

# Exercices on session *Getting started with R* (3/3)

## Matrices

We are going to use a matrix called *occ* to get data on occurrence of species in sites (1 if the species is present, and 0 if it is absent).

- Create the following matrix and check that we have the structure we want.

	Sp1	Sp2	Sp3	Sp4	Sp5
site1	1	0	1	0	1
site2	1	1	1	1	1
site3	1	0	0	0	0
site4	1	0	1	0	1

- Calculate the number of species in each site.
- Calculate the number of sites in which each species occurs.
- Transpose the matrix to get the following:

	site1	site2	site3	site4
Sp1	1	1	1	1
Sp2	0	1	0	0
Sp3	1	1	0	1
Sp4	0	1	0	0
Sp5	1	1	0	1

## Lists

- Create the following list:

```
$occurrence
  Sp1 Sp2 Sp3 Sp4 Sp5
site1  1  0  1  0  1
site2  1  1  1  1  1
site3  1  0  0  0  0
site4  1  0  1  0  1
```

```
$site_state
site1 site2 site3 site4
"DF"  "GO"  "GO"  "MT"
```

## Operators and Functions

- Calculate the square root of 25
- Check that the exponential of the logarithm of 1 is equal to 1. *NB: If you try to do it for another number, you will get an unexpected result due to rounding.*
- Check that 2 is between 0 and 10 (there are different ways to do it)
- Get the absolute value of each element of the following vector *vec*:

```
[1] -4  5  8 -9 -3
```

- Get the range of values in *vec*
- Calculate the basal area of a tree of diameter 25 cm (the basal area is the area of a circle of the diameter of a tree), in m<sup>2</sup>

## Packages

Install the following packages from CRAN:

- `vegan`
- `questionr`

## For next time

Download the following data sets [here](#) and here [here](#) and store them in your raw data folder.