

Hello World!

C++ in QF I - a course by Paweł Sakowski

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Labs 01

After labs #1 you should be able to:

- Create first C++ program.
- Be familiar with basic C++ syntax.
- Compile and run a C++ program.
- Print text into console.
- Gather input from keyboard.
- Add comments to the source code.
- Work with simple variables and data types.
- Declare variables and assign values to them.
- Print variables.
- Understand simple type conversions.
- Work with characters, strings and constants.

Fundamental data types

- **Numerical integer types:** They can store a whole number value, such as 7 or 1024. They exist in a variety of sizes, and can either be signed or unsigned, depending on whether they support negative values or not.
- **Floating-point types:** They can represent real values, such as 3.14 or 0.01, with different levels of precision, depending on which of the three floating-point types is used.
- **Character types:** They can represent a single character, such as 'A' or '\$'. The most basic type is `char`, which is a one-byte character. Other types are also provided for wider characters.
- **Boolean type:** The boolean type, known in C++ as `bool`, can only represent one of two states, true or false.

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Fundamental data types

Group	Type names*	Notes on size / precision
Character types	<code>char</code>	Exactly one byte in size. At least 8 bits.
	<code>char16_t</code>	Not smaller than <code>char</code> . At least 16 bits.
	<code>char32_t</code>	Not smaller than <code>char16_t</code> . At least 32 bits.
	<code>wchar_t</code>	Can represent the largest supported character set.
Integer types (signed)	<i><code>signed char</code></i>	Same size as <code>char</code> . At least 8 bits.
	<i><code>signed short int</code></i>	Not smaller than <code>char</code> . At least 16 bits.
	<i><code>signed int</code></i>	Not smaller than <code>short</code> . At least 16 bits.
	<i><code>signed long int</code></i>	Not smaller than <code>int</code> . At least 32 bits.
	<i><code>signed long long int</code></i>	Not smaller than <code>long</code> . At least 64 bits.
Integer types (unsigned)	<code>unsigned char</code>	(same size as their signed counterparts)
	<code>unsigned short int</code>	
	<code>unsigned int</code>	
	<code>unsigned long int</code>	
	<code>unsigned long long int</code>	
Floating-point types	<code>float</code>	
	<code>double</code>	Precision not less than <code>float</code>
	<code>long double</code>	Precision not less than <code>double</code>
Boolean type	<code>bool</code>	
Void type	<code>void</code>	no storage
Null pointer	<code>decltype(nullptr)</code>	

* The names of certain integer types can be abbreviated without their *signed* and *int* components - only the part not in *italics* is required to identify the type, the part in *italics* is optional. I.e., *signed short int* can be abbreviated as *signed short*, *short int*, or simply *short*; they all identify the same fundamental type.

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- ❶ Write a program which will print the following information:
My name is
Today is
I'm a student of Quantitative Finance.
- ❷ Write a program, which will convert yards into meters.
Upgrade it to gather input from the user. Then try to upgrade it to ask user for any two unit names, its multiplier, and write correct output.
- ❸ Write a program, which will help you to find out what are the ASCII symbols for 1, 2, 3, a, b, c, A, B, C, ect. Try to do things other way around and search the internet how to find a character by the certain integer.
- ❹ Write a program, which will print out a Christmas tree.
Try to read about string variables to make the code smarter.

Thank you!