LAB RECORD

23CSE111- Object Oriented Programming

Submitted by

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IN

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March - 2025

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BONAFIDE CERTIFICATE

This is to certify that the Lab Record work for 23CSE111- Object Oriented Programming Subject submitted by ***CH.SC.U4CSE24140 – ROHITH S*** in **"Computer Science and Engineering"** is a Bonafide record of the work carried out under my guidance and supervision at Amrita School of Computing, Chennai.

This Lab examination held on / /2025

Internal Examiner 1 Internal Examiner 2

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UML DIAGRAMS

1. STUDENT MANAGEMENT

1.a) Use Case Diagram:

1.b) Class Diagram:

1.c) Sequence Diagram:

1.d) Object Diagram:

1.e) State-Activity Diagram:

2. LIBRARY MANAGEMENT

2.a) Use Case Diagram:

2.b) Class Diagram:

2.c) Sequence Diagram:

2.d) Object Diagram:

2.e) State-Activity Diagram:

3. Basic Java Programs

3.a) Simple Calculator:

Code:

```
import java.util.*;
public class calc {
    int add(int num1, int num2) {
        return num1 + num2;
    }

    int sub(int num1, int num2) {
        return num1 - num2;
    }

    int multiply(int num1, int num2) {
        return num1 * num2;
    }

    double divide(int num1, int num2) {
        if (num2 == 0) {
            System.out.println("Error! Can't divide by zero!");
            return 0;
        }
        return (double) num1 / num2;
    }

    public static void main(String args[]) {
        Scanner sc = new Scanner(System.in);
        calc obj = new calc();

        System.out.print("Enter your first number: ");
        int num1 = sc.nextInt();

        System.out.print("Enter your second number: ");
        int num2 = sc.nextInt();

        sc.nextLine();

        System.out.print("Choose your operator (+ - * /): ");
        String oper = sc.nextLine();

        if (oper.equals("+")) {
            System.out.println("Addition: " + obj.add(num1, num2));
        } else if (oper.equals("-")) {
            System.out.println("Subtraction: " + obj.sub(num1, num2));
        } else if (oper.equals("*")) {
```

```
            System.out.println("Multiplication: " + obj.multiply(num1,
num2));
        } else if (oper.equals("/")) {
            System.out.println("Division: " + obj.divide(num1, num2));
        } else {
            System.out.println("Invalid operator!");
        }
    }
}
```

Output:

```
Enter your first number: 200
Enter your second number: 3
Choose your operator (+ - * /): *
Multiplication: 600
PS C:\Users\123sr\OneDrive\Desktop\Basic java programs>
```

3.b) Even or Odd:

Code:

```
import java.util.*;
public class evenorodd{
    public static void main(String args[]){
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter a number: ");
        int a = sc.nextInt();
        if(a%2==0){
            System.out.println("It is a even number");
        }
        else{
            System.out.println("It is a odd number");
        }
    }
}
```

Output:

```
Enter a number:
25253
It is a odd number
PS C:\Users\123sr\OneDrive\Desktop\Basic java programs>
```

3.c) Factorial:

Code:

```
import java.util.*;
public class factorial{
    public static void main(String args[]){
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter your number: ");
        int a = sc.nextInt();
        sc.close();
        int fact=1;
        if(a>0){
            for(int i =1;i<=a;i++){
            fact = fact*i;
            }
            System.out.println("The factorial is "+fact);
        }
        else if(a==0){
            System.out.println("The factorial is 1");
        }
        else{
            System.out.println("Invalid input");
        }

        }
    }
```

Output:

```
Enter your number: 6
The factorial is 720
PS C:\Users\123sr\OneDrive\Desktop\Basic java programs>
```

3.d) Fibonacci Series:

Code:

```
import java.util.Scanner;
public class fibonacci {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter n: ");
        int n = sc.nextInt(), a = 0, b = 1;
        System.out.print("Fibonacci Series For first "+n+" Numbers " + a +
" " + b);
        for (int i = 2; i < n; i++) {
            int next = a + b;
            System.out.print(" " + next);
            a = b; b = next;
        }
        sc.close();
    }
}
```

Output;

```
Enter n: 5
Fibonacci Series For first 5 Numbers 0 1 1 2 3
```

3.e) Largest of three numbers :

Code:

```
import java.util.*;
public class largest3numbers{
    public static void main(String args[]){
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter your first number: ");
        int a = sc.nextInt();
        System.out.println("Enter your second number: ");
        int b = sc.nextInt();
        System.out.println("Enter your third number: ");
        int c = sc.nextInt();
        if(a>b && a>c){
            System.out.println(a+" is the largest number ");
        }
        else if(b>a && b>c){
            System.out.println(b+" is the largest number ");

        }
        else if(c>a && c>b){
         System.out.println(a+" is the largest number ");
        }

    }
}
```

Output:

```
Enter your first number:
4
Enter your second number:
2
Enter your third number:
5
5 is the largest number
PS C:\Users\123sr\OneDrive\Desktop\Basic java programs>
```

3.f) Number of Digits:

Code:

```
import java.util.*;
public class numdigits{
    public static void main(String args[]){
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter your number: ");
        int number =sc.nextInt();
String numberString = String.valueOf(number);
int numberOfDigits = numberString.length();
System.out.println("Number of digits is: "+numberOfDigits);
    }
}
```

Output:

```
Enter your number: 95295125
Number of digits is: 8
PS C:\Users\123sr\OneDrive\Desktop\Basic java programs>
```

3.g) Palindrome Check:

Code:

```
import java.util.*;
public class palindrome{
    public static void main(String args[]){
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter your number: ");
        int num = sc.nextInt();
        sc.close();
        int rev = 0;
        int r =0;
        int num2=num;
        while(num>0){
            r = num % 10;
            rev = rev*10+r;
            num=num/10;
        }
        if(rev==num2){
            System.out.println("It is a palindrome! ");
```

```
        }
        else{
            System.out.println("It is not a palindrome! ");
        }
    }
}
```

Output:

```
Enter your number: 212
It is a palindrome!
PS C:\Users\123sr\OneDrive\Desktop\Basic java programs>
```

3.h) Prime Checker:

Code:

```
import java.util.*;
public class primenumber{
    public static void main(String args[]){
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int num = sc.nextInt();
        sc.close();
        boolean isPrime = num>1;
        for (int i=2;i*i<=num;i++){

        if (num%i==0){
            isPrime=false;
            break;
        }
    }
        if(isPrime){
            System.out.println("Prime");
        }
        else{
            System.out.println("Not prime");
        }
}
}
```

Output:

```
Enter a number: 429
Not prime
PS C:\Users\123sr\OneDrive\Desktop\Basic java programs>
```

3.i) Reverse Number:

Code:

```
import java.util.*;

public class numreverse {
    public static void main(String args[]) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int num = sc.nextInt();
        int r = 0;
        int rev = 0;
        while(num > 0) {
            r = num % 10;
            rev = rev * 10 + r;
            num = num / 10;
        }
        System.out.println("Reversed number is: "+rev);
    }
}
```

Output:

```
Enter a number: 42141
Reversed number is: 14124
PS C:\Users\123sr\OneDrive\Desktop\Basic java programs>
```

3.j) String Reversal:

Code:

```
import java.util.*;
public class reversestr{
    public static void main(String args[]){
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter your string");
        String str =sc.nextLine();
        String rstr = " ";
        char ch;
        for(int i = 0;i<str.length();i++){
            ch=str.charAt(i);
            rstr=ch+rstr;

        }
        System.out.println(rstr);
    }
}
```

Output:

```
Enter your string
hello
olleh
PS C:\Users\123sr\OneDrive\Desktop\Basic java programs>
```