'LakeHuron' dataset

Тест, 10 вопроса

1
Баллы

1.

This Quiz has questions that are related steps to model a time series titled 'LakeHuron' in 'datasets' package in R.

In the following code, we look at the dataset:

```
1  LakeHuron
2  plot(LakeHuron)
```

Выполнить

Сбросить

Which one of the following is plausible?

- There is an upward trend in the time series.
- There is a downward trend in the time series.
- There is no trend at all in the time series.

1
Баллы

2.

'LakeHuron' dataset

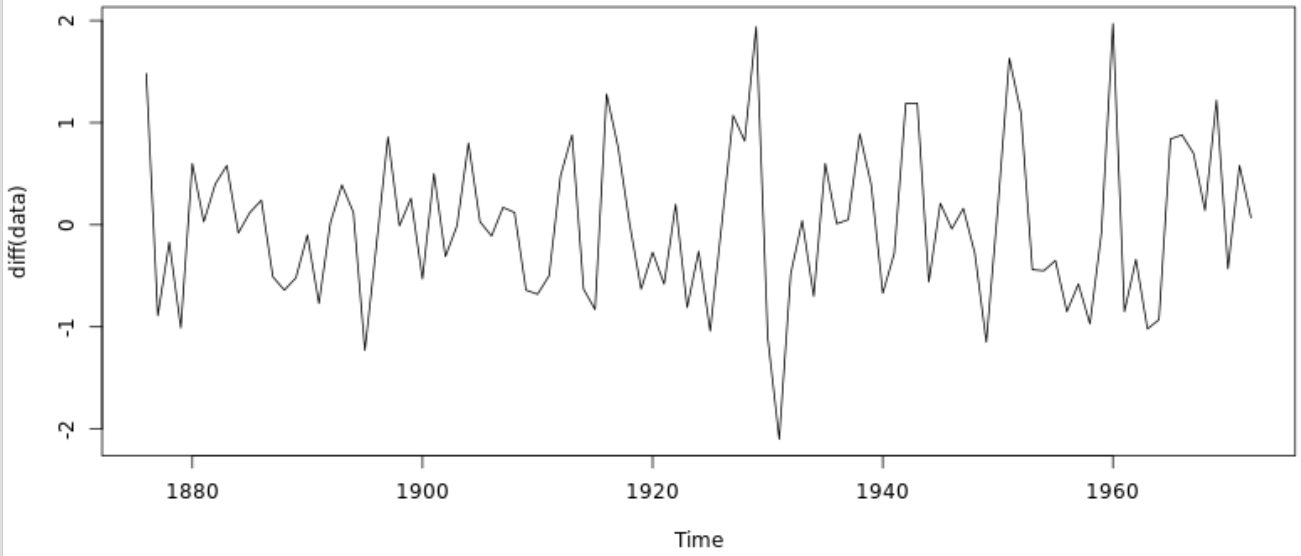
Тест, 10 вопроса

How one can remove the trend (i.e. de-trend) the time series 'LakeHuron' in R? You can use the code block below to check your answer.

```
1  data<- LakeHuron
2  plot(diff(data)) # Edit this line
```

Выполнить

Сбросить



- diff(data)
- detrend(data)
- demean(data)

1 Баллы

3.

Find the PACF of the differenced time series in a code block below.

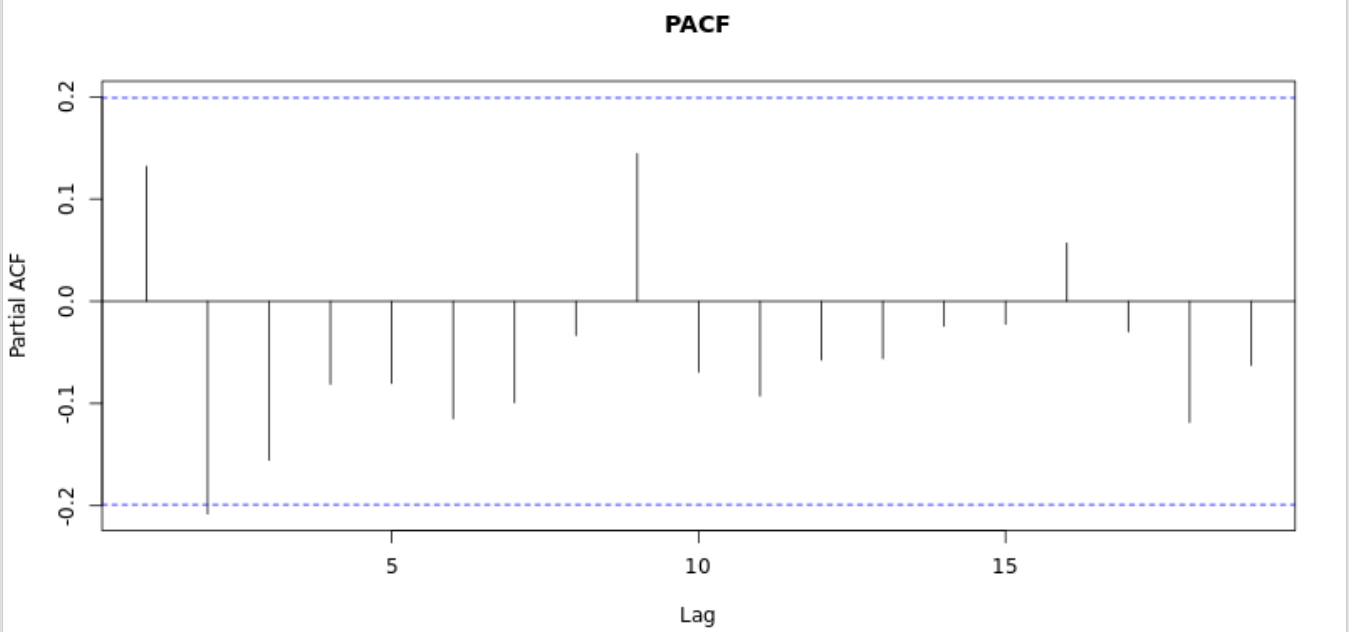
'LakeHuron' dataset

Тест, 10 вопросов

```
pacf(diff(LakeHuron), main='PACF')
```

Выполнить

Сбросить



Which lags are significant?

- None
- lag 2 and lag 20
- lag 2

1 Баллы

4.

If we ignore the significant partial autocorrelation coefficient at a higher lag, what would significant partial autocorrelation coefficient at a lower lag suggests?

- It suggests that AR(20) model might be suitable for this time series.
- It suggests that MA(2) model might be suitable for this time series.

'LakeHuron' dataset

Тест, 10 вопроса

- It suggests that AR(2) model might be suitable for this time series.

1 Баллы

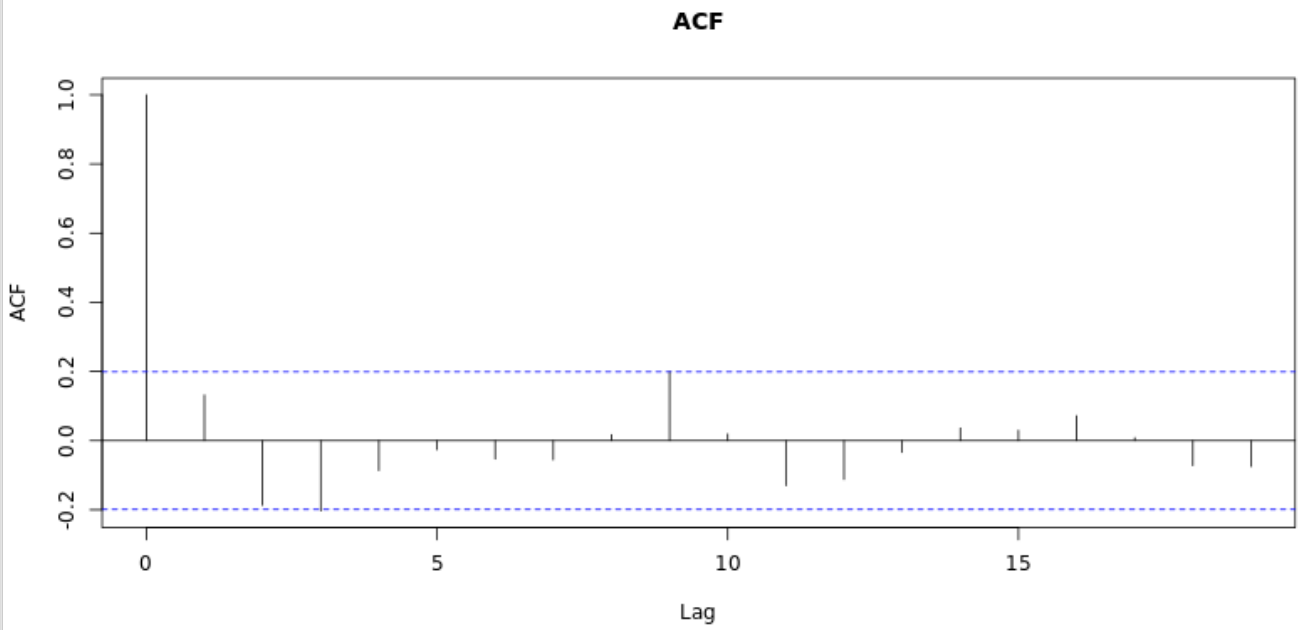
5.

Find the first three autocorrelation coefficients of the differenced time series using the code block below.

```
1  r <- acf(diff(LakeHuron), main='ACF')$acf[1:3]
2
```

Выполнить

Сбросить



- 0.1319, -0.1871, -0.2035
- 1.0000, 0.1319 -0.2081
- 1.0000, 0.1319, -0.1871

1 Баллы

6.

We start fitting an AR model to the time series 'LakeHuron'. What is the matrix R in Yule-Walker estimation if we are fitting an AR(2) model?

'LakeHuron' dataset

Тест, 10 вопроса

- $\begin{bmatrix} 1.000 & 0.1319 \\ 0.1319 & 1.000 \end{bmatrix}$
- $\begin{bmatrix} 1.000 & 0.1319 & -0.1871 \\ 0.1319 & 1.000 & 0.1319 \\ -0.1871 & 0.1319 & 1.000 \end{bmatrix}$
- $\begin{bmatrix} 0.1319 & -0.1871 \\ -0.1871 & 0.1319 \end{bmatrix}$

---

1 Баллы

7.

In the code block below, estimate the coefficients of the AR(2) model we are fitting to the time series 'LakeHuron'. Some lines of the code are provided, and some are missing.

```
1   R=matrix(1,2,2) # matrix of dimension 2 by 2, with entries all 1's.
2   r=NULL
3   r[1:2]=acf(diff(LakeHuron), plot=F)$acf[2:3]
4   R[1,2]=r[1] # only diagonal entries are edited
5   R[2,1]=r[1] # only diagonal entries are edited
6   R
7   b=matrix(r,nrow=2,ncol=1)
8   b
9
10  # Continue with a routine here to find the coefficients of the fitted model.
        See parameter estimation in this lesson for help.
11  phi.hat=solve(R,b)[,1]
12  phi.hat
```

Выполнить

Сбросить

```
          [,1]      [,2]
[1,] 1.0000000 0.1319241
[2,] 0.1319241 1.0000000
           [,1]
[1,]  0.1319241
[2,] -0.1870874
[1]  0.1593793 -0.2081134
```

- $\hat{\phi}_1 = 0.1594, \hat{\phi}_2 = -0.2081$
- $\hat{\phi}_1 = 0.1319, \hat{\phi}_2 = -0.1871$
- $\hat{\phi}_1 = 1.0000, \hat{\phi}_2 = 0.1319$

'LakeHuron' dataset

Тест, 10 вопроса

1 Баллы

8.

Estimate the variance of the noise in the model in the code block below.

```
R=matrix(1,2,2) # matrix of dimension 2 by 2, with entries all 1's.
r=NULL
r[1:2]=acf(diff(LakeHuron), plot=F)$acf[2:3]
R[1,2]=r[1] # only diagonal entries are edited
R[2,1]=r[1] # only diagonal entries are edited
R
b=matrix(r,nrow=2,ncol=1)
b
phi.hat<-solve(R,b)
phi.hat

c0=acf(diff(LakeHuron), type='covariance', plot=F)$acf[1]

# Calculate the variance of teh noise below. See estimation lectures in this
  lesson for help.
var.hat=c0*(1-sum(phi.hat*r))
var.hat
```

Выполнить

Сбросить

```
          [,1]      [,2]
[1,] 1.0000000 0.1319241
[2,] 0.1319241 1.0000000
           [,1]
[1,]  0.1319241
[2,] -0.1870874
           [,1]
[1,]  0.1593793
[2,] -0.2081134
[1] 0.5219945
```

- 0.5220
- 0.7225
- 0.1319
- 0.1594

1 Баллы

9.

Let X_t=LakeHuron and Y_t=diff(LakeHuron). Which one of the following is the fitted model for Y_t?

- $Y_t = 0.1594Y_{t-1} - 0.2081Y_{t-2} + Z_t$

where Z_t~ Normal $(0, 0.5220)$.

'LakeHuron' dataset

Тест, 10 вопроса

- [ ] $Y_t = 0.1594Y_{t-1} - 0.2081Y_{t-2} + Z_t$

  where Z_t~ Normal $(0, 0.7225)$

- [ ] $Y_t = 0.1319Y_{t-1} - 0.1871Y_{t-2} + Z_t$

  where Z_t~ Normal $(0, 0.5220)$.

- [x] $(1 - 0.1594B + 0.2081B^2)Y_t = Z_t$

  where Z_t~ Normal $(0, 0.7225^2)$.

---

1 Баллы

10.
Let X_t=LakeHuron and Y_t=diff(LakeHuron). Which one of the following is the fitted model for X_t?

- [ ] $X_t = 1.1594X_{t-1} - 0.3675X_{t-2} + 0.2081X_{t-3} + Z_t$

  where Z_t~ Normal $(0, 0.5220)$.

- [ ] $X_t = 0.1594X_{t-1} - 0.2081X_{t-2} + Z_t$

  where Z_t~ Normal $(0, 0.5220)$.

- [x] $(1 - 0.1594B + 0.2081B^2)(1 - B)X_t = Z_t$

  where Z_t~ Normal $(0, 0.7225^2)$.

- [ ] 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

'LakeHuron' dataset

Тест, 10 вопроса