

9. Inference for Quantitative Data: Slopes

Starter Quiz · 课前小测

AP Statistics

Name: _____ Score: _____

1. The slope b from a sample is...
 - ☐ an estimate of the true slope β
 - ☐ always exactly β
 - ☐ a fixed constant
 - ☐ the correlation
2. For slope inference with $n = 20$, what are the degrees of freedom ($n - 2$)?

3. A 95% interval for a slope is (2.1, 6.3). You can conclude...
 - ☐ convincing evidence of a positive linear relationship
 - ☐ no relationship
 - ☐ the slope is 0
 - ☐ nothing
4. The usual null hypothesis for a slope test is...
 - ☐ $H_0: \beta = 0$
 - ☐ $H_0: b = 0$
 - ☐ $H_a: \beta \neq 0$
 - ☐ $H_0: r = 1$
5. $b = 4.2$, $SE_b = 1.0$. Compute the slope test statistic $t = b/SE_b$.

6. A question about a linear relationship between two quantitative variables calls for...
 - ☐ slope t-inference
 - ☐ a two-proportion z-test
 - ☐ a chi-square test
 - ☐ a one-mean t-test
7. The sampling distribution of the sample slope b is centered at the true slope β .
 - ☐ True ☐ False

8. $b = 4.2$, $SE_b = 1.0$, $t^* = 2.10$. Find the margin of error $t^* \cdot SE_b$.

9. A 95% interval for a slope is $(-1.0, 3.4)$. You can conclude...
 - ☐ no convincing evidence of a linear relationship
 - ☐ a strong positive relationship
 - ☐ a strong negative relationship
 - ☐ the slope is exactly 0
10. A two-sided output p-value is 0.001. For a one-sided H_a (with b in the claimed direction), what is the p-value?

AP Statistics1. **an estimate of the true slope β**

b estimates the unknown population slope β , with uncertainty.

2. **18**

$df = n - 2 = 18$ (slope and intercept estimated).

3. **convincing evidence of a positive linear relationship**

The interval is entirely positive (above 0).

4. **$H_0: \beta = 0$**

H_0 is about the population slope β being 0.

5. **4.2**

$4.2 / 1.0 = 4.2$.

6. **slope t-inference**

Two quantitative variables + a trend $\rightarrow$ slope inference.

7. **True**

b is unbiased for β .

8. **2.1**

$2.10 \times 1.0 = 2.10$.

9. **no convincing evidence of a linear relationship**

The interval contains 0, so a flat slope is plausible.

10. **0.0005**

Halve the two-sided value: $0.001 / 2 = 0.0005$.