STAT 2300 - Homework 2

Reading

Read Chapter 2

Conceptual Exercises

(don't hand these in - answers are at the end of the chapter)

Chapter 2 # 1, 3, 4, 9

R Exercises

Hand these in as a knit Markdown document

Chapter 2 # 16, 18, 21, 22, 23

Problem A

The data `faithful` is built in to R, and describes eruptions of the Old Faithful geyser in Yellowstone. The variable `faithful$waiting` gives the time (in minutes) to the next eruption.

  a. Make a histogram of the waiting times. Describe what you see.
  b. By repeatedly computing the sample mean $\bar{Y}$, make a histogram of the sampling distribution from the waiting distribution when $n = 4$. What is the approximate range of the $\bar{Y}$ distribution?
  c. Repeat part (b) but take samples of size $n = 16$.
  d. Without actually performing the simulation, what range would you expect to find with samples of size $n = 64$?

Problem B

Create a vector of data with the numbers 1-99 and the number 1000. Make a histogram of the sampling distribution for $\bar{Y}$ when $n = 4$. Does it appear normally distributed?

Using sampling with replacement, about how large does n need to be before the sampling distribution of $\bar{Y}$ appears normal?