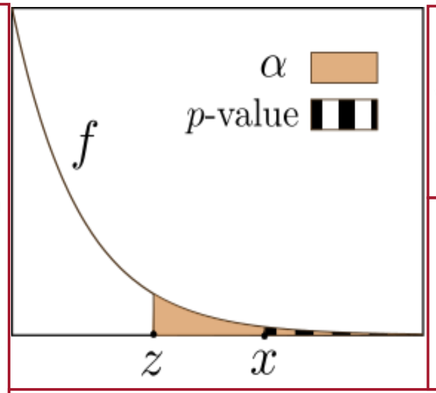
HYPOTHESIS TESTING

Null Hypothesis

A null hypothesis is a statement that a population parameter has a known or specified (claimed) value: $H0$: $\mu = \mu 0$
That is, the null hypothesis states that a population parameter (in this case μ) is equal to a specific value (which we are calling $\mu 0$ here, i.e. we replace $\mu 0$ with a specific value).



For any given hypothesis test, we would need to know that the data is usually distributed and the variance.

Test Static: For any given hypothesis test, we can calculate our sample test static.

p Value: A p-value measures the probability of obtaining a result equal to or more extreme than the observed results, assuming that the null hypothesis is true.

Hypothesis Testing (H)
Steps:

Hypotheses: State the null and the alternative hypothesis in terms of the parameter of interest.

A — **Assumptions**
Check the underlying assumptions of the test.

T — **Test Static**
Calculate the test static.

P — **P-Value**
Obtain the p-value for the test from the distribution of the test static

D — **Decision**
If the p-value is less than 0.05 (the significance level), reject the null hypothesis. If the p-value is not less than 0.05, do not reject the null hypothesis.

C — **Conclusion**
Write a conclusion to the original research question, in terms of the target population.

Large P Value

If the difference between the sample statistic and the null value is small

↓

The p-value will be large and...

↓

There will be insufficient evidence against the null hypothesis

↓

We will not be able to reject H0

Small P Value

If the difference between the sample statistic and the null value is increased.

↓

The p-value will decrease and...

↓

The evidence against the null hypothesis increase and...

↓

We reject H0

One Numeric Value:

Mean or Median: Present a single statistic that represents your primary data point, such as the average score of a group.

Two Numeric Values:

Comparison Values: Include two related metrics for comparison, such as:
"Group A: 80"
"Group B: 70"

p-value:

Significance Testing: Provide the results of a p-value test to assess the
difference between the two groups:
"P-value: 0.03 (indicating a statistically significant difference at the 0.05 level)."

Significant Result	Using a signinfcance level of 5% (i.e. a = 0.05), “if the p-value is less than 0.05, reject $H0$". There is evidence against the claim (H0), so we have a statistically significant result.
Non-Significant Result	Using a signinfcance level of 5% (i.e. a = 0.05), “if the p-value is greater than 0.05, fail to reject $H0$". There is no evidence against the claim (H0), so we have an inconclusive result.