Domanda **5**

Risposta corretta

Punteggio ottenuto

1,00 su 1,00

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From the following analysis of the residuals in a linear model, we could conclude that one of the model's assumptions is more questionable than the others. Which one?

Residuals vs Fitted

Normal Q-Q

Standardized residuals!

Residuals

0.0

1.0

0

4

-0.4 -0.2 0.0 02

Fitted values

**0.4**

Scale-Location

0.4

-0.2 0.0

02 0.4

Fitted values

Scegli un'alternativa:

a. Linearity

b. Normality

**c.** Homoschedasticity

d. The random components have zero mean

La risposta corretta è: Linearity

Standardized residuals

302

Standardized residuals

-20 2

-2

-1

0 1

2

Theoretical Quantiles

Residuals vs Leverage

0.000

0.002

0.004

0.006

Leverage

**B**

Domanda **1**

Risposta corretta

Punteggio ottenuto

The dataset airquality reports Daily air quality measurements in New York, May to September 1973. The response variable is the Ozone concentration in ppb Ozone. Suppose as possible covariates: the wind speed in mph wind the solar activity in lang solar R, the temperature in Fahrenheit degrees Temp and the month Month Look at the following model summary:

1,00 su 1,00

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Call:

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In(Formula Ozone Solar. + Wind Temp+ Month, data = airquality)

Residuals:

10 Median

30

Max

Min

-36.534 -13.276 -1.179 9.119 96.335

Coefficients:

(Intercept) -235.52336

Solar.R

Hind

0.05665

14.01795

Estimate Std. Error t value Pr|t|)

46.53648 -5.861 1.79-86

0.02180 2.598 0.018714

4.88595 3.431 0.002962

Temp

4.06195

0.57838 7.121 1.38e-18 \*\*\*

Month

-2.69378

1.48674 -1.915 0.858225

Wind: Temp

-0.22384

0.85281 -4.289 4.88e-85

Signif. codes: @ \*\*\*\*\* 0.001 \*\*\*\* 0.81 \*\*\* 0.85 1.7

Residual standard error: 19.37 on 185 degrees of freedon

(42 observations deleted due to missingness)

Multiple R-squared: 0.6765, Adjusted R-squared: 8.6611

F-statistic: 43.92 on 5 and 185 OF, p-value: < 2.2e-16

Which of the following sentences is false:

Scegli un alternativa:

a. The comparison of the fitted model with the null model is described by the F statistics, whose observed value is 43.92 with p-P and np degrees of freedom.

b. The interaction between wind and Temp is statistically significant.

C. At level a = 0.01 the variable Month is not statistically significant.

d. The estimated model for the i-th unit is

**y;** = -235.52 +0.057Solar. R; +14.02Wind; +4.06Temp; -2.69Month;

La risposta corretta è: The estimated model for the i-th unit is

**3**=-235.52+0.057Solar. R, +14.02Wind; +4.06Temp; -2.69Month;

Domanda 3

Risposta corretta

Punteggio ottenuto

1,00 su 1,00

Assume you want to study the proportion of patients that positively react to a drug. In a previous

*test* th

the

drug was effective on the 80% of patients. If you want to include this information in your Bayesian analysis of the data, which prior do you think is most appropriate among the following ones?

Scegli un'alternativa:

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100), from

100)

a. curve(duni+(x,

b. curve(**dnorm**(x, 0.8, 2), from

C.

C curve(dganma(x, 1, 1))

curve(dbeta(x, 5, 23)

La risposta corretta è: curve (dbeta(x, 5, 2))

Domanda 4

Risposta corretta

Punteggio ottenuto

1,00 su 1,00

P Contrassegna

domanda

Suppose from a linear model we get that the log-likelihood evaluated in the MLE @ is 1(0)=-25.1 Suppose then to have **Akaike** information criterion, AIC = 74.2 Which of the following sentences is true?

Scegli un'alternativa:

-

Ora. A model with 7 parameters and the same value of *1*(*9*) is worse than the current one.

b. The number of parameters of the model is p = 24.

c. The

he value 1(0)=-25.1 alone is indicative of a satisfactory goodness of fit.

d. A model with 13 parameters and the same value of 1(0) is worse than the current one

La risposta corretta è: A model with 13 parameters and the same value of 1(0) is worse than the current one.

Domanda 2

Risposta corretta

Punteggio ottenuto

1,00 su 1,00

P Contrassegna

domanda

Suppose y1,..., Ysoi.i. d. Po(A) and the following prior density is proposed on the parameter A *π*(A) = √(2) Ae 22, x>0

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We are interested in the posterior distribution. From the **following** plot what can you conclude?

density

0.0

0.5

1.0

1.5

2.0

Prior Posterior Likelihood

0

1

2

3

5

6

λ

Scegli un'alternativa:

a. The posterior is a *Po*(+).

b. The prior mean is greater than the posterior mean.

c. The posterior mode is closer to the prior mode than to the MLE

d. The posterior mean is (2+)/32

La risposta corretta è: The posterior mean is (2+Σy,)/32

Domanda 6

Risposta corretta

Punteggio ottenuto

1,00 su 1,00

p Contrassegna

domanda

Suppose a statistical test Ho: A = 1 against *H1* : λ = 2 for **a** sample (y1,...,y) from an exponential model of the form *ƒ(Y*; A) Ae is posed. For a specified threshold k., the rejection region of the Neyman-Pearson likelihood ratio-test is then.

Scegli un'alternativa:

a. A*(Y*)=2e Σ (-2) *ka*

b. A(*Y*)=2e

© © A*(Y*) = ¦¦e

ka

ka

d. A(Y) = eka

La risposta corretta è: A*(Y*) = 2e > ka