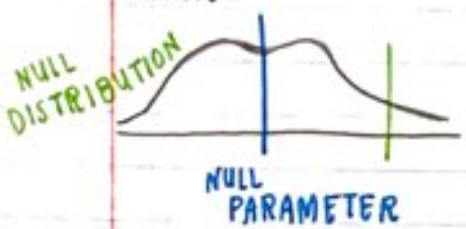
PART 3 REVIEW

"Formal" Hypothesis Testing

* Does our statistic "fit in" with the believed set of values?



Hypotheses

TWO-TAILED TESTS

$H_0: \mu = 0$	$H_0: \mu_1 = \mu_2$
$H_1: \mu \neq 0$	$H_1: \mu_1 \neq \mu_2$

* Is our parameter ↓ to value?
* Are " parameters equal?
* These are setting-specific! Read the Q!
  * Two/one tailed affects the p-value.

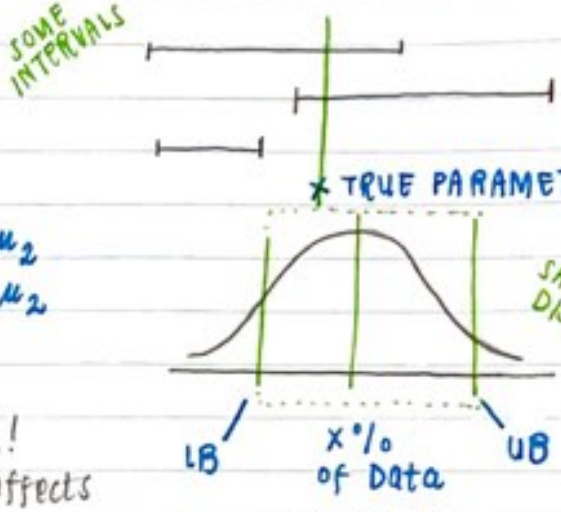
Assumptions

These are setting specific as well, but you need **RANDOM SAMPLES!**

* Random
* Shape?
* Sample size? Counts? n big?

Confidence Intervals

* For every HT, there exists a CI!
* Our CI is generated by a method that generates true-parameter-containing intervals some % of the time.



* Recall the sampling distribution has fixed n.
* We capture 95% of the sampling distribution by providing quantiles. (x-values!)

  LB = 2.5, UB = 97.5

What You Know

HT:
1. Test Assumptions
2. Write hypotheses
3. Calculate test statistic
4. p-value, interp
5. Conclude

CI:
- Estimate ± Error
  - Estimate: setting specific
  - Error: critical value * standard error
    - critical value: z^*, t^*
    - standard error: Formulas, R output

Your conclusions will give you the same information!

Setting-specific

Your Toolbox

- **Z**: Means, Proportions, 2 Proportions
- **F**: Many Means
- **T**: Means, 2 Means, Paired Data, Regression Slope
- **BOOTSTRAP**: CI
- **X^2**: Counts
  - GOF
  - Independence
- **PERMUTATION TEST**: 2 means, Correlation

THE DATA

0.5
0.7
1
0.2

* Measurements on some value

0	1
1	0
0	0
1	0
1	0

* Get proportions by taking the mean of a binary column

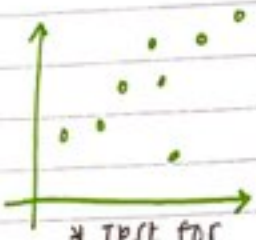
-0.2
-0.3
0.2
0.5

* same

1	5
1	7
2	6
1	5

* for 2 values

A	B	D = B-A
1	0	1
5	2	3
1	0	1
3	1	2



* Test for slope

10	20	17

* k categories
* counts (positive)

11	30	12
12	10	35

* r, c categories
* also counts

* k groups
* Measurements

A	B	B	Z

* Data can be in different formats

1
3
2
1
3

* One small representative sample (random)
* Measurements
* Estimate the parameters

5	Daly City
6	Embarcadero
3	Daly City
4	Daly City
7	Embarcadero

* Two small samples
* Measurements and labels

* We can calculate many correlations
* switch X's and Y's for labels