Ho: Green Aliens (Null) do no exits
Ha: Green alliens do exist

α low (skeptic)

α high (gullaable)

Ho: Gree aliens does not exits

Ha: Green alnens don't exist

α low   (dog matic)

α high

✳ Uber fires drivers if more than 5% riders com-
plain. After 1000 rides Uber makes a decision.

Assume driver
is good

Ho: $P \leq 0.05$ (good) retain driver   retainment
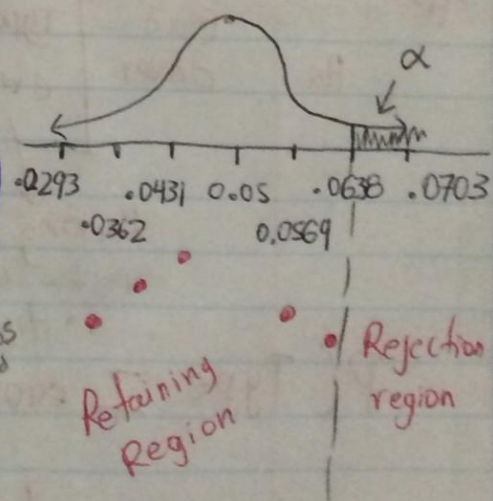Ha: $P > 0.05$ (bad)   Fire driver   or rejection

before
Ho: $p = 0.05$
Ha: $p \neq 0.05$

$\hat{P} \sim N \left(0.05, \left(\sqrt{\dfrac{0.05 \times 0.95}{1000}}\right)^2\right)$

α

⟵ ·0293 ·0431 0·05 ·0638 ·0703
          ·0362   0.0569

$= N(0.05, 0.0069^2)$

retain
if P=0.05
tion bad

$\hat{P} \sim N(0.05, 0.0069^2)$

Retaining
Region

Rejection
region

$\alpha = \frac{1}{2}5\%$ $\Rightarrow$ Z_α
$\uparrow$
Not
$Z_{\frac{\alpha}{2}}$ cause not proportioning to both & sides

Z 2.5% is 2

5% For $Z_{\frac{\alpha}{2}}$
2.5% for Z_α

Retaining region $= (-\infty, \; P + Z_\alpha \sqrt{\frac{P(1-P)}{n}}]$

percent to z, z to percent.

$$= (-\infty, \; .0638]$$

$\hat{P} = \frac{71}{1000} = 0.071 \notin$ retainment Region
$\Rightarrow$ Refer Ho
$\Rightarrow$ Bad driver
$\Rightarrow$ Fire

Retain keep him   (Reject Ho)
Ho· keep him   Fire Him

		Ho keep him	Fire Him
Ho	Good driver	✓	Type I error
Ha	Bad driver	Type II error	✓

Twe

$\rightarrow$ Firing a good driver
• Low cost

Keeping a bad driver
Cost - More complains -
• High cost

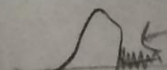*make α higher, Type II goes down
or
*make n bigger

$P(\text{Type I error}) = \alpha$

One - tailed

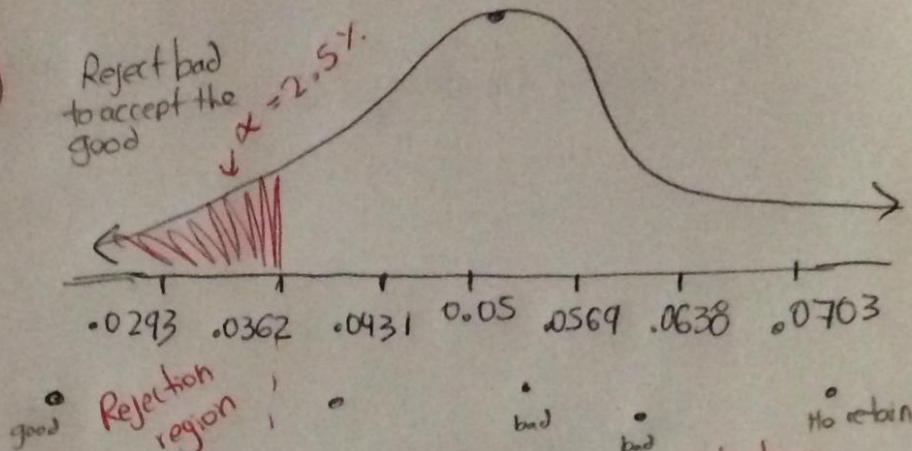One - Proportion hypothosis Test
(Right Tail) when testing for > than

One-tailed
One-proportion Hypothesis Test   (left tail)

Assume guy is bad, Prove you're good

$H_0: p \geq 0.05$ (bad)

$H_a: p < 0.05$ (good)

$\alpha = 2.5\%$ $\Rightarrow Z_\alpha$

Reject bad
to accept the $\alpha = 2.5\%$
good

.0293 .0362 .0431 0.05 .0569 .0638 .0703

good   Rejection
       region

bad

bad   Ho retain

Retation
region

• at some point
  can't say he's bad
  any more.

• Pick at certain point where I'm not
  comfortable   anymore to say he's
  bad.

Retainment
Region $= \left[p - Z_\alpha \sqrt{\dfrac{p(1-p)}{n}}, \infty \right)$

$= [0.0362, \infty)$

$\hat{p} = \dfrac{71}{1000} = .071 \in$ Retainment Region

$\Rightarrow$ No evidence to support He's good

Decision $\Rightarrow$ Fire
Retain

reject

	Fire	Keep
H₀ Bad	✓	type I error
Hₐ Good	Type II error	✓

True (left side label)

Keep → Keeping a bad driver

Firing a good driver

P(Type I driver) $= \alpha$

lowering α lower region
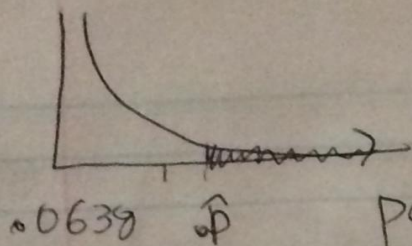
.0638 $\hat{p}$ Prob of Seeing your data
or "more extreme" given the null hypothesis is true.

$Prob := P(\hat{p} > \hat{p} \mid H_0 \text{ is true})$

$= P(\hat{p} > .071 \mid P = 0.05)$

$= P\left(\dfrac{\hat{p} - .05}{.0069} > \dfrac{.071 - .05}{.0069}\right)$

$= P(Z > 3.04) = \quad 0.6018 =$ Significance level

$\boxed{0.1\%}$

$< \alpha \Rightarrow$ reject