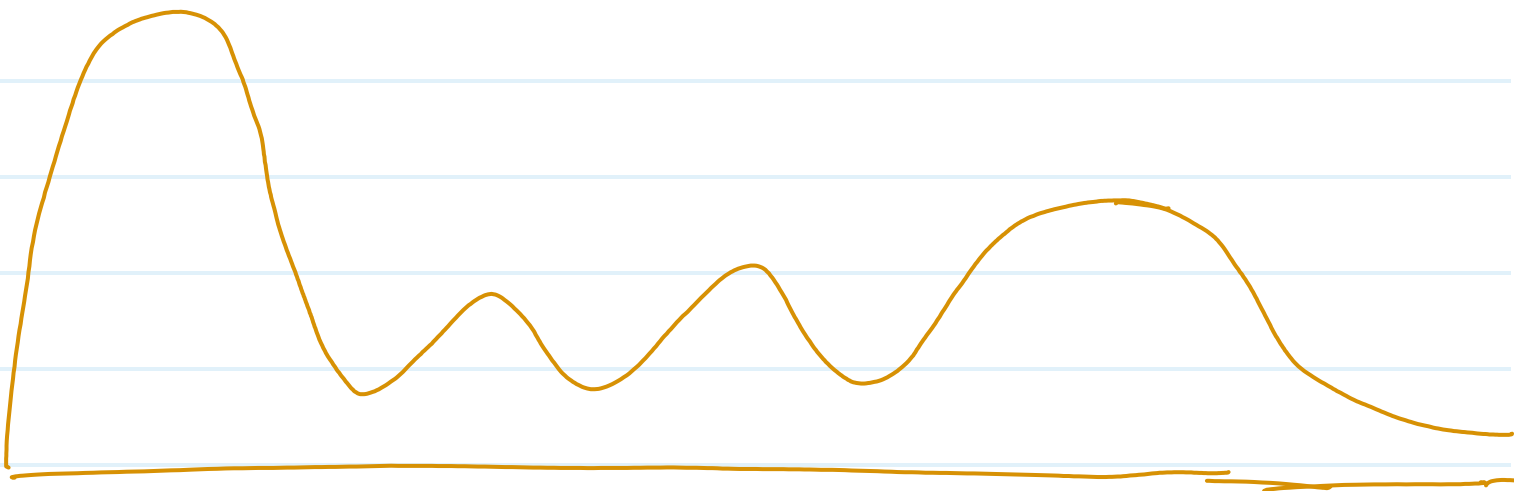
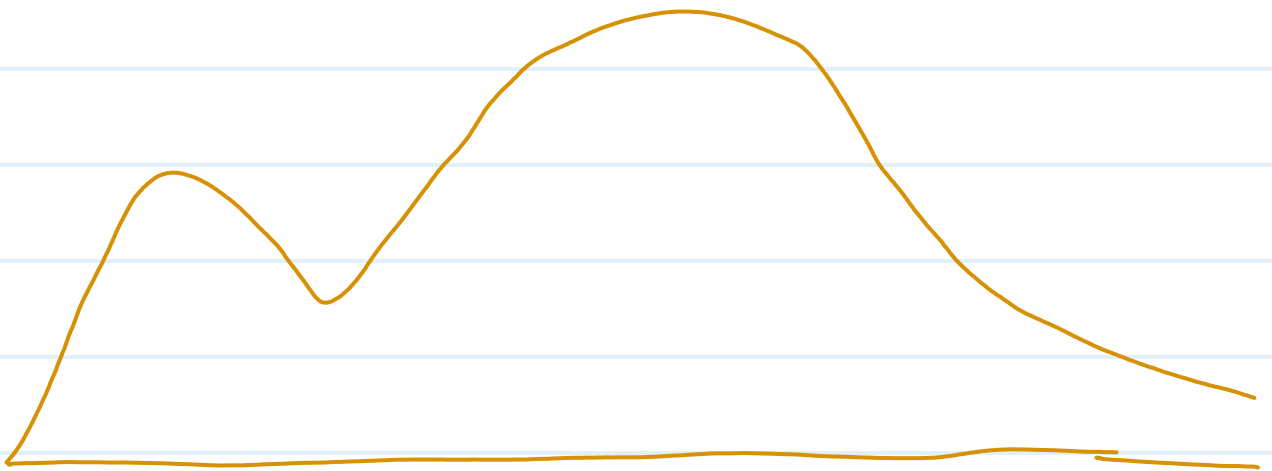
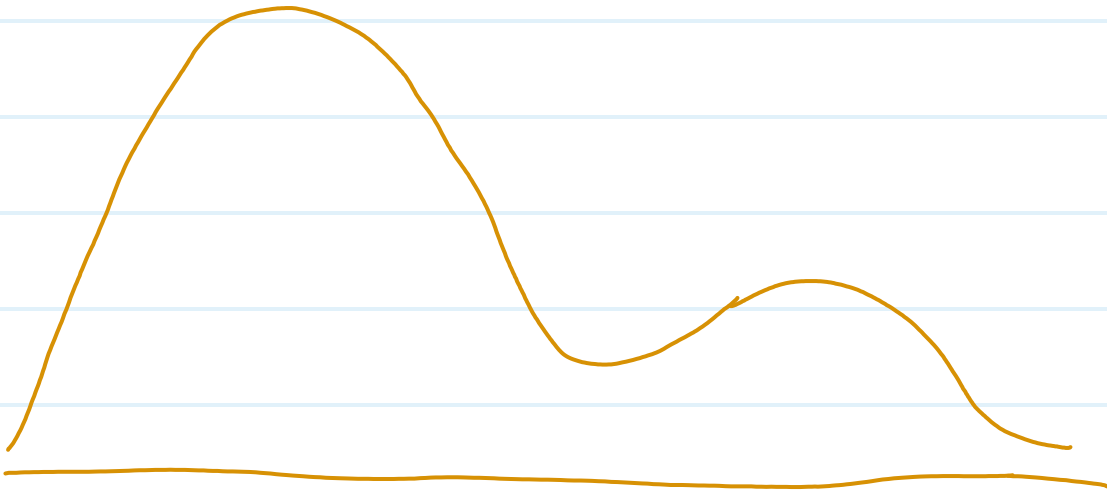


# Center limit theorem

Population Distribution.



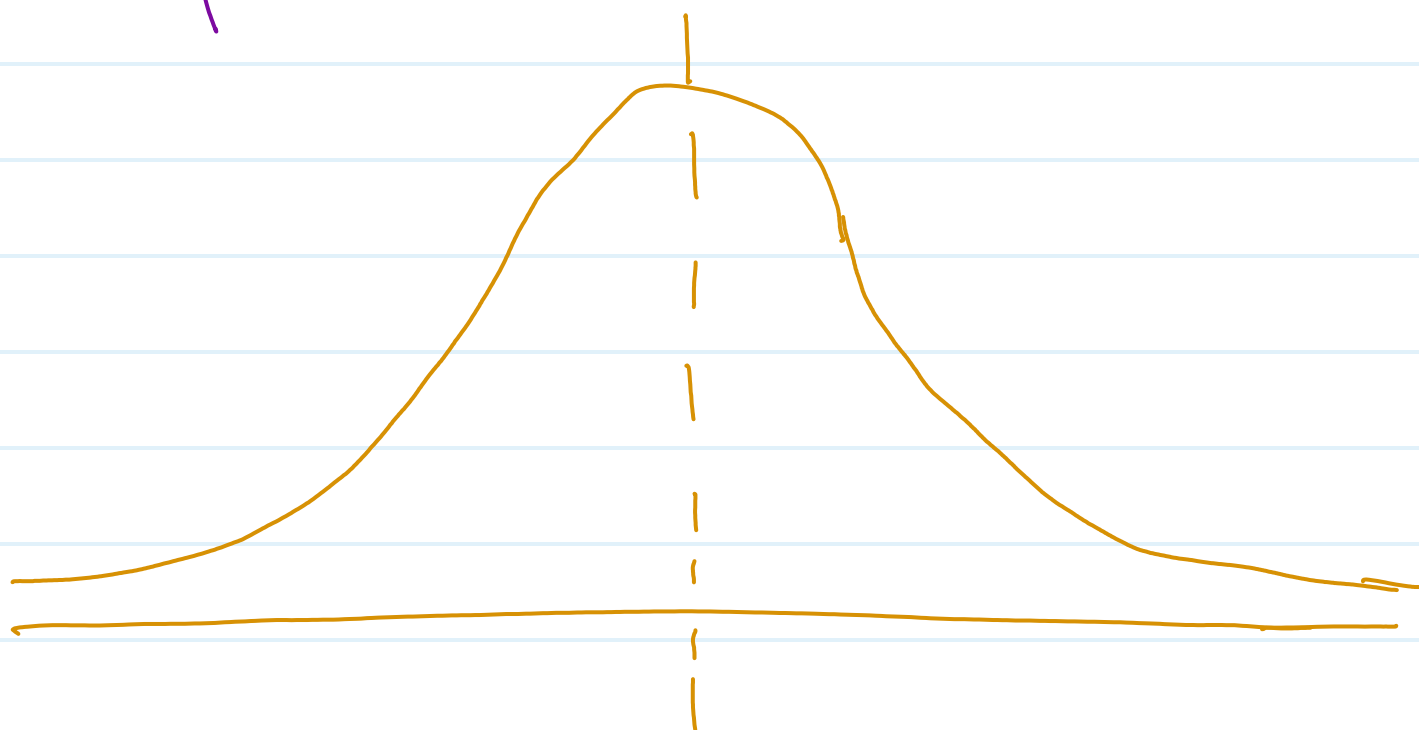
CLM say if you collect sample from population with sample size  $\geq 30$ .

Sample (n) =  $n_1, n_2, n_3, \dots, n_{40}$

sample size  $\geq 30$

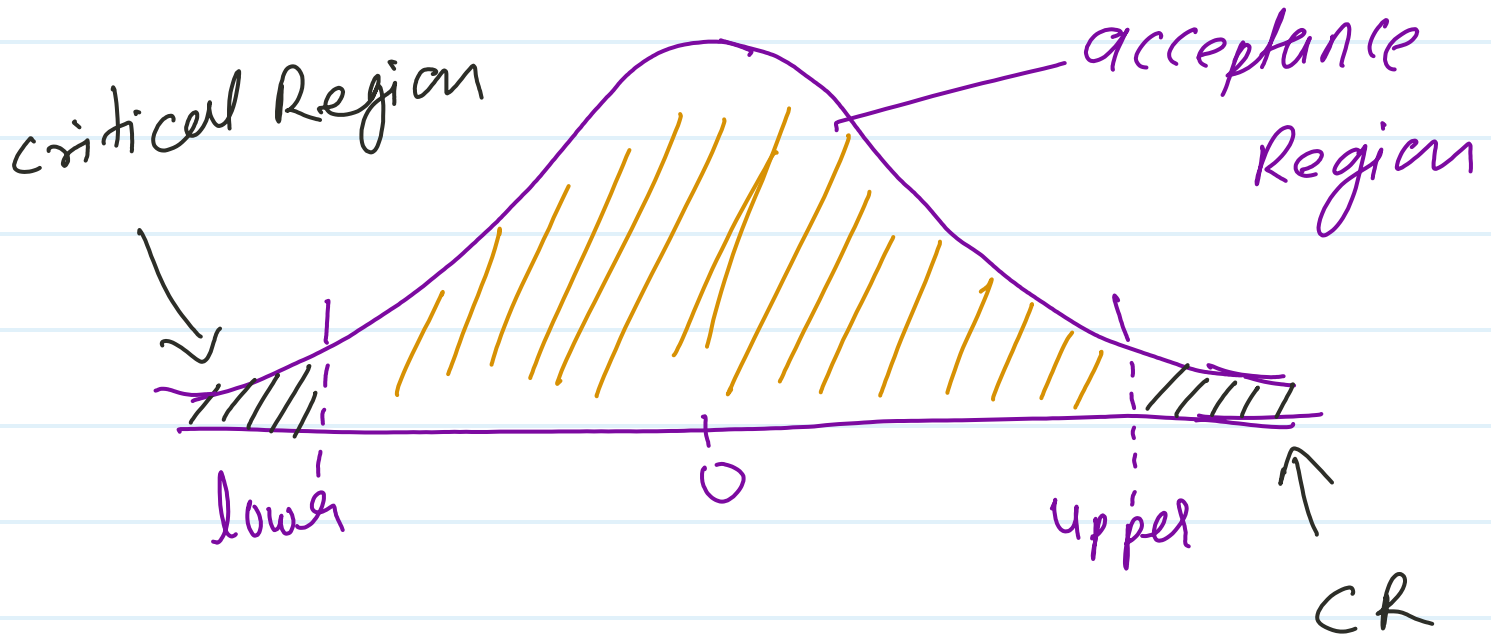
Sample mean =  $\bar{x}_1, \bar{x}_2, \bar{x}_3, \dots, \bar{x}_{40}$

eg. [11, 17, 21, 23, 26, 29, 32, 37]



# Hypothesis testing

## \* Confidence interval -



$H_0$  (null hypothesis) It support always confidence Interval. (Acceptance Region)

$H_1$  (Alternative hypothesis) It support always critical Region.

✓  $H_0$  - We fail to reject  $H_0$ .

✓  $H_1$  = we reject  $H_0$ , and accept  $H_1$ .

$$N = 10000$$

$$\mu = 285$$

$$n = 40$$

$$\bar{x} = 140$$

Two tail -



$$\mu = \bar{x} = \text{Null hypothesis}$$

$$\mu \neq \bar{x} = \text{Alternate hypothesis.}$$

$\alpha$  = Critical Region

C.R = Acceptance Region

P = It is probability of  $H_0$  to be True.

$$P = 0.15$$

$$\alpha = 0.05$$

$$P > \alpha$$



In this case we fail to reject null hypothesis.

$$P < \alpha$$

We reject null hypothesis and accept alternate hypothesis.

\* Type of hypothesis test

(i) Parametric test

(ii) Non-parametric test

# ① Parametric test

① Z-test

② T-test

③ Binomial test

④ Poisson test

⑤ Exponential test

## ② Non-parametric test

① Chi-square test

② Anova (F1)

{ Sample size  $< 30$   
 $\sigma$  missing } T-test

{ Sample size  $\geq 30$   
 $\sigma$  given } Z-test.

