

# C++ LAUNCHPAD



## Lecture-5

## Fundamentals-IV

- Arrays
- Functions

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# Optimising Bubble Sort !

# Other Language Constructs

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

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  $m+n$ .

# Insertion Sort !



# Binary Search!

## 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...

# C++ LAUNCHPAD



Thank You!

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