Sunday, 23
August 15

Launchpad

Lecture -2

Programming Fundamentals -1

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CODING BLOCKS

Code Blocks?

BT – Greedy Pirates

A pirate ship captures a treasure of 1000 golden coins. The treasure has to be split among the 5 pirates: 1, 2, 3, 4, and 5 in order of rank. The pirates have the following important characteristics: infinitely smart, bloodthirsty, greedy. Starting with pirate 5 they can make a proposal how to split up the treasure. This proposal can either be accepted or the pirate is thrown overboard. A proposal is accepted if and only if a majority of the pirates agrees on it. **What proposal should pirate 5 make?**

BT – Infinite Quarter Sequence

You are wearing a blindfold and thick gloves. An infinite number of quarters are laid out before you on a table of infinite area. Someone tells you that 20 of these quarters are tails and the rest are heads. He says that if you can split the quarters into 2 piles where the number of tails quarters is the same in both piles, then you win all of the quarters. You are allowed to move the quarters and to flip them over, but you can never tell what state a quarter is currently in (the blindfold prevents you from seeing, and the gloves prevent you from feeling which side is heads or tails). **How do you partition the quarters so that you can win them all?**

Any doubts on assignment?

Time to write Hello World!

Simple Interest Calculation

Primitive Data Types

- Boolean - bool
- Character - char
- Integer – int
- Floating Point – float
- Double Floating Point – double

Data type modifiers

Several of the basic types can be modified using one or more of these type modifiers

- signed
- unsigned
- short
- long

Largest of three numbers

Print all numbers from 1 to N

Change Code to take User Input

Print table of Fahrenheit to Celsius

Print the following table for Fahrenheit to Celsius 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
```

Recap!

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 ;

Datatypes

Fundamental Datatypes

1. Character Types
   - char – 1 Byte
2. Numerical Integer Types
   - signed char – 1 Byte
   - signed short int [or short int] – 2 Byte
   - int [or signed int] – 4 Bytes
   - signed long int [or long int] – 8 bytes
   - Unsigned Versions of Above
3. Floating Types
   - float
   - double – precision not less than float
   - long double – precision not less than double
4. Boolean Types
   - bool

Variables

- Variables – Symbolic name and can be given variety of Values.
- For variable name we can use uppercase and lowercase letters, digits from 1to9 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;]

Constants

- Integer Constants [5, 7678L, 75u, 75ul]
- Character Constants [‘A’, ‘\n’, ‘\t’]
- Float Constants [3.14159F, 3.45, 1.0E9, 1.0E-9]
- String Constants [“Coding Blocks”]

If statement

- 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 Blocks”;
}
```

While Loop

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

Lets do these 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

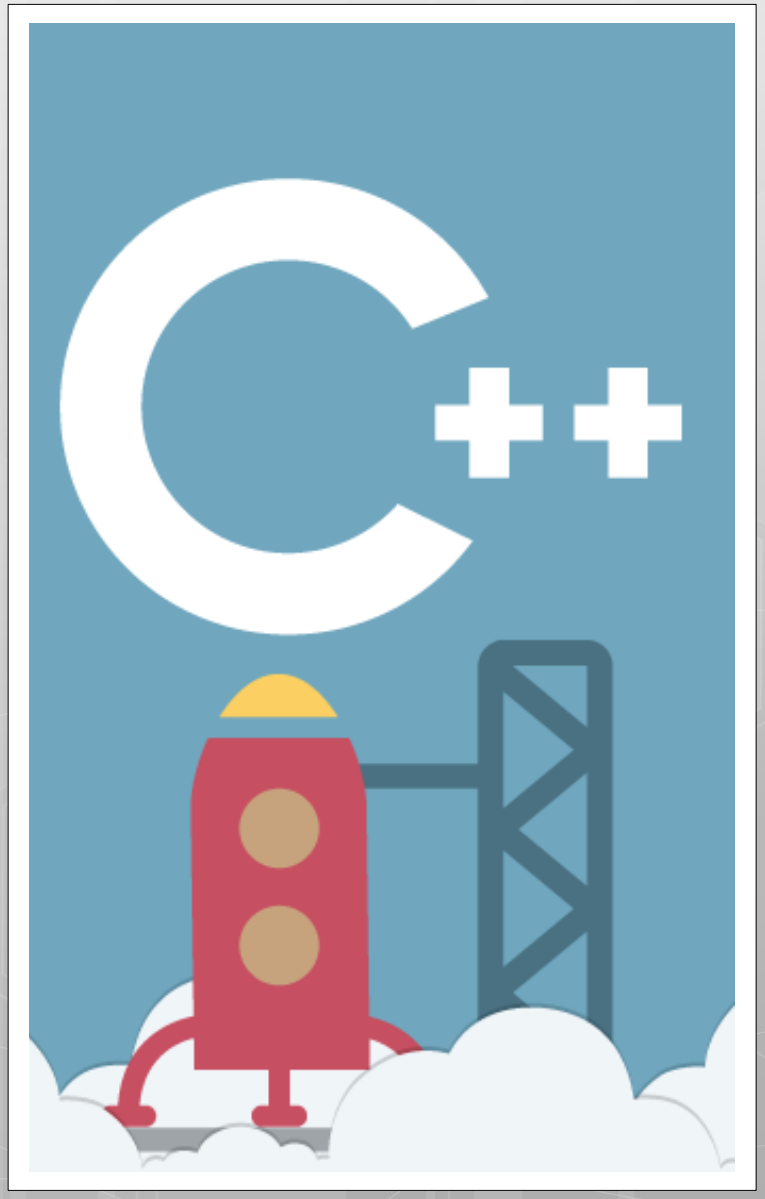
  4 5 6

  7 8 9 10

Time to Try?

- 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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