W271, Unit 1 Question 3

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$$\begin{cases} H_0 : \pi_1 - \pi_2 = 0 \\ H_1 : \pi_1 - \pi_2 \neq 0 \end{cases}$$

We will use the following test statistic:

$$Z_0 = \frac{\hat{\pi}_1 - \hat{\pi}_2}{\sqrt{\bar{\pi}(1-\bar{\pi})\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

using

$\bar{\pi} = \frac{251}{338} = 0.7426$; $\frac{1}{n_1} = \frac{1}{299} = 0.00334$; $\frac{1}{n_2} = \frac{1}{285} = 0.00351$; $\hat{\pi}_1 = \frac{251}{299} = 0.8395$; $\hat{\pi}_2 = \frac{251}{285} = 0.8807$

we obtain $|Z_0| = 1.14$, which is less then critical value of 1.96 for normally distributed statistic. Therefore, there is not enough evidence to reject null hypothesis.