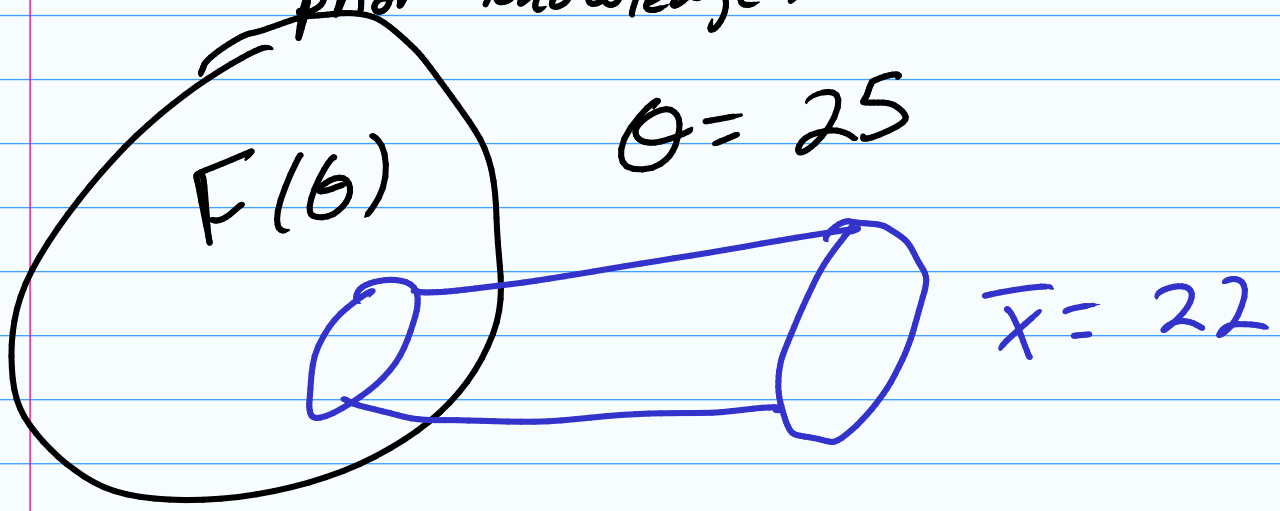
Hypothesis Testing.

Claims: A statement about the population based on some prior knowledge.



Is 25 still the true population parameter.

or is 22 a better represented based on our data.

Is 22 different from 25?

How far from 25 is considered different?

22 ←|3|→ 25 ?

24 ←|1|→ 25 ?

(1). Set up your hypotheses.

(a) Null hypothesis
(b) Alt. hypothesis.

(2). Construct a test statistic.
Quantifies How far away are you from your hypothesized value

(a) What makes a good test statistic?

test statistic should have a sampling distribution.

Probability

(3). What size of the probability should we accept as being different.

0 — — —|— — — — 1
Different 50% Same

significance level
which indicates the cut off point when we state something is different.

④ Make a decision.
is our hypothesized value different from the data.

⑤ Draw conclusions.

Types of Hypothesis Tests.

1. Difference Proportions.
2. Difference in Means.
3. Difference in Variances.
4. Difference in Medians.
5. Differences in Distributions.

Hypothesis Testing in Bayesian is different.

1. Bayes Factor
2. Credible Intervals

① Hypotheses.

(A) Null Hypothesis.

This is what you test to determine if there is some different from a hypothesized value.

During a hypothesis test.

Reject Null or **Fail to Reject Null**

H_0 ← Null Hypothesis

Set of.

It is always set to default thinking / norm, or equal to.

$H_0: \mu = 8$ — Is the mean equal to 8.

$H_0: p_1 - p_2 = 0$ — Is the difference in proportion equal 0.

$H_0: \beta_1 = 0$ — Is the association between X and Y not existent.

Other forms of H_0

$H_0: \mu = 0$

$H_0: \mu \leq 0$

$H_0: \mu \geq 0$

Alternative Hypothesis. H_a or H_1

The opposite of null hypothesis.

$H_0: \mu = 0$ $\quad$ $H_a: \mu \neq 0$

$H_0: \mu \leq 0$ $\quad$ $H_a: \mu > 0$

$H_0: \mu \geq 0$ $\quad$ $H_a: \mu < 0$

$$M(x) = \beta_0 + \frac{\beta_1}{x + \beta_2}$$

$$z = \frac{1}{x + \beta_2}$$

$$M(z) = \beta_0 + z\beta_1$$