

L2F Lab 8: Testing Hypotheses About Proportions

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- TA Evaluation
 - Please fill out the TA-evaluation forms with the **PENCIL**, since pen will not scan.
 - I will NOT be in the room while the evaluations are being filled out.
 - So I will need a **student volunteer** to collect the forms, put them in the envelope, and deliver them to the main office (on 3rd floor).
- Practice finals \$3/each
- Tips and code for lab 8

Question 1

Lab 8 pre-reading shows all the tools you need for completing question 1.

You may use the following formula and command to compute the test statistics

- Formula :
$$\frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$$
- Command: !!! REMEMBER to replace 'phat', 'p0' and 'n' with your actual numbers!!!

```
(phat - p0)/(sqrt(p0 * (1 - p0)/n))
```

Question 2 (a)

- For Rcmdr users: Follow the instructions/steps on the problem sheet.
- For R code users: Type in the following R code.

```
# First simulate 1500 samples from binomial distribution
samples <- rbinom(n = 1500, size = 100, prob = 0.8)
# Find the estimated proportions ("p hat") for each sample
p_hat <- samples/100
# Tell R your 'p0' is 0.8 and 'n' is 100
p0 <- 0.8
n <- 100
# Compute test statistics
teststat <- (p_hat - p0)/(sqrt(p0 * (1 - p0)/n))
# Compute p-values (Two sided)
pvalues <- 2 * pnorm(-abs(teststat))
# Alternatively, you may compute p-value (One sided)
pvalues <- pnorm(teststat, lower.tail = T)
```

Question 2 (c)

```
# Whether p values is smaller than 0.05 (rejection)  
smallp <- ifelse(pvalues < 0.05, 1, 0)  
# Count the actual number of 'smaller than 0.05' (rejection)  
sum(smallp)  
# The proportion of 'smaller than 0.05' (rejection)  
sum(smallp)/1500
```