Lecture 1: R Fundamentals Review

In-Class Activities

Answer the following questions in an RMarkdown document and discuss it with the people around you (no need to write the problem down, just give it a header (## Problem 1, etc.):

1. Create a vector called 'pi' consisting of: $3, 1, 4, 1, 5, 9, 2, 6, 5, 3, 5, 9$
   (a) Calculate the mean of this vector
   (b) Calculate the median of this vector
   (c) Raise each element of the vector to the third power
   (d) Calculate the standard deviation of this vector using the built-in function
   (e) Calculate the standard deviation of this vector by typing in the formula
   (f) Create a new vector called 'e' which is $2, 7, 1, 8, 2, 8, 1, 8$
   (g) Add 'pi' and 'e' together and save it as vector 'z'
   (h) Display the 1st, 3rd, and 7th element of this new vector 'z'
2. Create a vector (give it a fun name) which is the values 1 through 99:
   (a) Calculate the mean of this vector
   (b) Display any values which are less than the square-root of the mean
   (c) Display any values which are equal to the mean of your vector
   (d) Display any values which are greater than 90 or less than 5
   (e) Display values which are within 5 of the median
3. Display the "rivers" dataset (available in base R within the "datasets" library, just type 'rivers' to access it)
   (a) Determine how many rivers there are in total, does this match up with the description in R?
   (b) Find the number of rivers which are less than 450
   (c) Find the proportion of rivers which are less than 450 or greater than 1000
   (d) Calculate the mean length for rivers which are less than 900
4. Finally, try knitting your solutions into an RMarkdown file. Can you do it as a pdf? If it gives you an error (like saying you don't have a LaTeX distribution on your computer) then try the following commands below:
   (a) To do it as a pdf you may need to install the "tinytex" package using the command *install.packages("tinytex")*. Then, try loading the library using the command *library(tinytex)*. Finally, type *tinytex::install_tinytex()* to install a LaTeX distribution on your computer. You should now be able to knit the file as a pdf.