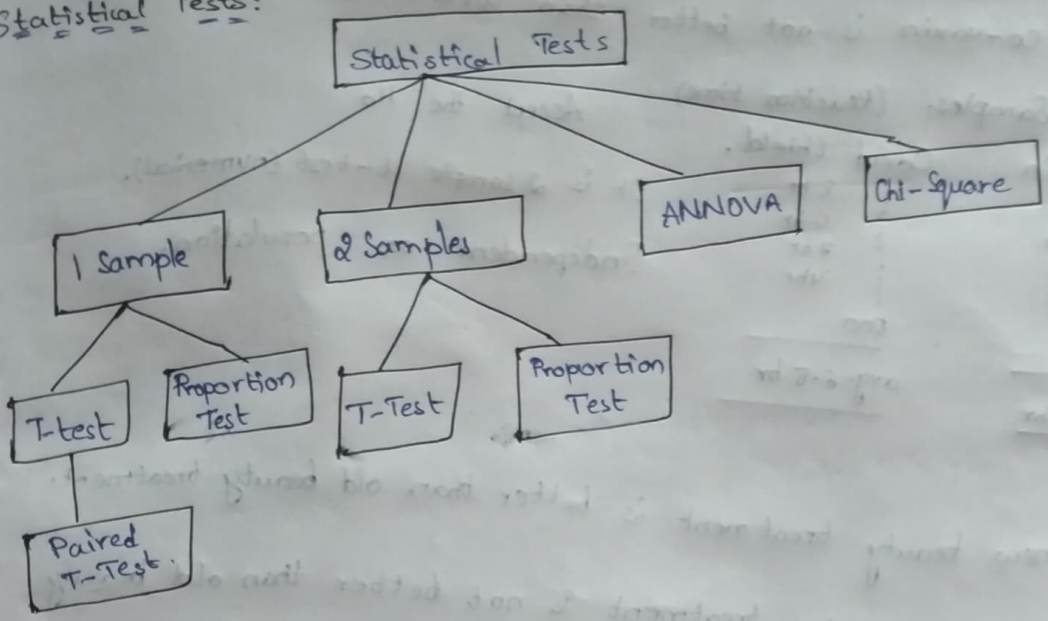
Nov-5:

Statistical Tests:



Example:

1. H_0: the avg. salary of bangalore IT employees is 25k

H_A: No, The avg. salary of bangalore IT employees is not 25k.

Here, we need minimum one sample. We collect salary of employees (numerical data)

1 sample

$H_0 = 25k$

$H_A \neq 25k$.

30 k
28 k
18 k
25 k
40 k
20 k
29 k

This is two-tailed test.

This is called as "1 sample T-test" & it is dependent on population.

2. H_0: In India, more than 50% of people are unemployed

H_A: No, In India ~~50%~~ more than 50% of people are not unemployed.

1 Tail test : $H_0 > 50\%$, $H_A < 50\%$

We have to accept the Null hypothesis.

1 sample

Yes
No
No
Yes
No
No
Yes

Categorical data → One Sample proportion Test & dependent on population.

60% UE & 40% E

3. vaccine

H_0: The Co-vaxin is better than covid shield.

H_A: No, Co-vaxin is not better than covid shield.

2 Samples. (Reaction time)

	Co-vaxin		Covid shield.
1	2hr	1	8 hr
2	2.5hr	2	12 hr
3	1.5hr	3	7 hr
⋮	3hr	⋮	4hr
500		500.	
avg.	3.5 hr	avg.	6.5 hr

Accept the H_0

It is 2 sample t-test (numerical).

Independent on population.

4.

H_0: The new beauty treatment is better than old beauty treatment.

H_A: No the new beauty treatment is not better than old beauty treatment.

categorical data.

Reject the H_0.

It is 2-sample proportion test

Independent on population.

	Sample 1: New beauty Treatment		Sample 2 old beauty Treatment.
		1	Yes
1	No	2	Yes
2	No	3	Yes
3	Yes	⋮	No
⋮		50	Yes
50	No		40 - Yes
	35 - No		10 - No
	15 - Yes		

5.

H_0: New weightloss program where you can see significant difference.

H_A: No By new weightloss program you can't be able to see significant difference.

Sample

	Before treatment	After treatment.
1	83 kg	71 kg
2	95 kg	80 kg
3	78 kg	80 kg
⋮	⋮	⋮
50	110 kg	88 kg

Accept the H_0

Numerical data.

It is one sample paired T-test.

ANNOVA Test (Analysis of Variance):

Ho: Your Batch students can't able to score more than 90M.

HA: No, My Batch students will score more than 90M.

	B1	B2	B3	B4	B5
1.	72				
2.	65				
3.	81				
4.	90				
	⋮				
5.	87			89	63
	82	89	94		

Reject Ho.

If one sample is proving it is enough

Questions:

1. In the 2000 Indian census the age of the individual in a small town where found to be the following:

In the year 2000.

Less than 18	18 - 35	> 35
20%	30%	50%

In 2010 Age of $n = 500$ individuals were sampled, below are the results.

In the year 2010

Less than 18	18 - 35	> 35
121	288	91

Using $\alpha = 0.05$ would you calculate the population distribution of ages has changed in the last ten years?