CS4097D Object-Oriented Systems Lab: Assignment 2

(1) Write a Java program to find the new length of a given sorted array after removing the occurrences more than twice from the duplicate elements.

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

(2) Write a Java program that accepts a sentence, and print the number of words in the sentence and ASCII code of all the characters present in the sentence.

Sample Input:
        JAVA ABC
Sample Output:
        Words count is 2
        'J' 74
        'A' 65
        'V' 86
        'A' 65
        ' ' 32
        'A' 65
        'B' 66
        'C' 67

(3) Write a Java program that accepts a String, and remove all the duplicate characters from that String.

        Sample Input1: JAVA
        Sample Output1: JAV
        Sample Input2: PROGRAMMING
        Sample Output2: PROGAMIN

(4) Write Java program for Maximum length Palindrome Substring of given String.

        Sample Input1: BANANAS
        Sample Output1: 5
        Sample Input2: ABC
        Sample Output2: 1
        Sample Input3: AAA
        Sample Output3: 3

(5) Write a Java program to calculate the mess bill in a hostel. An inmate can be either a student or an employee. The per day mess rate for vegetarians is 100 and for non vegetarian 120. An employee needs to pay 5% of the total price extra. Calculate the total mess bill with respect to input details. Assume that the name of a student or employee has a single word. (All assumptions should be clearly specified in the submission)

> *Sample input and output*
>
> Enter the inmate details: Aiswarya employee veg
> Enter the number of days: 20
> 2100
>
> Enter the inmate details: Amrutha student veg
> Enter the number of days: 20
> 2000
>
> Enter the inmate details: Arathi employee nonveg
> Enter the number of days: 30
> 3780
>
> Enter the inmate details: Ruhina student nonveg
> Enter the number of days: 20
> 2400

(6) Write a java program to display the student details (Name, RollNumber, CGPA and Percentage). Percentage should be converted from CGPA using member function. Input will be the total number of students followed by student details in the order of Name, RollNumber and CGPA(Assuming that the name of student has only one word, representing the first name). Output should be the details of all the students in the order Name, RollNumber, CGPA and percentage. Use accessor (setter and getter) methods for accessing the attributes. (Percentage = 9.5*CGPA)

> *Sample input:*
> Enter number of students: 2
> Enter Student Details
> Aakash M180562CA 7
> Naman M180507CA 8
>
> *Sample Output:*
> Aakash M180562CA 7 66.5 %
> Naman M180507CA 8 76%

(7) Write a Java program to sort (ascending order) the student data on the basis of their height (Make your own *Student* class with data members: *rollNumber*, *fullName*, *height*, *weight* and with member functions: *readStudent*, *printStudentDetails*).

Hint: Make use of object array to hold the collection of students; Assume that the height values are unique for each student

    Sample Input:
    Enter the number of students 5
    Enter details (*rollNumber*, *fullName*, *height*, *weight*) separated by comma in each line
    B1610010, Aravind M, 160cm, 50Kg
    B1610020, Anju Gupta, 150cm, 30Kg
    B1610030, Jasmine Jacob, 155cm, 40Kg
    B1610040, Mukund S, 159cm, 60Kg
    B1610050, Veena V, 151cm, 40Kg

    Sample Output:
    B1610020, Anju Gupta, 150cm, 30Kg
    B1610050, Veena V, 151cm, 40Kg
    B1610030, Jasmine Jacob, 155cm, 40Kg
    B1610040, Mukund S, 159cm, 60Kg
    B1610010, Aravind M, 160cm, 50Kg

(8) Define a class **Train** in java with the following specifications:

Data Members
    busno - to store Bus Number
    from - to store Place name of origin (single word)
    to - to store Place name of destination (single word)
    distance - to store the Distance in Kilometres
    type – to store Bus Type such as 'O' for ordinary (O, F , L use enum).

Member Functions
    A constructor function to initialize all data members. Use 'O' as type if nothing is specified for Type.
    A function *CalcFare* to calculate Fare as per the following criteria:

Type	Fare
'O'	10*Distance
'F'	20*Distance
'L'	24*Distance

    A function *Show* to display the content of all the data members on screen

Sample Input/Output:

    1-Add details
    2-Show details
    3-Exit

    Enter choice 1
    Enter bus details(Busno,from,to,distance,type)
    120 kannur calicut 500 F

    1-Add details
    2-Show bus details

3-Exit

Enter choice 1
Enter bus details(Busno,from,to,distance,type)
123 palayam mukkam 1400

1-Add details
2-Show details
3-Exit

Enter choice 2
Bus Details (Busno,from,to,distance,type, fare)
120 kannur calicut 500 F 10000
123 palayam mukkam 1400 O 14000

1-Add details
2-Show details
3-Exit

Enter choice 3

(9) Write a java program to implement an inventory system for the video rental store. A video store consists of many videos. Each video consists of a title and a status of whether the video is rented out or not. There should be a method to track whether the video is rented or returned.
The video store will provide the facility to add a new video (by title) to the inventory, check out a video (by title), return a video to the store, and list the whole inventory of videos in the store.
Create a main class VideoStoreLauncher with a method which will test the functionality. The videos can be added in bulk by specifying the number of videos first then followed by their titles.

Sample input and output
1.Add video
2.Check availability
3.Rent a video
4.Return
5.List the inventory
6.Exit

Choice:
1
N:
4
Titles:
The Shawshank Redemption
Godfather I
The Dark Knight
The Lady

Choice:

2
Title:
The Dark Knight
Available

Choice:
3
Title:
The Dark Knight

Choice:
2
Title:
The Dark Knight
NotAvailable

Choice:
5
"The Shawshank Redemption", "Godfather I", "The Lady"
Choice:
4
Title:
The Dark Knight

Choice:
2
Title:
The Dark Knight
Available

Choice:
6