T.VASANTHA

CH.SC.U4CSE24147

OBJECT ORIENTED PROGRAMMING (23CSE111)

LAB RECORD

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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.U4CSE24147 – VASANTHA T*** 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

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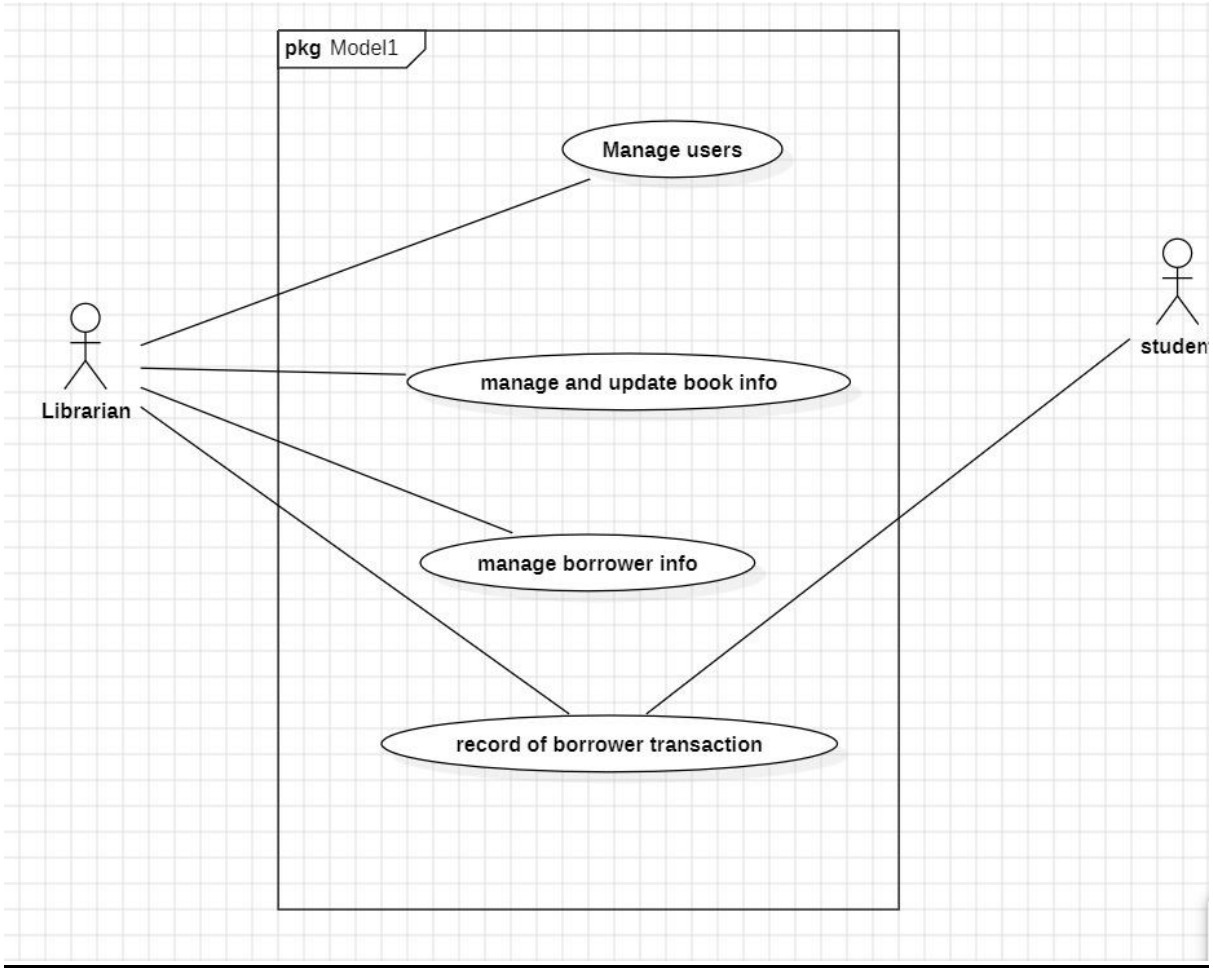
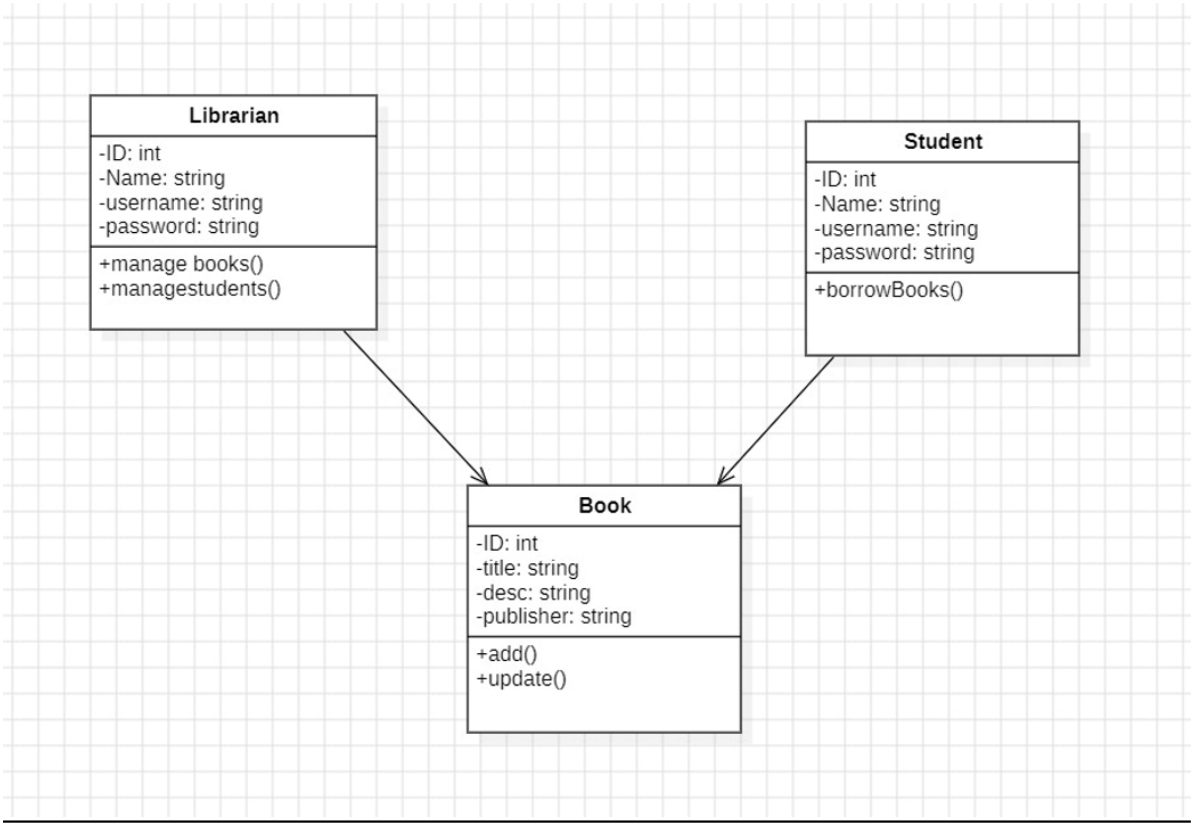
UML DIAGRAMS

1. LIBRARY MANAGEMENT SYSTEM

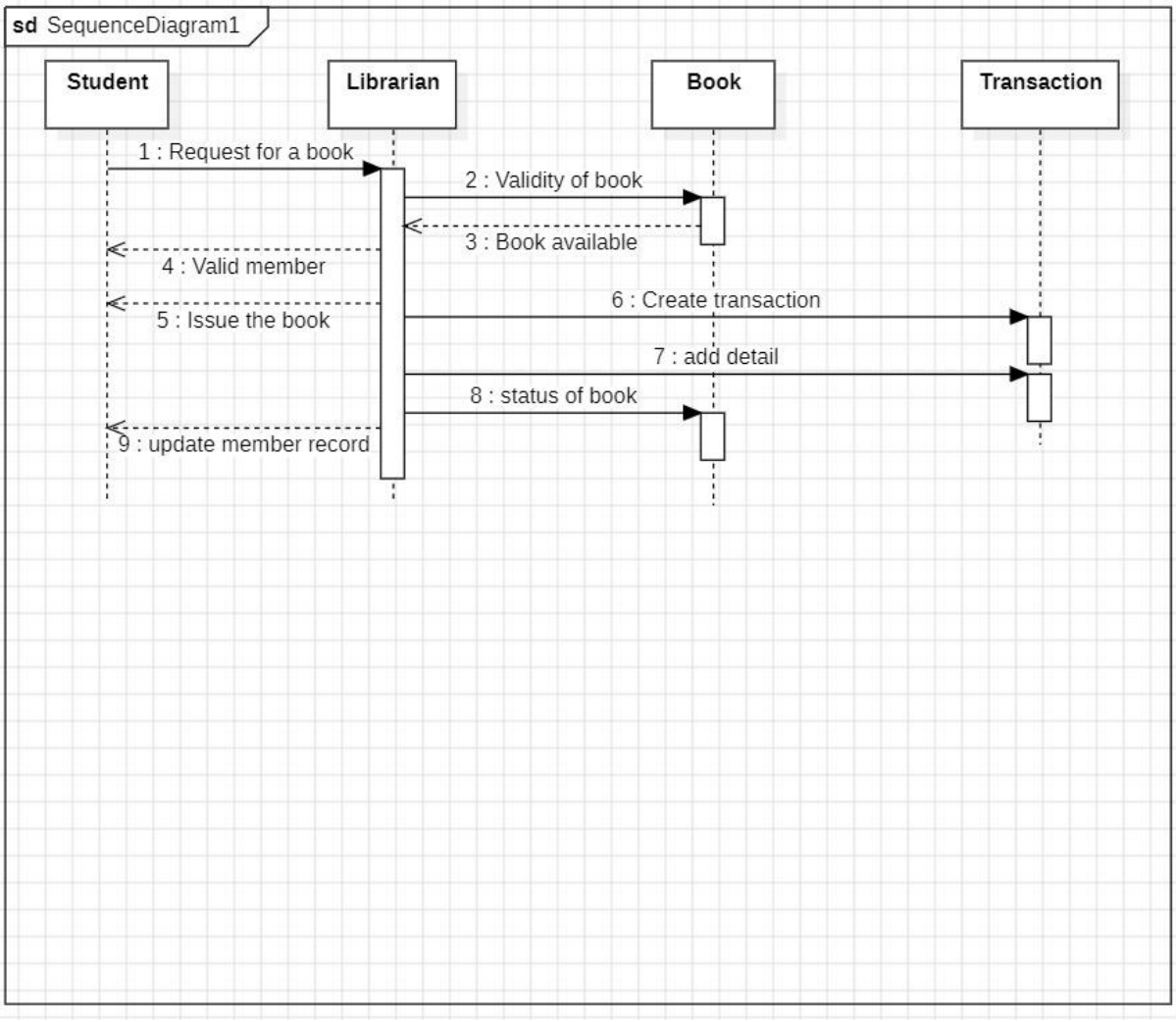
1.a) Use Case Diagram:



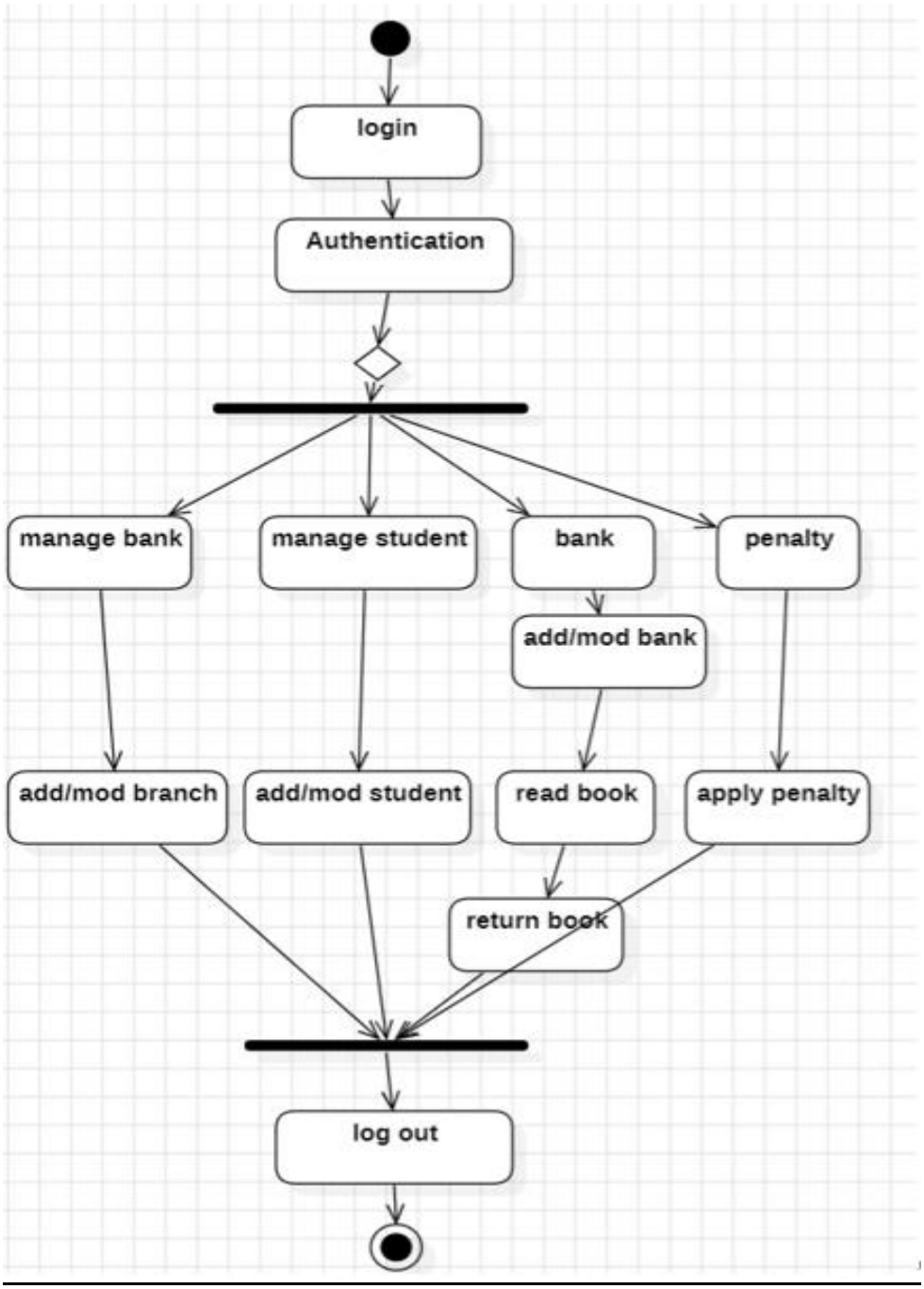
1.b) Class Diagram



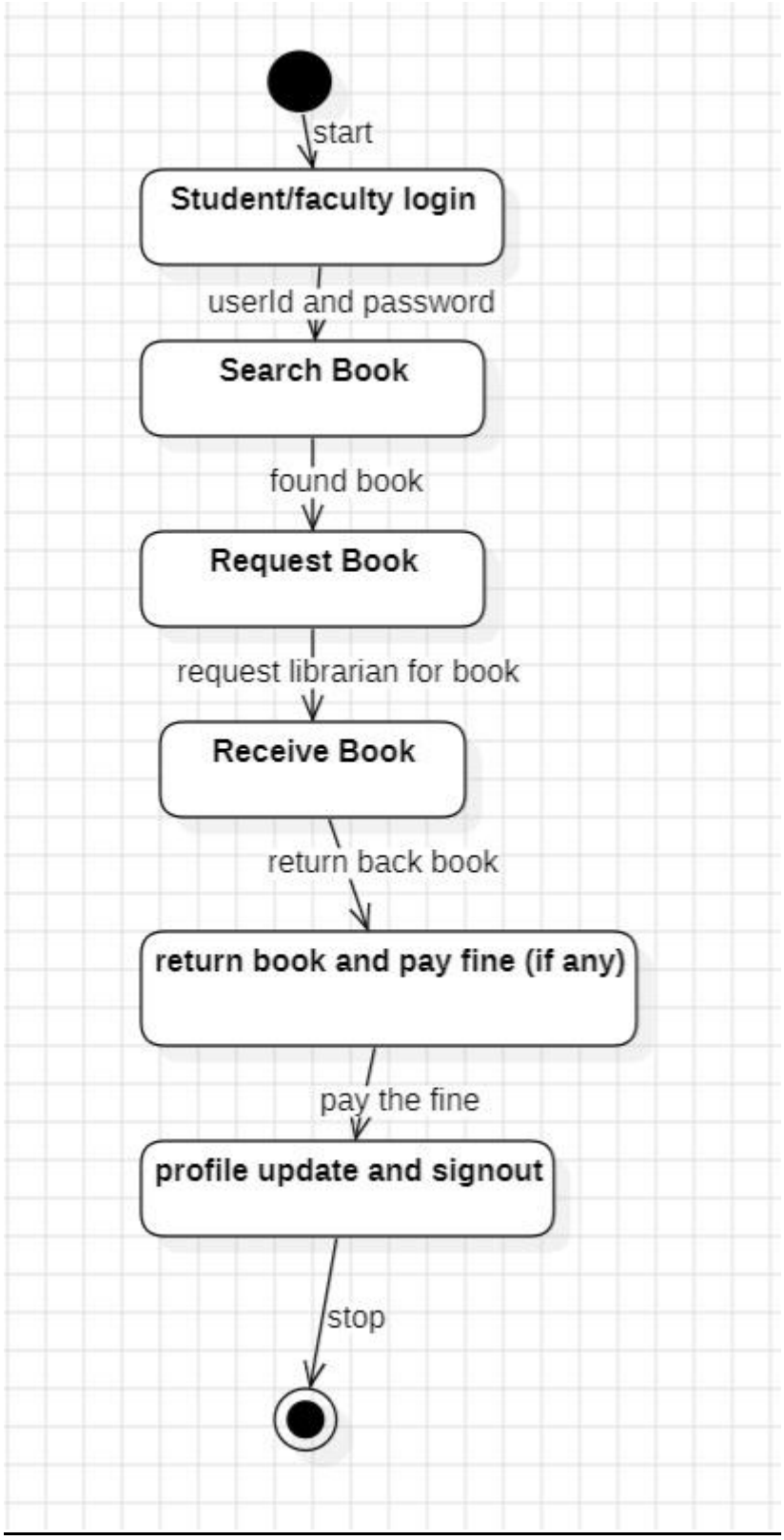
1.c) Sequence Diagram



1.d) State Diagram

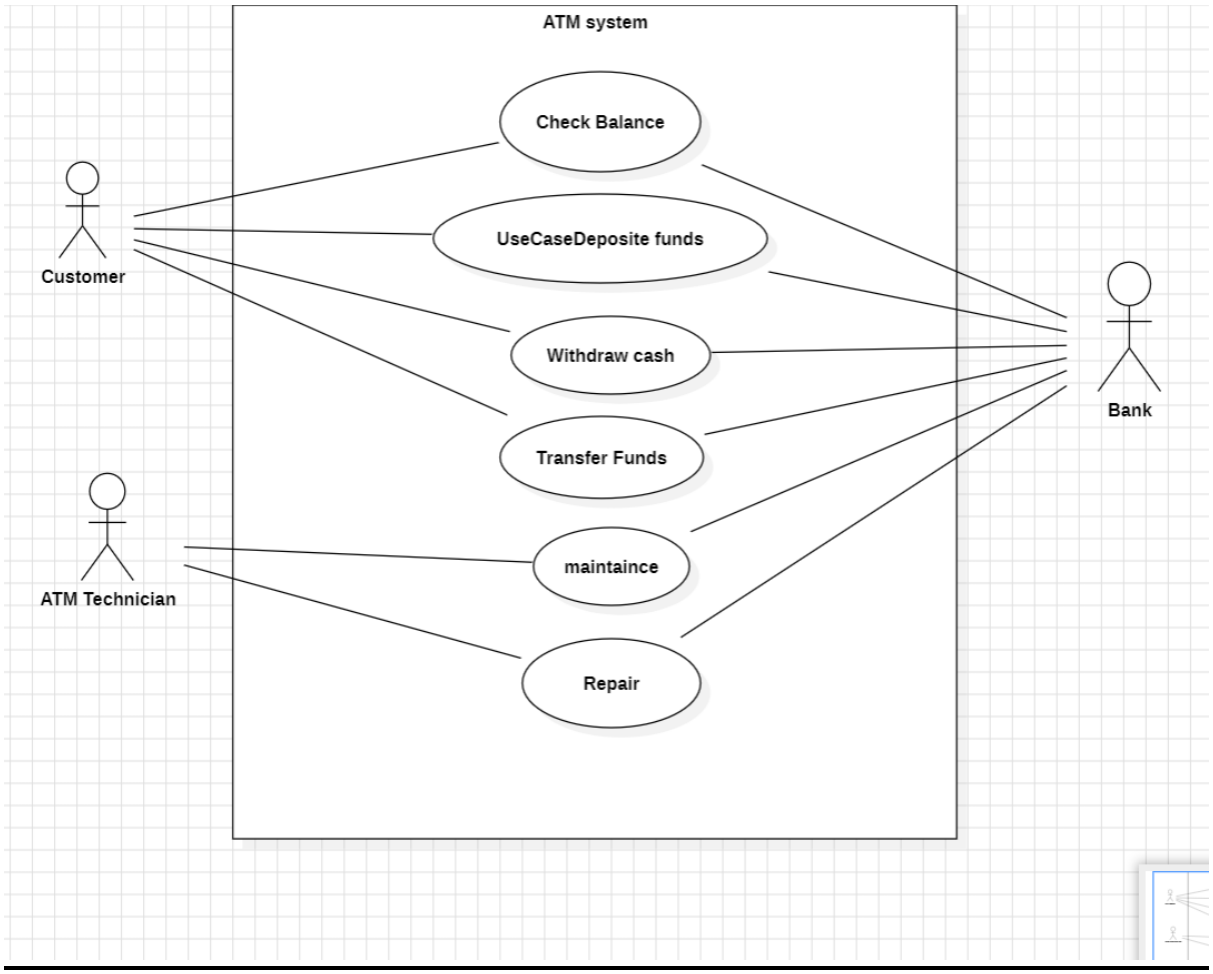


1.e) Activity Diagram

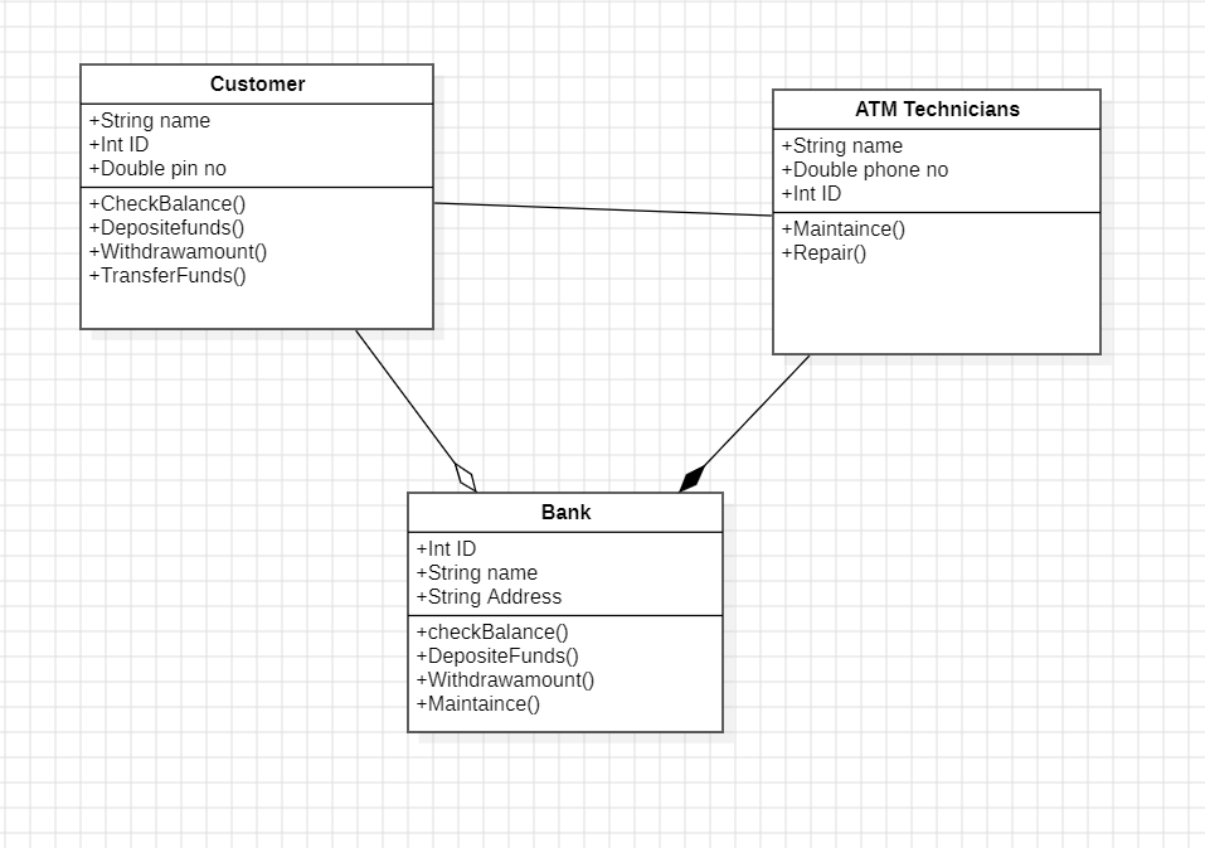

start
Student/faculty login
userId and password
Search Book
found book
Request Book
request librarian for book
Receive Book
return back book
return book and pay fine (if any)
pay the fine
profile update and signout
stop

2.ATM SYSTEM

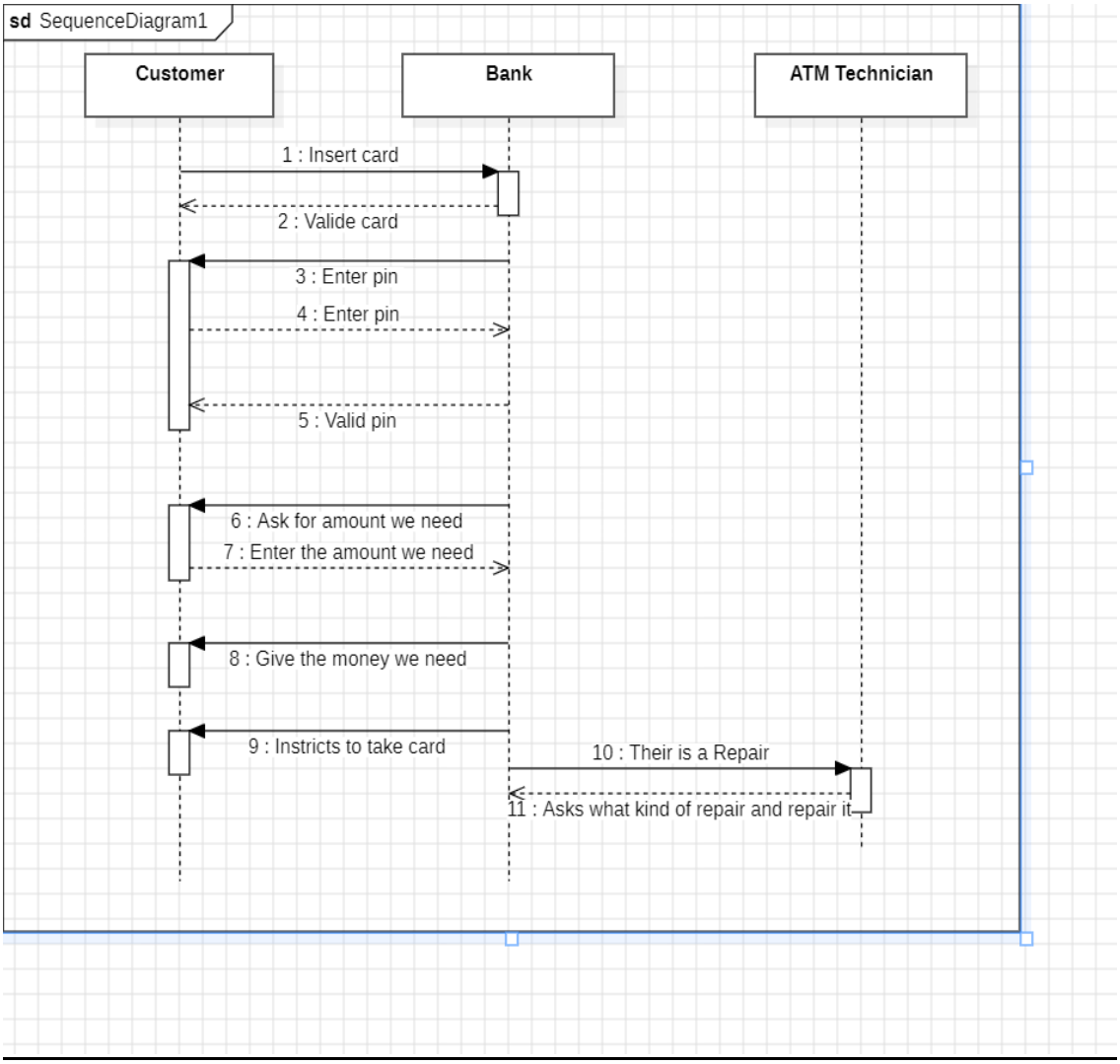
2.a)Use Case Diagram



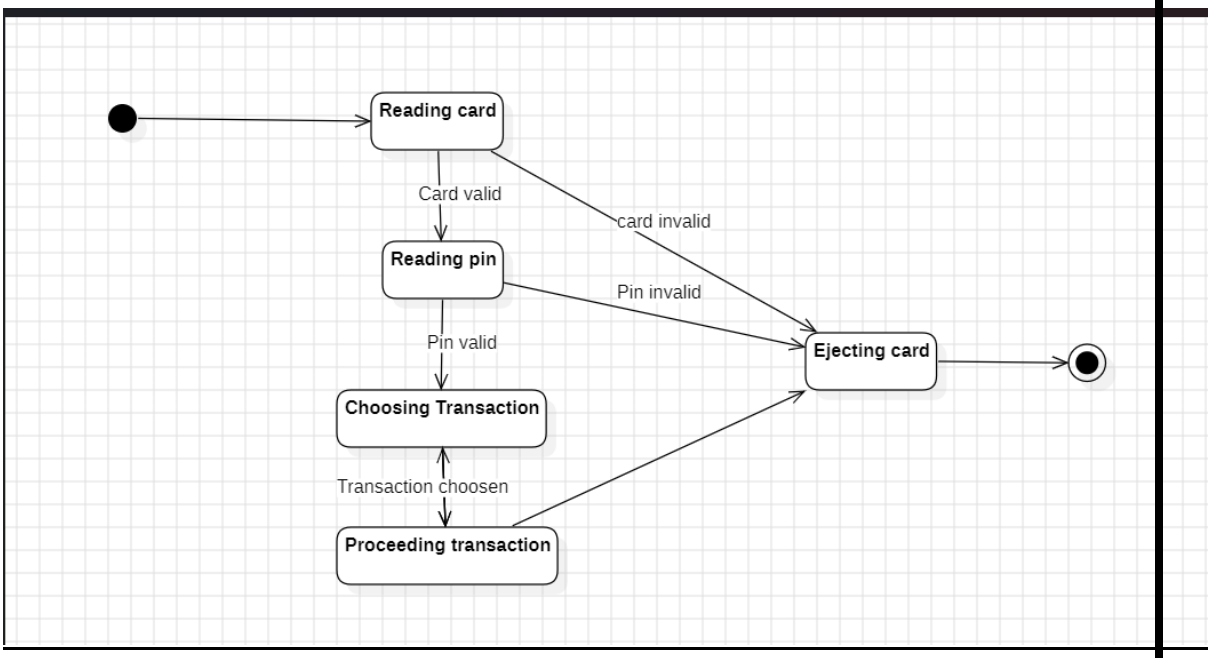
2.b) Class Diagram



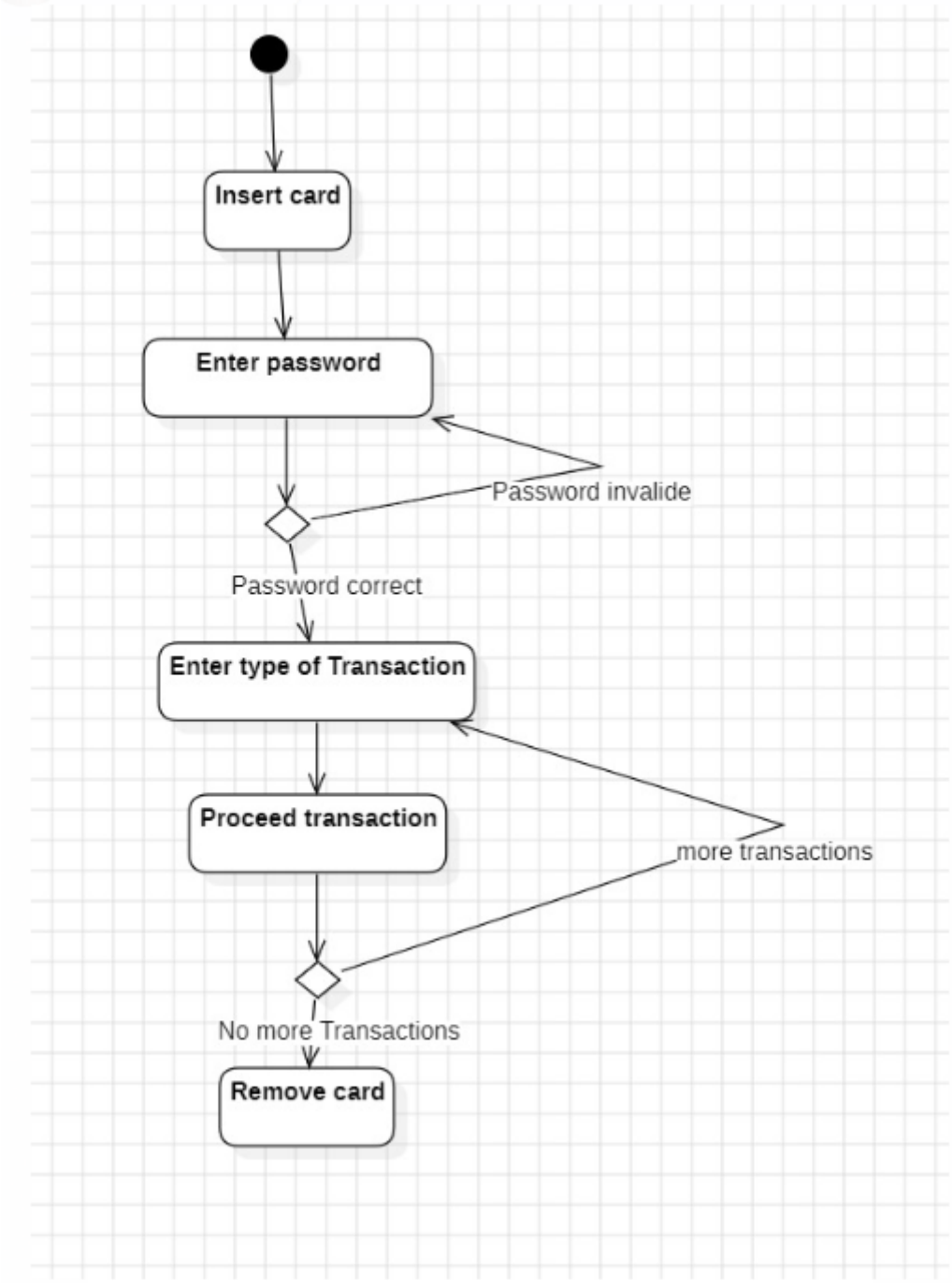
2.c) Sequence Diagram



2.d)State Diagram



2.e) Activity Diagram


Insert card
Enter password
Password invalide
Password correct
Enter type of Transaction
Proceed transaction
more transactions
No more Transactions
Remove card

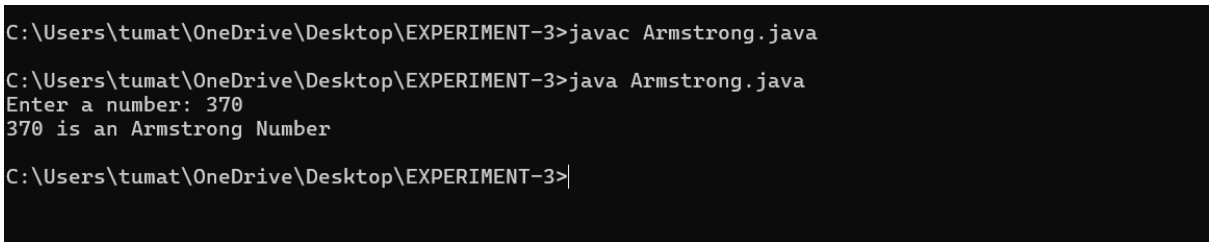
3.BASIC JAVA PROGRAMS

3.a) ARMSTRONG NUMBER

CODE:

```
import java.util.Scanner;
public class Armstrong {
   public static void main(String[] args) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter a number: ");
      int num = sc.nextInt(), sum = 0, temp = num;
      while (temp != 0) {
         int digit = temp % 10;
         sum += digit * digit * digit;
         temp /= 10;
      }
      System.out.println(num + " is " + (num == sum ? "an Armstrong Number" :
"not an Armstrong Number"));
         }
}
```

OUTPUT:



3.b) CountDigits

CODE:

```
import java.util.Scanner;
public class CountDigits {
   public static void main(String[] args) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter a number: ");
      int num = sc.nextInt(), count = 0;
      while (num != 0) {
         count++;
         num /= 10;
```

```
        }
        System.out.println("Number of Digits: " + count);

    }
}
```

OUTPUT:

```
C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>javaC CountDigits.java

C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>java CountDigits.java
Enter a number: 7645
Number of Digits: 4

C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>
```

3.c) EvenOdd

CODE:

```
import java.util.Scanner;
public class EvenOdd {
   public static void main(String[] args) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter a number: ");
      int num = sc.nextInt();
      if (num % 2 == 0)
         System.out.println("Even Number");
      else
         System.out.println("Odd Number");
        }
}
```

OUTPUT:

```
C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>javaC EvenOdd.java

C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>java EvenOdd.java
Enter a number: 43
Odd Number

C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>
```

3.d) Factorial

CODE:

```
import java.util.Scanner;
```

```
public class Factorial {
   public static void main(String[] args) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter a number: ");
      int num = sc.nextInt(), fact = 1;
      for (int i = 1; i <= num; i++) {
         fact *= i;
      }
      System.out.println("Factorial: " + fact);

   }
}
```

OUTPUT:

```
C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>javaC Factorial.java

C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>java Factorial.java
Enter a number: 6
Factorial: 720

C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>
```

3.e) Fibonacci

CODE:

```
public class Fibonacci {
    public static void main(String[] args) {
        int n = 10, a = 0, b = 1;
        System.out.print("Fibonacci Series: " + a + " " + b);
        for (int i = 2; i < n; i++) {
            int next = a + b;
            System.out.print(" " + next);
            a = b;
            b = next;
        }
    }
}
```

OUTPUT:

```
C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>javaC Fibonacci.java

C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>java Fibonacci.java
Fibonacci Series: 0 1 1 2 3 5 8 13 21 34
C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>
```

3.f) Largestnumber

CODE:

```
import java.util.Scanner;
public class Largestnumber {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter three numbers: ");
        int a = sc.nextInt();
     int b = sc.nextInt();
     int c = sc.nextInt();
        System.out.println("Largest: " + Math.max(a,
Math.max(b, c)));
            }
}
```

OUTPUT:

```
C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>java Largestnumber.java
Enter three numbers: 10
20
30
Largest number: 30

C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>
```

3.g) Palindrome

CODE:

```
import java.util.Scanner;
public class Palindrome {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int num = sc.nextInt(), original = num, rev =
0;
        while (num != 0) {
            rev = rev * 10 + num % 10;
            num /= 10;
        }
        System.out.println(original + " is " +
(original == rev ? "a Palindrome" : "not a
Palindrome"));
            }
}
```

OUTPUT:

```
C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>javaC Palindrome.java

C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>java Palindrome.java
Enter a number: 3443
3443 is a Palindrome

C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>
```

3.h) Prime

CODE:

```
import java.util.Scanner;
public class Prime {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int num = sc.nextInt();
        boolean isPrime = num > 1;
        for (int i = 2; i <= Math.sqrt(num); i++) {
            if (num % i == 0) {
                isPrime = false;
                break;
            }
        }
        System.out.println(num + " is " + (isPrime ?
"a Prime Number" : "not a Prime Number"));
    }
}
```

OUTPUT:

```
C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>javaC Prime.java

C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>java Prime.java
Enter a number: 47
47 is a Prime Number

C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>
```

3.i) ReverseNumber

CODE:

```
import java.util.Scanner;
public class ReverseNumber {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number: ");
```

```
        int num = sc.nextInt(), rev = 0;
        while (num != 0) {
            rev = rev * 10 + num % 10;
            num /= 10;
        }
        System.out.println("Reversed Number: " + rev);
           }
}
```

OUTPUT:

```
C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>javaC ReverseNumber.java

C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>java ReverseNumber.java
Enter a number: 6754
Reversed Number: 4576

C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>
```

3.j) SumOfNumber

CODE:

```
import java.util.Scanner;
public class SumOfDigits {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int num = sc.nextInt(), sum = 0;
        while (num != 0) {
            sum += num % 10;
            num /= 10;
        }
        System.out.println("Sum of Digits: " + sum);
           }
}
```

OUTPUT:

```
C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>javaC SumOfDigits.java

C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>java SumOfDigits.java
Enter a number: 6754
Sum of Digits: 22

C:\Users\tumat\OneDrive\Desktop\EXPERIMENT-3>
```