

Estimation.R

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```
library(readxl)
```

```
## Warning: package 'readxl' was built under R version 3.4.4
```

```
Congress <- read_excel("Piracy.xlsx", col_names = TRUE)

t.test(Congress$years, conf.level = .90)
```

```
##
##  One Sample t-test
##
## data:  Congress$years
## t = 27.791, df = 533, p-value < 2.2e-16
## alternative hypothesis: true mean is not equal to 0
## 90 percent confidence interval:
##  11.06303 12.45757
## sample estimates:
## mean of x
##  11.7603
```

```
## R 3.1 - Car Seats
# sample mean = 30.7833, sample sd = 1.7862, sample size = 12
## find the 90% C.I. of true mean speed
```

```
mean <- 30.7833
sd <- 1.7862
n <- 12

error <- qnorm(0.95)*sd/sqrt(n)
left <- mean - error
right <- mean + error

left
```

```
## [1] 29.93516
```

```
right
```

```
## [1] 31.63144
```

```
## R3.2 Poll
## Provide a 95% confidence interval estimate for MN voters favoring Democratic candidate
```

```
Polls <- read_excel("Poll.xlsx", col_names = TRUE)

table(Polls)
```

```
## Polls
##   1   2
## 358 407
```

```
p_hat <- 358 / (358 + 407)
```

```
p_hat
```

```
## [1] 0.4679739
```

```
# true binom test  
binom.test(358, 765, p_hat, conf.level = .95)
```

```
##  
## Exact binomial test  
##  
## data: 358 and 765  
## number of successes = 358, number of trials = 765, p-value = 1  
## alternative hypothesis: true probability of success is not equal to 0.4679739  
## 95 percent confidence interval:  
## 0.4321438 0.5040517  
## sample estimates:  
## probability of success  
## 0.4679739
```

```
# Wilson prop test  
prop.test(358, 765, conf.level = .95)
```

```
##  
## 1-sample proportions test with continuity correction  
##  
## data: 358 out of 765, null probability 0.5  
## X-squared = 3.0118, df = 1, p-value = 0.08266  
## alternative hypothesis: true p is not equal to 0.5  
## 95 percent confidence interval:  
## 0.4322160 0.5040576  
## sample estimates:  
## p  
## 0.4679739
```

```
## R3.3 Waiting  
## Find a 95% CI for mean wait time at the bank  
  
WaitTimes <- read_excel("WaitTime.xlsx", col_names = TRUE)  
  
t.test(WaitTimes$WaitTime, conf.level = .95)
```

```
##  
## One Sample t-test  
##  
## data: WaitTimes$WaitTime  
## t = 22.057, df = 99, p-value < 2.2e-16  
## alternative hypothesis: true mean is not equal to 0  
## 95 percent confidence interval:  
## 4.968816 5.951184  
## sample estimates:  
## mean of x  
## 5.46
```