**T-tests and P-value Interpretation**

p<0.05 🡪 Reject the null, in favor of the alternative

p>0.05 🡪 Fail to reject the null

\*\* T test is a test of mean

Two sided hypotheses

H0: mean 1 = mean 2 (two sample)

Mean 1 = constant (one sample)

mean (differences) = constant (paired)

Ha: mean 1 ≠ mean 2 (two sample)

Mean 1 ≠ constant (one sample)

mean (differences) ≠ constant (paired)

One sided hypotheses – greater than

H0: mean 1 <= mean 2 (two sample)

Mean 1<= constant (one sample)

Mean (difference) <= constant (paired)

Ha: mean 1 > mean 2 (two sample)

Mean 1 > constant (one sample)

Mean (difference) > constant (paired)

One sided hypotheses- less than

H0: mean 1 >= mean 2 (two sample)

Mean 1 >= constant (one sample)

Mean (differences) >= constant (paired)

Ha: mean 1 < mean 2 (two sample)

Mean 1 < constant (one sample)

Mean (differences) < constant (paired)

\*\*As a general rule, the thing we are interested in becomes the alternative (unless we are interested in proving something is equal- then it has to be the null)

**One sample T-test**

Assumptions: dataset is approximately normally distributed & data are independent

**Paired T-test**

Assumptions: differences are approximately normally distributed & data are independent

**Two sample T-test**

Assumptions: both datasets are approximately normally distributed & data are independent