P values

Touchpad

Normal bell shape curve.

Region more used

Region less used →

p value = 0.8. This means this region is touched, 80 times per 100 times.

Suppose here p = 0.01. This means this region is touched, 1 in 100 times.
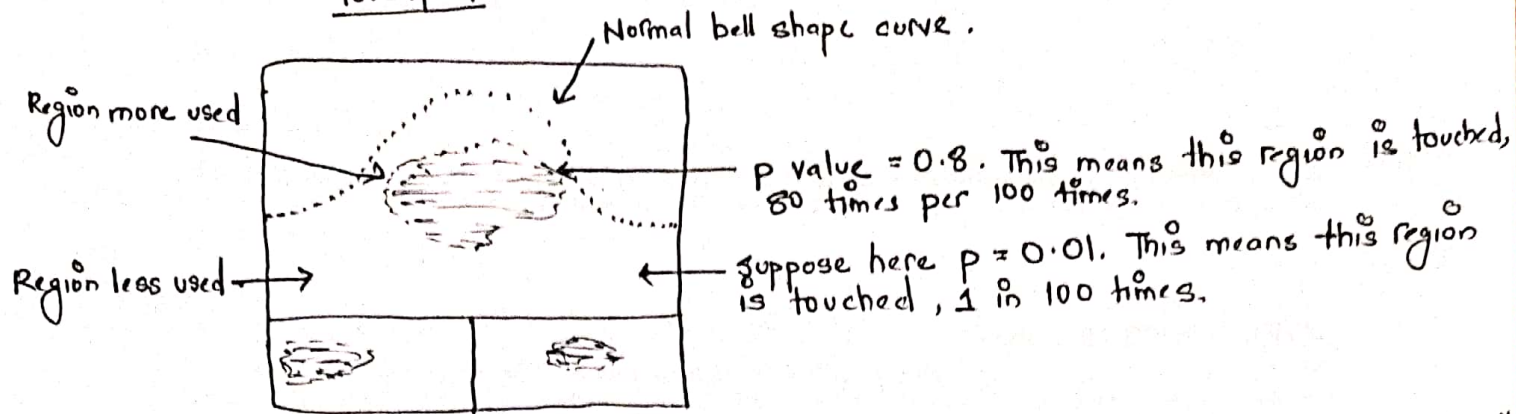
Statistical definition of P value → P value is the "probability" for the "Null hypothesis" to be "True".

Null hypothesis → It is a hypothesis which treat everything same and everything equal.

Conside 2 groups of 4 plants each : Group 1 → 4 plants → Fertilizer A.
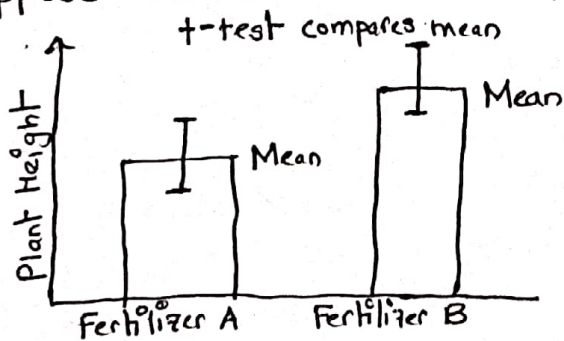Group 2 → 4 plants → Fertilizer B.

Here null hypothesis is there will be no difference in the effect of fertilizers A and fertilizers B.

So we can apply many statistical test like —i) t test (comparision of mean)
& based on each test, it is judged on the basis
of p value obtained.

ii) F test (comparison of Variance)
iii) ANNOVA (analysis of Variance) etc.

—P value can take any value ranges from 0 to 1.

Suppose P = 0.1, suggest 10 out of 100 times, 10 times null hypothesis will be true.
P = 0.3, suggest 30 out of 100 times, 30 times null hypothesis will be true.
P = 0.05, suggest 5 out of 100 times, 5 times null hypothesis will be true.

Suppose consider T test (comparison of mean)
t-test compares mean

Suppose t test Result,
p = 0.03, then 3 out of 100 times, 3 times null hypothesis will be true.
Our null hypothesis was there will be no difference in effect of fertilizers A and B.

So, should we consider this p-value significant or not?. It totally depend on you.

Suppose, 0.05 is the level of significance. Then in this case $P < 0.05$, so we have to reject the NULL hypothesis. So we have to conclude Fertilizers A and fertilizer B are significantly different.

Suppose, 0.01 is the level of significances. Then in this case $p > 0.01$, so we have to accept the NULL hypothesis. So we have to conclude Fertilizers A and Fertilizers B are same (no significant difference).

p value > level of significance, Null hypothesis is accepted.
P value < level of significance, Null hypothesis is rejected.