Lab Assignment 03



| **Course Code:** | **CSE111** |
| --- | --- |
| **Course Title:** | **Programming Language II** |
| **Topic:** | **String, Array** |
| **Number of Tasks:** | **12** |

## **String**

**Task - 01:** Write a Java program that will take one string input from the user. Then check and print whether it is a palindrome.

| **Sample Input** | **Output** |
| --- | --- |
| Java | Not a palindrome |
| madam | Palindrome |

**Task - 02:** Write a Java program that takes a string input in small letters from the user and prints the previous alphabet in sequence for each alphabet found in the input.

| **Sample Input** | **Output** |
| --- | --- |
| wxyz | vwxy |
| thecow | sgdbnv |
| abcd | zabc |

**Task - 03:** Write a Java program that will ask the user to input a string (containing exactly one word). Then your job is to print subsequent substring of the input string.

| **Sample Input** | **Output** |
| --- | --- |
| BANGLA | B  BA  BAN  BANG  BANGL  BANGLA |
| DREAM | D  DR  DRE  DREA  DREAM |

**Task - 04:** Write a Java program that will ask the user to input a word in small letters where each of its alphabets is unique and has not been entered before by the user. If the user does input a word that consists of duplicate alphabets, the program should reject the user’s input and ask for another word.

| **Sample Input** | **Output** |
| --- | --- |
| fahim | You entered fahim. |
| farah  akbor | “a” has been counted 2 times in the word “farah”.  Please enter another word.  You entered akbor. |
| alanna  ronan  john | “a” has been counted 3 times in the word “alanna”.  “n” has been counted 2 times in the word “alanna”.  “n” has been counted 2 times in the word “ronan”.  Please enter another word.  You entered john. |

**Task - 05:** Write a Java program that takes TWO string inputs (containing exactly one word in each string) from the user. Concatenate those two strings with a single space in between them. Generate a number which is the sum of all the letters in that concatenated string where A = 65, Z = 90, a = 97, and z = 122. Your task is to print that concatenated string and the number generated from that string.

| **Sample Input** | **Output** |
| --- | --- |
| Hello123  Wo%%rld | Hello123 Wo%%rld  1020 |
| Ja12-va  CHOWD+ HURY | Ja12-va CHOWD+ HURY  1087 |

**Task - 06:** Given a string, create and print a new string with all the consecutive duplicates removed.

| **Sample Input** | **Output** |
| --- | --- |
| ABBCCCCCBBAB | ABCBAB |
| AAABBBBCDDBBECE | ABCDBECE |

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## **Array**

**Task - 01:** Write a Java program that will take an integer number N from the user and create an integer array by taking N numbers from the user. Then take another number from the user and create a new array by removing that number from the input array. Finally, print the new array.

| **Sample Input** | **Sample Output** |
| --- | --- |
| N = 5  23  100  0  56  -34  Remove Element = 100 | Input array:  23 100 0 56 -34  New array:  23 0 56 -34 |
| N = 4  -5  10  2  -7  Remove Element = 43 | Input array:  -5 10 2 -7  Element not found |

**Task - 02:** Write a program that reads 5 numbers into an array and prints the smallest and largest number and their location in the array.

| **Sample Input** | **Sample Output** |
| --- | --- |
| 7  13  2  10  6 | The largest number 13 was found at location 1.  The smallest number 2 was found at location 2. |
| 2  4  -5  12  3 | The largest number 12 was found at location 3.  The smallest number -5 was found at location 2. |

**Task - 03:** Write a Java program that asks the user for the length of an array and then creates an integer array of that length by taking inputs from the user. Then, reverse the **original array** **without** creating any new array and print it. **[In-place reverse]**

| **Sample Input** | **Sample Output** |
| --- | --- |
| Enter the length of the array: 5  7  -31  344  97  100 | 100 97 344 -31 7 |

**Task - 04:** Write a Java program that will take an integer number N from the user and create an integer array by taking N numbers from the user. Print how many times each number appears in the array.

| **Sample Input** | **Sample Output** |
| --- | --- |
| N = 5  6  15  14  15  6 | 6 - 2 times  15 - 2 times  14 - 1 times |
| N = 6  -5  10  14  10  -7  10 | -5 - 1 times  10 - 3 times  14 - 1 times  -7 - 1 times |

**Task - 05:** Write a Java program that asks the user the length of an array (N) then takes N number of integers as elements for the array as input. First, remove the consecutive duplicate elements from the original array to form a new array. Then print the number of elements removed from the original array.

| **Sample Input** | **Sample Output** |
| --- | --- |
| N = 8  Please enter the elements of the array:  5  2  1  1  2  3  3  3 | New Array : 5 2 1 2 3  Removed elements : 3 |

**Task - 06:** Write a program that asks the user how many numbers to take. Then takes that many numbers in an array and prints the median value.

[How to Find the Median Value: <http://www.mathsisfun.com/median.html>]

| **Sample Input** | **Sample Output** |
| --- | --- |
| 5  10  50  40  20  30 | The median is 30.  **Explanation:** 30 falls in middle 10, 20, 30, 40, 50 |
| 4  30  10  40  20 | The median is 25.  **Explanation:** (20+30)/2=25 (average of two middle values from 10, 20, 30, 40. |