Department of Statistics & Computer Science

University of Kelaniya

ACADEMIC YEAR -2023/2024 (Semester I)

COSC 21063 / BECS 21223 / COST 44233 / COST 44303

Data Structures and Algorithms

Practical Tutorial 01

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1. Write a program to reverse the following character sequence using the Stack operations.

   abcde → edcba

2. Write a program to reverse a sentence **word by word** using the Stack operations and display the reversed sentence.

   Example:

   Input: Department of Statistics and Computer Science

   Output: Science Computer and Statistics of Department

3. Write a program to check whether a given string is palindrome using Stack Operations.

   Example: madam, mom, rotator (Any word that reads the same forward or backward)

4. Write a program that reads a string and prints the vowels in that given string in ascending order of the alphabet using two stacks.

   Example: Input: DIALOGUE
   Output: A E I O U

5. Write a program that reads an integer and prints its
   - **i. Binary**
   - **ii. Octal**
   - **iii. Hexadecimal Representation**

   using the Stack operations. (Hint: Use stacks to store remainders while converting an integer to binary, octal, and hexadecimal.)

6. 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 must be updated based on the remaining elements.
   Suppose the elements are pushed onto the stack in the order **{3, 12, 9, 27, 15}**
   Step 1: Push 3, Current Maximum: 3
   Step 2: Push 12, Current Maximum: 12
   Step 3: Push 9, Current Maximum: 12
   Step 4: Push 27, Current Maximum: 27
   Step 5: Push 15, Current Maximum: 27

   Finally, print the elements in descending order.
   Input: {3,12,9,27,15}
   Output: {27,15,12,9,3}