

## Question #71511, Math / Statistics and Probability

An insurance company collects data on seat-belt use among drivers in a country. Of 1400 drivers 30-39 years old, 18% said that they buckle up, whereas 379 of 1100 drivers 55-64 years old said that they did. Find a 98% confidence interval for the difference between the proportions of seat-belt users for drivers in the age groups 30-39 years and 55-64 years.

Construct a 98% confidence interval.

The 98% confidence interval for  $P_1 - P_2$  is from \_ to \_

**Answer.**

$$\hat{p}_1 = 0.18, n_1 = 1400, \hat{p}_2 = \frac{379}{1100} = 0.34, n_2 = 1100.$$

98% CI =

$$\begin{aligned} &= \left( \hat{p}_1 - \hat{p}_2 - z_{0.01} \sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}, \hat{p}_1 - \hat{p}_2 + z_{0.01} \sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}} \right) = \\ &= (0.18 - 0.34 - 2.326 \sqrt{\frac{0.18 \cdot 0.82}{1400} + \frac{0.34 \cdot 0.66}{1100}}, 0.18 - 0.34 + 2.326 \sqrt{\frac{0.18 \cdot 0.82}{1400} + \frac{0.34 \cdot 0.66}{1100}}) = \\ &= (-0.16 - 0.04, -0.16 + 0.04) = (-0.20, -0.12). \end{aligned}$$

Answer provided by <https://www.AssignmentExpert.com>