`rowSums` × `apply` × `for`

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Introduction

This exercise is focused on comparison of three approaches (which are looping through the dataset) to count the number of species in each sample (row) of the dataset `dune` from library `vegan`.

What to do

1. Initiate library `vegan` (you need to install it first if you haven't done it before).
2. Initiate dataset ''dune'', containing data about species composition of vegetation plots sampled in dune vegetation (rows = samples, columns = species).
3. I used function ''rowSums'' to count numbers of species in each plot and saved it into the object `result.rowSums`:

```
result.rowSums <- rowSums (dune > 0)
result.rowSums
# 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20
# 5 10 10 13 14 11 13 12 13 12  9  9 10  7  8  8  7  9  9  8
```

4. Please, use two other alternative approaches to count numbers of species in each row of the matrix:
   a) using function `apply` and save the results into object `result.apply`,
   b) using looping function `for`, and save the results into an object `result.for`.
5. Both `result.apply` and `result.for` should contain the same result as `result.rowSums`, and when printed on the screen, all three must give exactly the same result:

```
result.rowSums
# 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20
# 5 10 10 13 14 11 13 12 13 12  9  9 10  7  8  8  7  9  9  8

result.apply
# 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20
# 5 10 10 13 14 11 13 12 13 12  9  9 10  7  8  8  7  9  9  8

result.for
# 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20
# 5 10 10 13 14 11 13 12 13 12  9  9 10  7  8  8  7  9  9  8
```

Hints

1. If you have not installed `vegan` before, you need to first call `install.packages`. To just initiate the already installed library, you will need the command `library`.
2. Use function `data` to initiate the dataset `dune` available in `vegan`.
3. …
4. These two approaches quite widely differ in the length of the script:
   a) this is simple, just use `apply` and specify correct `MARGIN` and `FUN` arguments;
   b) in case of `for` loop, you need to first create an empty variable `result.for`, which is a vector of length equal to the number of rows in `dune` dataset, and with names of individual items identical with `rownames (dune)`. Then create a `for` loop which will fill the vector element-by-element by the result of the calculation. Functions you may need: `vector`, `names`, `for`.
5. …