Introduction to C++

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LIP Summer Internships

Contents

- Short introduction to C++ language and demonstration;
- Hands-on exercises:
  - Independent work with exercises proposed in the next slides;
    - Support will be available in zoom (during the tutorial) and slack (any time!)

- Demonstration an exercises will be done online:
  - https://www.onlinegdb.com/online_c++_compiler
    - This tutorial can be followed on any operating system;
    - Do not require a LIP account;
    - A link to the classroom exercises will be supplied in zoom chat

Exercise 1

The goal of this task is to write a simple/first C++ program:

- write a program that prints out "Hello World!".

Exercise 2

The goal is to write a code that prints a table with the values given by a parabola.

Exercise 3

- Implement a program that defines an array with the following values

  {10.5, 9.3, 11.4, 10.9, 13, 8.4, 9.2, 8.9, 10.3, 11.2, 12.1, 8.4, 9.2, 9.9, 10.1}

- The program should run over all values and print them to the screen. Then it should ask the user to enter a number between 1 and 15 and print the corresponding number of the array.

Exercise 4

- Implement a program that defines an array with the following values

  {10.5, 9.3, 11.4, 10.9, 13, 8.4, 9.2, 8.9, 10.3, 11.2, 12.1, 8.4, 9.2, 9.9, 10.1}

- and calculate and prints the correspondent mean and standard deviation values.

$$< x >= \frac{1}{N}\sum_{i=1}^{N} x_i \qquad \sigma = \sqrt{var}, \qquad var = \frac{1}{N}\sum_{i=1}^{N}(x_i - < x >)^2$$

Exercise 5

- Implement a program that defines the following arrays

- **A**: {10.5, 9.3, 11.4, 10.9, 13, 8.4, 9.2, 8.9, 10.3, 11.2, 12.1, 8.4, 9.2, 9.9, 10.1}
- **B**: {1, 0, 0, 1, 0, 1, 1, 1, 0, 0, 1, 0, 1, 0, 1}

- Loop over the entries of **B** and whenever you find an entry with the value 1 print the corresponding entry of **A**. Then for all entries marked with 0 (or 1) calculate the mean value and the standard deviation.