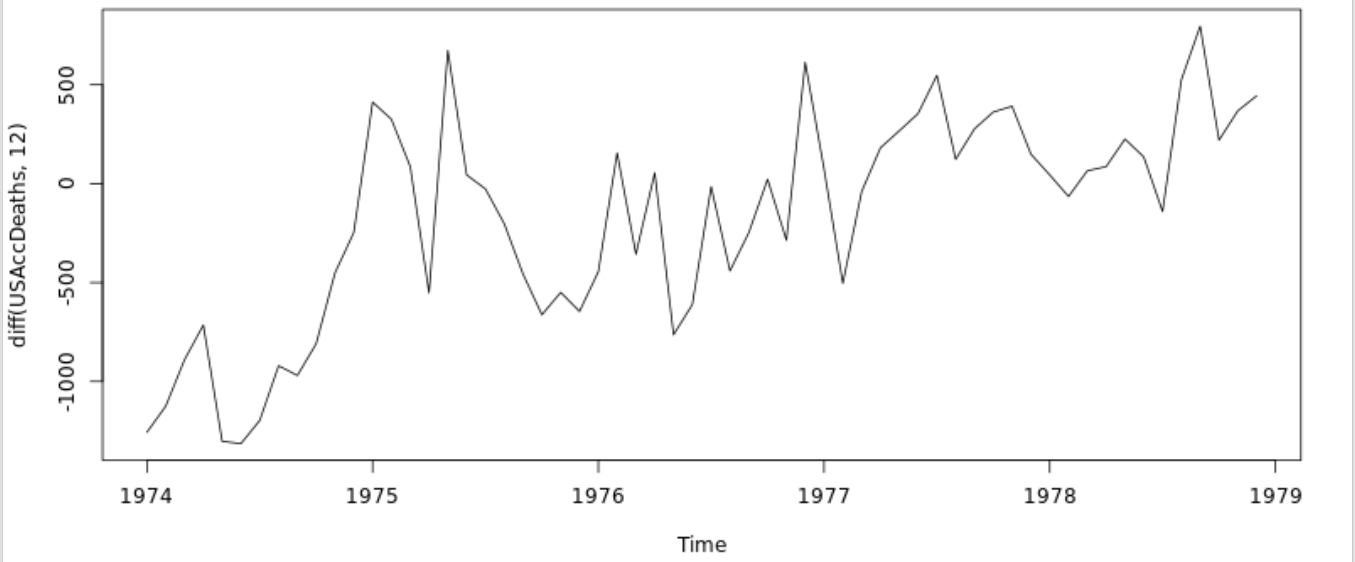
2.

We first get rid of the seasonal trend by differencing the values at the same month of each year. Plot the seasonally differenced time series in the code block below.

```
1  plot(diff(USAccDeaths, 12))
```

Выполнить

Сбросить



What can be said about the plot?

- [ ] The seasonally differenced time series is stationary.
- [x] There is a clear upward trend.

1
Баллы

3.

'USAccDeaths' dataset

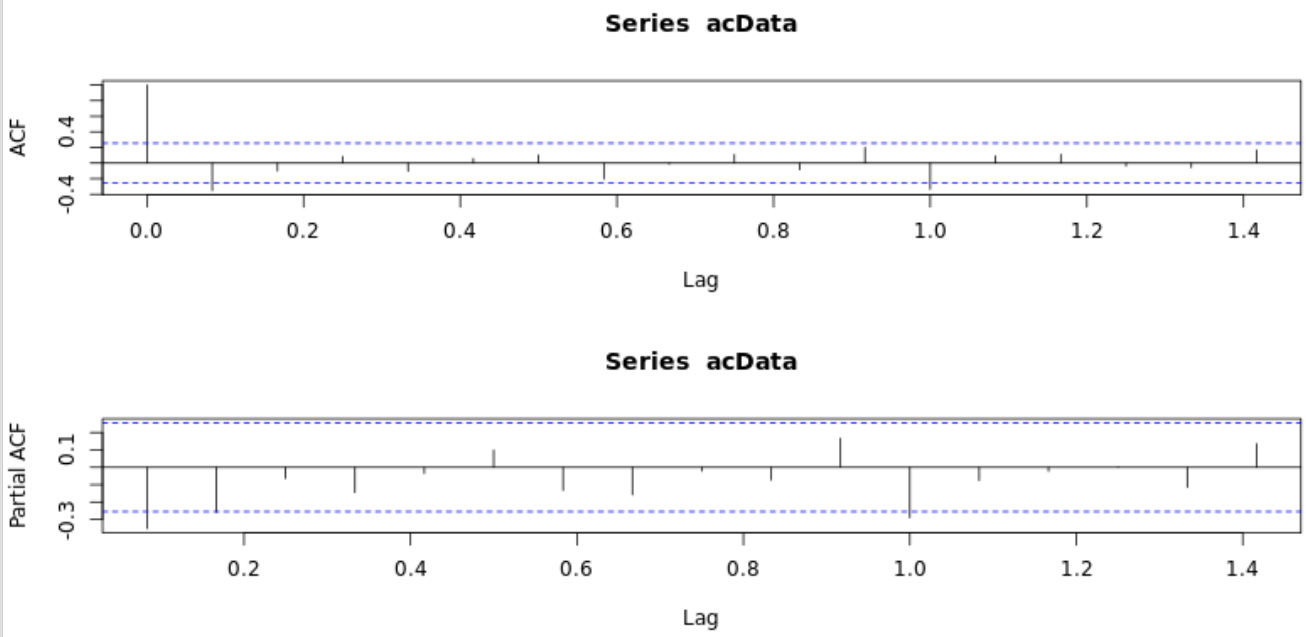
We de-trend the seasonally differenced time series by taking non-seasonal differencing, diff(), and call the obtained time series 'acData'. Obtain ACF and PACF of 'acData' in the code block below.

Тест, 8 вопроса

```
1  par(mfrow=c(2,1))
2
3  # obtain acf and pacf below
4  acData <- diff(diff(USAccDeaths, 12))
5  acf(acData)
6  pacf(acData)
7
```

Выполнить

Сбросить



What do they suggest about the order of AR and seasonal AR terms?

- [x] Significant adjacent lags in PACF suggest the order of AR terms, $p \leq 2$.
- [ ] The significant autocorrelation coefficient at lag 12 suggests the order of seasonal AR term, $P \leq 1$.
- [x] The significant partial autocorrelation coefficient at lag 12 suggests the order of seasonal AR term, $P \leq 1$.
- [ ] Significant adjacent lags in ACF suggest the order of AR terms, $p \leq 1$.

1 Баллы

4.

Obtain ACF and PACF of 'acData' in the code block below.

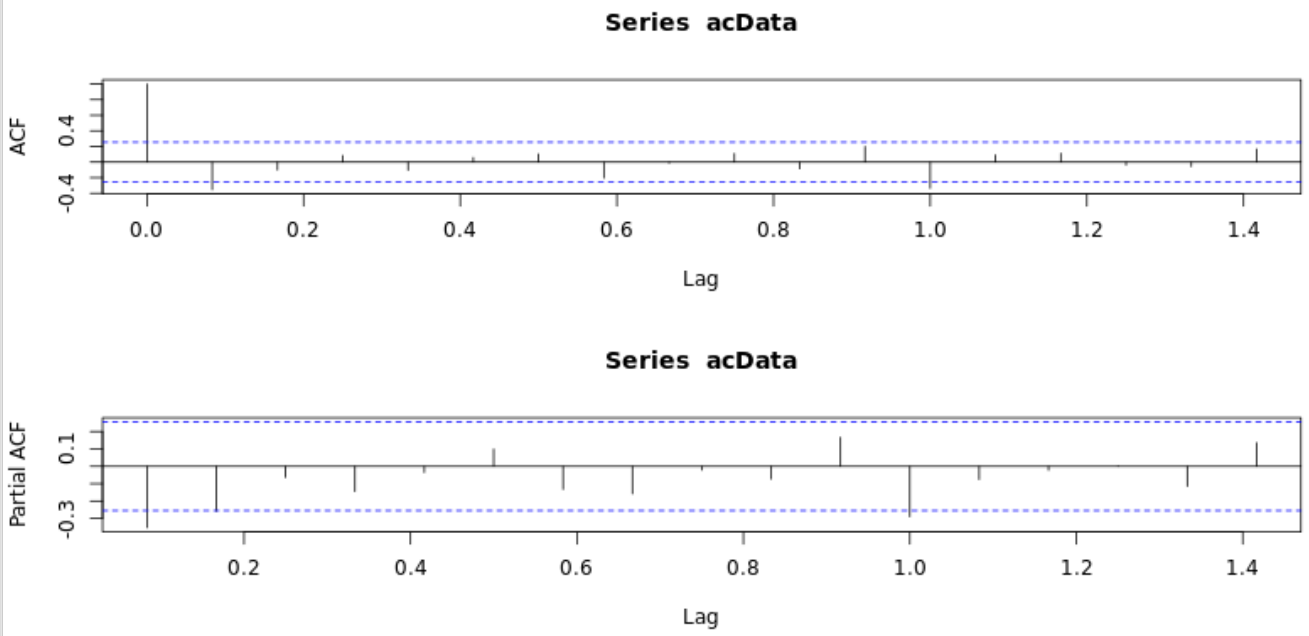
'USAccDeaths' dataset

Тест, 8 вопросов

```
1  par(mfrow=c(2,1))
2
3  # obtain acf and pacf below
4  acData <- diff(diff(USAccDeaths, 12))
5  acf(acData)
6  pacf(acData)
7
```

Выполнить

Сбросить



What do they suggest about the order of MA and seasonal MA terms?

- [ ] Significant adjacent lags in PACF suggest the order of MA terms, $q \leq 2$.
- [x] The significant autocorrelation coefficient at lag 12 suggests the order of seasonal MA term, $Q \leq 1$.
- [ ] The significant partial autocorrelation coefficient at lag 12 suggests the order of seasonal MA term, $Q \leq 1$.
- [x] Significant adjacent lags in ACF suggest the order of MA terms, $q \leq 1$.

1 Баллы

5.

We try few different models, and choose the model with smallest AIC: SARIMA$(0,1,1,0,1,1)_{12}$. If X_t=USAccDeaths, which of the followings is/are the fitted model?

- [ ] $(1-0.4303B)(1-0.5528B^{12})X_t = (1-B)(1-B^{12})Z_t$ where $\sigma_Z^2 = 99347$.
- [x] $X_t = X_{t-1} + X_{t-12} - X_{t-13} + Z_t - 0.4303Z_{t-1} - 0.5528Z_{t-12} + 0.2379Z_{t-13}$ where $\sigma_Z^2 = 99347$.
- [ ] $X_t = 0.4303X_{t-1} + 0.5528X_{t-12} - 0.2379X_{t-13} + Z_t - Z_{t-1} - Z_{t-12} + Z_{t-13}$ where $\sigma_Z^2 = 99347$.

$(1-B)(1-B^{12})X_t = (1-0.4303B)(1-0.5528B^{12})Z_t$ where $\sigma_Z^2 = 99347$.

'USAccDeaths' dataset

Тест, 8 вопроса

1 Баллы

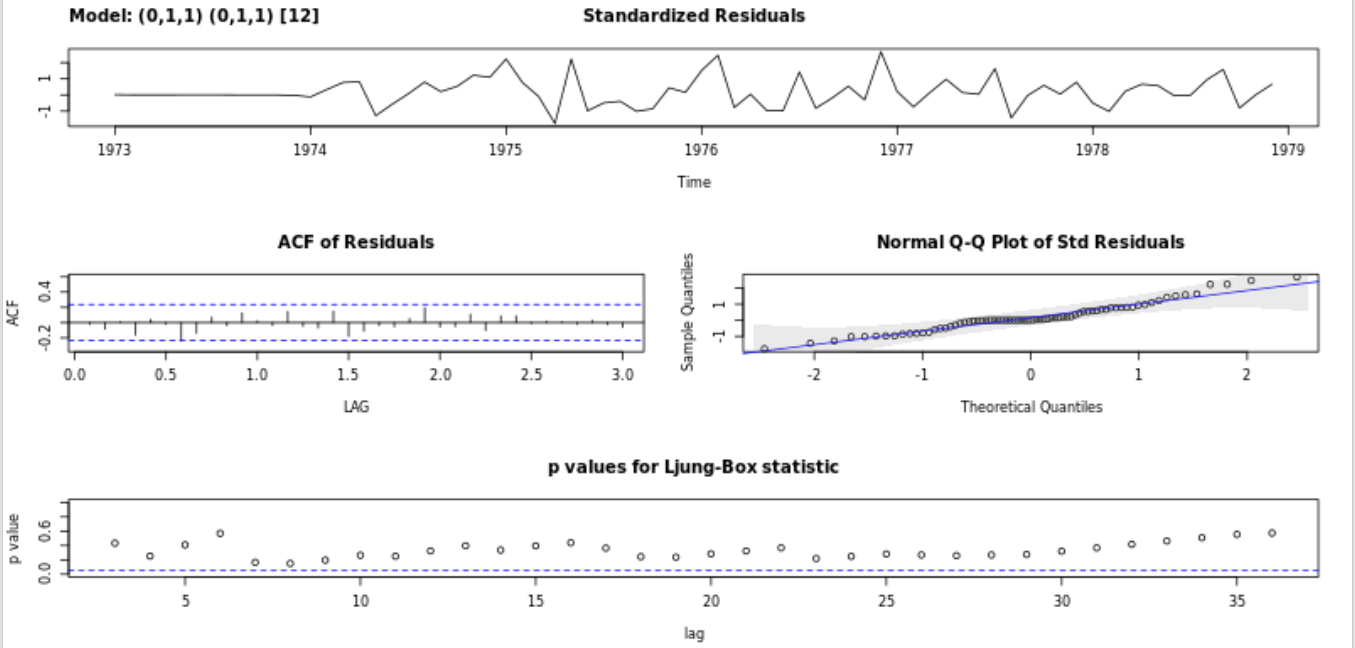
6.

We carry residual analysis by using sarima() routine from 'astsa' package.

```
1  library(astsa)
2
3  sarima(USAccDeaths, 0,1,1,0,1,1,12)
```

Выполнить

Сбросить



What can be said about the residuals?

- [x] p-values from Ljung-Box test are high meaning that there is no significant autocorrelation left in the residuals.
- [x] There is a systematic departure from linearity in QQ-plot which implies that residuals have a heavier tail compared to the Gaussian distribution.
- [ ] There is a strong evidence against the whiteness of the residuals.
- [ ] ACF shows no significant autocorrelation in the residuals.

1 Баллы

7.

Obtain the p-values of the coefficients in the fitted model in the code block below.

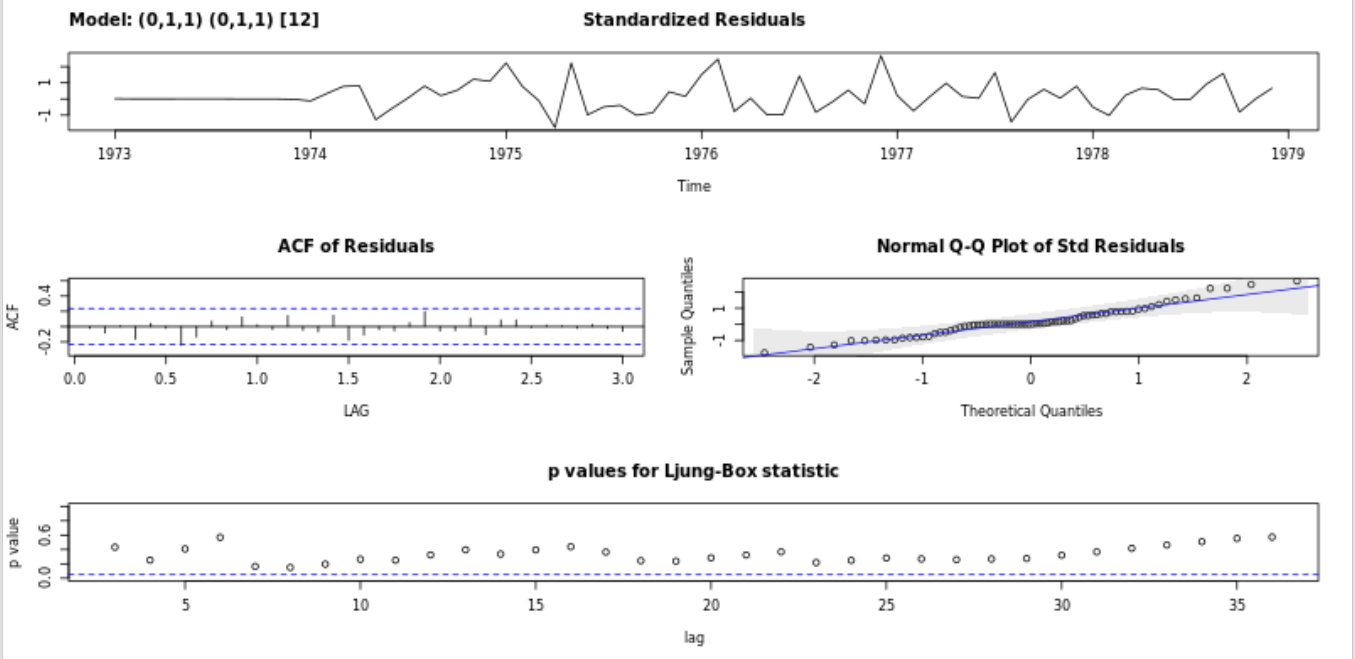
'USAccDeaths' dataset

Тест, 8 вопросов

```
1 library(astsa)
2
3 model<-sarima(USAccDeaths, 0,1,1,0,1,1,12)
4 model$ttable
5
```

Выполнить

Сбросить



What do they mean?

- (●) p-values are 0.0008 and 0.0028 for MA and seasonal MA coefficients, respectively. The fact that they are both less than any reasonable significant level, both coefficients (terms) are significant.
- ( ) p-values are 0.1228 and 0.1784 for MA and seasonal MA coefficients, respectively. The fact that they are both higher than any reasonable significant level, none of the coefficients (terms) are significant.

1 Баллы

8.

'USAccDeaths' dataset

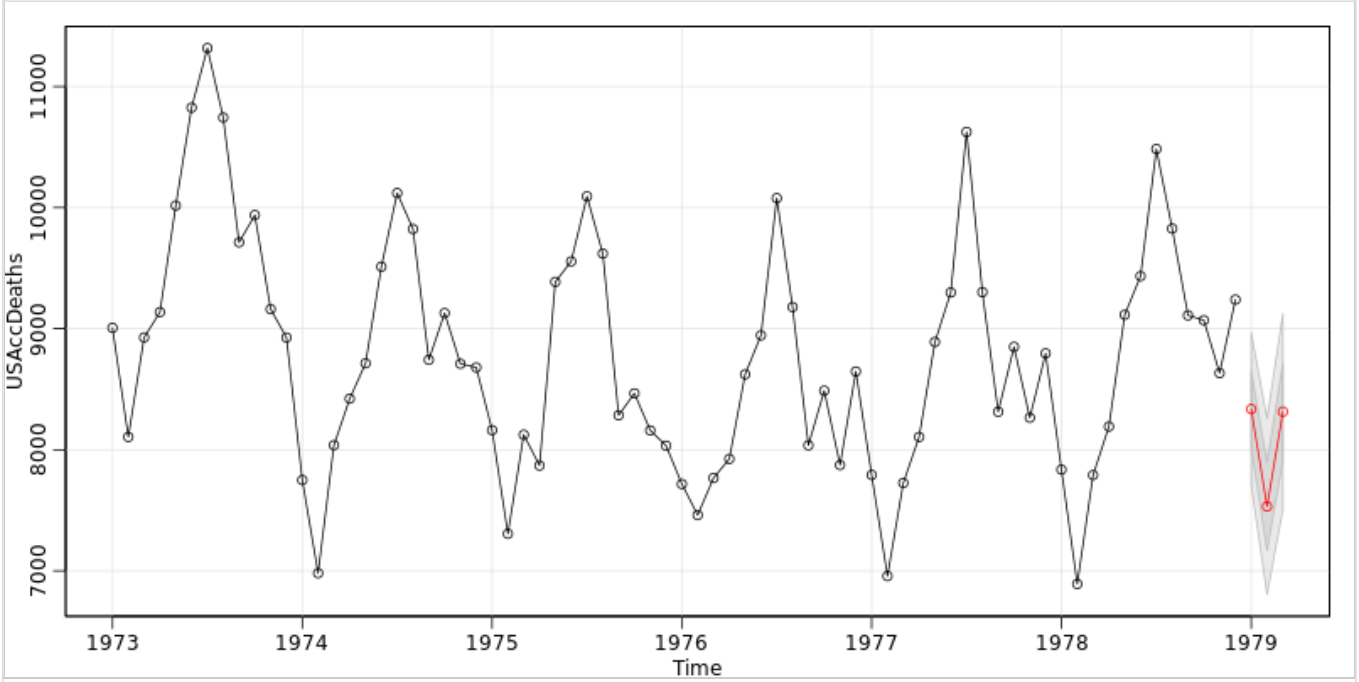
Use sarima.for() routine in the code block below to obtain the point forecast for the number of accidental deaths in the March of 1979. The answer is rounded.

Тест, 8 вопроса

```
1  library(astsa)
2
3  ### Write the arguments of the routine below
4  sarima.for(USAccDeaths, 3, 0,1,1,0,1,1,12)
```

Выполнить

Сбросить



- (●) 8315
- ( ) 7791
- ( ) 7532
- ( ) 8336

☐ Я понимаю, что отправка работы, выполненной не мной, может привести к тому, что курс не будет засчитан, а аккаунт Coursera заблокирован.

Узнайте больше о Кодексе чести Coursera

Введите Ф. И. О. (как в удостоверении личн

Submit Quiz

'USAccDeaths' dataset

Тест, 8 вопроса