STA2023 Boroward College

Two proportions Hypothesis testing

Assume that you plan to use a significance level of $\alpha = 0.05$ to test the claim that $p_1 = p_2$, Use the given sample sizes and numbers of successes to find the P-value for the hypothesis test.

1) $n_1 = 100$ $n_2 = 100$
   $x_1 = 38$ $x_2 = 40$

Use the traditional method to test the given hypothesis. Assume that the samples are independent and that they have been randomly selected

2) Use the given sample data to test the claim that $p_1 > p_2$. Use a significance level of 0.01.

Sample 1	Sample 2
$n_1 = 85$	$n_2 = 90$
$x_1 = 38$	$x_2 = 23$

3) A marketing survey involves product recognition in New York and California. Of 558 New Yorkers surveyed, 193 knew the product while 196 out of 614 Californians knew the product. At the 0.05 significance level, test the claim that the recognition rates are the same in both states.

4) Use the given sample data to test the claim that $p_1 < p_2$. Use a significance level of 0.10.

Sample 1	Sample 2
$n_1 = 462$	$n_2 = 380$
$x_1 = 84$	$x_2 = 95$

Construct the indicated confidence interval for the difference between population proportions $p_1 - p_2$. Assume that the samples are independent and that they have been randomly selected.

5) $x_1 = 19$, $n_1 = 46$ and $x_2 = 25$, $n_2 = 57$; Construct a 90% confidence interval for the difference between population proportions $p_1 - p_2$. 5) _____

A) $0.605 < p_1 - p_2 < 0.221$ B) $-0.187 < p_1 - p_2 < 0.136$

C) $0.252 < p_1 - p_2 < 0.574$ D) $0.221 < p_1 - p_2 < 0.605$

1) 0.7718
2) H_0: $p_1 = p_2$. H_1: $p_1 > p_2$.
   Test statistic: z = 2.66. Critical value: z = 2.33.
   Reject the null hypothesis. There is sufficient evidence to support the claim that $p_1 > p_2$.
3) H_0: $p_1 = p_2$. H_1: $p_1 \neq p_2$.
   Test statistic: z = 0.97. Critical values: z = ±1.96.
   Fail to reject the null hypothesis. There is not sufficient evidence to warrant rejection of the claim that the recognition rates are the same in both states.
4) H_0: $p_1 = p_2$. H_1: $p_1 < p_2$.
   Test statistic: z = -2.41. Critical value: z = -1.28.
   Reject the null hypothesis. There is sufficient evidence to support the claim that $p_1 < p_2$.
5) B