INCEPTION

C++ Foundation & Data Structures

Lecture 2 : Programming Fundamentals 1

Tuesday, 28 May 2019

Any Doubts in Assignments

Binary Number System

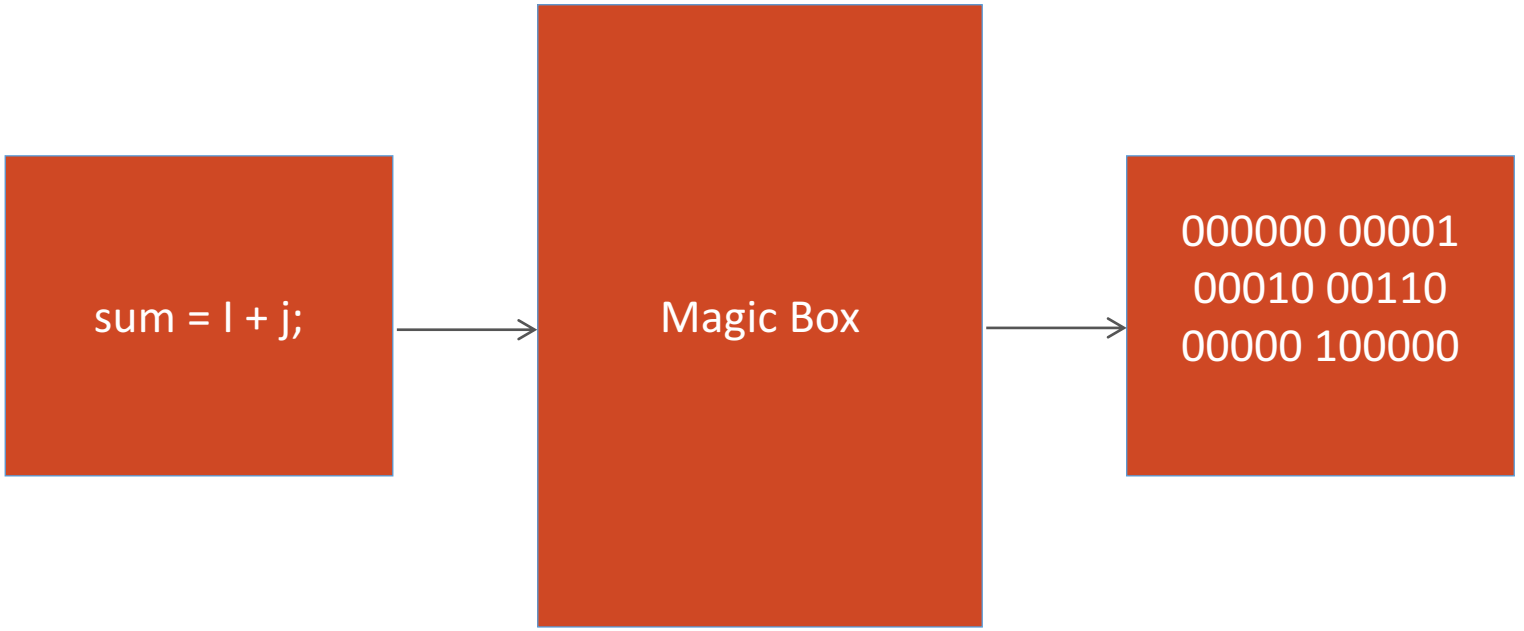
Binary Number System

- 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.

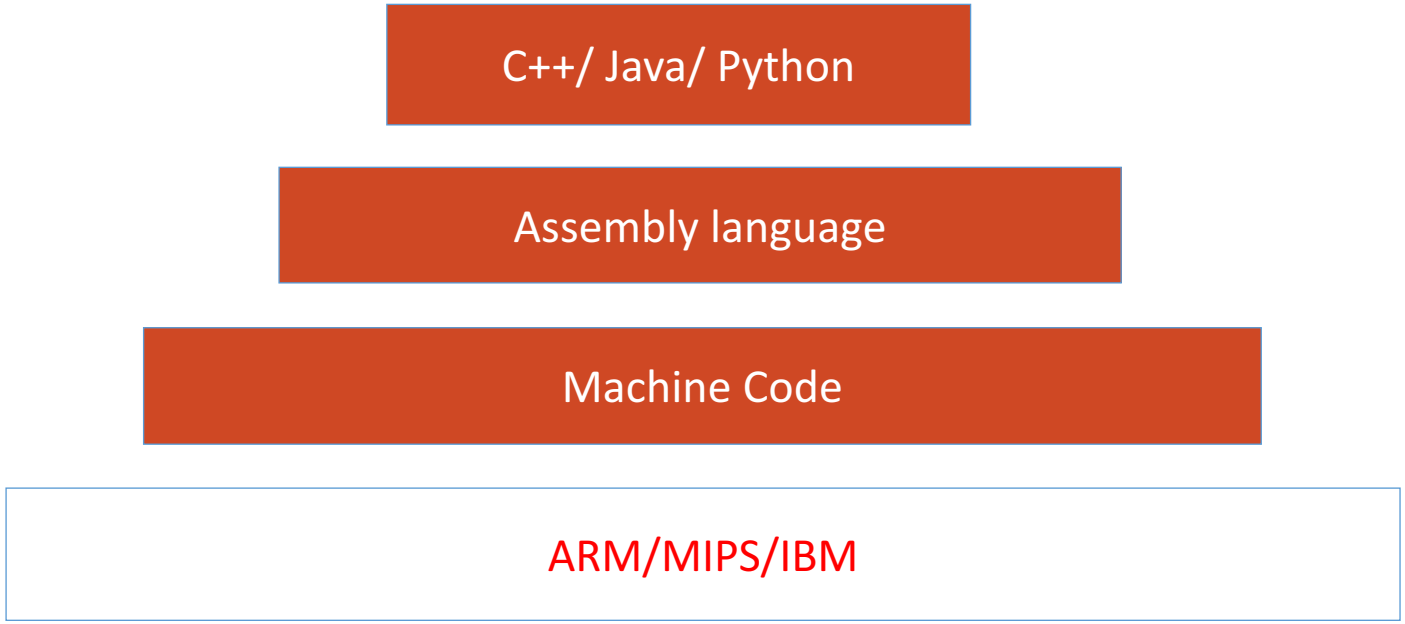
BT - 4: Criminal Cupbearers

An evil king has 1000 bottles of wine. A neighboring queen plots to kill the bad king, and sends a servant to poison the wine. The king's guards catch the servant after he has only poisoned one bottle. The guards don't know which bottle was poisoned, but they do know that the poison is so potent that even if it was diluted 1,000,000 times, it would still be fatal. Furthermore, the effects of the poison take one month to surface. The king decides he will get some of his prisoners in his vast dungeons to drink the wine. Rather than using 1000 prisoners each assigned to a particular bottle, this king knows that he needs to murder no more than 10 prisoners to figure out what bottle is poisoned, and will still be able to drink the rest of the wine in 1 month time. How does he pull this off ?

How does CPP/Java work?



High/Low Level Languages



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?

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

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
}
```

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Few more problems

- Find min and max 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

- Largest of N numbers
- 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

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