3.2 Among 100 fish caught in a certain lake, 18 were inedible as a result of the chemical pollution of the environment. Construct a 99 percent confidence interval for the corresponding true population proportion.

We want a 99% Confidence Interval for a proportion

\[ \alpha = 0.01 \]

\[ \hat{p} - E < P < \hat{p} + E \]

\[ E = Z_\alpha \sqrt{\frac{\hat{p}\hat{q}}{n}} \]

**Sample Data**

\[ n = 100 \]
\[ \hat{p} = \frac{x}{n} = \frac{18}{100} = 0.18 \]
\[ \hat{q} = 0.82 \]

\[ 0.18 - E < P < 0.18 + E \]

\[ E = 2.575 \sqrt{\frac{(0.18)(0.82)}{100}} \approx 0.0989 \]

\[ 0.081 < P < 0.279 \]

STAT >> TESTS A: 1-Prop Z Int...

We are 99% confident that the true population proportion is between 8.1% and 27.9%.

STUDY: Chapter 6: Section 6.4
- Estimating a Population Proportion