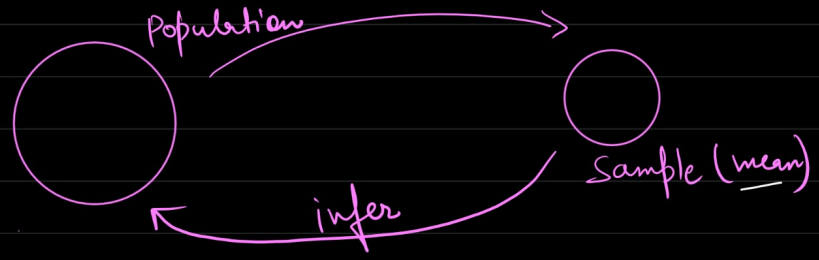
Hypothesis testing and mechanism

* You can guess that avg age of population of India is 45 years



inferential statistics

* Hypothesis | testing

* Hypothesis → It is a claim or statement or an assumption about a population parameter that can be tested using statistical methods.

eg: Average salary of IT employee is 50k

eg: Consumption of Ice-cream is more in Summer.

eg: The person is not guilty if accused of any crime.

① Null hypothesis → The initial or default assumption.

→ Ex: Person is not guilty.

② Alternate hypothesis → Opposite of Null hypothesis

Ex: Person is guilty.

* Hypothesis testing

→ You made a claim about the population (say average age is 45 years) (Hypothesis)

→ Due to time & resource constraints, you can not go to each person of population to record age.

→ Take sample, Calculate avg age of sample & Check if the sample avg age is close to the claim that you have made about population. ⇒ Trying to verify the hypothesis

⇓

hypothesis testing.

* Mechanism (Hypothesis testing)

Step ① Frame the hypothesis.

Claim/statement

→ Null hypothesis (H_0)

→ Alternate hypothesis (H_A)

Ex1 Claim: Avg age of people in PW skills is 45 years.

$H_0: \mu_{age} = 45$ $H_A: \mu_{age} \neq 45$

↳ will → H_0 will have equality sign.

Ex2 Avg age of Employee in ABC organisation is atleast 45 years.

$\mu_{age} \geq 45$ $\mu_{age} < 45$

$H_0: \mu_{age} \geq 45$

$H_A: \mu_{age} < 45$

Ex3: Avg age of employes is greater than 45 years.

$\mu_{age} > 45$ $\mu_{age} \leq 45$

H_0: will have equality symbol.

$H_0: \mu_{age} \leq 45$

$H_A: \mu_{age} > 45.$

Eg: Avg age is greater than equals to 45 years

$H_0: \mu_{age} \geq 45$ $H_A: \mu_{age} < 45$

Step-2 Statistical analysis (pvalue, significance level)

Step-3 Conclusion to reject H_0 or fail to reject H_0.