Department of Computer Engineering
(AY: 2020-21)

Experiment list

Sub – Java Programming Lab
Class – SE Comp

1. To implement Java Program Structures & Simple Programs

i. WAP to display hello Message on screen.

ii. Write a Java program that reads a positive integer from command line and count the number of digits the number (less than ten billion) has.

2. To implement Java control statements and loops

i. WAP to find roots of a Quadratic equation. Take care of imaginary values.

ii. Write a menu driven program using switch case to perform mathematical operations.

iii. WAP to display odd numbers from given range/ prime numbers from given range

iv. WAP to display default value of primitive data types

v. WAP to display the following patterns:

```
1
2 1
1 2 3
4 3 2 1
1 2 3 4 5
6 5 4 3 2 1
1 2 3 4 5 6 7
```

```
  A
 CB
FED
JIHG
```

3. To implement Arrays

i. WAP to find whether the entered 4 digit number is vampire or not. Combination of digits from this number forms 2 digit number. When they are multiplied by each other we get the original number. (1260=21*60, 1395=15*93, 1530=30*51)

ii. WAP to display the following using irregular arrays

```
1
2 3
4 5 6
```

iii.

Write a program that queries a user for the no.: of rows and columns representing students and their marks.

Reads data row by row and displays the data in tabular form along with the row totals, column totals and grand total

Hint : For the data 1, 3, 6, 7, 9, 8 the output is

1	3	6	|	10
7	9	8	|	24
8	12	14	|	34

4. To implement Vectors

i. WAP that accepts a shopping list of items and performs the following operations: Add an item at a specified location, delete an item in the list, and print the *contents of the vector*

ii. Write a java programs to find frequency of an element in the given Vector array.

5. To implement Strings

i. WAP to check if 2 strings are Meta strings or not. Meta strings are the strings which can be made equal by exactly one swap in any of the strings. Equal string are not considered here as Meta strings.
Example: str1 = "geeks", str2 = "keegs"
By just swapping 'k' and 'g' in any of string, both will become same.
Example: str1 = "Converse", str2 = "Conserve"
By just swapping 'v' and's' in any of string, both will become same.

Algorithm (if reqd):

1. Check if both strings are of equal length or not, if not return false.
2. Otherwise, start comparing both strings and count number of unmatched characters and also store the index of unmatched characters.
3. If unmatched characters are more than 2 then return false.
4. Otherwise check if on swapping any of these two characters in any string would make the string equal or not.
5. If yes then return true. Otherwise return false.

ii. Write a java program to count number of alphabets, digits, special symbols, blank spaces and words from the given sentence. Also count number of vowels and consonants.

6. To implement Functions, recursive functions and overloading

i. WAP to display area of square and rectangle using the concept of *overloaded* functions

ii. Write menu driven program to implement recursive functions for following tasks.
a) To find GCD and LCM
b) To find X^Y
c) To print n Fibonacci numbers
d) To find reverse of number
e) To 1+2+3+4+…….+ (n-1)+n
f) Calculate sum of digits of a number

7. To implement Array of Objects

i. WOOP to arrange the names of students in descending order of their total marks, input data consists of students details such as names, ID.no, marks of maths, physics, chemistry. (Use array of objects)

8. To implement Constructors and overloading

i. WAP find area of square and rectangle using overloaded constructor

ii. Create Rectangle and Cube class that encapsulates the properties of a rectangle and cube i.e. Rectangle has default and parameterized constructor and area() method. Cube has default and parameterized constructor and volume() method. They share no ancestor other than Object.

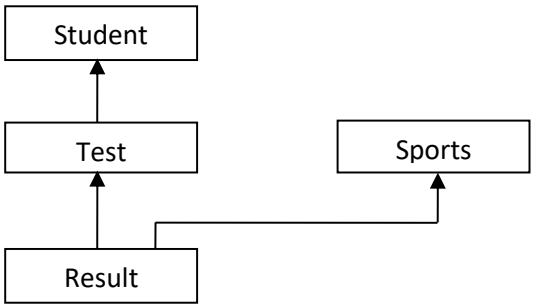
Implement a class Size with size() method. This method accepts a single reference argument z. If z refers to a Rectangle then size(z) returns its area and if z is a reference of Cube, then z returns its voliume. If z refers to an object of any other class, then size(z) returns -1. Use main method in Size class to call size(z) method.

9. To implement Abstract classes

i. Write a ***abstract class*** program to calculate area of circle, rectangle and triangle

10. To implement Inheritance, interfaces and method overriding

i. WAP to implement three classes namely Student, Test and Result. Student class has member as rollno, Test class has members as sem1_marks and sem2_marks and Result class has member as total. Create an interface named sports that has a member score (). Derive Test class from Student and Result class has multiple inheritances from Test and Sports. Total is formula based on sem1_marks, sem2_mark and score.



11. To implement Package

i. WAP to create a user defined package & import the package in another program.

12. To implement exceptions in Java

i. Write a Java Program to input the data through command Line and Find out total valid and in-valid integers. (Hint: use exception handling)

ii. Write a Java Program to calculate the Result. Result should consist of name, seatno, date, center number and marks of semester three exam. Create a User Defined Exception class MarksOutOfBoundsException, If Entered marks of any subject is greater than 100 or less than 0, and then program should create a user defined Exception of type MarksOutOfBoundsException and must have a provision to handle it.

13. To implement Multithreading

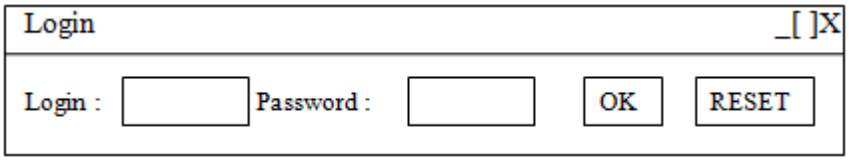
i. Write java program to print Table of Five, Seven and Thirteen using Multithreading (Use Thread class for the implementation). Also print the total time taken by each thread for the execution.
ii. Write java program to implement the concept of Thread Synchronization

14. To implement Applets.

i. Write java program to draw the house on an applet.
ii. Write java program to create an advertisement banner on an applet using multithreading

15. Designing Graphical User Interfaces in Java using AWT and Event handling

i. Write java program to create a registration form using AWT.
ii. On Applet: Take a Login and Password from the user and display it on the third Text Field which appears only on clicking OK button and clear both the Text Fields on clicking RESET button.



16. Develop simple swing applications and complex GUI using Java Swing classes.

i. Write a program to create a window with four text fields for the name, street, city and pin code with suitable labels. Also windows contains a button MyInfo. When the user types the name, his street, city and pincode and then clicks the button, the types details must appear in Arial Font with Size 32, Italics.
ii. WA applet with 4 swing buttons with suitable texts on them. When the user presses a button a message should appear in the label as to which button was pressed by the user

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