



Lecture-5

Fundamentals-IV

- Arrays
- Functions

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Optimsing Bubble Sort!



Other Language Constructs

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



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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.



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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?

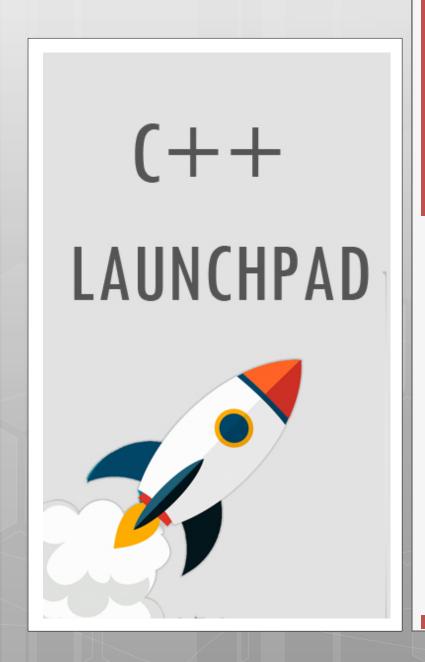
- Binary Search
- Write a function which takes a number X and a array and prints all prints all pairs which sum to X.
- Write a function which takes two sorted arrays, and their lengths as arguments and returns combined median of them without using the third array.
- Implement Insertion Sort.



What is next class about?

Arrays contd...







Thank You!

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