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Lab Manual **:** 03
Course Code : CSE207
Course Title : Data Structure
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Objective:

The objective of this lab is to provide basic concept of stack. At the end of the lab, students are able:

- To learn how to create a stack
- To learn how to perform push and pop operation in stack
- To learn how to use stack for parsing unmatched parenthesis in an algebraic expression
- To learn how to use stack for reversing data.

At first, create an ADT of stack that will contain the below function:

- Push
- Pop
- Size
- Isempty
- Destroy
- Top

After implementing the ADT solve the following problems by using the required functions from the ADT.

Exercise 1:

Now you have to perform the following lab task on the stack. First, build a stack ADT. Use the way that I have taught you in class. Then implement the exercises mentioned in the lab manual.

Exercise 2:

Write the program called copyStack that copies the contents of one stack into another. The algorithm passes two stacks, the source stack and the destination stack. The order of the stacks must be identical.

Exercise 3:

Reversing data requires that a given set of data be reordered so that the first and last elements are exchanged. The idea of reversing data can be used in solving classical problem such as converting a decimal number to a binary number. Now write a program using stack that will convert decimal number to binary number. For example:

Input	**Output**
45	101101
4	100

Exercise 4:

Write a program that reverses the contents of a stack (the top and bottom elements exchange positions, the second and the element just before the bottom exchange positions, and so forth until the entire stack is reversed). (Hint: Use temporary stacks.)

Exercise 5:

Parenthesis parsing

Write a program using stack that will parse parenthesis of an equation. Use stack data structure for parsing.