

Department of Computer Science

Lecture Outline

Data Structures – 4th CSE

Lecture: Recursion and Stacks

All Programming to be done in C language.

Classroom Lectures:

Lecture 10: Recursion

<https://youtu.be/UwSe-5KFjXo?list=PLMyfWb67qjR2wSszN6pArN5qtfnMsFmXN>

Lecture 11 - Introduction to Stacks, Dynamic and Static Implementation:

<https://youtu.be/i1Zx9YonjhY>

Lecture 12 - Applications of Stacks

<https://youtu.be/OLDrGYX-4gl>

1. Recursion	<ol style="list-style-type: none">Definition of RecursionBase Condition, Tailed and non-tailed recursionDirect and Indirect recursionBasic recursive function examplesRecursion vs Iteration, advantages and disadvantagesTowers of Hanoi problem using Recursion.How Recursion is used in function callsHow Recursion follows last in first out (LIFO).Towers of Hanoi (Self Study) Links: https://www.geeksforgeeks.org/recursion/
2. Stacks	<ul style="list-style-type: none">Recursion and Stacks.Definition and LIFO principle.Static and dynamic implementation.
3. Stacks	<ul style="list-style-type: none">Applications of stacks.<ul style="list-style-type: none">Stack FramesReversing a stringBalancing SymbolsCalculation/Evaluation of Postfix Expressions using stacksConstruction of Expression TreesUse in backtracking and Depth First SearchDetails about : Infix, prefix and postfix expressions.

	<ul style="list-style-type: none">- Converting infix to postfix expression using stacks.- Converting Infix to Postfix using stacks
Resource Materials	<ul style="list-style-type: none">• https://www.tutorialspoint.com/data_structures_algorithms/recursion_basics.htm• https://www.hackerearth.com/practice/data-structures/stacks/basics-of-stacks/tutorial/• https://www.tutorialspoint.com/data_structures_algorithms/stack_algorithm.htm• https://www.tutorialride.com/data-structures/applications-of-stack-in-data-structure.htm• https://www.faceprep.in/data-structures/stack-applications-in-data-structure/