3.2.R1

1/1 point (graded)

We run a linear regression and the slope estimate is 0.5 with estimated standard error of 0.2. What is the largest value of b for which we would NOT reject the null hypothesis that $\beta_1 = b$? (assume normal approximation to t distribution, and that we are using the 5% significance level for a two-sided test; need two significant digits of accuracy)

0.9

✔ **Answer:** 0.892

0.9

CI_upper = 0.5 + 2x0.2 = 0.9

Explanation

The 95% confidence interval $\hat{\beta}_1 \pm 1.96\ S.E.(\hat{\beta}_1)$ contains all parameter values that would not be rejected at a 5% significance level.

3.2.R2

1/1 point (graded)

Which of the following indicates a fairly strong relationship between X and Y?

- [x] $R^2 = 0.9$
- [ ] The p-value for the null hypothesis $\beta_1 = 0$ is 0.0001
- [ ] The t-statistic for the null hypothesis $\beta_1 = 0$ is 30

✔

Explanation

The R^2 is the correlation between the two variables and measures how closely they are associated. The p value and t statistic merely measure how strong is the evidence that there is a nonzero association. Even a weak effect can be extremely significant given enough data.