

Math 741 Assignment 17 (Hand-IN)

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9.4.8.(H) solution: Let p_1 and p_2 denote divorce rate of first and second breeds. Then we can formulate the test as following,

$$H_0 : p_1 = p_2$$

$$H_1 : p_1 \neq p_2$$

with $x_1 = 175, n_1 = 609$ and $x_2 = 100, n_2 = 160$. Let $\alpha = 0.05$,

$$\hat{p}_1 = 175/609, \hat{p}_2 = 100/160, \hat{p}_p = \frac{175 + 100}{609 + 160} = \frac{275}{769}$$

$$z_0 = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\frac{\hat{p}_p(1-\hat{p}_p)}{n_1} + \frac{\hat{p}_p(1-\hat{p}_p)}{n_2}}} = -7.8298$$

$$P - value = 1 - P(-7.8298 < Z < 7.8298) \approx 0$$

Since $P - value = 0 < \alpha = 0.01 \implies$ Reject H_0 . Therefore, there is enough evidence to say that the two divorce rate is not the same.