Question

A survey of 100 students finds report they 48% are excited by the opportunity to take a statistics class. Construct a 95% confidence interval on the true proportion of students who are excited to take a statistics class.

Solution

A 95% confidence interval on the true proportion of students who are excited to take a statistics class is

$$CI = \left(\hat{p} - z^* \sqrt{\frac{\hat{p}(1 - \hat{p})}{n}}; \ \hat{p} - z^* \sqrt{\frac{\hat{p}(1 - \hat{p})}{n}} \right),$$

where $z^* = 1.96$ for 95% confidence level.

$$CI = \left(0.48 - 1.96 \sqrt{\frac{0.48(1 - 0.48)}{100}}; 0.48 + 1.96 \sqrt{\frac{0.48(1 - 0.48)}{100}} \right) = (0.382; 0.578).$$

Answer: $(0.382; 0.578)$.