

Week 2 Practice Quiz

Practice Quiz, 5 questions

✓ **Congratulations! You passed!**

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points

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Read the following scenario and then, from the choices that follow, choose the correct set of hypotheses for the scenario:

Since 2008, chain restaurants in California have been required to display calorie counts of each menu item. Prior to menus displaying calorie counts, the average calorie intake of diners at a restaurant was 1100 calories. After calorie counts started to be displayed on menus, a nutritionist collected data on the number of calories consumed at this restaurant from a random sample of diners. Do these data provide convincing evidence of a difference in the average calorie intake of a diners at this restaurant?

☐ $H_0: \bar{x} = 1100 H_A: \bar{x} < 1100$

☒ $H_0: \mu = 1100 H_A: \mu \neq 1100$

Correct

This question refers to the following learning objective(s):

- Always construct hypotheses about population parameters (e.g. population mean, μ) and not the sample statistics (e.g. sample mean, \bar{x}). Note that the population parameter is unknown while the sample statistic is measured using the observed data and hence there is no point in hypothesizing about it.
- Define the null value as the value the parameter is set to equal in the null hypothesis.
- Note that the alternative hypothesis might be one-sided ($\mu <$ or $>$ the null value) or two-sided ($\mu \neq$ the null value), and the choice depends on the research question.

☐ $H_0: \mu = 1100 H_A: \mu > 1100$

☐ $H_0: \mu = 1100 H_A: \mu < 1100$

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Which of the following is the correct definition of the p-value?

☐ $P(H_0 \text{ true} \mid H_A \text{ false})$ ☒ $P(\text{observed or more extreme sample statistic} \mid H_0 \text{ true})$

Correct

This question refers to the following learning objective(s):
Define a p-value as the conditional probability of obtaining a sample statistic at least as extreme as the one observed given that the null hypothesis is true.

p-value = $P(\text{observed or more extreme sample statistic} \mid H_0 \text{ true})$

Define a p-value as the conditional probability of obtaining a sample statistic at least as extreme as the one observed given that the null hypothesis is true.

☐ $P(H_0 \text{ true} \mid \text{observed data})$ ☐ $P(H_0 \text{ true})$

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One-sided alternative hypotheses are phrased in terms of:



< or >

Correct

This question refers to the following learning objective(s):

Note that the alternative hypothesis might be one-sided ($\mu < \text{or } > \text{ the null value}$) or two-sided ($\mu \neq \text{ the null value}$), and the choice depends on the research question.

 $\approx \text{ or } =$  $\leq \text{ or } \geq$  \neq

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A Type 2 error occurs when the null hypothesis is

☒ not rejected when it is false

Correct

This question refers to the following learning objective(s):
Note that the conclusion of a hypothesis test might be erroneous regardless of the decision we make.

- Define a Type 1 error as rejecting the null hypothesis when the null hypothesis is actually true.
- Define a Type 2 error as failing to reject the null hypothesis when the alternative hypothesis is actually true.

☐ rejected when it is false

☐ not rejected when it is true

☐ rejected when it is true



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points

5.

True / False: Decreasing the significance level (α) will increase the probability of making a Type 1 error.

☐ True

☒ False

Correct

Note that the probability of making a Type 1 error is equivalent to the significance level when the null hypothesis is true.

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