COMPUTER ENGINEERING LABORATORY

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Exercises: loops, arrays

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Exercise 1

Write the first 30 elements of a series defined as follows: the first three elements are worth 1, the subsequent ones (i>=4) are worth the sum of the elements i-1 and i-3

Some suggestions:

- you could use an array of integers or you could use 4 int variables

Exercise 2

Write a program that, given a number N>0 (at most 10) of different integer values provided as command-line arguments, prints on the screen the maximum and minimum of the inserted sequence, the position in which this value was inserted and the sequence ordered in ascending mode.

Some suggestions:

- use the function atoi (simpler) or strtol (more complete and robust) to convert the string arguments in integer values

```
for (int i = 1; i < argc; i++)
    printf("%s\t", argv[i]);
```

Exercise 3

Given a string, transform it in a new string, in which every character is located OFFSET positions further in the alphabet

- The alphabet considered is:
  - ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz
- The alphabet is cyclical: after the 'z' there is the 'A'
- For example, with OFFSET = 4
  - the character 'a' becomes 'e'
  - the letter 'X' becomes 'b'
  - the letter 'x' becomes 'B'
- The complexity of the program lies in the fact that in ASCII coding the sequences 'A'..'Z' and 'a'..'z' (the sequence of uppercase characters comes first) are not consecutive, but there is half another set of characters, so it is necessary to break the program into 2 ifs.

Exercise 4

Define the Course type, which allows you to represent information concerning language courses. In particular, for each course it is necessary to represent the following data:

- language: a sequence of 10 characters;
- level: an integer;
- numberEnrolled: an integer;
- teacherName: a sequence of 30 characters;
- The set of Students (maximum 10).

Each student is a structured data, composed of:

- studentName (sequence of 10 characters)
- studentLastName (sequence of 10 characters)
- studentAge (integer)

Exercise 4

Declare the school variable, capable of representing the set of courses of a certain school. A school groups a maximum of 30 courses.

Write in C language the part of the algorithm to calculate the average age of students enrolled in English language courses (assuming that the variable school has been initialized with information relating to 30 courses).