Department of Statistics & Computer Science
University of Kelaniya
ACADEMIC YEAR – 2021/2022
COSC 21063/ BECS 21223/ COST 44233-
Data Structures and Algorithms
Practical Tutorial 01

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01) Write a program to reverse a user given number using Stack operations. Example: 12345 → 54321

02) Write a program that reads a mathematical expression from the user, evaluates it using stack operations, and prints the result.(hint: Enter a mathematical expression using operators +, -, *, and / only)

Example:

Input: 6+2*3-4/2

Output: 10

03) Write a program that reads a sentence from the user and prints the words containing vowels in alphabetical order using stack operations.

Example:

Input: The sky is blue

Output: blue
is
the

04) Given a sentence contains multiple words and write a program to reverse the entire sentence word by word using Stack operations and display the top element of the stack.

Input: Data Structures and Algorithms
Output: Algorithms and Structures Data

05) Write a program to check whether the given string is palindrome using stack operations.

Ex: palindrome – Mom, Madam

06) Write entire java program to convert a given integer to octal and hexadecimal.

07) Write a program to validate the order of opening and closing parentheses in a mathematical expression using stack operations. The program should determine whether the parentheses are balanced or not.

08)

a) Write a program to keep track of the highest value included in a given stack. The element with the highest value may be at the top of the stack, but as soon as another element is added, the maximum value is determined by the remaining elements.

Suppose the elements are pushed on to the stack in the order {1, 4, 16, 7, 45}

Step 1: Push 1, Current Maximum: 1

Step 2: Push 4, Current Maximum: 4
Step 3: Push 16, Current Maximum: 16
Step 4: Push 7, Current Maximum: 16
Step 5: Push 45, Current Maximum: 45

b) Change the above program to determine the maximum value using the remaining elements when an element from the stack is removed.