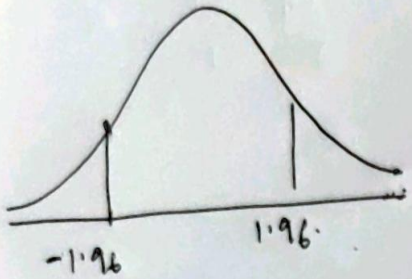
Assignment 5 - Tshirt problem statement.

There are 100k employee. $n = 500$ (300 XL, 200 L).

$H_0 = p_1 = p_2$

$H_1 = p_1 \neq p_2$.

$\alpha = 0.05$, C.I = 95%



$n_1 = n_2 = n = 500$.

$p_1 = 300$, $p_2 = 200$

$\hat{p_1} = \frac{p_1}{n_1} = \frac{300}{500} = 0.6$

$\hat{p_2} = \frac{p_2}{n_2} = \frac{200}{500} = 0.4$

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

$= \frac{500}{1000} = 0.5$

$$z = \frac{(\hat{p_1} - \hat{p_2})}{\sqrt{\hat{p}(1-\hat{p})}\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$z = \frac{0.6 - 0.4}{\sqrt{0.5(1-0.5)}\sqrt{\frac{1}{500} + \frac{1}{500}}} \Rightarrow z = \frac{0.2}{0.5 \times 0.002}$$

$z = 200$

$200 > 1.96 \rightarrow$ Reject Null hypothesis.

Conclusion:

200 L shirts & 300 XL shirts with 95% C.I //.