Data Analysis and Statistical Inference
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In-Video Quiz Questions for
Unit 6: Part 4 – (1) Inference for Linear Regression

(02:20) – slide 3, after "And R square is 0.78, meaning that 78% of the variability in foster twins' IQs can be explained by the biological twins' IQ's."

1. Given the following model output and that R-squared for this model is 78%, which of the following is **false**?

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	9.2076	9.2999	0.99	0.3316
bioIQ	0.9014	0.0963	9.36	0.0000

(a) For each 10 point increase in the biological twin's IQ, we would expect the foster twin's IQ to increase on average by 9 points.

(b) The linear model is fosterIQ = 9.2 + 0.9 × bioIQ.

(c) Roughly 78% of the foster twins' IQs can be accurately predicted by the model.

(d) Foster twins with IQs higher than average IQs are predicted to have biological twins with higher than average IQs as well.

(02:34) – slide 4, after "The overall question we want to answer is, is the explanatory variable a significant predictor of the response variable?"

2. Assuming that these 27 twins comprise a representative sample of all twins separated at birth, we would like to test if these data provide convincing evidence that the IQ of the biological twin is a significant predictor of IQ of the foster twin. What are the appropriate hypotheses?

a) $H_0: b_0 = 0$; $H_A: b_0 \neq 0$
b) $H_0: \beta_0 = 0$; $H_A: \beta_0 \neq 0$
c) $H_0: b_1 = 0$; H_A: $b_1 \neq 0$
d) $H_0: \beta_1 = 0$; H_A: $\beta_1 \neq 0$

(07:29) – slide 8, after "and the standard error of the slope, we said, comes from the regression output."

3. What is the critical t score for the 95% confidence interval for the slope of the relationship between biological and foster twins' IQs?

a) 1.65
b) 1.96
c) 2.06
d) 2.33

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Answers:

1. c

Explanation: R-squared does not tell us about the percentage of observations that can be predicted accurately.

2. d

Explanation: Hypotheses are always about parameters (not point estimates) and subscript 0 refers to the intercept and 1 refers to the slope.

3. c

Explanation: $df = 27 - 2 = 25$, $qt(0.975, 25) = 2.06$