

Probability and Statistics - MAS291

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Started on	Monday, 30 March 2020, 1:36 PM
State	Finished
Completed on	Monday, 30 March 2020, 1:36 PM
Time taken	12 secs
Marks	1.00/16.00
Grade	0.63 out of 10.00 (6%)

Question 1

Complete
Mark 0.00 out of 1.00

Flag question

In order to fairly set flat rates for auto mechanics, a shop foreman needs to estimate the average time it takes to replace a fuel pump in a car. How large a sample must he select if he wants to be 99% confident that the true average time is within 8 minutes of the sample average? Assume the standard deviation of all times is 21 minutes. Let $z_{0.005} = 2.58$.

- Select one:
- $E = z \frac{\sigma}{\sqrt{n}}$
- $8 = 2.58 * \frac{21}{\sqrt{n}}$
- $n = 45.866$
- ☐ a. 45
- ☐ b. 48
- ☐ c. 46
- ☐ d. 47

The correct answer is: 46

Question 2

Not answered
Marked out of 1.00

Flag question

A manufacturer of golf equipment wishes to estimate the number of left-handed golfers. How large a sample is needed in order to be 95% confident that the sample proportion will not differ from the true proportion by more than 2%? A previous study indicates that the proportion of left-handed golfers is 15%.

- Select one:
- $0.02 = z \cdot 0.025 \sqrt{\frac{0.15 * (0.85)}{n}}$
- $n = \frac{(-1.96)^2 * 0.15 * 0.85}{0.02^2} = 1224.51$
- ☐ a. 241
- ☐ b. 1225
- ☐ c. 153
- ☐ d. 217

The correct answer is: 1225

Question 3

Not answered
Marked out of 1.00

Flag question

The grade point averages for 11 randomly selected students in a statistics class are listed below.

2.4 3.2 1.8 1.9 2.9 4.0 3.3 0.9 3.6 0.8 2.2

What is the effect on the width of the confidence interval if the sample size is increased to 15?

- Select one:
- $E = z \frac{\sigma}{\sqrt{n}}$
- $E = z \frac{\sigma}{2} \sqrt{\frac{p * (1 - p)}{n}}$
- ☐ a. The width remains the same.
- ☐ b. It is impossible to tell without more information.
- ☐ c. The width decreases.
- ☐ d. The width increases.

The correct answer is: The width decreases.

Question 4

Complete
Mark 1.00 out of 1.00

Flag question

Construct a 96% confidence interval for the population mean, μ . Assume the population has a normal distribution. A study of 31 bowlers showed that their average score was 187 with a standard deviation of 8.

- Select one:
- $X(\text{average}) \pm E$
- $E = z \frac{\sigma}{\sqrt{n}}$
- $187 \pm z_{0.02} * 8 / \sqrt{31}$
- 184.05
- ☐ a. (183.9, 190.1)
- ☐ b. (186.3, 197.7)
- ☐ c. (222.3, 256.1)
- ☐ d. (115.4, 158.8)

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The correct answer is: (183.9, 190.1)

Question 5

Not answered
Marked out of 1.00
Flag question

Construct a 95% confidence interval for the population standard deviation σ of a random sample of 25 men who have a mean weight of 170.4 pounds with a standard deviation of 10.3 pounds. Assume the population is normally distributed.

Select one:

- ☐ a. (7.5, 16.2)
- ☐ b. (8.0, 14.3)
- ☐ c. (56.9, 263.9)
- ☐ d. (7.9, 15.0)

The correct answer is: (8.0, 14.3)

$$X^2_{right} = X^2(0.025, 24) = \text{CHISQ.INV.RT}(2.5; 24)$$
$$X^2_{left} = X^2(0.975, 24) = \text{CHISQ.INV.RT}(97.5; 24)$$

$$\sqrt{\frac{(n-1) * S^2}{X^2_{right}}} \leq \delta \leq \sqrt{\frac{(n-1) * S^2}{X^2_{left}}}$$
$$\sqrt{\frac{(25-1) * 10.3^2}{39.364}} \leq \delta \leq \sqrt{\frac{(25-1) * 10.3^2}{12.401}}$$
$$\sqrt{64.68} \leq \delta \leq \sqrt{205.32}$$

Question 6

Not answered
Marked out of 1.00
Flag question

Of 900 randomly selected cases of lung cancer, 360 resulted in death within five years. Construct a 95% two-sided confidence interval on the death rate from lung cancer.

Select one:

- ☐ a. (0.12, 0.43)
- ☐ b. (0.37, 0.43)
- ☐ c. (0.12, 0.95)
- ☐ d. (0.37, 0.95)

The correct answer is: (0.37, 0.43)

$$P^{\wedge} \pm E$$
$$P^{\wedge} = \frac{360}{900} = 0.4$$
$$E = z_{\frac{\alpha}{2}} \sqrt{\frac{p^{\wedge}(1-p^{\wedge})}{n}} = -1.96 * \sqrt{\frac{0.4*0.6}{900}} = -0.032$$
$$P^{\wedge} \pm E = (0.37, 0.43)$$

Question 7

Not answered
Marked out of 1.00
Flag question

The principal of a middle school claims that test scores of the seventh-graders at his school vary different from the test scores of seventh-graders at a neighboring school, which have variation described by $\sigma = 24.1$. Assume that a hypothesis test of the given claim will be conducted. Identify the type I error for the test.

	Ho TRUE	Ho FALSE
Reject Ho	Error Type 1	\checkmark
Resolve Ho	\checkmark	Error Type 2

Select one:

- ☐ a. None of the other choices is true
- ☐ b. The error of rejecting the claim that the standard deviation is less than 24.1 when it really is less than 24.1.
- ☐ c. The error of rejecting the claim that the standard deviation is 24.1 when it really is 24.1.
- ☐ d. The error of failing to reject the claim that the standard deviation is different from 24.1 when it is actually 24.1.

The correct answer is: The error of rejecting the claim that the standard deviation is 24.1 when it really is 24.1.

Question 8

Not answered
Marked out of 1.00
Flag question

You wish to test the claim that $\mu \leq 38$ at a level of significance of $\alpha = 0.01$ and are given sample statistics $n = 43$, $s = 4.7$, $\bar{x} = 39.8$. Compute the value of the test statistic. Round your answer to two decimal places.

Select one:

- ☐ a. 2.51
- ☐ b. 3.51
- ☐ c. 1.96
- ☐ d. None of the other choices is true
- ☐ e. 2.65

The correct answer is: 2.51

$$T_o = \frac{\bar{X} - U_o}{\frac{s}{\sqrt{n}}}$$

$$T_o = \frac{39.8 - 38}{\frac{4.7}{\sqrt{43}}} = 2.51$$

Question 9

Not answered
Marked out of 1.00
Flag question

Find the test statistic t_0 for a sample with $n = 12$, $\bar{x} = 30.2$, $s = 2.2$, and $\alpha = 0.01$ if $H_0: \mu = 28$. Round your answer to three decimal places.

Select one:

- ☐ a. None of the other choices is true
- ☐ b. 2.132
- ☐ c. 3.464
- ☐ d. 4.100

- ☐ d. 1.070
- ☐ e. 2.001

The correct answer is: 3.464

Question 10

Not answered
Marked out of 1.00
Flag question

Find the critical value or values of χ^2 based on the given information.

$H_1: \sigma < 26.1$
 $n = 29$
 $\alpha = 0.01$

$$\begin{aligned} &\text{Lefttail} \\ &= \text{CHISQ.INV.RT}(0.99, 28) \\ &X^2(1 - \alpha, n - 1) \\ &X^2(0.99, 28) = 13.565 \end{aligned}$$

Select one:

- ☐ a. None of the other choices is true
- ☐ b. 2.088
- ☐ c. 13.565
- ☐ d. 48.278
- ☐ e. 20.090

The correct answer is: 13.565

Question 11

Not answered
Marked out of 1.00
Flag question

Determine the critical values to test the claim about the population proportion $p \neq 0.325$ given $n = 42$ and $\bar{p} = 0.247$. Use $\alpha = 0.01$.

Select one:

- ☐ a. 2.575 and -2.575
- ☐ b. 2.33 and -2.33
- ☐ c. 1.96 and -1.96
- ☐ d. None of the other choices is true
- ☐ e. 1.645 and 1.645

Claim	U # n	U <= n	U < n
Null hypothesis Ho	U = n	U <= n	U >= n
Alternative Hy, H1	U # n	U > n	U < n
Ký hiệu	1	2	3

Find critical Value
1 => Two tail $\pm z(\alpha/2)$
2 => Right tail test $z\alpha$
3 => Left tail test $-z\alpha$

The correct answer is: 2.575 and -2.575

Question 12

Not answered
Marked out of 1.00
Flag question

In simple linear regression, which of the following statements indicates there is no linear relationship between the variables x and y?

Select one:

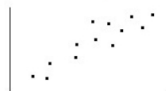
- ☐ a. Coefficient of correlation is 0.0.
- ☐ b. Coefficient of determination is 1.0.
- ☐ c. Coefficient of correlation is 0.9.
- ☐ d. Coefficient of determination is -1.0.

The correct answer is: Coefficient of correlation is 0.0.

Question 13

Not answered
Marked out of 1.00
Flag question

For a group of employees at the local video store, the scatter diagram compares the number of days worked per year and the average number of stairs climbed weekly (x) is shown below.



State whether there is no correlation, a positive correlation, or a negative correlation between the x and y variables.

Select one:

- ☐ a. Positive correlation
- ☐ b. No correlation
- ☐ c. Negative correlation

The correct answer is: Positive correlation

Question 14

Not answered
Marked out of 1.00
Flag question

Find the value of the linear correlation coefficient r.

x	85.3	78.3	80.6	95.8
y	12.2	15.1	19.4	17.4

Select one:

- ☐ a. 0.77
- ☐ b. 0.07
- ☐ c. 0.85
- ☐ d. 0.17

Mode → 3 → 2 → Nhập dữ liệu X,Y vào|

Value of linear Correlation = Ship 1 -> 5 -> 3|

The correct answer is: 0.07

Question 15

Not answered

Marked out of 1.00

Flag question

Consider a random sample of 27 observations of two variables X and Y. The following summary statistics are available: $\sum y_i = 57.2$, $\sum x_i = 1253.4$, $\sum x_i^2 = 73296.4$, and $\sum x_i y_i = 3133.7$. What is the y-intercept of the sample regression line?

Formula for b_0 and b_1

Select one:

- ☐ a. 1.035
- ☐ b. None of the other choices is true
- ☐ c. 0.649
- ☐ d. 3.463
- ☐ e. 3.832

$$b_0 = \frac{(\sum y) (\sum x^2) - (\sum x) (\sum xy)}{n(\sum x^2) - (\sum x)^2} \quad (\text{y-intercept})$$

$$b_1 = \frac{n(\sum xy) - (\sum x) (\sum y)}{n(\sum x^2) - (\sum x)^2} \quad (\text{slope})$$

$$B1 = R * \sqrt{\frac{S_{yy}}{S_{xx}}}$$
$$B1 * S_{xy} = SSR$$

The correct answer is: 0.649

Question 16

Not answered

Marked out of 1.00

Flag question

Suppose we have the following information from a simple regression: $\beta_0 = 107.4$, $\beta_1 = -14.39$, $se(\beta_0) = 2.8$, $se(\beta_1) = 2.4$, $n = 200$.

What is the value of the test statistic for testing $H_0: \beta_0 = 110.4$?

Select one:

- ☐ a. None of the other
- ☐ b. -1.071
- ☐ c. 3.89
- ☐ d. -7.12
- ☐ e. 4.08

$$H_0: \beta_0 = 110.4$$
$$H_1: \beta_1 = *$$
$$t_0 = \frac{\hat{\beta}_0 - \beta_0}{se(\hat{\beta}_0)}$$
$$t_0 = \frac{107.4 - 110.4}{2.8} = -1.071$$

The correct answer is: -1.071

$$H_1: \beta_1 = *$$
$$t_0 = \frac{\hat{\beta}_1 - \beta_1}{se(\hat{\beta}_1)}$$

Finish review

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