



Hypothesis Testing

Test and Level of Significance

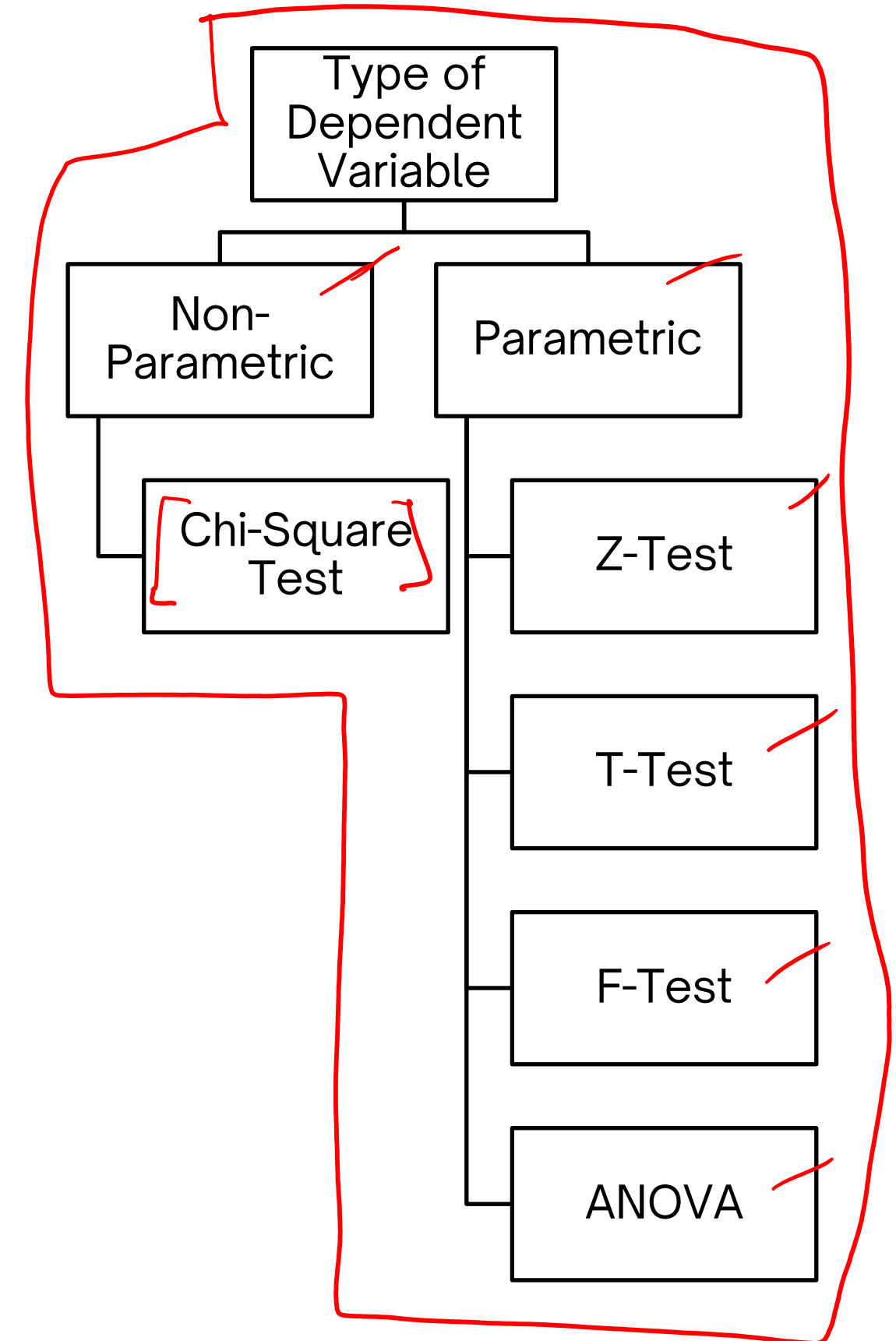
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Test of Significance



- A statistical hypothesis test is a method of making decisions using data from a scientific study
- In statistics, a result is called statistically significant if it has been predicted as unlikely to have occurred by chance alone, according to a pre-determined threshold probability.



Test of Significance

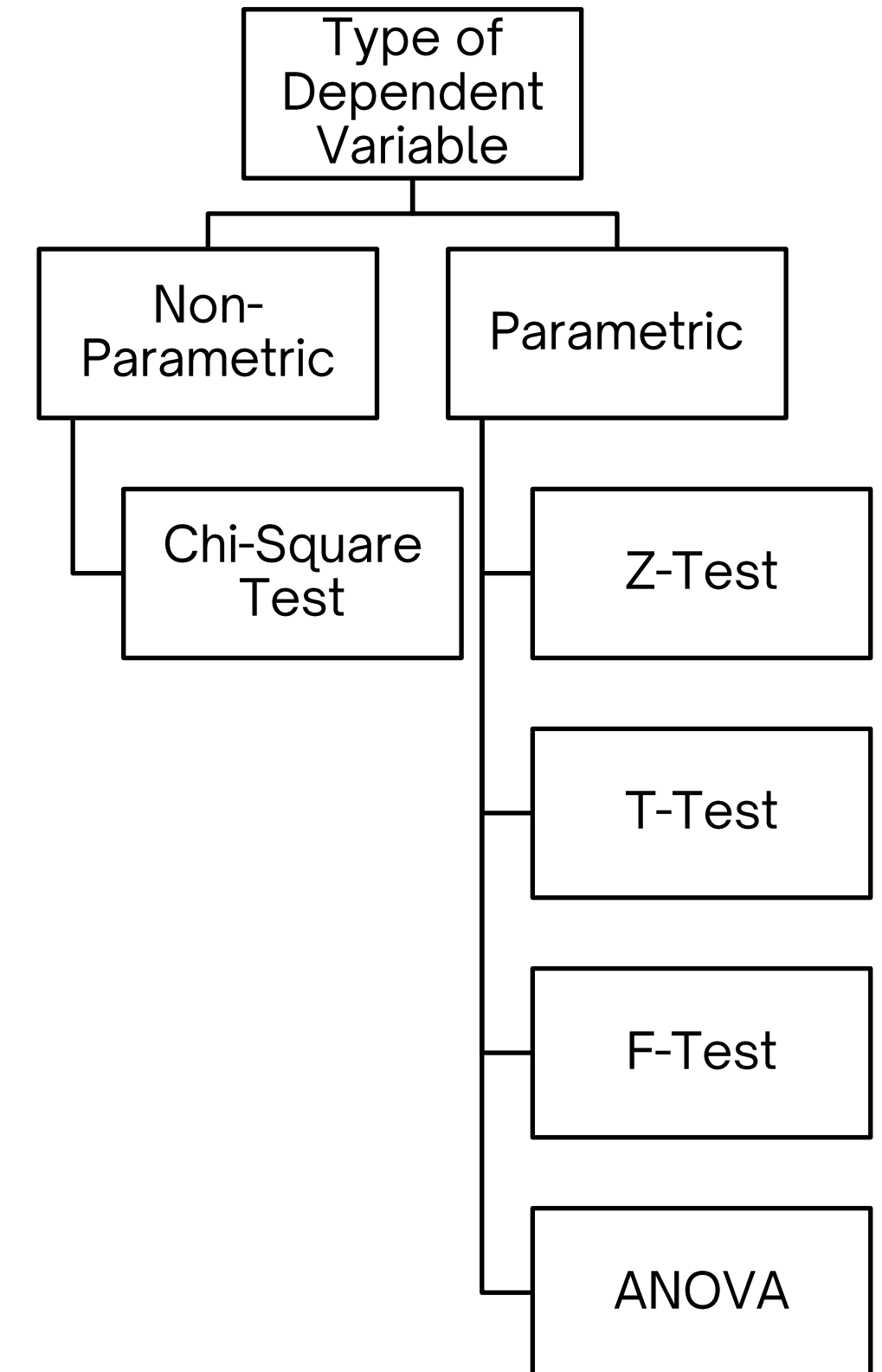


- A test of significance is a formal procedure for comparing observed data with a claim (a hypothesis), the truth of which is being assessed.

- Testing sample & commenting on population.

Questions answered by test of significance:

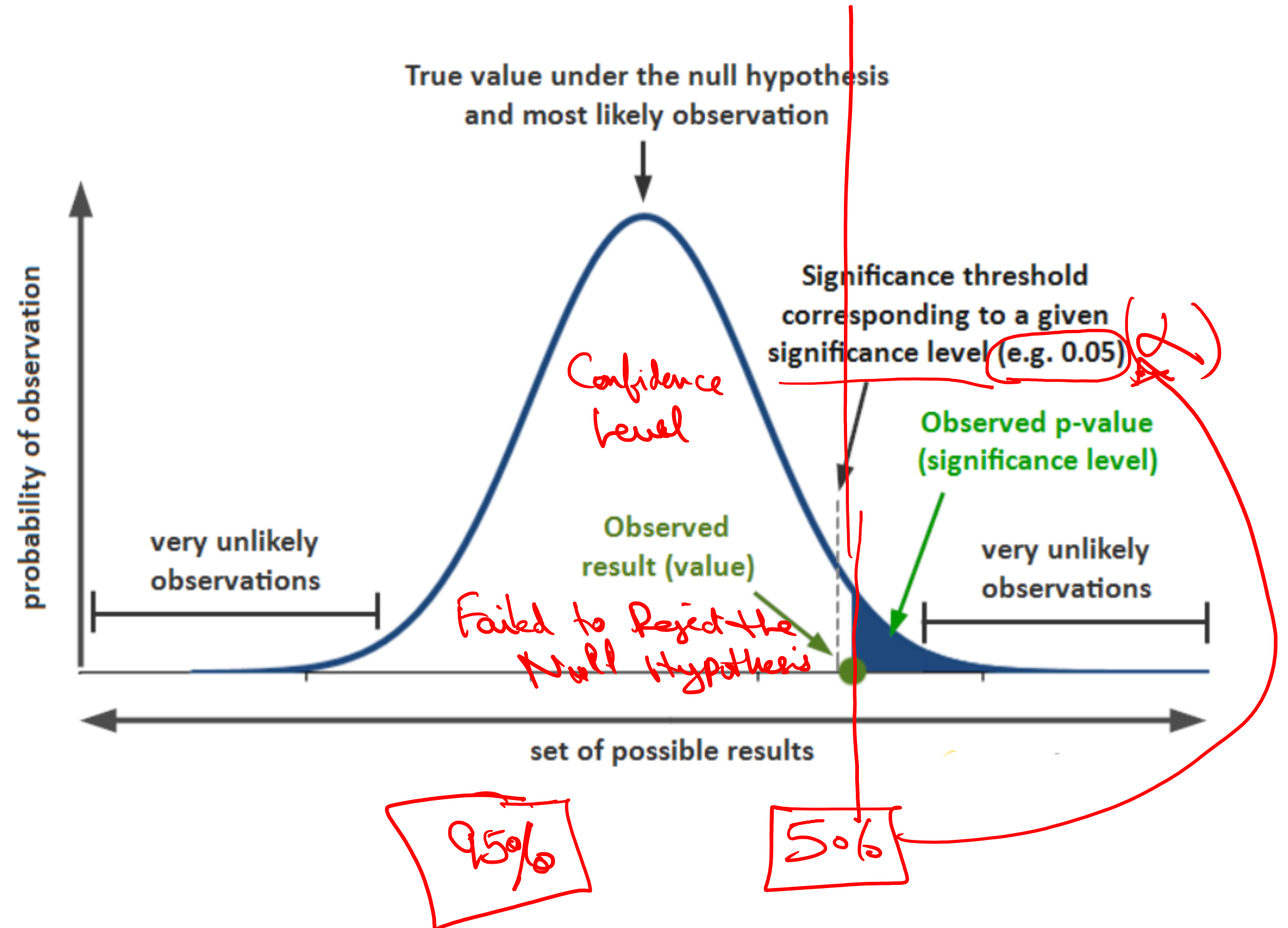
1. Is the difference true or by chance alone?
2. Will another set of samples be also different?



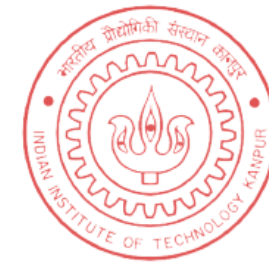
P-value



- p-value is the probability that we would have seen our data (or something more unexpected) just by chance if the null hypothesis (null value) is true
- Small p-values mean the null hypothesis is unlikely given the data



Level of Significance

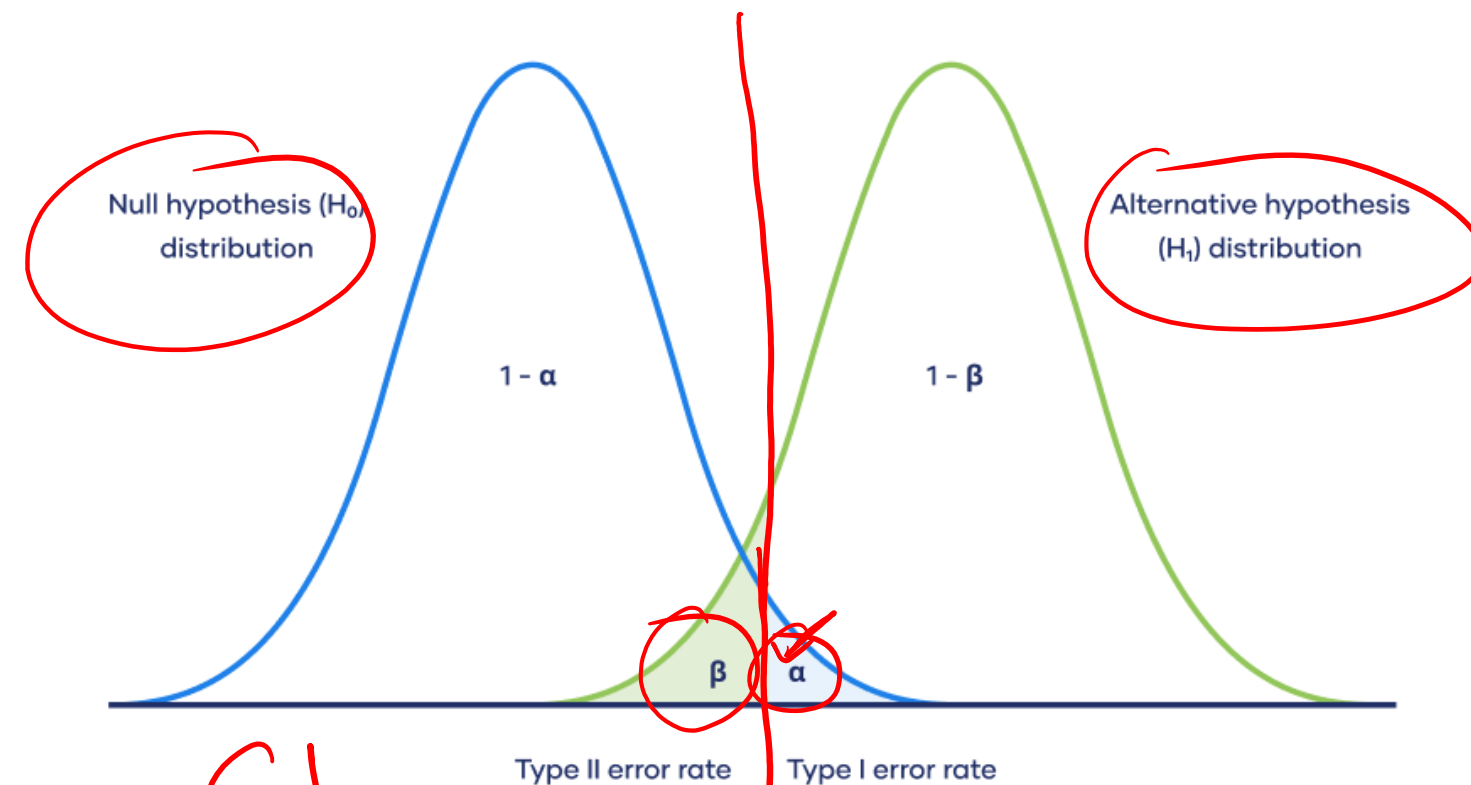


- The significance level of an event (such as a statistical test) is the probability that the event could have occurred by chance.
- If the level is quite low, that is, the probability of occurring by chance is quite small, we say the event is significant.

$SL = \alpha$
 $CL = 1 - \alpha$

Decision	Null Hypothesis is:	
	True	False
Fail to reject H_0	Correct Decision	Type II error β
Reject H_0	Type I error α	Correct Decision

Probability of making Type I and Type II errors



CL (0.95) 95% ← | SL (0.05) 5%

Hypothesis Testing



- Hypothesis testing is used to assess the plausibility of a hypothesis by using sample data.
- There are 5 ways for hypothesis testing:

1. Chi-square Test

2. Z-Test

3. T-Test

4. F-Test

5. ANOVA

large / Variance is known

Small / Variance is not-known

Variance are known

dep and Indp

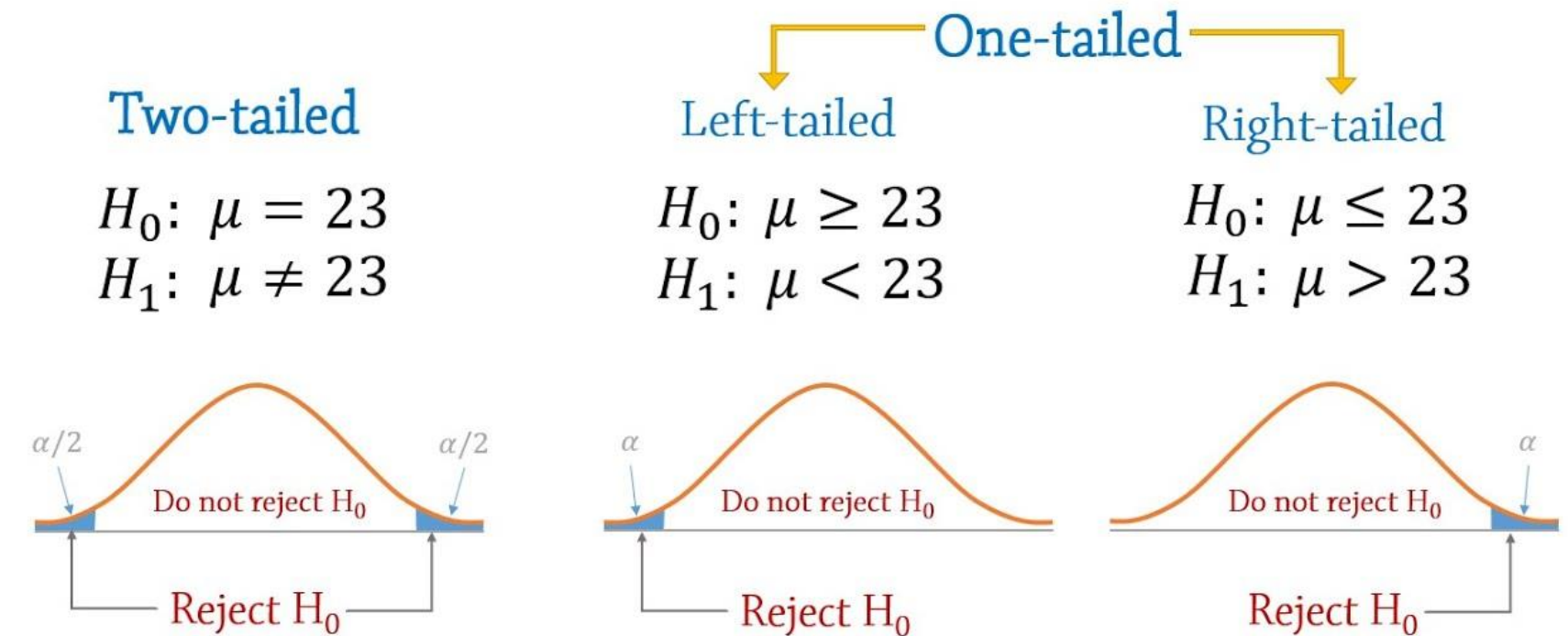
both are metric data sets.

Means are known

Means are not known

ANCOVA
MANOVA

Hypothesis Testing



Thank you

