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Courses » Applied Time-Series Analysis

Announcements

Course

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## Unit 7 - Week 2: Review of Probability & Statistics

### Course outline

R-based Exam

How to access the portal?

Assignment 0

R Tutorials

Week 1: Introduction &amp; Overview

Week 2: Review of Probability &amp; Statistics

 Course Notes for Week 2 Lecture 06A: Probability and Statistics Review (Part 2)-1 Lecture 06B: Probability and Statistics Review (Part 2)-2 Lecture 06C: Probability and Statistics Review (Part 2)-3 Lecture 07A: Probability and Statistics Review (Part 2)-4 Lecture 07B: Probability and Statistics Review (Part 2)-5 Lecture 07C: Probability and Statistics Review (Part 2)-6 Lecture 08A: Probability and Statistics Review (Part 2)-7 Lecture 08B: Probability and Statistics Review (Part 2)-8 Lecture 09A: Probability and Statistics Review (Part 2)-9 Lecture 09B: Probability and Statistics Review (Part 2)-10 Lecture 09C: Introduction to Random Processes-1 Quiz : Week 2 Assignment Data set: w2\_q9.Rdata Week 02 assignment solutions Week 2 feedback

Week 3: Introduction to Random Processes, Auto- and Cross-Correlation Functions

Week 4: Auto- and cross-correlation functions (contd.), Models for Linear Stationary Processes

Week 5: Models for Linear Stationary &amp; Non-Stationary Processes

### Week 2 Assignment

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

Due on 2018-02-07, 23:59 IST

1 point

- 1) If two random variables  $X$  and  $Y$  have joint p.d.f.

$$f(x, y) = 1.128e^{x^2+y^2-6x-6y+18},$$

then the conditional expectation  $E(Y/X)$  of the p.d.f. at  $X = 5$  is \_\_\_\_\_

- a.  $e^{-5}$   
b. 0  
c. 3  
d.  $-\frac{2}{e}$

- a  
 b  
 c  
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

2)

- a  
 b  
 c  
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

3)

- 3) If two random variables  $X$  and  $Y$  have joint p.d.f. as given below, which of the following is TRUE?

$$f(x, y) = \frac{4}{9}(x + y + xy + 1), \quad 0 \leq x \leq 1, 0 \leq y \leq 1$$

- a.  $X$  and  $Y$  are independent  
b.  $X$  and  $Y$  are uncorrelated, but not independent  
c.  $X$  and  $Y$  are correlated  
d. Marginal density  $f_X(X) = 1.5(1 + X)$

- a  
 b  
 c  
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

1 point

1 point

Week 6: Models for Linear Non-Stationary Processes (contd.), Fourier Transforms

Week 7: Fourier Transforms, DFT and Periodogram

Week 8: Spectral Representations & Estimation Theory

Week 9: Estimation Theory

Week 10: Estimation Methods

Week 11: Estimation methods (contd.)

Week 12: Estimation of Power Spectral Density & Time Series Models

Case Studies on Modelling

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Interactive Session

4)

1 point

4. There are three boxes. One of the boxes contains a chocolate and your friend knows one containing it. Instead of passing this information to you he asks you to guess the one containing it. After you have your first guess declared, your friend decides to open one of the remaining two boxes which does not contain the chocolate for sure. Given that you don't know which of the two boxes contain the chocolate, he allows you to take a second guess. Which one of the options below will you do?

- a. Stick to the previous choice, because probability of winning with first guess is more.
- b. Does not matter as the probability of winning is the same with both the other boxes.
- c. Change the choice, because probability of winning with the changed guess is more.
- d. None of the above.

- a  
 b  
 c  
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

5)

1 point

5. Suppose a random variable  $X$  has the p.d.f  $f(X = x)$ , then the p.d.f of  $Y = X^3$  (in analytical form) \_\_\_\_\_.

- a.  $f(X = x^3)$
- b.  $f(X = x)^3$
- c.  $\int_{-\infty}^{y^{1/3}} f(x)dx$
- d.  $\frac{d}{dy} \int_{-\infty}^{y^{1/3}} f(x)dx$

- a  
 b  
 c  
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

d

6)

1 point

6. Given the variance-covariance matrix of three random variables  $X$ ,  $Y$  and  $Z$ ,

$$\Sigma = \begin{pmatrix} 1.4471 & 0.1756 & 0.0891 \\ 0.1756 & 1.1556 & 0.1835 \\ 0.0891 & 0.1835 & 1.1545 \end{pmatrix}$$

the correlation between  $(X, Y)$ ,  $(Y, Z)$  and  $(X, Z)$  respectively are \_\_\_\_\_

- a. 0.1358, 0.1589, 0.0689
- b. 0.1756, 0.1835, 0.0891
- c. 0.1050, 0.1375, 0.0533
- d. 0.1358, 0.1835, 0.0533

- a  
 b  
 c  
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

7)

1 point

7. For the random variables (zero-mean)  $X, Y$  and  $Z$  given in Question 6, consider predictor of  $Y$  in terms of  $X$  and  $Z$ :  $\hat{Y} = aX + bZ$ . The optimal estimate of  $a$  minimizes  $E(Y - \hat{Y})^2$  is \_\_\_\_\_.

- a. 0.1112
- b. 0.1211
- c. 0.2111
- d. 0.1121

- a  
 b  
 c  
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

d

8)

1 point

8. For a Gaussian random variable  $X$ , if  $Y = X^2$  then  $X$  and  $Y$  are \_\_\_\_\_.

- a. Uncorrelated and independent
- b. Correlated and independent
- c. Uncorrelated, dependent
- d. Correlated and dependent

- a  
 b  
 c  
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

9)

1 point

9. For the data given in w2\_q9.Rdata, fit two linear models of the form  $X = \hat{a}Y$  .  $Y = \hat{b}X$ . What is the value of  $\hat{a}\hat{b}$ ?

- a. 0.8403
- b. 0.8601
- c. 0.8056
- d. 0.8976

- a  
 b  
 c  
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

10)

1 point

10. The partial correlation coefficient between DAX and CAC market indices from the given in 'EuStockMarkets' in R is \_\_\_\_\_.

- a. -0.830
- b. 0.597
- c. 0.830
- d. -0.597

- a  
 b  
 c



d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

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