Basic Programming

Starting with C++

What is programming?

Programming is the process of taking an algorithm and encoding it into a notation, a programming language, so that it can be executed by a computer. Your computer is a dumb machine, you need to explain every single thing to it. In order to give him instruction, you need a language to communicate

What is programming language?

A **programming language** is a formal language which comprises a set of instructions used to produce various kinds of output. Programming languages are used to create programs that implement specific algorithms.

CAUTION
THIS MACHINE
HAS NO BRAIN
USE YOUR OWN

List of Programing languages

C/C++

Java

Javascript

Python

Ruby/Rails

R

Enough of talks, where to code?

IDE VS CODE EDITORS

IDE-An integrated development environment (IDE) is a software suite that consolidates the basic tools developers need to write and test software. Typically, an IDE contains a code editor, a compiler or interpreter and a debugger that the developer accesses through a single graphical user interface (GUI).

A **source code editor** is a text editor program designed specifically for editing source code of computer programs. It may be a standalone application or it may be built into an integrated development environment (IDE) or web browser. Source code editors are a fundamental programming tool, as the fundamental job write and edit source code.

Tip

There are many IDEs available, like Code blocks, CLion, online editors like CS50 IDE (aka cloud 9), hackerearth.

Some more basics please

Compiler: A compiler is a special program that processes statements written in a particular programming language and turns them into machine language or "code" that a computer's processor uses.

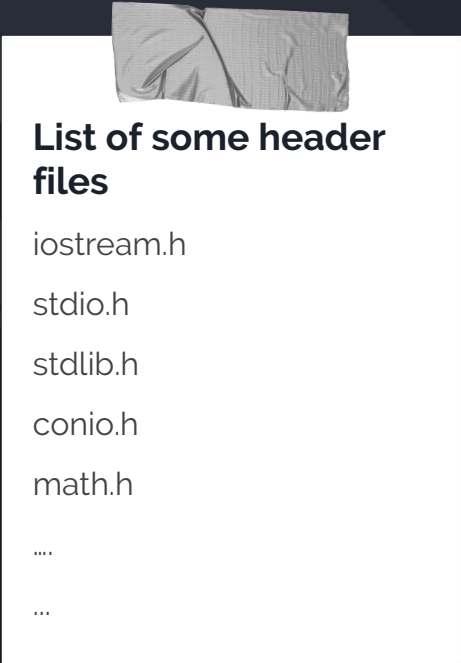**Debugger**:A debugger is a software program used to test and find bugs (errors) in other programs.

Printing Hello world!

```cpp
#include <iostream.h>
using namespace std;

int main()
{
    cout << "Hello World!" << endl;
    return 0;
}
```

9:1

What are header files?

As programs grow larger and larger (and include more files), it becomes increasingly tedious to have to forward declare every function you want to use that lives in a different file. Wouldn't it be nice if you could put all your declarations in one place? C++ code files (with a .cpp extension) are not the only files commonly seen in C++ programs. The other type of file is called a **header file**, sometimes known as an **include file**.
Header files usually have a .h extension, but you will sometimes see them with a .hpp extension or no extension at all. The purpose of a header file is to hold declarations for other files to use.

List of some header files

iostream.h

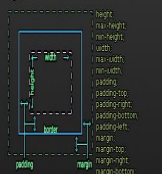stdio.h

stdlib.h

conio.h

math.h

…..

…

cin, cout

The cin and cout statements are known as console input and console output respectively. They take input and output from the console that is your keyboard

```
1  #include <iostream.h>
2  using namespace std;
3
4  int main()
5  {
6      cout << "Hello World!" << endl;
7      return 0;
8  }
9
```

9:1

The main( ) function

The `main()` function doesn't really have to do anything other than be present inside your C source code. Eventually, it contains instructions that tell the computer to carry out whatever task your program is designed to do. But it's not officially required to do anything.

DATA TYPES & VARIABLE

1) Int
2) Float
3) Char
4) Double

Variable:- A **variable** provides us with named storage that our programs can manipulate.

5

X

Operators

1) Assignment Operators
2) And Operator(&&)
3) Or Operator(||)
4) Not Operator(!=)
5) Bool Operator(==)
6) Increment & Decrement Operators(a++ , ++a , a-- , --a)

Loops in C++

```cpp
#include <iostream.h>
using namespace std;

int main()
{
    for (int i = 1; i <= 1000; i++)
    {
        cout << i << endl;
    }
}
```

8:16

Loops in programming are used when we need to repeatedly execute a block of statements.
For example:
Suppose we want to print nos. from 1 to 1000.
Should we write it 1000 times? No NEVER!
We use loops for these execution

Types of Loops

while loop

initialization expression;

while (**test_expression**)

{

  // statements

  update_expression;

  }

```cpp
#include <iostream.h>
using namespace std;

int main()
{
    int i = 2; // Initialization expression

    do
    {
        // loop body
        cout << "Hello World\n";

        // update expression
        i++;

    } while (i < 1);   // test expression

    return 0;
}
```

do while

initialization expression;

do

{

  // statements

  update_expression;

} while (**test_expression**);

```cpp
#include <iostream.h>
using namespace std;

int main()
{
    // initialization expression
    int i = 1;

    // test expression
    while (i < 6)
    {
        cout << "Hello World\n";

        // update expression
        i++;
    }

    return 0;
}
```

for loop

for (initialization expr; test expr; update expr)

{

  // body of the loop

  // statements we want to execute

}

```cpp
#include <iostream.h>
using namespace std;

int main()
{
    for (int i = 1; i <= 10; i++)
    {
        cout << "Hello World\n";
    }

    return 0;
}
```

THANK YOU!

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