Unit 16 - Week 11: Estimation methods (contd.)

Week 11 Assignment

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

Due on 2018-04-15, 23:59 IST

1) *1 point*

1. For the linear predictor

$$\hat{Y} = \hat{a}X + \hat{b}Z,$$

given the sample covariance matrix of the regressors

$$S = \begin{pmatrix} 0.5 & 0.1 \\ 0.1 & 0.25 \end{pmatrix},$$

find the 99% confidence intervals for the OLS estimate of b, when we have suffici high number of samples and $\sigma_e^2 = 1$ is the variance of the measurement noise in

a. ± 4.49
b. ± 2.95
c. ± 6.22
d. ± 8.91

No, the answer is incorrect.
Score: 0

Accepted Answers:
c. ± 6.22

2) *1 point*

2. Given the data-generating process

$$v[k] + d_1 v[k-1] + d_2 v[k-2] = e[k],$$

where $e[k]$ is a zero-mean *exponential* white noise process. Which of the followir about the properties of the OLS estimates of d_1 and d_2 of an AR(2) model fit to t process?

a) The estimates are unbiased and consistent
b) The estimates are biased and consistent
c) The estimates are unbiased and not fully efficient
d) The estimates are unbiased and fully efficient

No, the answer is incorrect.
Score: 0

Accepted Answers:
c) The estimates are unbiased and not fully efficient

3) *1 point*

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

Case Studies on Modelling

DOWNLOAD VIDEOS

Interactive Session

3. For a stationary process, the "impulse-response" coefficients are estimated as:

$\hat{h}[0]$	$\hat{h}[1]$	$\hat{h}[2]$	$\hat{h}[3]$	$\hat{h}[4]$	$\hat{h}[5]$	$\hat{h}[6]$	$\hat{h}[7$
1 (± 0.073)	-0.0387 (± 0.0985)	0.2943 (± 0.1147)	0.9688 (± 0.1247)	0.5030 (± 0.1307)	0.2073 (± 0.1327)	-0.0408 (± 0.1307)	0.0 $(\pm 0.$

What is the order of the process?

- a) 2
- b) 3
- c) 4
- d) 5

No, the answer is incorrect.
Score: 0

Accepted Answers:
c) 4

4) *1 point*

4. Given two observations $v[2]$, $v[1]$ of an $AR(1)$ process $v[k] = -d_1 v[k-1] + e[k]$ $e[k] \sim \mathcal{N}(0, \sigma_e^2)$, the maximum likelihood estimate of d_1 is obtained as _____

a. $\hat{d}_1 = -\dfrac{v[2]}{v[1]}$

b. $\hat{d}_1 = -\dfrac{v[2]^2}{v[1]^2}$

c. $\hat{d}_1 = -\dfrac{v[2]v[1]}{v[1]^2 + v[2]^2}$

d. $\hat{d}_1 = -\dfrac{2v[2]v[1]}{v[1]^2 + v[2]^2}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
d. $\hat{d}_1 = -\dfrac{2v[2]v[1]}{v[1]^2 + v[2]^2}$

5) *1 point*

5. For the same process and data points in Q.4, the correponding least square estima is obtained as _____.

a. $\hat{d}_1 = -\dfrac{v[2]}{v[1]}$

b. $\hat{d}_1 = -\dfrac{v[2]^2}{v[1]^2}$

c. $\hat{d}_1 = -\dfrac{v[2]v[1]}{v[1]^2 + v[2]^2}$

d. $\hat{d}_1 = -\dfrac{2v[2]v[1]}{v[1]^2 + v[2]^2}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
a. $\hat{d}_1 = -\dfrac{v[2]}{v[1]}$

6) *1 point*

6. For any random process, the scenerio in which the MLE estimate is identical to I estimator is _____.

- a) Gaussian prior and MAP estimate.
- b) Uniform prior and MAP estimate.
- c) Gaussian prior and median estimate.
- d) Uniform prior and median estimate.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b) Uniform prior and MAP estimate.

7) 1 point

7. For the MA(1) process $v[k] = e[k] - e[k-1]$ where $e[k] \sim \mathcal{N}(0,1)$ the best BLP using only $v[0], v[1], v[2]$, is obtained as _____. (hint: use projection th

a. $v[3] = -0.75v[2] - 0.5v[1] - 0.25v[0]$
b. $v[3] = -v[2] - v[1] - v[0]$
c. $v[3] = -0.58v[2] - 0.5v[1] - 0.5v[0]$
d. $v[3] = -0.25v[2] - 0.5v[1] - 0.55v[0]$

No, the answer is incorrect.
Score: 0

Accepted Answers:
a. $v[3] = -0.75v[2] - 0.5v[1] - 0.25v[0]$

8) 1 point

8. The corresponding MSE for the BLP in Q.7 is obtained as _____.

a) 1
b) 1.5
c) 1.25
d) 2

No, the answer is incorrect.
Score: 0

Accepted Answers:
c) 1.25

9) 1 point

9. In a constant temperature-sensing experiment, there are two sensors, one of which - it adds a Gaussian measurement error with variance $\sigma_1^2 = 0.8$. After collecti samples, due to a fault in the sensor, it switches off, and triggers the backup senso adds a Gaussian measurement error with variance $\sigma_2^2 = 1.6$, which is on for anot samples. The temperature data is given in `w10_q9.RData`. Find the WLS estima mean temperature. (Round off to 2 decimal places) _____.

a) 10.57
b) 46.51
c) 59.97
d) 50.56

No, the answer is incorrect.
Score: 0

Accepted Answers:
c) 59.97

10) 1 point

10. To the data given in `w10_q10.RData`, an AR(2) model was fit using OLS. Wh degree of freedom and the unbiased estimate of σ_e^2, (the variance of the drivi rounded to 2 decimal places?

a) 98, 0.85
b) 98, 0.87
c) 2, 0.83
d) 2, 0.81

No, the answer is incorrect.
Score: 0

Accepted Answers:
b) 98, 0.87

Previous Page End