C++

LAUNCHPAD

CODING BLOCKS

Lecture-8

Recursion

- Understanding Recursion
- Problems on Recursion
- Merge Sort

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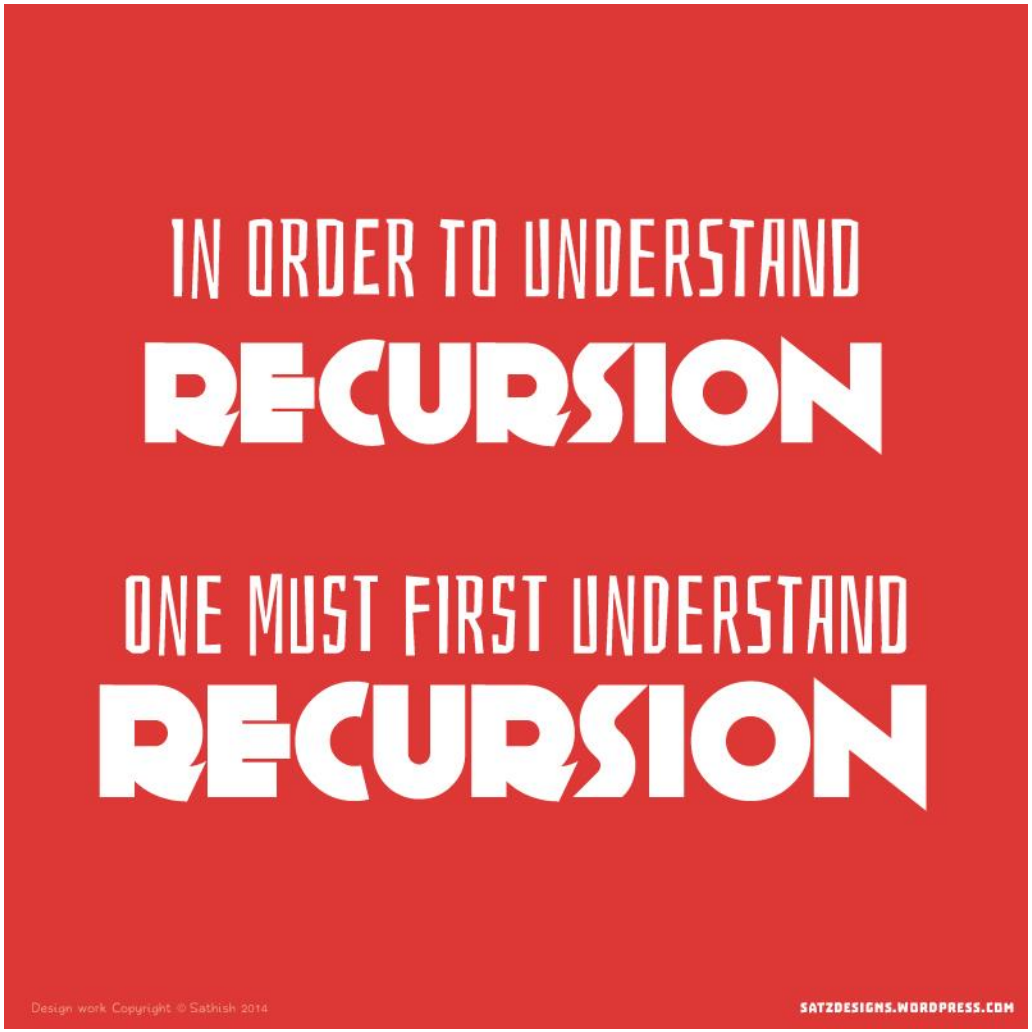
How to understand Recursion ?



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What is Recursion?

Recursion in computer science is a method where the solution to a problem depends on solutions to smaller instances of the same Problem.

Warm Up

- Write a program to calculate factorial of a number.

Print Factorial of N

- What is the recursive call?
- What is the base case?

Call Stack!

Parts of Recursive Algorithm

- Base Case (i.e., when to stop)
- Work toward Base Case
- Recursive Call (i.e., call ourselves)

The "work toward base case" is where we make the problem simpler. The recursive call, is where we use the same algorithm to solve a simpler version of the problem. The base case is the solution to the "simplest" possible problem

Print Nth Fibonacci Number

- What is the recursive call?
- Base Case?

Behind the scenes!

Check if an array is sorted

- What is the recursive call?
- Base Case?

Lets code some more problems

- Sum of Array
- Selection Sort
- Print Numbers –
  1) Increasing Order
  2) Decreasing Order

Your Turn

- Write code for a function power(x,n) which evaluates x^n.

- Given an integer say –

  2048 , print “two zero four eight” using recursion.

- Given an array
  - Check if it contains 7
  - Find first index of 7
  - Find last index of 7
  - Find all indices of 7

Time to try?

- Bubble Sort using recursion.
- Binary Search using recursion.
- Convert a String into Integer using recursion.

Merge Sort!

What is next class about?

- More into recursion.

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Thank You!

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