

National Research University Higher School of Economics
Faculty of Computer Science
Bachelor's Program "HSE University and University of London Double Degree
Program in Data Science and Business Analytics"

Introduction to Programming

Workshop #6

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This week's outline

- **Workshop 5 27.01.2021**
 - Practice with strings
 - Stringstream
- **Workshop 6 29.01.2021**
 - Functions
 - Files

Wednesday's Outline

- 0) Read a whole line with spaces in-between.
- 1) Exercise 1: Extend a code to concatenate strings and print a name in a simple format.
- 2) Exercise 2: Split an input string by spaces.
- 3) Exercise 3: Split an input string by a given delimiter.
- 4) Library `stringstream`
- 5) Approach to split an string with a given delimiter using the library `stringstream`.

Today's outline (complete in the next slides)

- 0) Function declaration
- 1) Function arguments – passing by values
- 2) Functions with arrays as arguments
- 3) Checking out array structure in memory
- 4) References
- 5) Function arguments – passing by reference

Exercise 1

Code a program in C++ where:

- read an integer **n** from the user.
- pass variable **n** *by value* and variable **res** *by reference* to a function called *factorial*(n, res).
- The function *factorial* should calculate the factorial of **n** and to put the result on variable **res**. ($\text{res} = n!$)
- Print the result in the main function.

Today's outline

- 0) Function declaration
- 1) Function arguments – passing by values
- 2) Functions with arrays as arguments
- 3) Checking out array structure in memory
- 4) References
- 5) Function arguments – passing by reference
- 6) Functions taking C-like strings as arguments
- 7) Creating a C-like string and returning it to the main function
- 8) Functions taking `<string>` C++ objects as arguments
- 9) Creating and writing a file
- 10) Reading from a file
- 11) Relative paths and configuration

Exercise 2

Code a program in C++ where:

- 1) reads a text plain file whose content is the first 20 natural numbers. Each number is one line.
- 2) insert the values in an integer array.
- 3) Calculates the sum of the array.

The three tasks (1-3) must be done in separate functions.