

## CS234 Object Oriented Programming and Design Patterns Lab(B. Tech-III)

### Assignment-1

1. Write a menu driven program in Java to compute the Area of minimum 4 different geometrical shapes.
2. Write a Java program to check whether a number is Automorphic number or not.
3. Write a Java Program to find the reverse of a number (Take user input).
4. WJJP to compute and display the count of occurrence of 4 in a number. E.g. 4564 will compute 2
5. Write a Java program that implement the concept of Encapsulation.

### Assignment-2

1. Write a program to add all the values in a given number and check if the sum is prime number or not. Ex: 1234->10, not prime
2. Take input from user a character variable in a program and if the value is alphabet then print "Alphabet" if it's a number then print "Digit" and for other characters print "Special Character".
3. Write a program to print first 10 number of the following Series using Do-while Loops 0,1,1,2,3,5,8,13..
4. Write a Java program to find the sum of the series 1-2+3-4+...
5. Write a java program to print the following pattern

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

### Assignment 3(A)

1. Write a Java program to search an element in an array.
2. Write a java program to sort n elements in an array.
3. Write a java program to find the sum of diagonal elements of a matrix.
4. Write a java program whether a given string is palindrome or not.

5. Write a java program to print the element of an array that has occurred the highest number of times. Example: Array-> 10,20,10,30,10,40,99 O/P: 10

### Assignment 3(B)

1. Take a 2-Dimensional array(3×4) of matrix and display it. [The elements of an array will be user input] .{Display it using for loop and enhanced for loop individually}.
2. Take 5 String type elements into an array list. Then (i) print the elements in the array list. (ii)add elements in the array list. (iii) Access elements in the array list (iv)Change elements in the list (v) Remove elements from the list.
3. Take a 3-dimensional array and display its value.
4. Write a program for sorting of elements from an array list.
5. Write a Java program to search an element in a array list.
6. Write a Java program to find minimum of 5 elements from an array list.
7. Write a Java Program to print the transpose of a matrix.

### Assignment 4:

1. Write a program to find greatest number in a 3\*3 array. The program is supposed to receive 9 integer numbers as command line arguments.
2. Create a class Box that uses a parameterized constructor to initialize the dimensions of a Box.(dimensions are width, height, depth of double type). The class should have a method that calculates and returns the volume of the Box. Obtain an object and print the corresponding volume in main() function.
3. Write a program in Java with class Rectangle with the data fields width, length, area and color. The length, width and area are of double type and color is of string type. The methods are set\_length() , set\_width() , set\_color(), and find\_area(). Create two object ofRectangle and compare their area and color. If area and color same for the objects then display “Matching Rectangles” otherwise display “Non Matching Rectangle”.
4. Write a Java Program to find the area of a rectangle, square using constructor overloading.
5. Write a program in Java to generate hexadecimal equivalent of a number without using array.

### Assignment-5

1. Write a Patient class which inherits from the Person class. Patient can again be two types: indoor and outdoor. The Patient class requires the following: a) a variable to store the patient ID for b) a variable to store the department of hospital c) a variable to store the ward of hospital d) a variable to store the patient 's date of joining the hospital e) a variable to store the patient 's address f) a variable to store the medical fees that the patient pays.

g) constructor methods, which initialize the variables h) a method to calculate the medical fees (for both indoor and outdoor patient)

2. Create a class named 'Animal' which includes methods like eat() and sleep(). Create a child class of Animal named 'Bird' and override the parent class methods. Add a new method named fly(). Create an instance of Animal class and invoke the eat and sleep methods using this object. Create an instance of Bird class and invoke the eat, sleep and fly methods using this object.

3. A HighSchool application has two classes: the Person superclass and the student subclass. Using inheritance, in this lab you will create two new classes, Teacher and CollegeStudent. A Teacher will be like Person but will have additional properties such as salary (the amount the teacher earns) and subject (e.g. "Computer Science", "Chemistry", "English", "Other"). The CollegeStudent class will extend the Student class by adding a year (current level in college) and major (e.g. "Electrical Engineering", "Communications", "Undeclared").

### Assignment-6

1. WAP to design a class using Abstract methods and classes.
2. WAP to handle the Exception using try and multiple catch blocks.
3. WAP to create a simple class to find the area and volume of rectangle and box using super and this keyword.
4. WAP to handle the user defined Exception using throw keyword.
5. WAP to multiply 2 matrices.

### Assignment-7

1. Write a program to accept name and age of a person from the command prompt(passed as arguments when you execute the class) and ensure that the age entered is  $\geq 18$  and  $< 60$ . Display proper error messages. The program must exit gracefully after displaying the error message in case the arguments passed are not proper. (Hint : Create a user defined exception class for handling errors.)
2. WAP to implement nested try statements.
3. WAP to design a String class that perform String method(Equal, reverse the string, change case).
4. Write a Java program to find the area of a rectangle and square using interface.
5. Illustrate the use of Thread class and create 3 threads A, B, C for undertaking three different tasks.

### Assignment 8

1. Show an example of priority among 3 threads.
2. WAP to design a class account using the inheritance and static that show all functions of a bank (Withdrawal, deposit).

### Assignment 9

1. Show an example of swing in java to create text box, button, radio button,checkbox in a frame.