ASSIGNMENT.

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Q: A Data Analyst Company where there are 100k employees — in a Company. The HR wants to order some amount of t-shirt for employees. If 500 people from the entire Company are used for this Analysis, how many people will use XL-tshirts and L-tshirts do the data Analyst needs to order. Assumption is if C-I = 95%

Solution

If 200 XL-tshirt and 300 L tshirt are to be ordered.

① $H_0 : P_1 = P_2$ number of XL tshirt and L-tshirt to be ordered are same.

$H_1 : P_1 \neq P_2$.

Let $P_1 = 200$

$P_2 = 300$

$n = 500$

② $\alpha = 0.05$ $C \cdot I = 95\%$.

③ Ztest will be used since $n > 30$
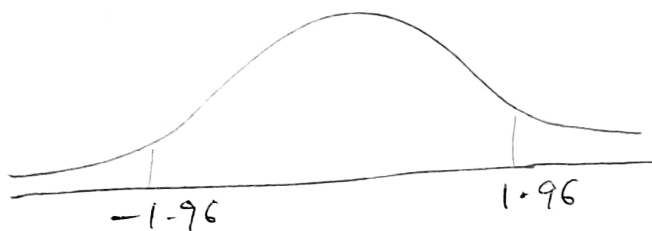
$Z_{0.025} = 1.96$.

$P_1 = \dfrac{200}{500}$

$P_1 = 0.4$

$P_2 = \dfrac{300}{500}$

$P_2 = 0.6$.

$n_1 = 500$

$n_2 = 500$

④ Decision rule.

-1.96 1.96

⑤ Calculate test statistics

$$z = \frac{\left(\hat{P}_1 - \hat{P}_2\right)}{\sqrt{\hat{P}(1-\hat{P})_b} \; \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

where $\hat{P} = \frac{x_1 + x_2}{n_1 + n_2}$

$$= \frac{200 + 300}{500 + 500} = \frac{500}{1000} = 0.5$$

$$\hat{P} = 0.5.$$

Thus, $z = \dfrac{0.4 - 0.6}{\sqrt{0.5(0.5)}\sqrt{\frac{1}{500} + \frac{1}{500}}}$

$$z = \frac{-0.2}{0.5 \times 0.063} = \frac{-0.2}{0.0316} = -6.33$$

Comparing z statistics with z table.

$-6.33 < 1.96$ ——— Reject null hypothesis

∴ The number of XL T-shirt and L t-shirt to be ordered will not be the same.