

Introduction to C++ Programming

"C++ Programming Basics"

Fundamentals of OOPs

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Overview

- Need to understand some fundamentals before writing even most elementary programs
- Three fundamentals:
 - basic program construction
 - variables
 - input/output
 - transfer of control (decisions and loops)
- Microsoft (Cygwin), Borland or Turbo C++, GCC (GNU Compiler Collection), compiler



A Simple Program

welcome.cpp program

```
#include <iostream > \\preprocessor directive
using namespace std;

void main() { \\main method begin
    cout << "Wellcome to C++ programming\\n";
    /*
    a simple program that prints a
    string constant and an escape sequence
    to move cursor to new line
    * \\
} \\main method ends
```



Descriptions for the program welcome.cpp

- Save program with .cpp extension always
- Directives:
 - preprocessor directive
 - using directive
- Every c++ program must have a main method, which is the entry point for the program execution
- The `cout` identifier and the `<<` operator:
 - `cout`: is an object predefined in C++ corresponding *standard output stream*
 - `<<`: called *insertion* or *put to* operator
- String constant: "Wellcome to C++ programming\n"
- Comments



Variables and Data Types

- Variables: has a symbolic name and can be given a variety of values
- Data Types: Every variable must have a type (pre-defined, user-defined)
 - Integers : `short`, `int`, `long`
 - Characters: `char`
 - Floating Points: `float`, `double`, `long double`
 - Boolean: `bool`



Operators

- Arithmetic operators: $+$, $-$, $/$, $*$, and $\%$
- Assignment operators: $=$, $+=$, $-=$, $*=$, $/=$, and $\%=$
- Increment and Decrement operators: $++$, $-$ both prefix and postfix
- Relational operators: $==$, $<$, $>$, $<=$, $>=$, and $!=$
- Logical operators: $||$, $\&\&$, $!$



Type Conversion

- Data Type Conversion:

Automatic Conversion: happens in mixed-type expression, usually types are considered as higher or lower based roughly on their size

Casts: manually cast one type to another (static casts, dynamic casts, reinterpret casts, and const casts)



Some basic input output essentials

- Streams are used for performing input/output operations
- For console input/output the `cin/cout` objects of the standard input/output streams library are used

```
int x;  
cin >> x;  
cout << x << "value was entered" ;
```



Decisions

- `if` statement
- `if else` statement
- `switch` statement
- `break` statement
- `? :` conditional operator



Loops

- `for` loop
- `while` loop
- `do...while` loop
- `continue` statement
- `break` statement



- Array of simple data types:

```
int marks[5];  
int marks[3] = 55;  
cout«marks[3];
```

- Structure: Collection of simple variables (simple data types):

```
struct Point {  
    int x;  
    int y;  
}
```

- Enumeration: a different approach to define new special data types in certain useful situations, consider following example

```
enum days_of_the_week {Sun, Mon, Tue, Wed, Thu, Fri, Sat};
```



What's next?

Dealing with Classes and Objects in C++ programming language



Your Turn: Time to hear from you!



1

¹<https://fensafitters.files.wordpress.com/2013/07/3d095.jpg>



References



Robert Lafore

Object-Oriented Programming in C++, 4th Edition .
2002.



Piyush Kumar

Object oriented Programming (Using C++)

<http://www.compgeom.com/piyush/teach/3330>

