STAT 280 B: Statistical Programming

Assignment 1 [Posted: Tuesday, January 23, 2024]
Due: 8:00pm January 30, 2024

Suggested exercises from textbook: A first course in statistical programming with R, Third Edition. Braun, W. J., & Murdoch, D. J. (2021). Cambridge University Press.

Instructions

- Students should upload their solutions on Moodle before due date. Late submissions will not be accepted.
- Solutions should be uploaded as a single PDF.
- Make sure to clearly state the problem number in your solutions. Always show the code used to solve an exercise (not the output only, unless explicitly stated) and comment on your code by using `#` where appropriate.
- Readability of code and clarity of presentation will be taken into account when marking.
- Each problem is worth 10 points.

Textbook problems

- Section 2.1; Poblems **3** and **6** on page 11:
  (**Problem 3** "Using one line of R code, ... terms of 1,2, ..., 30 years").
  (**Problem 6** "Using one line of R code..., radii 3, 4, ..., 100").

- Section 2.3; Problems **1**, **2**, **7**, **8** and **9** on page 21:
  (**Problem 1** "Calculate the sum $\Sigma_{j=0}^{n} r^j$, ..., for $r = 1.06$").
  (**Problem 2** "Referring to the above question, ..., 100 values in a vector").
  (**Problem 7** "Calculate the sum, ..., for $N = 500, 1000, 2000, 4000, 8000$.").
  (**Problem 8** "Using `rep()` and `seq()` as needed, ..., `3 4 5`").
  (**Problem 9** "Using `rep()` and `seq()` as needed,..., `7 8 9`").

Problem I

Create the following vectors in `R using seq() and rep()`

(i) $1, 1.5, 2, 2.5, ..., 12$

(ii) $1, 8, 27, 64, ..., 1000$

(iii) $1, -\frac{1}{2}, \frac{1}{3}, -\frac{1}{4}, ..., -\frac{1}{100}$

(iv) $1, 0, 3, 0, 5, 0, 7, ..., 0, 49$

(v) $1, 3, 6, 10, 15, ..., \Sigma_{i=1}^{n} i, ..., 210$ `[Look up ?cumsum]`

(vi) $1, 2, 2, 3, 3, 3, 4, 4, 4, 4, ..., 9, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10$

`[Hint: type ?seq, and read about the times argument.]`