

September 15,
2016

Launchpad

Lecture - 9

Recursion - 2

Prateek Narang

Any doubts?

Lets look at few more problems to understand recursion better.

Finding the last 7 ?

Finding All positions of 7 ?

Bubble Sort Recursive ?

Multiply two numbers using recursion !

Converting a string to integer !

No of ways to reach top of a
ladder
by taking a jump of 1 or 2 or 3 ?

Towers of Hanoi !

Find all subsequence of a string

“abc” – “”, “a”, “b”, “c”, “ab”, “ac”, “bc”, “abc”

Before we think about recursive solution lets look at few things:

- I. We need this function to return an array of strings.
- II. But in C++ we know we cannot return array as this would be address of local variable.
- III. Instead we can pass it as argument and expect it to fill this array with the strings.
- IV. We also need to know how many strings in this array were filled by the function so that we can iterate over it and print it.

Lets find recursion in it.

- I. $S("") = []$
- II. $S("c") = ["", "c"]$
- III. $S("bc") = ["", "c", "b", "bc"]$
- IV. $S("abc") = ["", "c", "b", "bc", "a", "ac", "ab", "abc"]$

Figured out?

$S("abc") = S("bc") + \text{copy of all } S("bc") \text{ with 'a' prefixed.}$

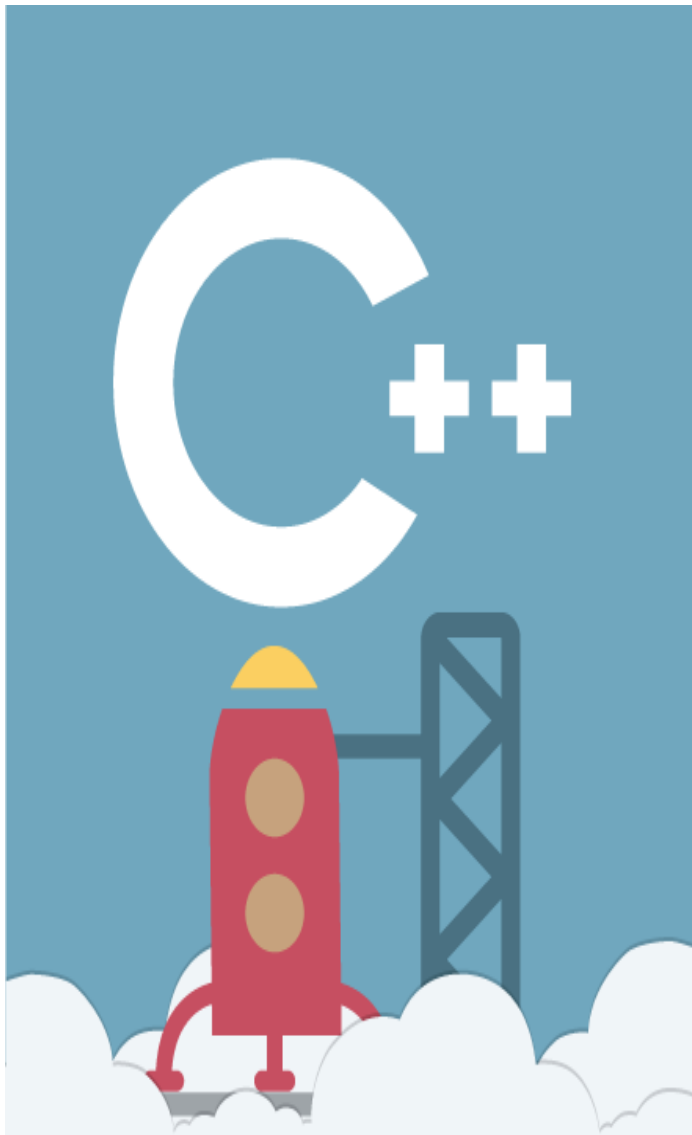
Time to code.



Permutations of a String.

Tug of War... (HomeWork)

Tug of War - Given a set of n integers, divide the set in two subsets of $n/2$ sizes each such that the difference of the sum of two subsets is as minimum as possible. If n is even, then sizes of two subsets must be strictly $n/2$ and if n is odd, then size of one subset must be $(n-1)/2$ and size of other subset must be $(n+1)/2$.



Thank You!

Prateek Narang

prateek@codingblocks.com
+91-9718694389
