Université Grenoble Alpes

Introduction à la modélisation statistique bayésienne 2026-01-23

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Type: 004

Exam ID(101): 26012300001

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Answers 1 - 4

	a	b	c	d	e
1	☐	☐	☐	☐	☐
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	a	b	c	d	e

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In the following please fill in your answers.

3

4

1. The waiting time (in minutes) at the cashier of two supermarket chains with different cashier systems is compared. The following statistical test was performed:

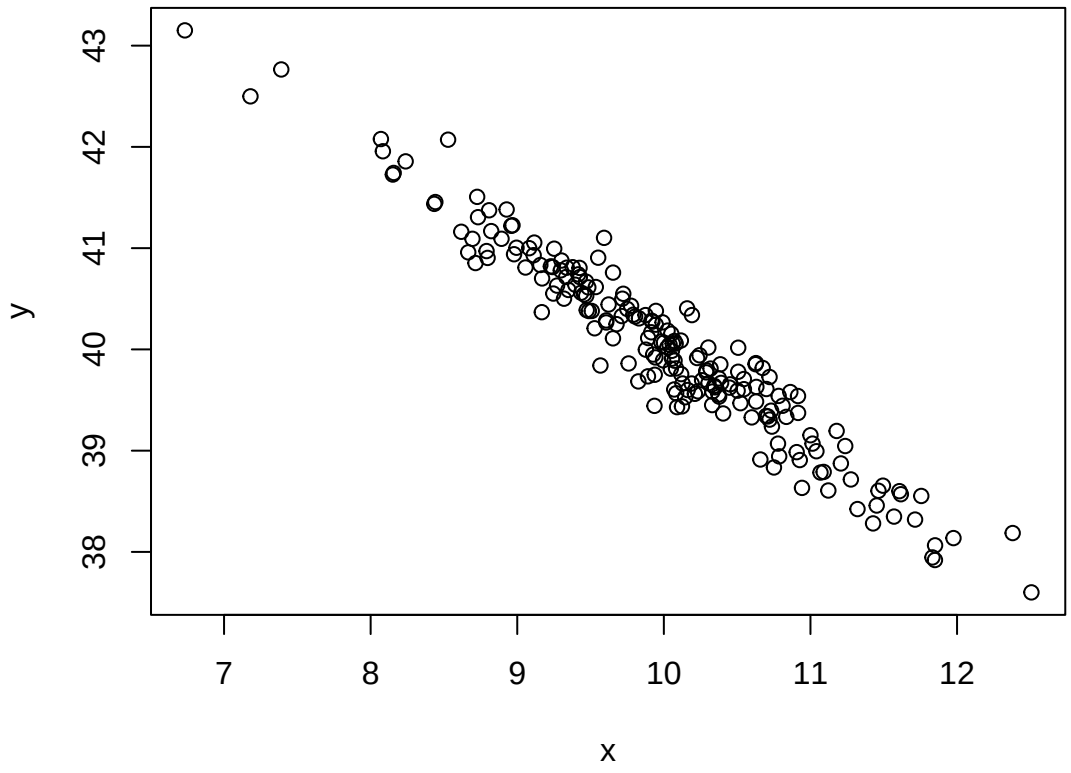
```
    Two Sample t-test

data:  Waiting by Supermarket
t = 0.80023, df = 108, p-value = 0.4253
alternative hypothesis: true difference in means between group Sparag and group Consumo is not e
95 percent confidence interval:
 -0.757795  1.783920
sample estimates:
 mean in group Sparag mean in group Consumo
             5.755474              5.242412
```

   Which of the following statements are correct? (Significance level 5%)

   a. The absolute value of the test statistic is larger than 1.96.
   b. A one-sided alternative was tested.
   c. The p-value is larger than 0.05.
   d. The test shows that the waiting time is longer at Sparag than at Consumo.
   e. The test shows that the waiting time is shorter at Sparag than at Consumo.

2. The following figure shows a scatterplot. Which of the following statements are correct?



   a. The scatterplot is standardized.
   b. The standard deviation of Y is at least 6.

c. For $X = 10.6$, Y can be expected to be about 41.4.

d. The absolute value of the correlation coefficient is at least 0.8.

e. The mean of Y is at least 30.

3. What is the name of the R function for least-squares regression?

4. Consider the following regression results:

```
Call:
lm(formula = log(y) ~ x, data = d)

Residuals:
    Min      1Q  Median      3Q     Max
-3.8002 -1.3191  0.2715  0.9820  4.2663

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  -0.1239     0.2697  -0.459    0.648
x             1.6693     0.2494   6.693 3.23e-08 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 1.823 on 44 degrees of freedom
Multiple R-squared:  0.5045,    Adjusted R-squared:  0.4932
F-statistic:  44.8 on 1 and 44 DF,  p-value: 3.226e-08
```

Describe how the response `y` depends on the regressor `x`.