INCEPTION

C++ Foundation & Data Structures

Lecture 2 : Programming Fundamentals 1

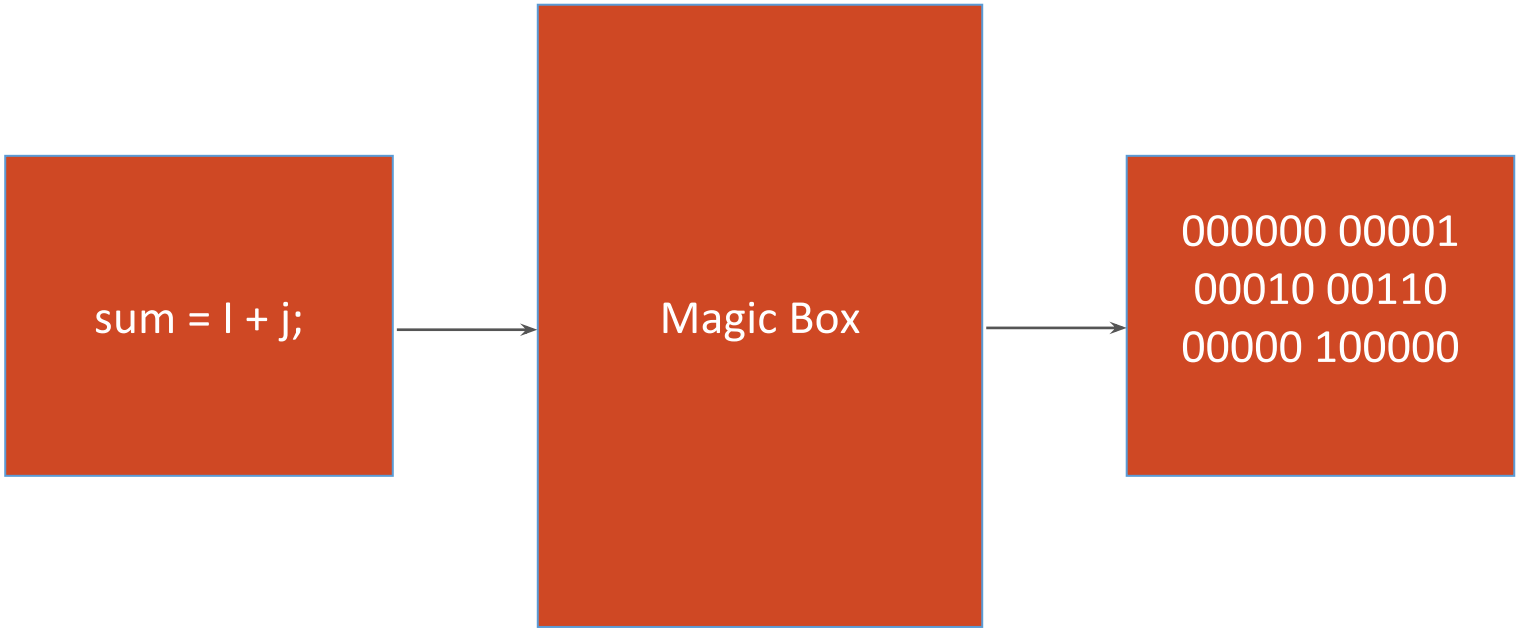
Any Doubts in Assignments

Binary Number System

Binary Number System

- The binary, or base-2, numbering system is based on the same principles as the decimal, or base-10, numbering system, with which we are already familiar
- Bit(Binary Digit) is the basic unit. It can have only one of two values (0 or 1), and may therefore be physically implemented with a two-state device.
- Bits are commonly stored and manipulated in groups generally referred as Byte (group of 8 bits)
- Number of bits effect accuracy of result and also limits the size of numbers manipulated by computer.

How does CPP/Java work?



Time to Write Hello World!

Simple Interest Calculation

Primitive Data types

- Boolean
- Character
- Integer
- Floating Point
- Double Floating Point

Signed vs Unsigned

Largest of three numbers

Print all numbers from 1 to N

How to take user Input?

Basics

- Program Always starts with main()
- { } are used to enclose a block (function, if, while etc.}.
- C++ Compiler Ignores whitespace (space, carriage returns, linefeeds, tabs, vertical tabs, etc.)
- Output using cout
- Input using cin
- Comments (// & /*… */)
- Every statement must end with a ;

Variables

- Variables – Symbolic name and can be given variety of Values.
- For variable name we can use uppercase and lowercase letters, digits from 1 to 9 and underscore (_).
- First character must be underscore or letter.
- C++ is strongly typed language. So every variable needs to be declare before using it. [int a;]
- Variables when just declared have garbage value until they are assigned a value for the first time.
- We can assign a specific value from the moment variable is declared, called as initialization of variable [float b = 0.0;].

If Else

- **Single If**

```
if (a > 10) {
    cout << “Hello!”;
}
```

- **If Else**

```
If (a>10) {
        cout << “Hello!”;
} else {
        cout << “World.”;
}
```

- **If .. Else If .. Else**

```
If (a>10 && a <20) {
        cout << “Hello!”;
} else if (a >20 && a <30) {
        cout << “Hello World!”;
} else {
        cout << “Welcome to Coding Ninjas”;
}
```

While Loop

```
while( condition is true ) {
      //do some stuff
}
```

Variables

- Variables – Symbolic name and can be given variety of Values.
- For variable name we can use uppercase and lowercase letters, digits from 1 to 9 and underscore (_).
- First character must be underscore or letter.
- C++ is strongly typed language. So every variable needs to be declare before using it. [int a;]
- Variables when just declared have garbage value until they are assigned a value for the first time.
- We can assign a specific value from the moment variable is declared, called as initialization of variable [float b = 0.0;].

Print Fahrenheit Table

Print Following table using Formula: C = (5/9)(F - 32)

0	-17
20	-6
40	4
60	15
80	26
100	37
120	48
140	60
160	71
180	82
200	93
220	104
240	115
260	126
280	137
300	148

Few more problems

- Find min out of 5 numbers
- Check if a number is prime
- Write code to print the following pattern

```
1
2 3
4 5 6
7 8 9 10
```

Your Turn

- Print all Fibonacci number less than N
- Find all prime numbers between 2 to N
- Write code to print the following pattern

```
    1
   232
  34543
 4567654
567898765
```

THANK YOU

CODING NINJAS

Manisha Khattar
manisha@codingninjas.in