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...

   ☐ H0: $\beta = 0$

   ☐ H0: b = 0

   ☐ Ha: $\beta \neq 0$

   ☐ H0: 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 Ha (with b in the claimed direction), what is the p-value?

    _____

9. Inference for Quantitative Data: Slopes

Answers · 答案

AP Statistics

1. **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. **H0: $\beta = 0$**

   H0 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 → slope inference.

7. **True**

   b is unbiased for β.

8. **2.1**

   2.10 × 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.