H_0 = diffender hypothisis / claimed
H_1 = Attacker " / new claim

in Hypothesis testing

we try to examine Significance of H_1
if Significance of H_1 is high. it mean
* he is upto somthing and
Not to be ignored * prooven by
Significance Test
if not proves that "previous claim
was false " but the credibality
can be questioned.

if Significance of H_1 is low * just ignore H_1
"Eumpire Stick with Decision"

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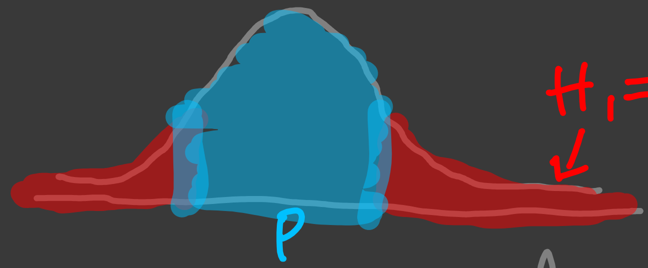
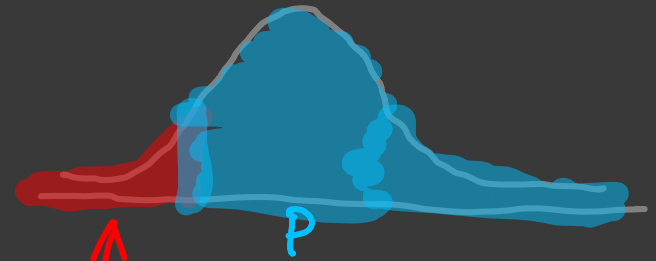
if $p = x \Rightarrow H_0$ → two Tailed test
$p \neq x \Rightarrow H_1$

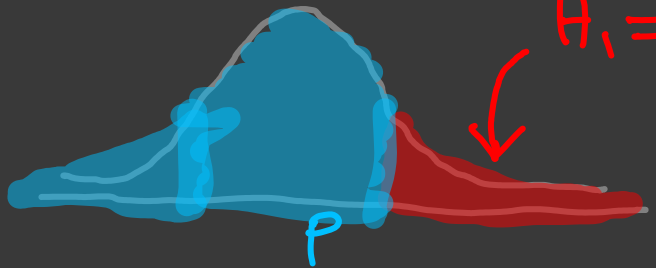


$H_1 \Rightarrow P \neq X$

if p and x relation → one tailed test
relation is non pin point
like $\leq, \geq, >, <$
for H_0 or H_1



$H_1 \Rightarrow P < X$ or
$P \leq X$



$H_1 \Rightarrow P > X$ or
$P \geq X$

Type I Error = Rejecting H_0 when it is true

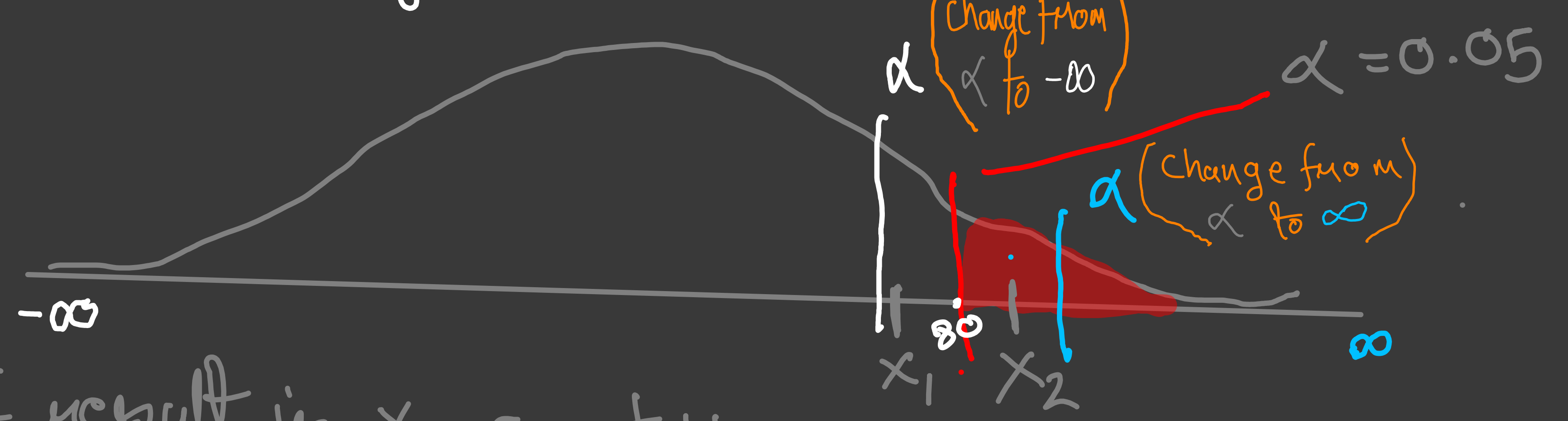
mean α was a wrong selection
it should have bin High

α = α after Type I error correction

α = α after Type 2 error correction

$P = H_0$ True

$1 - P = H_1$ True



if result is X_1 accept H_0
is X_2 reject H_0

area under Curve

* X_2 is when H_1 significance is low that $H_0 \Rightarrow P \leq 80$ is Wrong it is more than 80 so accept H_1

* X_1 is when H_1 significance is High that means $H_0 \Rightarrow P \leq 80$ is right

* so H_1 is used to prove or not the claimes H_0

Normal distribution → continous data distribution with bell curve usually been in world so "Normal".

Standard Normal dist → Normal dist with standard deviation = 1 "σ" and mean = 0 "μ".

* Note Hypothis work on sample mean distribution

When Sample Size is (n) and population STD (σ) or sample STD (S), " mean (μ)

1) $n < 30$, σ = not known then use $t = \dfrac{\bar{x} - \mu}{S/\sqrt{n}}$

2) $n < 30 \rightarrow \sigma$ = known then use $Z = \dfrac{\bar{x} - \mu}{\sigma/\sqrt{n}}$

$n > 30 \rightarrow \sigma$ = unknown $\rightarrow$ S not σ

if P (proportion like 90% of x) given not $\bar{x}$ (mean)

$$Z = \frac{\hat{p} - p}{\sqrt{pq/n}}$$

$q = 1 - p$

$\hat{p}$ = sample p

p = population p

t valuce (t_c) calculated $\rightarrow$ find in table

df = n−1

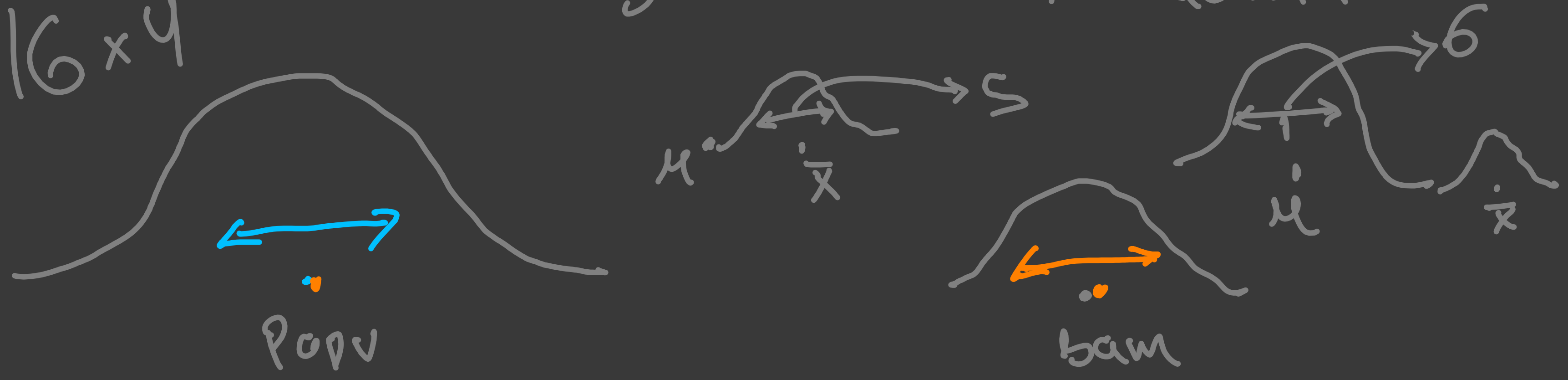
n sample size => $n < 30$ T test

α = $\leftarrow$ (0.01, 0.05 etc) Significance level

Z value (Z_c) $\rightarrow$ find in table

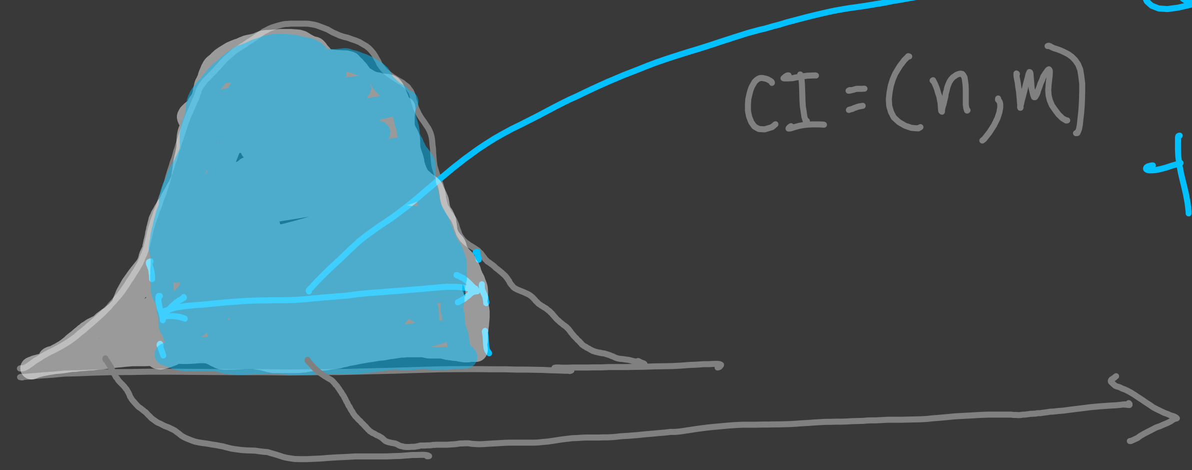
Z = 0.78 $\rightarrow$ vertical values / rows $\rightarrow$ horizontal values / column

16×4



Confidence level (aka confidence) = C

Significance level = α = $1-C$



CI=(n,m)

confidence interval

two tailed

confidence level (left or Right)

One tailed

(two tail) Area left = $\frac{\text{Confidence level} + 1}{2}$, Area Right = $\frac{1-CL}{2}$

One tail

Area = CL , H_1 area = $1-CL$

A_L → connected to → Z_α

margin of error → used to find range Population μ

$$\bar{x} - Z_\alpha \frac{\sigma}{\sqrt{n}} \le \mu \le \bar{x} + Z_\alpha \frac{\sigma}{\sqrt{n}}$$

Sample μ

n

m

error Bound for mean (EBM)

margin of error between (n to m) = CI

CI ∝ EBM

↑ proportional

$n \propto \frac{1}{EBM}$

as $EBM = \frac{CI_{diff}}{2}$

" $= \frac{m-n}{2}$

Sample Size →

$\hat{p} = \frac{x}{n}$ | $\hat{q} = 1 - \hat{p}$

(mean) $n = \frac{Z^2 \sigma^2}{EBM^2}$

(proportion) $n = \frac{Z^2 \hat{p}(1-\hat{p})}{EBM^2} = \frac{Z^2 \hat{p}\hat{q}}{EBM^2}$

Proportion margin of error

$\hat{p}$ - sample proportion, p → population proportion

$$(\hat{p} - EBM \leq p \leq \hat{p} + EBM)$$

$$EBM = Z\sqrt{\frac{\hat{p}\hat{q}}{n}}$$