

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
 - <https://wandbox.org/>



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.

$$\langle x \rangle = \frac{1}{N} \sum_{i=1}^N x_i$$

$$\sigma = \sqrt{var},$$

$$var = \frac{1}{N} \sum_{i=1}^N (x_i - \langle x \rangle)^2$$



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.