National Institute of Technology, Calicut

Department of Computer Science & Engineering

B.Tech, Winter Semester 2019-2020

CS4097D Object Oriented Systems Laboratory

Assignment Questions 1 (07/01/2020)

1. Implement a java program for the given array, and find all pairs whose sum is equal to number X in the array.

   Input : Enter the array
   {1, 4, 45, 6, 10, -8}
   sum to find be 16
   Output: Found the the pairs whose sum is 16 are 10,6

2. Given an array of integers such that all numbers occur even number of times except one. Implement a java program to find the number which occurs odd number of time.

   Input : Enter the size of the array
   {5, 7, 2, 7, 5, 2, 5}
   Output: 5

3. Write a Java program to find the new length of a given sorted array where duplicate elements appeared at most twice.

   Input : Original array: [1, 1, 2, 3, 3, 3, 4, 5, 6, 7, 7, 7, 7]
   Output: The length of the original array is: 13
   After removing duplicates, the new length of the array is: 10

4. Write a Java program to print right pascal triangle

   Input : Enter the number of rows: 5
   Output:

   ```
   *
   * *
   * * *
   * * * *
   * * * * *
   * * * *
   * * *
   * *
   *
   ```

5. Write a java program to sort an array elements using insertion sort algorithm.

   Input: 18 9 33 4 84 32
   Output: 4 9 18 32 33 84

6. Write a java program to remove duplicate element in an array.

   Input: 10,20,20,30,30,40,50,50
   Output: 10 20 30 40 50

7. Write a java program to find the sum of a Series 1/1! + 2/2! + 3/3! + 4/4! +…….+ n/n!

   Input : Enter the value of n 5
   Output: 2.70833
   Input : Enter the value of n 7
   Output: 2.71806

8. Write a java program to find missing number in an array

   Input : 7,5,6,1,4,2
   Output: Missing number : 3
   Input :5,3,1,2
   Output: Missing number : 4

9. Write a java program to partition the array into three equal sum segments.

   Input : 1, 3, 6, 2, 7, 1, 2, 8
   Output : [1, 3, 6], [2, 7, 1], [2, 8]
   Input : 7, 6, 1, 7
   Output : [7], [6, 1], [7]
   Input : 7, 6, 2, 7
   Output : Cannot divide the array into segments

10. Write a java program to multiply two matrices.

    Input : First matrix elements:
    1 1 1
    2 2 2
    3 3 3
    Second matrix elements:
    1 1 1
    2 2 2
    3 3 3
    Output : Multiplication of the matrix:
    6 6 6
    12 12 12
    18 18 18

11. Write a java program that prints all permutations of a given string

    Input: Enter the strings : ABC.
    Output: ABC ACB BAC BCA CBA CAB

12. Write a java program to sort a stack using another stack

    Input : 3, 5, 1, 4, 2, 8
    Output: 1, 2, 3, 4, 5, 8
    Input : 34, 3, 31, 98, 92, 23
    Output: 3, 23, 31, 34, 92, 98

13. Implement least recently used (LRU) page replacement algorithm and with 3 page frames to find the number of page faults using queue.

    Input : 1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5
    Output: 10

14. Implement a java program to perform the basic operations on a stack using an array

15. Implement a java program to insert all the vowels occurring in an input string to a linked list in the order of their arrival in the string and print the linked list

16. Write a java program to check if linked list is a palindrome.

17. Implement queue, using Linked List.

18. Given an expression string exp, write a java program to examine whether the pairs and the orders of "{","}","(",")","[","]" are correct by using stack. Print the array index of the matching parenthesis.

19. Given a singly linked list of 'n' integers, write a program to swap the elements in the linked list pairwise.

    Example:
    If the Linked List 'L' contains an odd number of elements {1, 2, 3, 4, 5} then pairs in this list are (1,2), (3,4) and leaving the last element unaltered.
    After swapping, the modified list will be 2, 1, 4, 3, 5 If the Linked List 'L' contains an even number of elements { 1, 2, 3, 4, 5, 6} then pairs in this list are (1,2), (3,4) and (5,6). After swapping, the modified list will be 2, 1, 4, 3, 6, 54

20. Implement Binary Search in Linked List.