BSc (Hons) in Information Technology

Year 2

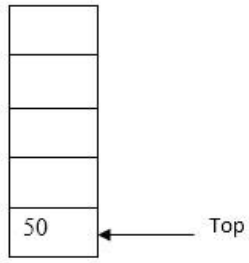
Data Structures and Algorithms – IT2070

Tutorial 1 – Stacks **2020**

Question 1

a) Consider the following Stack and draw the Stack frames after executing each statement given below.

int a = 22, b = 44;



i) theStack.push(2);

ii) theStack.push(a);

iii) theStack.push(a + b);

iv) theStack.pop();

v) theStack.push(b);

vi) theStack.push(a –b);

Question 2

i) A stack class has already been implemented with push() , pop() and peek() methods. It is used to store characters.
Write a code segment in your main application to insert following characters to a 'myStack' object created from the stack class.
'g' , 't', 'o', 'p'

ii) Write code segment to display all the values in a stack by removing them.

iii) What is the result of section ii) above?

Question 3

A stack class called StackX has been created to store characters. 'push' and 'pop' methods have been implemented. Implement the peek method of StackX class **using push and pop** methods.

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Tutorial 1 – Stacks 2019

Additional Exercises:

Question 1

i) Implement a class called StackX to store a set of characters.

ii) Create a class called Reverser to reverse a given string using the stack class created above.

```
class Reverser
{
    private String input;
    private String output;

    …….. }
```

(Hint: Pass the string to be reversed as an argument to the constructor and store it in input)

iii) In main() get a string from the user and reverse the string using the Reverser class.

Question 2

Use the stack class created in Question1 (i) and check whether a user entered expression is correctly parenthesized.

Ex: 3 + ((6 * 2) – 3) → valid
5 * 6 + (2 - 5 → not valid