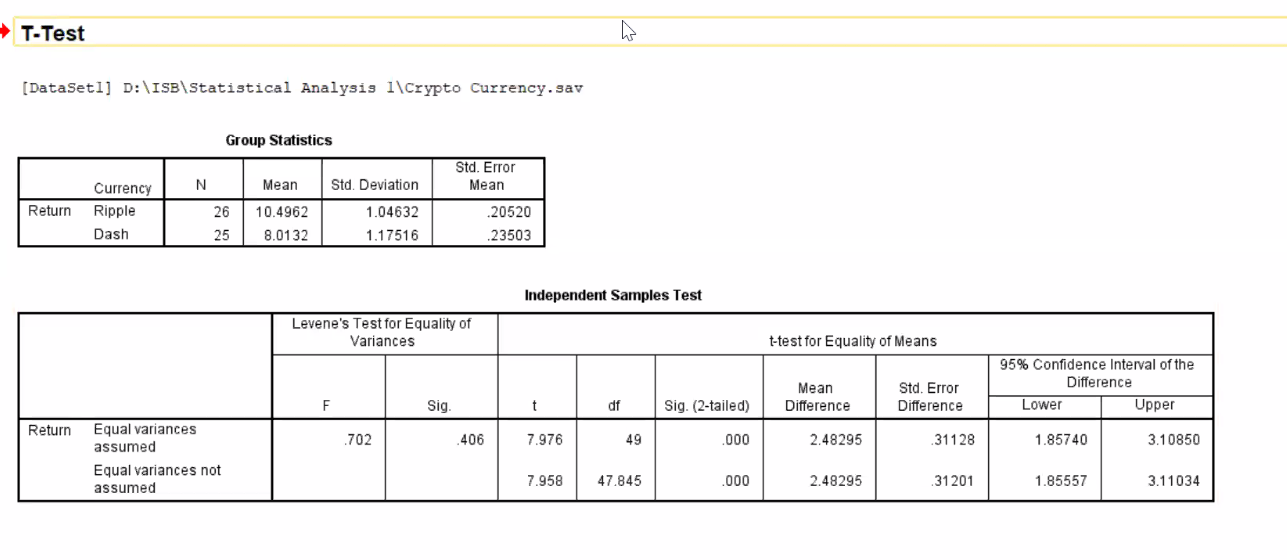
# SPSS Independent samples mean test



**Inherent variation:** Though any process however standardized can have certain variations that will show up in sampling.

**Process variation**: The process has really changed over time.

# ANOVA

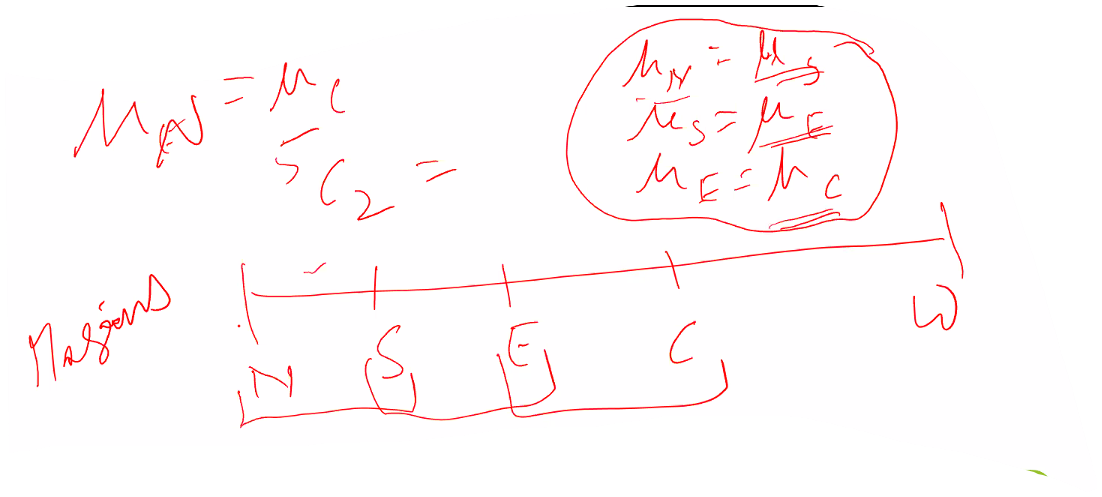
Why ANOVA is needed?

If we do a pairwise test as below it causes the below problem:

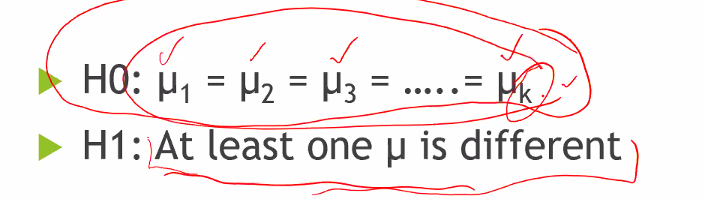
Suppose we have 5 populations. If we do a pair wise test for means we might end up in a situation as below:

1. µ1 = µ2
2. µ2 = µ3
3. µ3 = µ4
4. µ4 = µ5

Which finally may result is a contention that µ1 = µ5 which might not be true if plotted on a number line.



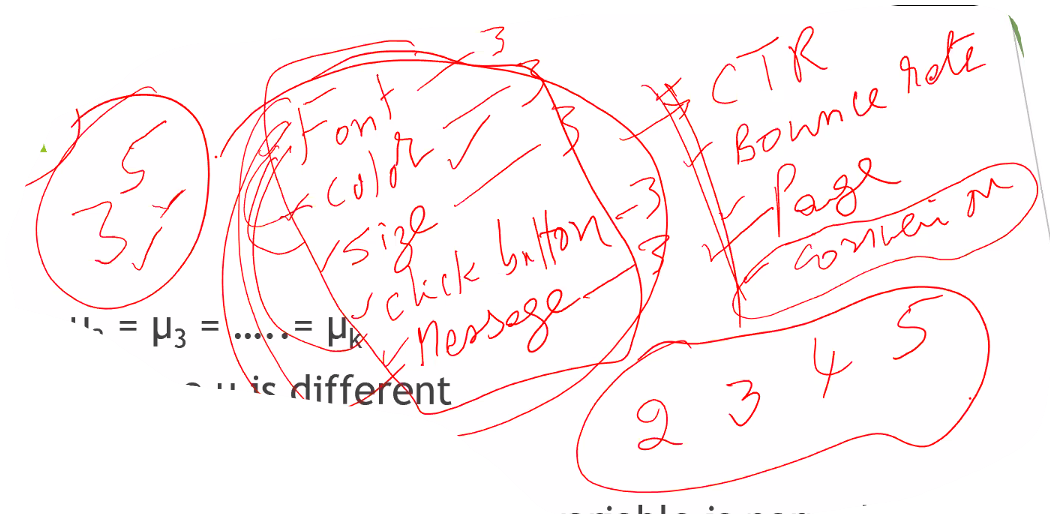
So we need something like a one-shot test to do this for multiple variables.



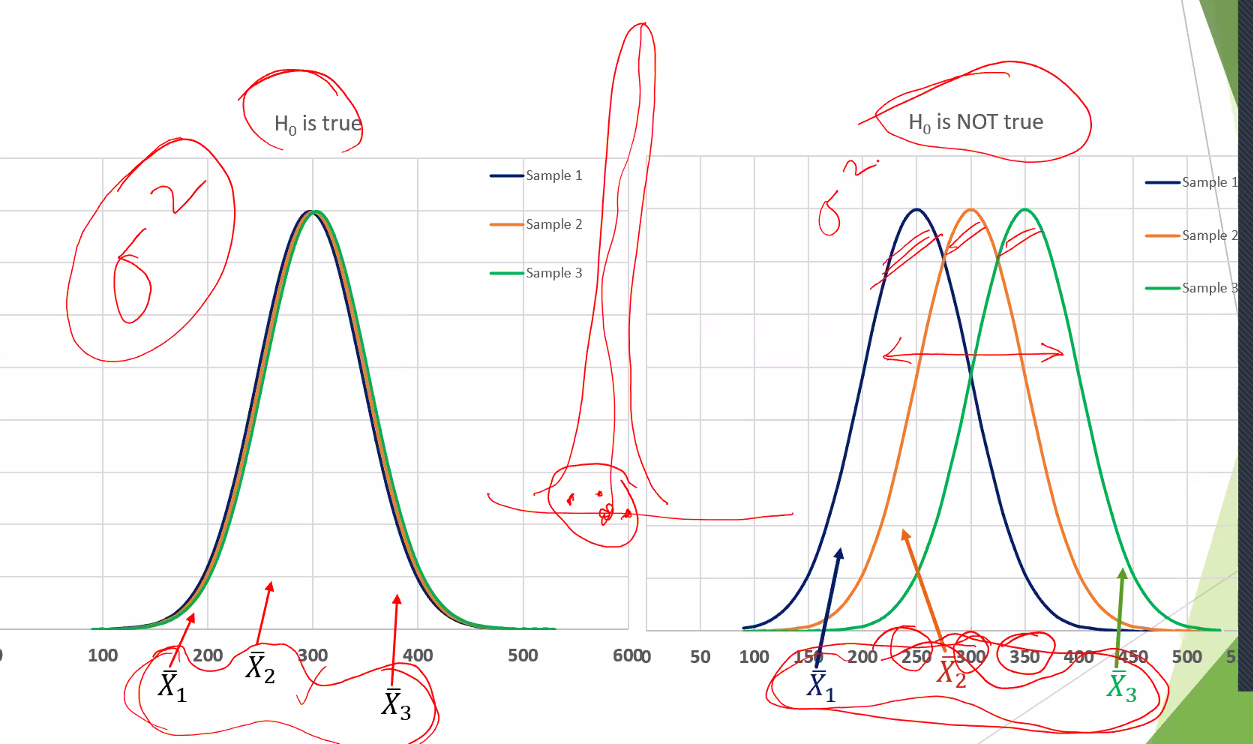
H0 is presumed that all the samples come from same population.

H1: That at least one of the samples come from a different population.

**What is MANOVA?**

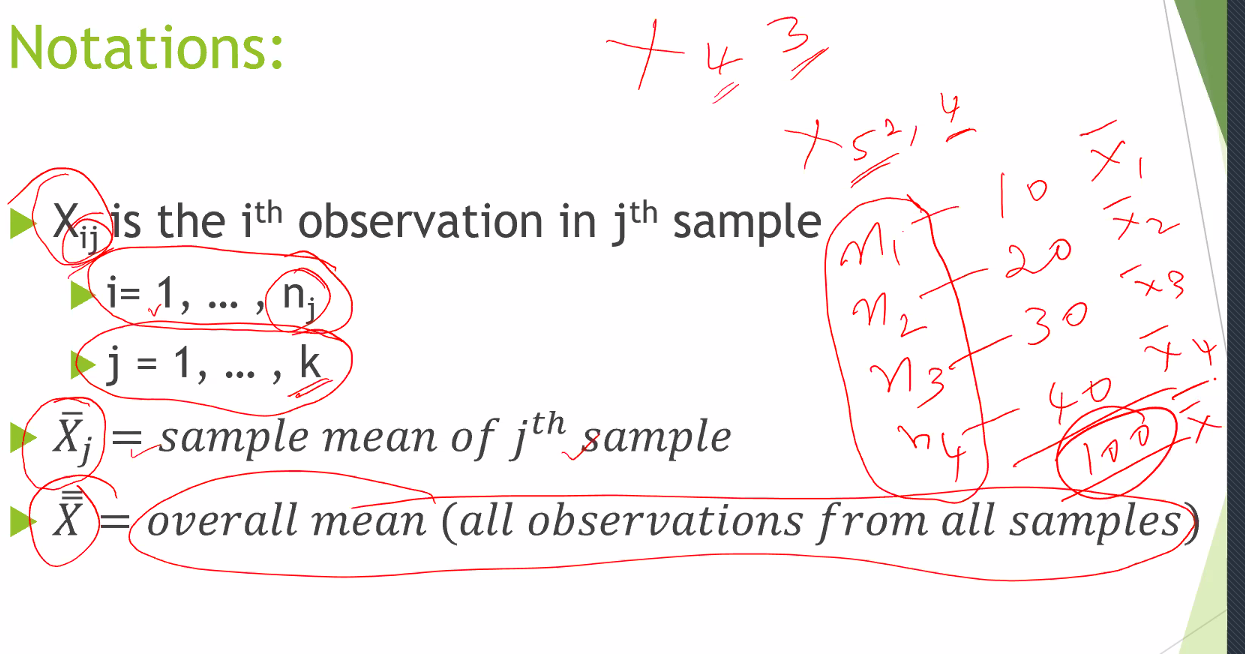
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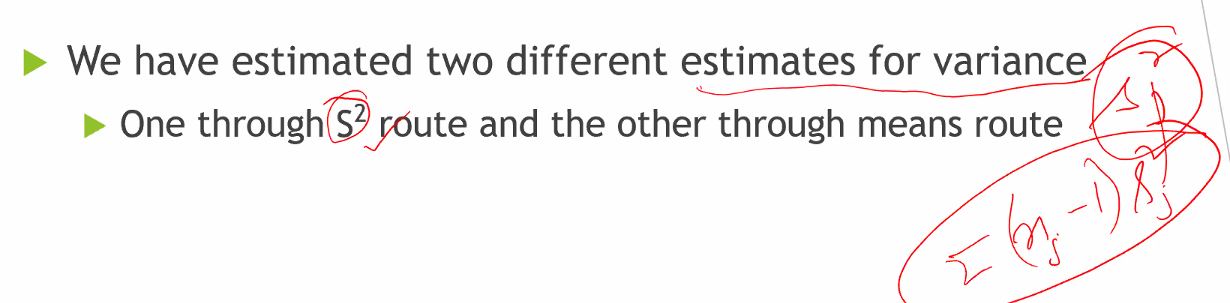
Multiple dependent variables make it MANOVA.

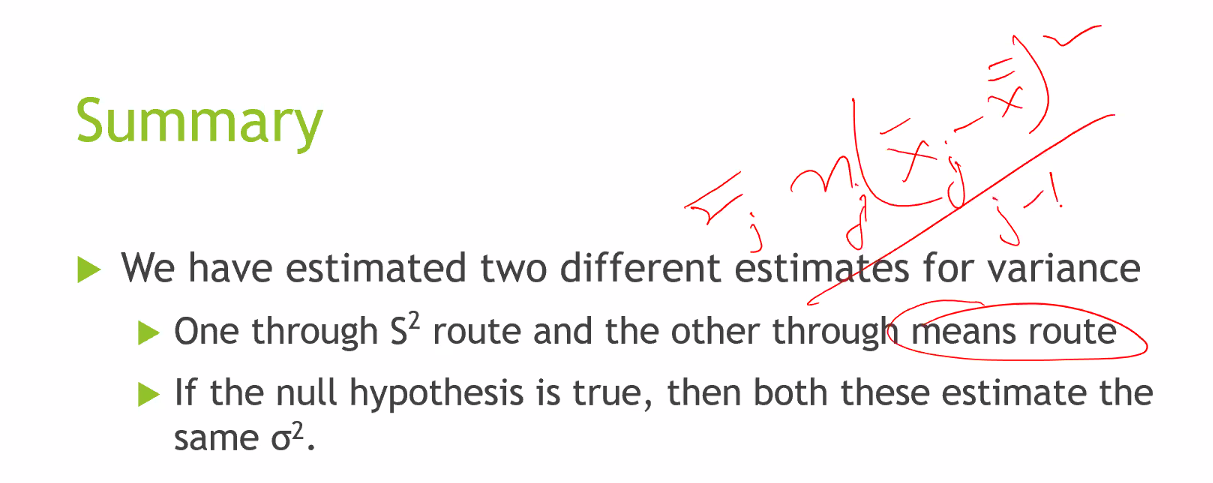
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If I am operating on the left side H0: The differences between X\_bar1,2,3 the variation is attributable only to the inherent variation of the population.

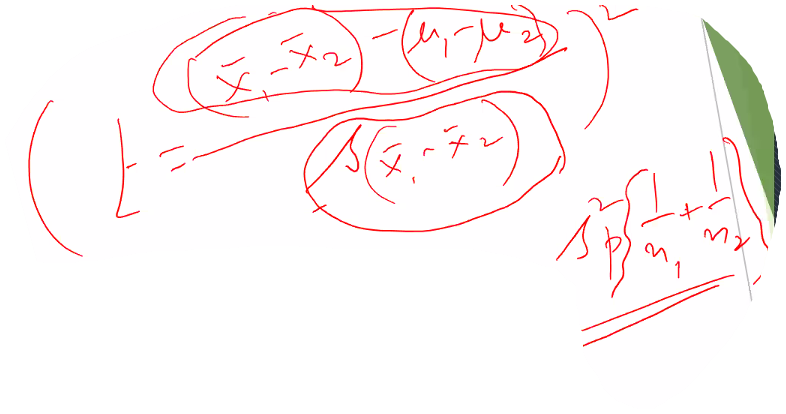
If H1: The differences is due to the variations of both the population variance and also the shifting of the means.

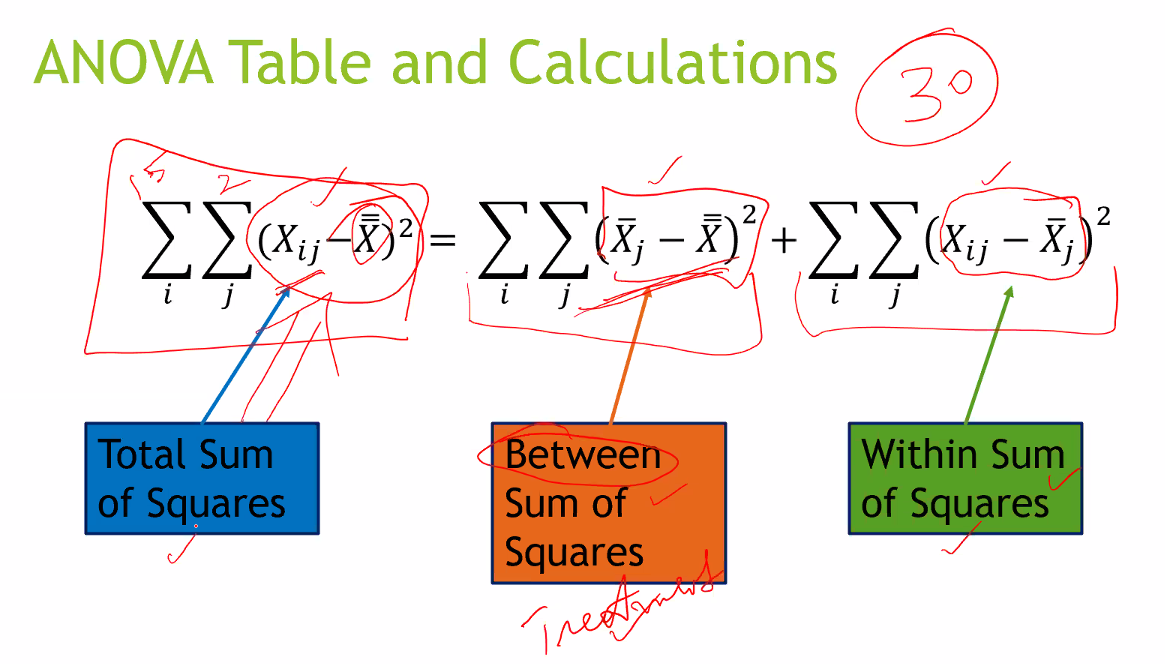






F = t2 if n = 2. (E.g. Chubby Chunky)





Between = Treatment SS2

Within = Error SS2.

Closer between SS2 to 0’s more reason not to reject the H0.

By default it is one sided test.