Exercises for the course

"An introduction to R"

Exercise Session Basic Algorithmics: Monday - March 2, 2020

Exercise 1:
What is the value of A, B (and C when relevant) at the end of each algorithm? We assume that the variables A, B and C are already defined as integers.

Algorithm 1
```
A <- 1
B <- A + 3
A <- 3
```

Algorithm 2
```
A <- 5
B <- 3
C <- A + B
A <- 2
C <- B -A
```

Algorithm 3
```
A <- 5
B <- A + 4
A <- A + 1
B <- A - 4
```

Algorithm 4
```
A <- 3
B <- 10
C <- A + B
B <- A + B
A <- C
```

Algorithm 5
```
A <- 5
B <- 2
A <- B
B <- A
```

Exercise 2: Write an algorithm that allows to exchange the values of two variables A and B. At the end of the algorithm, B should have the initial value of A and A should have the initial value of B.

Exercise 3: Write an algorithm that asks the user for a number and then calculates and prints the square value of this number.

Exercise 4: Write an algorithm that asks the user for a number and prints out whether this number is positive or negative.
Version 1: Do not consider the value 0.
Version 2: Upgrade your algorithm to include the value 0.

Exercise 5: Write an algorithm that asks the user for two numbers and prints whether the product of these two numbers is positive or negative. You should not compute the value of the product.

Exercise 6: We look at a bird species. In this species, females from 1 year and above build nests and males from 1 year and below 6 years also build a nest (to attract a female). Other individuals do not build a nest.
Write an algorithm that asks for the relevant information of one bird and prints whether this bird will build a nest or not.

Exercise 7: Write an algorithm that asks the user to enter a number between 1 and 10 and repeats until the user enters a valid number.

Exercise 8: Write an algorithm that asks the user for an integer, computes the product of all positive integers until this value (the factorial of the value) and prints the result.