Assignment

100k employees, L & XL Tshirts needs to be ordered. For sample data of 500, 300 were XL, 200 were L. CI = 95%.

$\Rightarrow$ $n = 500$, $\hat{p} = \frac{300}{500} = 0.6$, $\hat{q} = \frac{200}{500} = 0.4$

1) 500 is < 5% of population size.

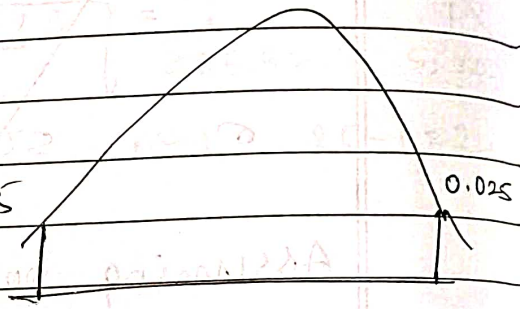
2) $np(1-p) \geq 10$

$500(0.6)(0.4) \geq 10$.

$120 \geq 10$ ∴ its a normal distribution

$\alpha = 0.05$, 2 Tail test.

$\alpha/2 = 0.025$



Limits $= \hat{p} \pm Z_{\alpha/2}\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$ 0.025

Higher limit $= 0.6 + Z_{0.025}\sqrt{\frac{(0.6)(0.4)}{500}}$

$= 0.6 + 1.96\,(0.0219)$

$= 0.643$

Lower proportion $= 0.6 - 1.96 \times 0.0219$

$= 0.557$.

XL within 55.7% & 64.3%

$55{,}707 < XL < 64{,}300$.

~~35700 ≤ L ≤ 44300~~

L within. $= 0.4 \mp 1.96(0.0219)$ & $0.4 \mp 1.96\left(\frac{0.0}{219}\right)$

0.357 & 0.442

L size tshirts = 35.7% & 44.2%