AMRITA VISHWA VIDYAPEETHAM
DEEMED TO BE UNIVERSITY UNDER SECTION 3 OF UGC ACT, 1956

SCHOOL OF COMPUTING

ROHITH S
CH.SC.U4CSE24140
OBJECT ORIENTED PROGRAMMING
(23CSE111)
LAB RECORD

AMRITA VISHWA VIDYAPEETHAM
AMRITA SCHOOL OF COMPUTING, CHENNAI

BONAFIDE CERTIFICATE

This is to certify that the Lab Record work for 23CSE111- Object Oriented Programming Subject submitted by ***CH.SC.U4CSE24113 – 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

Internal Examiner 1 Internal Examiner 2

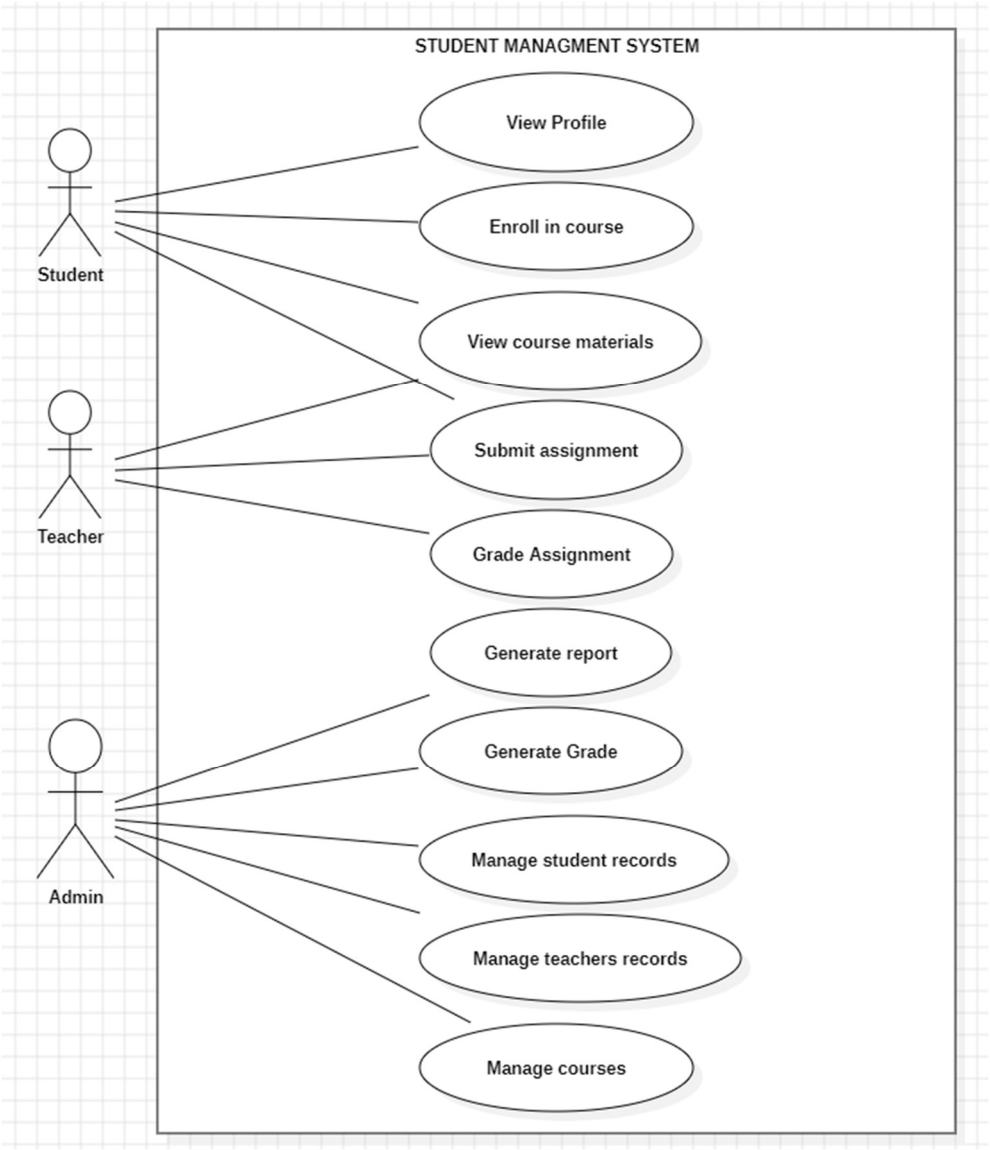
INDEX

S.NO	TITLE	PAGE.NO
	UML DIAGRAM	
1.	**STUDENT MANAGEMENT**	
	1.a) Use Case Diagram	4
	1.b) Class Diagram	5
	1.c) Sequence Diagram	5
	1.d) Object Diagram	6
	1.e) State-Activity Diagram	6
2.	**LIBRARY MANAGEMENT**	
	2.a) Use Case Diagram	7
	2.b) Class Diagram	8
	2.c) Sequence Diagram	8
	2.d) Object Diagram	9
	2.e) State-Activity Diagram	9
3.	**BASIC JAVA PROGRAMS**	
	3.a) Armstrong Number	10
	3.b) Sum of Even, Odd Digits	11
	3.c) Factorial	12
	3.d) Fibonacci Series	13
	3.e) LCM Calculator	14
	3.f) Number Pattern	15
	3.g) Palindrome Check	16
	3.h) Prime Checker	17
	3.i) Reverse Number	18
	3.j) Sum of Digits	19

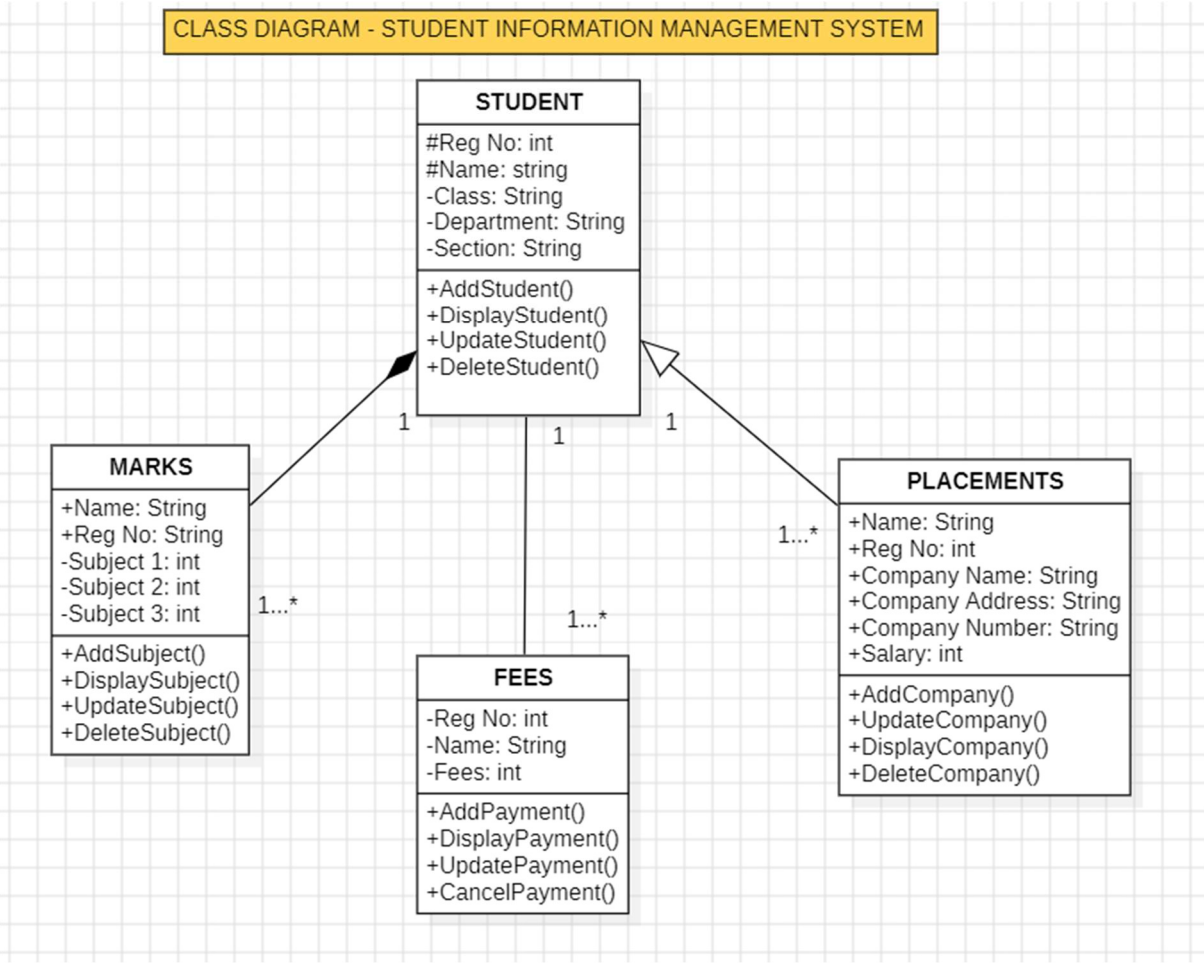
UML DIAGRAMS

1. STUDENT MANAGEMENT

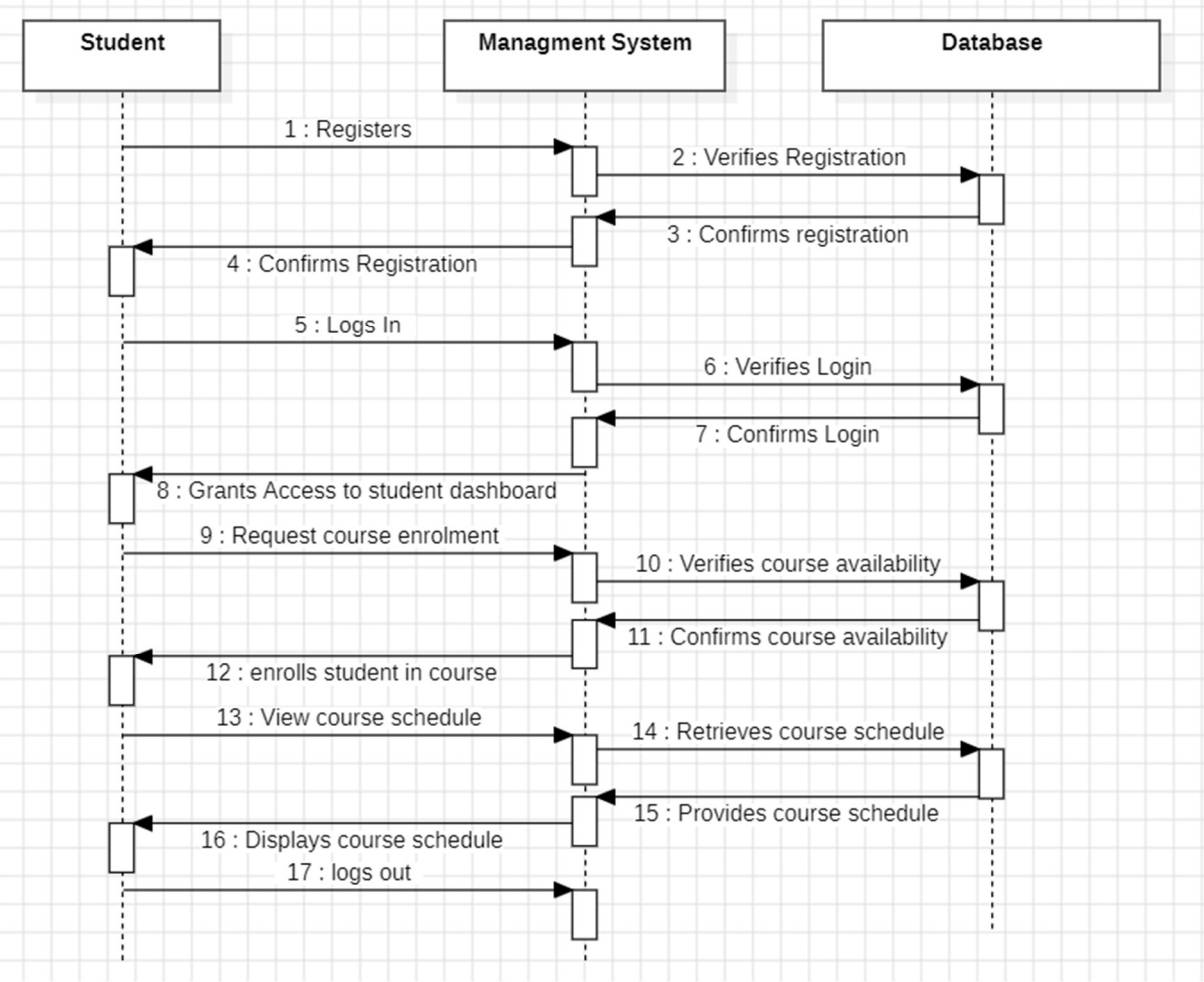
1.a) Use Case Diagram:



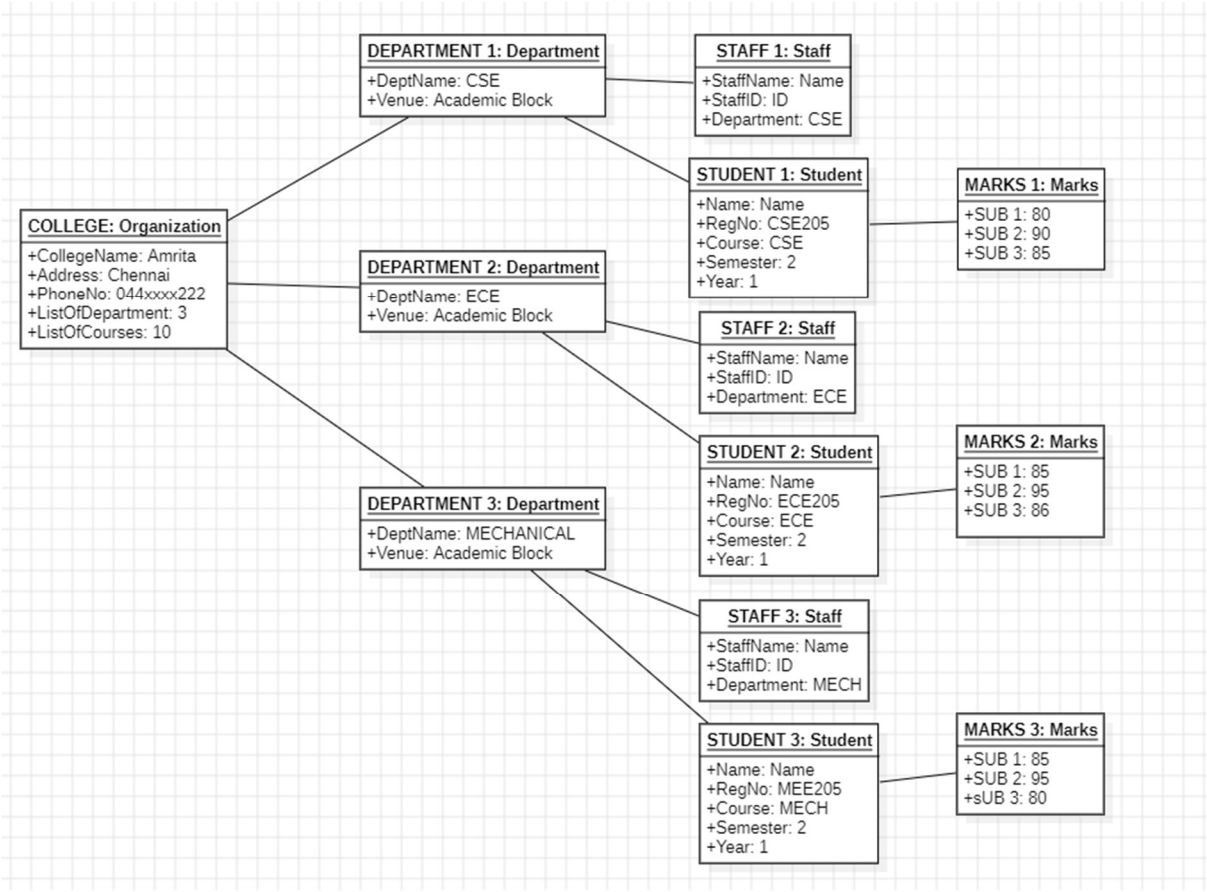
1.b) Class Diagram:



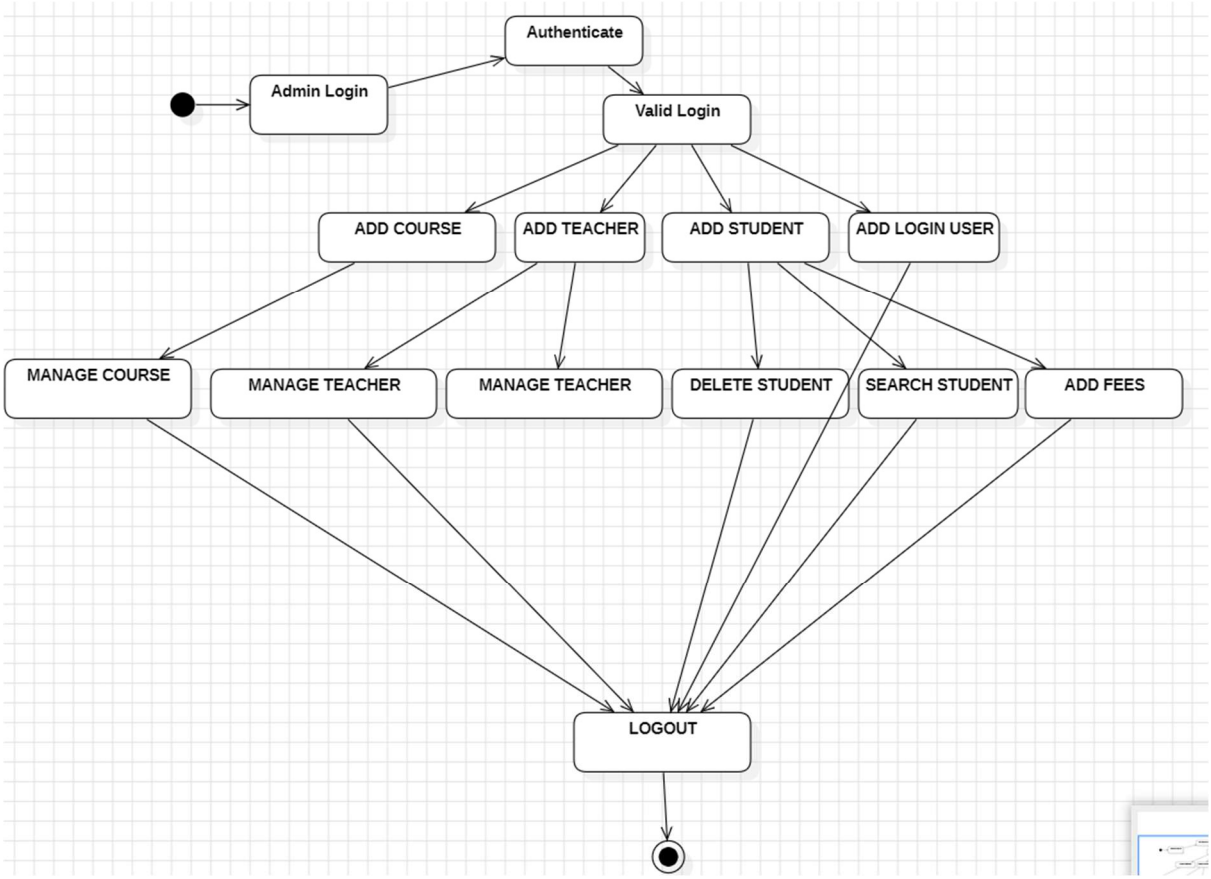
1.c) Sequence Diagram:



1.d) Object Diagram:

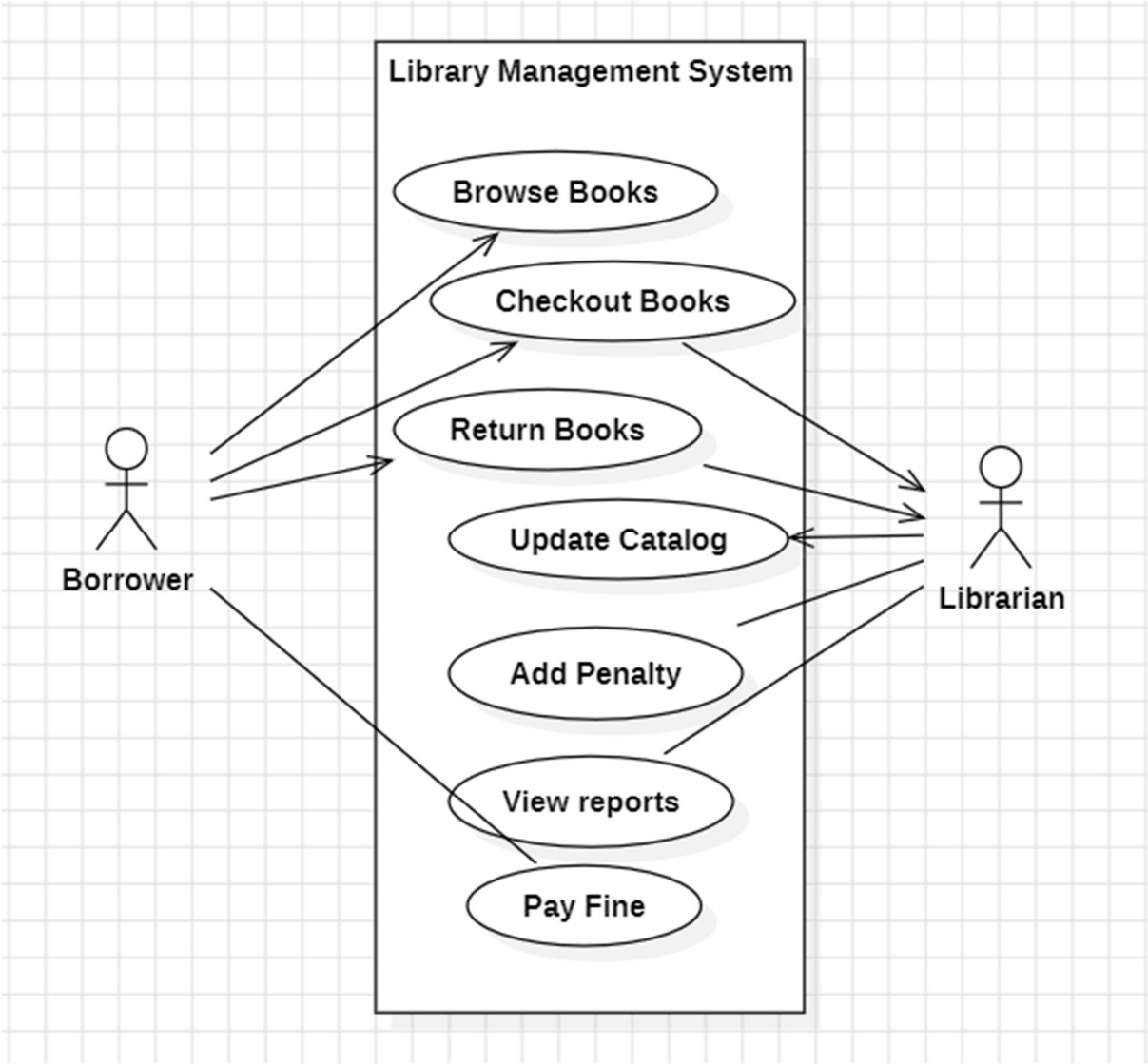


1.e) State-Activity Diagram:

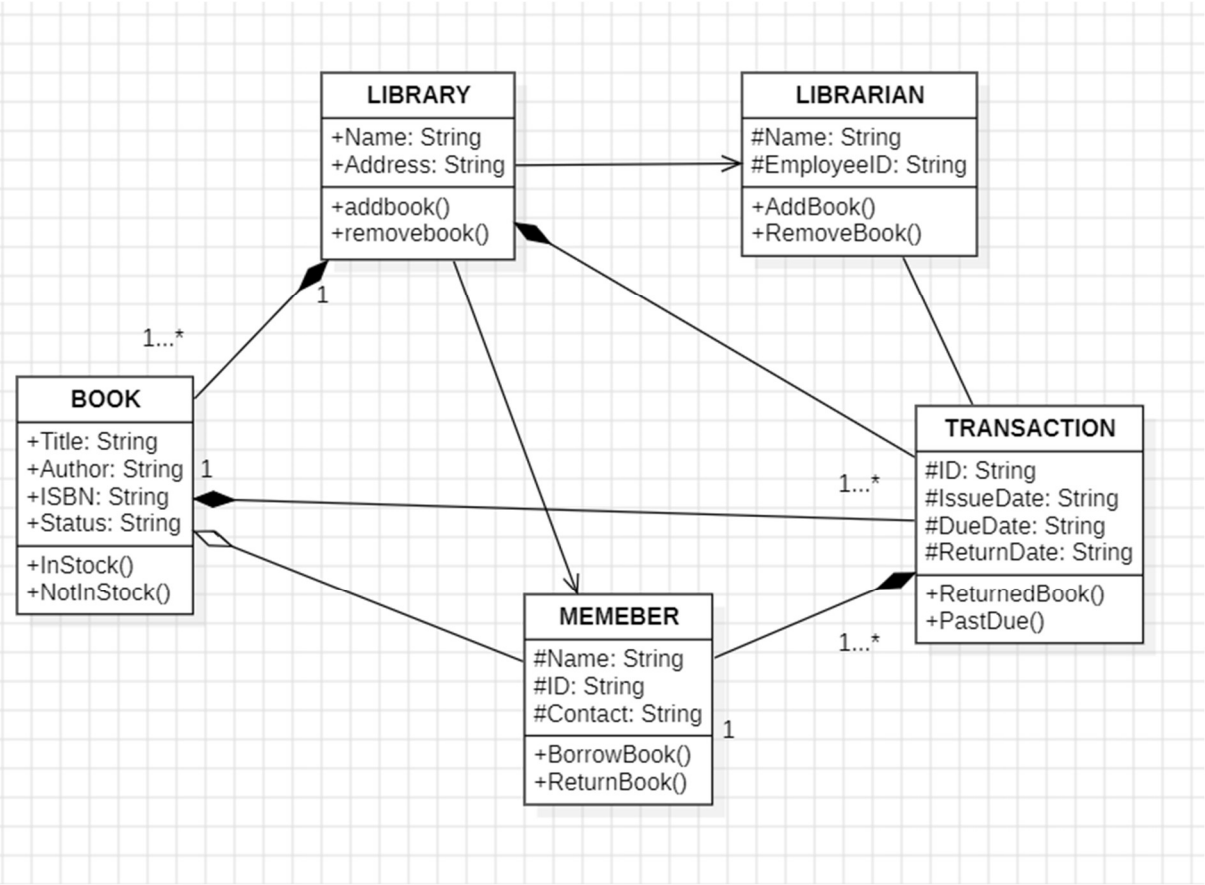


2. LIBRARY MANAGEMENT

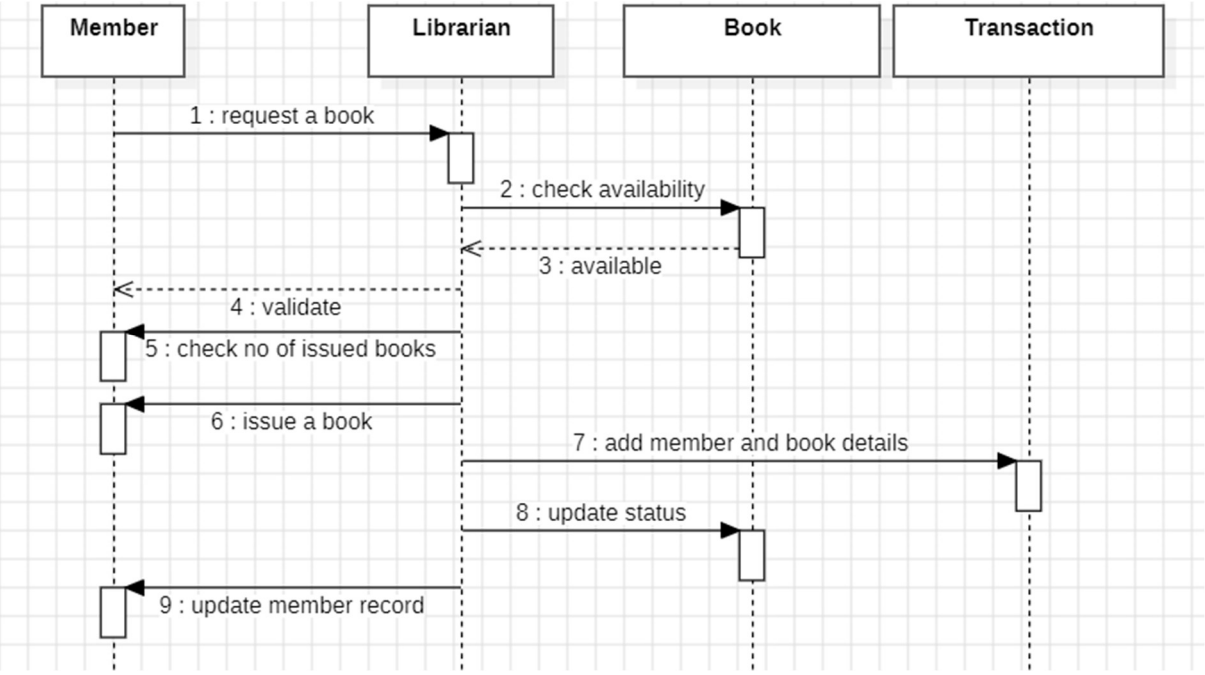
2.a) Use Case Diagram:



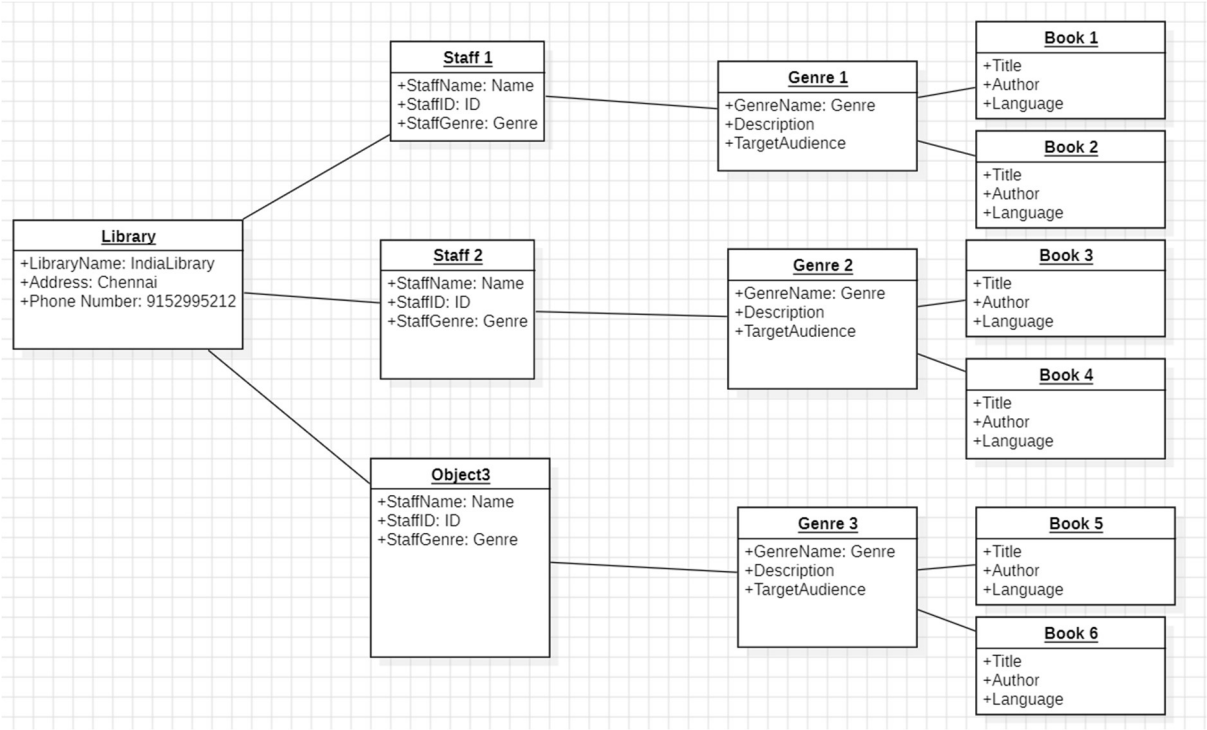
2.b) Class Diagram:



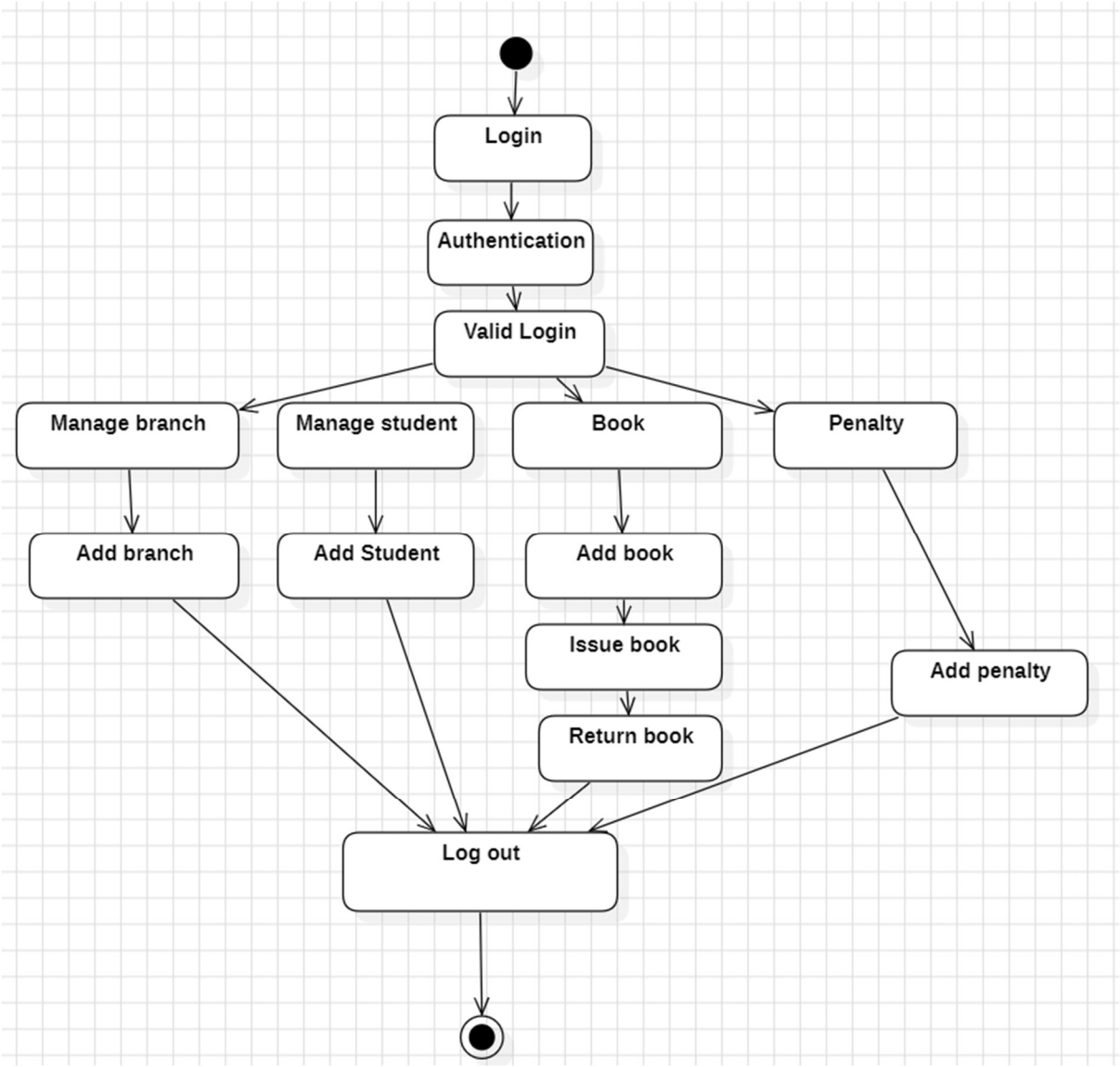
2.c) Sequence Diagram:



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>
```