CS-212L

Academic Year: 2020

Semester 3

Course Code: CS-212L

Course Title: Data Structures and Algorithm Lab

CS-212L

Type of Lab: Open Ended **Weightage: 10%**

CLO 1: CLO's.

State the Rubric	**Cognitive/Understanding**	CLO1	Rubric A

Rubric A: Cognitive Domain

Evaluation Method: GA shall evaluate the students for Question according to the following rubrics.

CLO	**0**	**1**	**2**	**3**	**4**
CLO1					

Lab

Objectives: Learn the concepts of Stack Data Structure

Processing Steps:

Step1: Ordering!

We many times in our life has saw an ordering in doing some task. Mean to say, you might has observed that when we do place notebooks on each other, first notebook is always at the end of pile, and when we try to get the first book, we have to first remove the book that are present on the top of that, and first inserted book was taken out at the last.

This phenomenon, we also used in Computer science, we have some problems which can be solve easily with this mechanism, to implement it we have a Data Structure known as Stack.

Step 2: What is Stack?

Stack is a linear data structure, which push and pop the elements in some specific ordering mechanism.

LIFO

LIFO (Last In First Out) or FILO (First In Last Out) is a ordering mechanism used by the stack data structure.

Step 3: Why Stack?

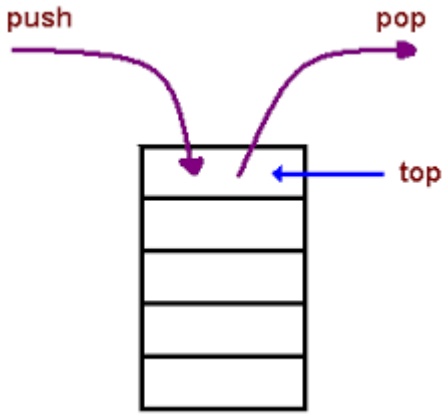
Stack data Structure is a general data structure which might and being used in many algorithms. Like you can find Stack in

- Undo/Redo
- Postfix expression to Infix conversation
- Parameter passing

Stack is dynamic, and every program has by default some memory area reserved for stack, and as element is inserted stack size decreases.

Step 4: How Stack Implemented?

Stack uses the “Stack top pointer” variable to handle the LIFO mechanism



It has three funtions

- Push(data)
- Pop()
- Top()

Push(data):

This function insert value at the “Stack top” pointer variable index and increment the pointer

Step1: Stack [Stack_top] = data

Step2: Stack_top = Stack_top + 1;

Pop():

This function returns the value at the “Stack top” pointer variable index and decrement the pointer

Step1: return Stack [Stack_top]

Step2: Stack_top = Stack_top - 1;

Top():

This function returns the value at the "Stack top" pointer variable index

Step1: return Stack [Stack_top]

Lab Task:

- Implement the Stack Data Structure with standard functions of Stack

Assignment:

- You are given a set of strings which contain only a's and b's, your program should be able to check whether the string have same number of a's and b's in it or not
    - Your program will say respond positive if it get "ab, aabb, aaabbbb, bbbaaa) and say false when it get ('aab, bbba, aaabbbb")
    - Solve this problem using Stack
    - Code should be commented properly, execute and terminate normally. Plagiarism will cause zero marking.