

T-test

Prob- On the "verbal section" of CAT
sample of 25 test taken, has a
mean of 520 with $S = 80$ (sample)
C.I. 95%?

Soln:- verbal section Avg. mark 520

$$H_0 = 520$$

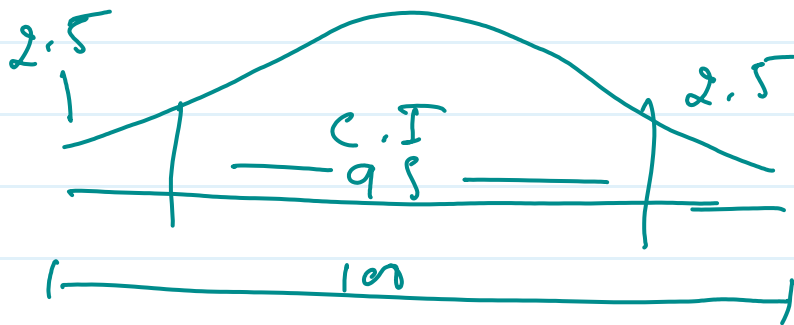
$$H_1 \neq 520$$

$$\bar{x} = 520$$

$$n = 25$$

$$S = 80$$

$$\alpha = 0.05$$



Two-tail

$$\left\{ \begin{array}{l} \text{one tail} = \alpha \\ \text{Two-tail} = \alpha/2 \end{array} \right\} \quad \alpha/2 \Rightarrow \frac{0.05}{2} = \underline{0.025}$$

$$\text{C.I.} = 1 - 0.025$$

$$\boxed{= 0.975}$$

t-test

{ sample size < 30, S given }

$$t\text{-test} = \bar{x} \pm t_{\alpha/2} \left(\frac{S}{\sqrt{n}} \right)$$

$$n = 25$$

$$n = 25 - 1 = 24 \text{ (D.f.f.)}$$

$$t = 2.06$$

$$\begin{aligned} +ve &= 520 + t_{0.025} \left(\frac{80}{\sqrt{25}} \right) \\ &= 520 + 2.064 \left(\frac{80}{\sqrt{25}} \right) \\ &= 553.02 \end{aligned}$$

$$\begin{aligned} -ve &= 520 - 2.064 \left(\frac{80}{\sqrt{25}} \right) \\ &= 486.97 \end{aligned}$$

$$\Rightarrow \underline{486.97 \text{ to } 553.02}$$

$$\text{Avg (mean)} = 520$$

Conclusion - we fail to reject null hypothesis,

✓ H_0 - we fail to reject null hy.

✓ H_1 = we reject null hy.
Accept alternate hyp.

eg

$$n = 28$$

$$\bar{x} = 410$$

$$S = 72$$

$$C.J. = 95$$

$$\alpha = 0.05$$

$$D.f. = 28 - 1 = 27$$

$$\Rightarrow \alpha = 2.052$$

$$\Rightarrow \checkmark 410 + 2.052 \left(\frac{72}{\sqrt{28}} \right)$$

$$\Rightarrow \boxed{437.92}$$

$$\Rightarrow 410 - 2.052 \left(\frac{72}{\sqrt{28}} \right)$$

$$\Rightarrow \boxed{382.}$$

$$\boxed{382 - 437}$$

$$H_0 \checkmark$$

Type-I error

Type-II error.

Type -I error

Person doesnot have cancer.

H_0 = doesnot have cancer

H_1 = have cancer

Error we mistakenly prove H_1

Type-II error

H_0 = Person has cancer

H_1 = doesnot have cancer.

Error :- we mistakenly prove H_0