WK-05 | 031-334 2019

Day 5

03/07/2022

Thursday JANUARY 31

Assignment Task

Q.1 In a company, there are 100k employees. HR wants to order some T-shirts for them; so he gave the data of 500 employees to data analyst that out of 500 employees 300 ordered XL and 200 ordered L. So tell me how many L & XL size T-shirt should I order? C.I. = 95%.

Soln (1) For XL size T-shirts

Estimate of sample $n = 500$

$XL = 300$

Population for XL $\hat{P}_1 = \frac{300}{500} = 0.6$

* For 95% C.I. $\alpha = 0.05$

So $Z_{\alpha/2} = Z_{0.025} = 1.96$ (from Z-Table)

$$\text{Margin of error} = Z_{\alpha/2}\sqrt{\frac{\hat{P}_1(1-\hat{P}_1)}{n}}$$

$$= 1.96 \times \sqrt{\frac{0.6 \times 0.4}{500}}$$

for population proportion

$$C.I. = \hat{P} \pm Z_{\alpha/2} \sqrt{\frac{\hat{P}(1-\hat{P})}{n}}$$

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Margin of error $= 1.96 \times \sqrt{\frac{24}{5 \times 10^4}}$

$= 1.96 \times 0.0219$

Margin of error $= 0.043$

So for 95% confidence Interval, range of employes who wear XL size is somewhere between

$= 0.6 \pm 0.043$

for +ve Upper limit $= 0.6 + 0.43$

$= 0.643$ or 64.3%

and for -ve lower limit $= 0.6 - 0.43$

$= 0.557$ or 55.7%

So XL size requirement is somewhere between 55.7% to 64.3%

And L size $\Rightarrow$ 100% - 64.3%

$= 35.7\%$ and $100\% - 55.7\%$

$= 44.3\%$

L-size **35.7% to 44.3%** Ans.

Ans.