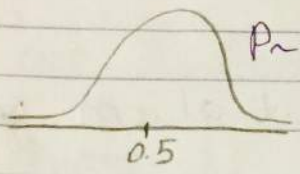
more "power" → prob of

"Retain" = "Accept"



Ret region [.446, .554] $\hat{p} = 0.48 \in$ ⇒ Retain H_0

$H_0: p = 0.501$

$H_a: p \neq 0.501$

H_0: Green Aliens do not exist (NULL)

H_a: Green Aliens do exist

↓ low skeptic (do not agree with statement)

↓ high (credualistic) believe easy

H_0: Green Aliens do exist

H_a Green aliens don't exist

↓ low (dogmatic)

↓ high (gullable) (agree easy)

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

$H_0: P \leq 0.05$ (good) → keep

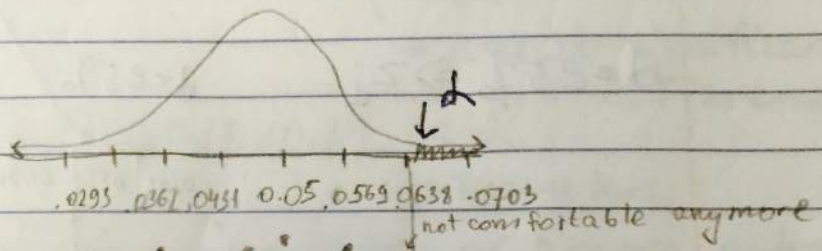
$H_a: p > 0.05$ (bad) → fire

$H_0: p = 0.05$

$H_a: p \neq 0.05$

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

↑ not $\frac{\alpha}{2}$



$\hat{p} \sim N(0.05, .0069^2)$ Retainment Region | Rejection Region

$$\text{Retainment Region} = \left(-\infty, p + Z_\alpha \sqrt{\frac{p(1-p)}{n}}\right]$$

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

$\hat{p} = \frac{71}{1000} = .071 \notin$ Ret Region

$\Rightarrow$ Reject H_0

$\Rightarrow$ Bad Driver

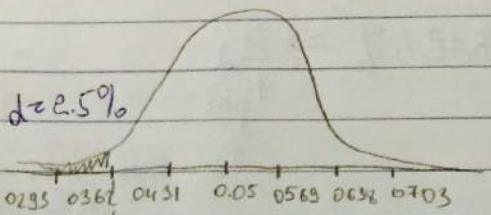
$\Rightarrow$ Fire

Truth	Decision: Retain H_0 (keep him)	Decision: Reject H_0 (fire him)
(H_0) Good driver	✓	Type I error → firing a good driver (low cost)
(H_a) Bad driver	Type II error → keeping a bad driver (High)	✓

One-tail
One-proportion
Hypothesis Test
(Right tail)

(Left tail)

$\alpha = 2.5\% \Rightarrow z_\alpha$



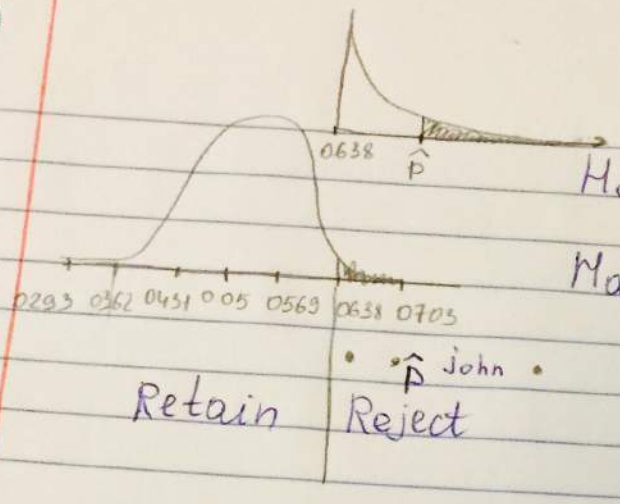
$\hat{p} = \frac{71}{1000} = .071 \in$ Retainment Region

$\Rightarrow$ No evidence to suggest he is good

$\Rightarrow$ Fire

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

Truth	Decision: Retain H_0 (fire)	Decision: Reject H_a (keep)
(H_0) Bad	✓	Type I error → keeping a bad driver
(H_a) Good	Type II error → firing a good driver	✓



Right tail

$H_0: p \leq 0.05$ (good)

$H_a: p > 0.05$ (bad)

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

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

statist. significance difference

$\text{Rand} = P(Z > 3.04) = .0018 \sqrt{0.1\%} < \alpha$

significance level

Probability of seeing your data or "more extreme" gain.