Stat 202 2015 ~~5~~ W11 Fri

New and Review

Doing Tests of Significance in StatCrunch

We are going to cover 3 categories of tests of significance

Stat → { Z Stats
T Stats
Proportion Stats

We've covered → One sample

The options are { With Data
With Summary

With Data asks for a column of numbers – the observations

With Summary asks for Summary stats

Sample mean	$\bar{x}$
Standard dev	σ
Sample size	n

"With data" option requires σ as well, say its optional but I don't think so

Pertes $\bar{x}$ and n from column of numbers

Both ask for

- Hypothesis test for μ
  (test of significance involving mean of population)

Null hypothesis $H_0 : \mu = \boxed{\mu_0}$ ← enter value for hypothesized mean (0 for default)

Alternative hypothesis H_a $\mu \neq$ / $<$ / $>$ } value above → one sided $>, <$ two sided $\neq$

- Confidence interval

  we haven't covered this yet but we will

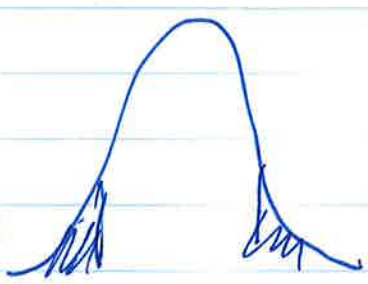
The test statistic for this test is

$$Z = \frac{\bar{x} - \mu_0}{\sigma/\sqrt{n}}$$

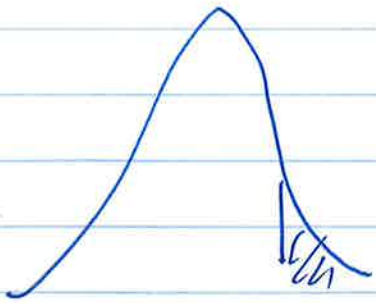
The distribution of the test statistic is $N(0,1)$

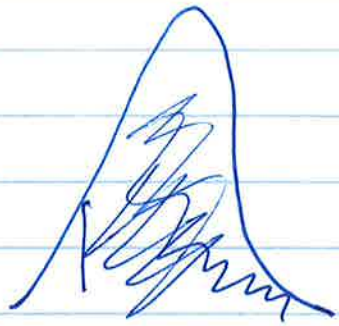
The p-value is the area under the bell curve $N(0,1)$ ~~and~~ over values which are as extreme or more extreme as the test statistic Z.

One Sided versus two sided alternatives

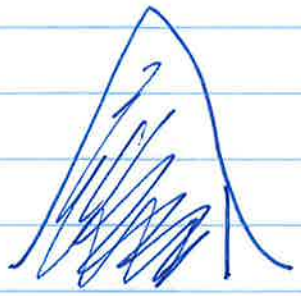


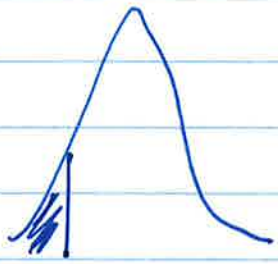
$\mu \neq \mu_0$





$\mu > \mu_0$





$\mu < \mu_0$

Significance - decide upon α ahead of time - α is level of significance
traditionally $\alpha = 0.05$

If $p \leq \alpha$ significant at level α
$p > \alpha$ insignificant at level α

A significant result means that the probability of seeing results as extreme or more extreme that what is actually observed in the data ~~are sufficiently small~~ assuming the null hypothesis is true is sufficiently small to reject the statement that the null hypothesis is true.

How small is that probability? That is given by the p-value!