

Homework 1

Context

This assignment reinforces ideas in the building blocks topic.

Due date

Due: September 25 at 5:00pm.

Points

- Problem 0.1: 25 points
- Problem 0.2: 25 points
- Problem 0.3: 5 points
- Problem 1: 15 points
- Problem 2: 15 points
- Problem 3: 15 points

Problem 0.1

This “problem” focuses on the use of R Markdown to write reproducible reports, and the use of R Projects to organize your work.

To that end:

- create a directory named `p8105_hw1_YOURUNI` (e.g. `p8105_hw1_ajg2202` for Jeff)
- put an R project in the directory
- create a single `.Rmd` file named `p8105_hw1_YOURUNI.Rmd`

Your solutions to Problems 1+ should be included in your `.Rmd` file, and your submission for this assignment will be a zip file of this directory.

We will assess adherence to the instructions above and whether we are able to knit your `.Rmd` – that is, whether your work is reproducible.

Problem 0.2

This “problem” focuses on correct styling for your solutions to Problems 1+. We will look for:

- meaningful variable names
- readable code (one command per line; adequate whitespace and indentation; etc)
- the use of both text and code in solutions
- a lack of superfluous code (e.g. no unused variables are defined)

Problem 0.3

Please complete the survey [here](#).

Problem 1

This problem focuses on vector operations and numeric summaries.

- Create a vector containing ten numbers
- Multiply your vector by 5
- Add 7 to your vector
- Create a second vector containing ten integers
- Add the two vectors
- Multiply the two vectors

Based on the preceding, comment on R's arithmetic operations when they involve (1) a vector and a scalar, and (2) two vectors. Try to add vectors of length ten and length nine; what happens? What if you add vectors of length ten and length five?

Problem 2

This problem focuses on subsetting, plotting, and the use of inline R code.

- Create a variable containing a random sample of size 10000 from a `uniform[0, 10]` distribution (the `runif` function will help)
- Remove values that are greater than 9.4
- Write a short description of your vector using inline R code, including:
 - length of the vector
 - mean and median
 - standard deviation
 - minimum and maximum values
- Repeat the above for a new random sample of size 5000 from a `Normal[5, sd = 5]` distribution, omitting values that are less than zero
- Make a histogram of the new sample.

Problem 3

This problem focuses on variable types, coercion, and data structures.

- Create a vector containing five integers and vector containing five character strings
- Add the two vectors. What happens?
- Combine the two vectors into one using `c()`. What is the class of the new vector?
- Create a vector containing the values "a", 7, and 42.
 - Can you add the second and third values of this vector? Why or why not?
- Create a list containing the values "a", 7, and 42.
 - Can you add the second and third values of this list? Why or why not?