Computer Programming
Bachelor in Biomedical Engineering
Bachelor in Applied Mathematics and Computing
Course 2020 / 2021

Exercise Sheet 1 – Part 2 - SOLUTIONS
MATLAB Syntax

Content Table

Exercises: USING VECTORS AND MATRICES IN A PROGRAM

Exercise 7

Write a program that asks for a number from the user, then computes and displays the square of that number.

SOLUTION

```
clear
number = input('Introduce a number: ')
number*number
```

Exercise 8

Write a program that asks for two numbers from the user and displays the sum of the two numbers.

SOLUTION

```
clear
number1 = input('Introduce a number: ')
number2 = input('Introduce another number: ')
number1+number2
```

Exercise 9

Write a program that asks the user to introduce the ages of three students and then prints them on screen. Solve the problem using three different variables to store the ages of the students.

SOLUTION

```
clear
studentA = input('Introduce the age of a student: ')
studentB = input('Introduce the age of another student: ')
studentC = input('Introduce the age of another one: ')
studentA
studentB
studentC
```

The command *clear* cleans the MATLAB memory (the so-called 'workspace').

It is good practice to include it at the beginning of our programs, as it can save us from having unexpected errors.

Exercise 10

Write a program that asks the user to introduce the ages of three students and then prints them on screen. Solve the problem storing the ages in a vector of 1 row and 3 columns: the age of the first student in row 1 column 1, the age of the second student in row 1 column 2, and the age of the third student in row 1 column 3.

SOLUTION

```
clear
students = zeros(1, 3)
students(1) = input('Introduce the age of a student: ')
students(2) = input('Introduce the age of another student: ')
students(3) = input('Introduce the age of another one: ')
students(1)
students(2)
students(3)
```

Note: We created an initial vector of 1 row and 3 columns with all zeros. Then we updated the values in the vector with the numbers the user introduced.

Your program will also work if you don't initialize the vector with zeros… but it is another good practice to do it this way

Another possible solution

```
clear
students = zeros(1, 3)
stA = input('Introduce the age of a student: ')
stB = input('Introduce the age of another student: ')
stC = input('Introduce the age of another one: ')
students = [stA stB stC]
students(1)
students(2)
students(3)
```

Exercise 11

Modify the previous program so that MATLAB asks the user to introduce a number between 1 and 3 and prints the age of the correspondent student.

The output of the execution may look like this:

```
Introduce the age of a student: 19
Introduce the age of another student: 20
Introduce the age of another one: 18
Introduce a number: 2
ans = 20
```

SOLUTION

```
clear
students = zeros(1, 3)
students(1) = input('Introduce the age of a student: ')
students(2) = input('Introduce the age of another student: ')
students(3) = input('Introduce the age of another one: ')
num = input('Introduce a number: ')
students(num)   %(alternative: students(1,num))
```

Exercise 12

Write a program which asks the user to introduce 4 numbers and puts them in a matrix of 2 rows and 2 columns. Next, it shows the average value on screen.

SOLUTION

```
clear
matnum = zeros(2,2)
matnum(1,1) = input('Introduce a number: ')
matnum(1,2) = input('Introduce a number: ')
matnum(2,1) = input('Introduce a number: ')
matnum(2,2) = input('Introduce a number: ')
(matnum(1,1)+ matnum(1,2) + matnum(2,1) + matnum(2,2))/4
%(alternative: sum(matnum, 'all')/4)
```

Exercise 13

Modify the previous program so that it also displays all the numbers in reverse order (starting from the last number introduced and ending with the first one).

SOLUTION

```
clear
matnum = zeros(2,2)
matnum(1,1) = input('Introduce a number: ')
matnum(1,2) = input('Introduce a number: ')
matnum(2,1) = input('Introduce a number: ')
matnum(2,2) = input('Introduce a number: ')
matnum(2,2)
matnum(2,1)
matnum(1,2)
matnum(1,1)
(matnum(1,1)+ matnum(1,2) + matnum(2,1) + matnum(2,2))/4
```

Exercise 14

Write a program that asks the user to introduce 3 characters and stores them in a vector. Then it prints all the characters one after the other.

The output of the execution may look like this:

```
        Introduce a character: d
        Introduce another character: o
        Introduce another character: g
ans = d
ans = o
ans = g
```

SOLUTION

```
clear
c(1) = input('Introduce a character: ','s')
c(2) = input('Introduce a character: ','s')
c(3) = input('Introduce a character: ','s')
c(1)
c(2)
c(3)
```