# Lab2

Exercises

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## Contents

## Exercise 1

- A:

  Create the Lab2 project. Use the same structure used for Lab1:

  - scripts,
  - plots,
  - data

- B:

  Install the palmerpenguins package, load the penguins dataset or, alternatively, download the .RData object from moodle and import it after placing it inside the data directory of the project (hint: use the load() function).

- C:

  Compute the mean, the standard deviation, and the median for the numeric variables of the dataset.

- D:

  Create a function called stat_auto that simultaneously returns both the mean and the standard deviation of a given vector (hint: return an object of type list or simply a vector). Then try it on the same numeric variables in C. to check the results (hint: if you obtain NA maybe you forgot to remove NA terms in the vector).

- E:

  Create a function called stat_manual that simultaneously returns both the mean and the standard deviation of a given vector without using the mean() and the sd() functions (hint: you can use length(), sum(), and na.omit() functions). Then try it on the same numeric variables in C. to check the results.

## B

```r
library(palmerpenguins)
data(penguins)
```

## C

```r
# Means
cat("Means: \n")
## Means:
colMeans(penguins[, c(3:6, 8)], na.rm = TRUE)
##    bill_length_mm    bill_depth_mm flipper_length_mm       body_mass_g
##          43.92193         17.15117         200.91520        4201.75439
##              year
##          2008.02907
cat("\n")

# Medians
cat("Medians: \n")
## Medians:
sapply(penguins[, c(3:6, 8)], median, na.rm = TRUE)
##    bill_length_mm    bill_depth_mm flipper_length_mm       body_mass_g
##             44.45            17.30            197.00           4050.00
##              year
##           2008.00
cat("\n")

# Standard deviations
cat("Standard deviations: \n")
## Standard deviations:
sapply(penguins[, c(3:6, 8)], sd, na.rm = TRUE)
##    bill_length_mm    bill_depth_mm flipper_length_mm       body_mass_g
##         5.4595837        1.9747932        14.0617137        801.9545357
##              year
##         0.8183559
cat("\n")
```

## D

```r
stat_auto <- function(vec, na.rm = FALSE) {
  if (na.rm == TRUE) {
    mean <- mean(vec, na.rm = TRUE)
    sd <- sd(vec, na.rm = TRUE)
  } else {
    mean <- mean(vec)
    sd <- sd(vec)
  }

  return(list("mean" = mean, "sd" = sd))
}

sapply(penguins[, c(3:6, 8)], stat_auto, na.rm = TRUE)
```

```
##      bill_length_mm bill_depth_mm flipper_length_mm body_mass_g
## mean 43.92193       17.15117      200.9152          4201.754
## sd   5.459584       1.974793      14.06171          801.9545
##      year
## mean 2008.029
## sd   0.8183559
```

E