Homework 3

Arturo Ortiz

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## R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

summary(cars)

## speed dist   
## Min. : 4.0 Min. : 2.00   
## 1st Qu.:12.0 1st Qu.: 26.00   
## Median :15.0 Median : 36.00   
## Mean :15.4 Mean : 42.98   
## 3rd Qu.:19.0 3rd Qu.: 56.00   
## Max. :25.0 Max. :120.00

## Including Plots

You can also embed plots, for example:



Note that the echo = FALSE parameter was added to the code chunk to prevent printing of the R code that generated the plot.

# Problem 1

## A. Construct a 95% confidence interval for the population proportion of all auto injury

## files that have exaggerated loss amounts.

data <- read.csv(“<https://raw.githubusercontent.com/EricBrownTTU/ISQS5346/main/InsuranceClaims.csv>”)

sample\_proportion <- mean(data$Buildup)

n <- length(data$Buildup)

standard\_error <- sqrt((sample\_proportion \* (1 - sample\_proportion)) / n)

margin\_of\_error <- 1.96 \* standard\_error

confidence\_interval <- c(sample\_proportion - margin\_of\_error, sample\_proportion + margin\_of\_error)

confidence\_interval

## B. Construct a 95% confidence interval for the population mean excess payment

## amount.

sample\_mean <- mean(data$ExcessPayment)

sample\_std <- sd(data$ExcessPayment)

standard\_error\_mean <- sample\_std / sqrt(n)

margin\_of\_error\_mean <- 1.96 \* standard\_error\_mean

confidence\_interval\_mean <- c(sample\_mean - margin\_of\_error\_mean, sample\_mean + margin\_of\_error\_mean)

confidence\_interval\_mean

## C. The insurance company estimates that the proportion of Buildup is 0.75 and the

## average excess payment is 400 Using only the confidence intervals developed in

## parts (a) and (b), assess the companies claims.

sample\_proportion <- mean(data$Buildup)

sample\_mean <- mean(data$ExcessPayment)

estimated\_proportion <- 0.75 estimated\_mean <- 400

# Check if the estimated proportion of buildup falls within the confidence interval

if (estimated\_proportion >= confidence\_interval[1] && estimated\_proportion <= confidence\_interval[2]) { cat(“The estimated proportion of buildup (0.75) falls within the confidence interval.”) } else { cat(“The estimated proportion of buildup (0.75) does not fall within the confidence interval.”) }

# Check if the estimated mean excess payment falls within the confidence interval

if (estimated\_mean >= confidence\_interval\_mean[1] && estimated\_mean <= confidence\_interval\_mean[2]) { cat(“estimated mean excess payment (400) falls within the confidence interval.”) } else { cat(“estimated mean excess payment (400) does not fall within the confidence interval.”) }