C++

LAUNCHPAD

CODING BLOCKS

Lecture-5

Fundamentals-IV

- Arrays
- Functions

Deepak Aggarwal

Other Language Constructs

- do while
- switch case
- Tertiary operator (? :)

Warm up?

Write a program to print following pattern:

```
*  ***  ***  *

**  **  **  **

***  *  *  ***
```

Time to talk about functions?

What is a function?

- A function groups a number of program instructions into one unit and gives it a name. This can then be invoked from other parts of the program.
- It adds conceptual organization and increases reusability of the code.

Lets move some programs to functions!

- Write function to print a table of Fahrenheit to Celsius table from 0 to 300.
- Lets convert the above to take limits from the user.
- Write a function to check if a number is prime or not.
- Use above in another function to generate all prime numbers from 2 to N, where N is given by user.

So a function looks like :

```
type name ( parameter1, parameter2, ...) {
        statements
}
```

- **type** is the type of the value returned by the function.
- **name** is the identifier by which the function can be called.
- **parameters** (as many as needed): Each parameter consists of a type followed by an identifier, with each parameter being separated from the next by a comma. Each parameter looks very much like a regular variable declaration (for example: int x), and in fact acts within the function as a regular variable which is local to the function. The purpose of parameters is to allow passing arguments to the function from the location where it is called from.
- **statements** is the function's body. It is a block of statements surrounded by braces { } that specify what the function actually does.

Time to try?

- Write a function to return factorial of a number?
- Write a function which uses above to calculate NCR

Call Stack?

Scope of Variables?

Call by value!

Call By Reference !

More about functions

- A function generally has three parts
  - Declaration
  - Definition
  - Invoking
- Declaration is optional if function is defined above main()
- A function needs to be defined or declared before it can be called i.e. if you are calling a function A() in function B() then A should be declared or defined above B.

Passing Arrays into a function!

Lets do some more problems?

- Write a function which takes an array and its length as argument and returns sum of its elements.
- Write a function which takes an array as argument and sorts them using selection Sort.
- There are two sorted arrays. First one is of size m+n containing only m elements. Another one is of size n and contains n elements. Write a function to merge these two arrays into the first array of size m+n.

Binary Search!

Insertion Sort !

Time to try?

- Binary Search
- Write a function which takes a number X and a array and prints all pairs which sum to X.
- Write a function which takes two sorted arrays, and their lengths as arguments and returns combined median of them without using the third array.
- Implement Insertion Sort.

What is next class about?

- Arrays contd…

CODING BLOCKS

Thank You!

Deepak Aggarwal