DEDY DWI PRASTYO
Even Semester 2023/2024

Exercises: Part 5

1. Generate 100 random samples (x) from a normal distribution with $\mu = 0,\ \sigma = 2$. For each element of x compute y, such that $y_0 = 0$ and

$$\begin{cases} y_{i+1} = y_i + x_i, & x_i \geq 0, \\ y_{i+1} = y_i - 2x_i, & -1 < x_i < 0, \\ y_{i+1} = y_i - x_i, & x_i \leq -1. \end{cases}$$

2. compute *max* and *min* of the variable $Sepal.Length$ for each species of the *iris* data. (Hint: use the family of $apply()$ functions)

3. write a function $delNAfun$ for deleting rows of a data frame containing NAs. (Hint: use function $f_1 = function(x)any(is.na(x)))$

4. with the help of $tcltk$ package create a question box asking "Have you finished all the exercises?änd answer yes or no.

5. Using the following variables: $x = 1$, $y = 40$, and $i = c(1:10)$, write a $for()$ loop that increments x by three and decrease y by two, for each i.

6. Create a function that will return the sum of 2 integers.

7. Create a function that will return TRUE if a given integer is inside a vector.

8. Create a function that given a data frame will print by screen the name of the column and the class of data it contains (e.g., Variable1 is Numeric).

9. Create the function unique, which, given a vector will return a new vector with the elements of the first vector with duplicated elements removed.

10. Create a function that given a vector and an integer will return how many times the integer appears inside the vector.

11. Create a function that given a vector will print by screen the mean and the standard deviation, it will optionally also print the median.

12. Create a function that given an integer will calculate how many divisors it has (other than 1 and itself). Make the divisors appear on a screen.

13. Create a function given a data frame, and a number or character will return the data frame with the character or number changed to NA.