M.A.KAUSHIK

CH.SC.U4CSE24123

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.U4CSE24123 – M.A.Kaushik* 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
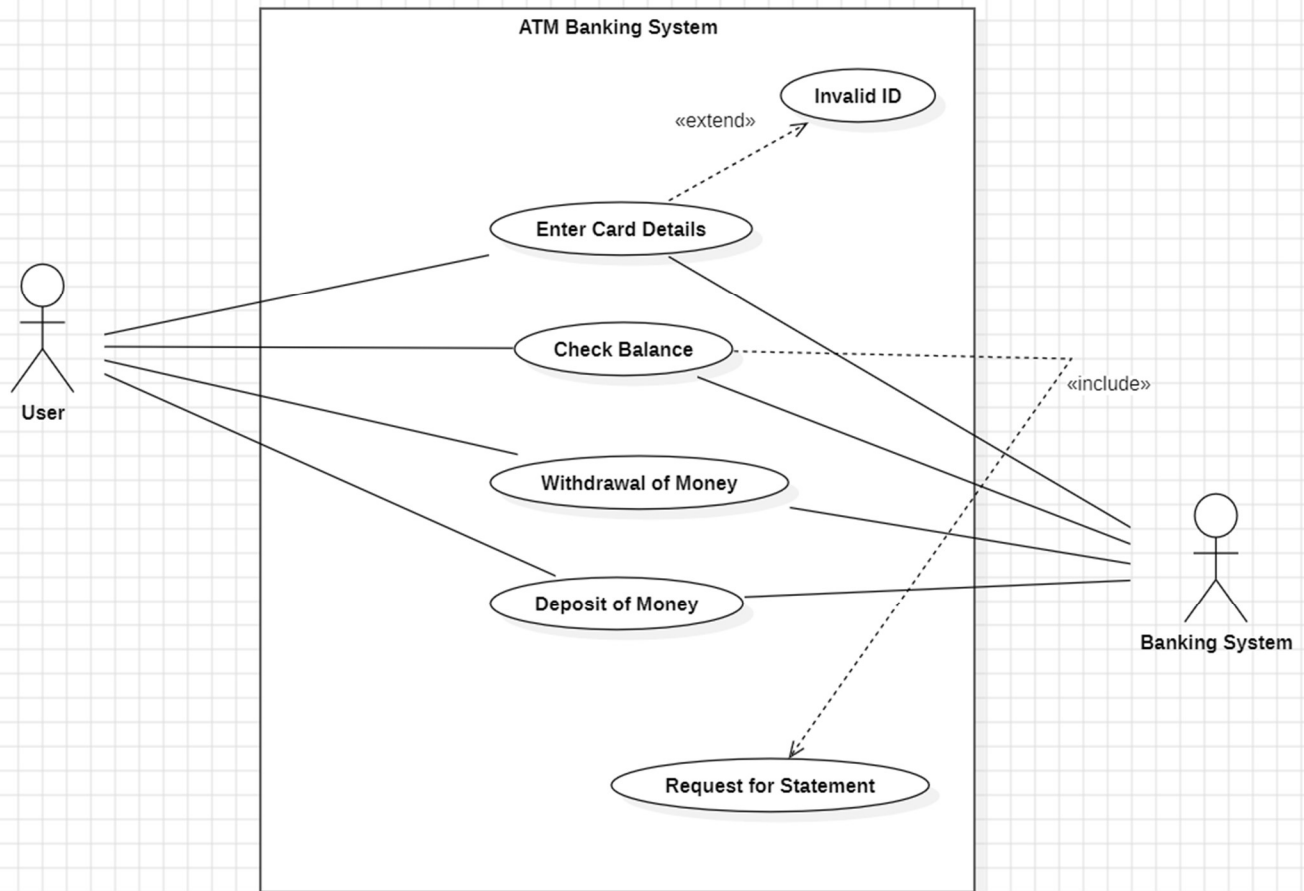
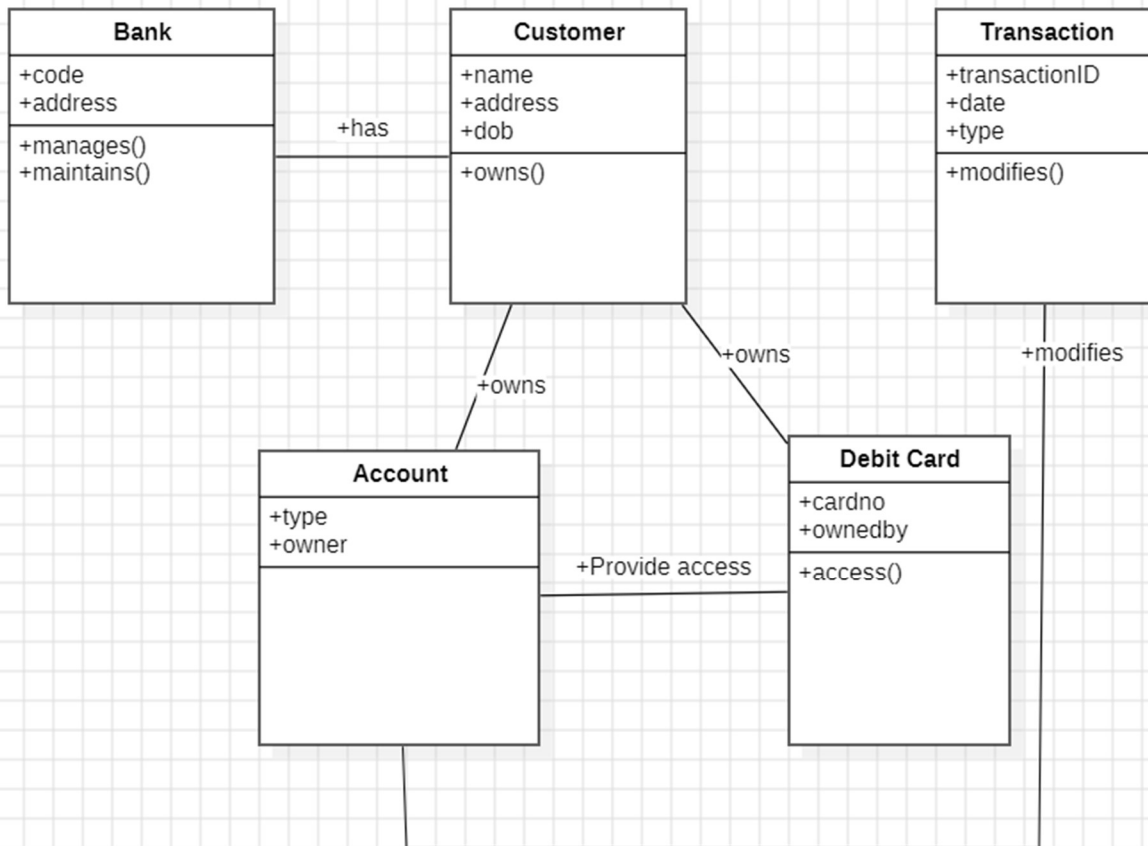Internal Examiner 1   Internal Examiner 2

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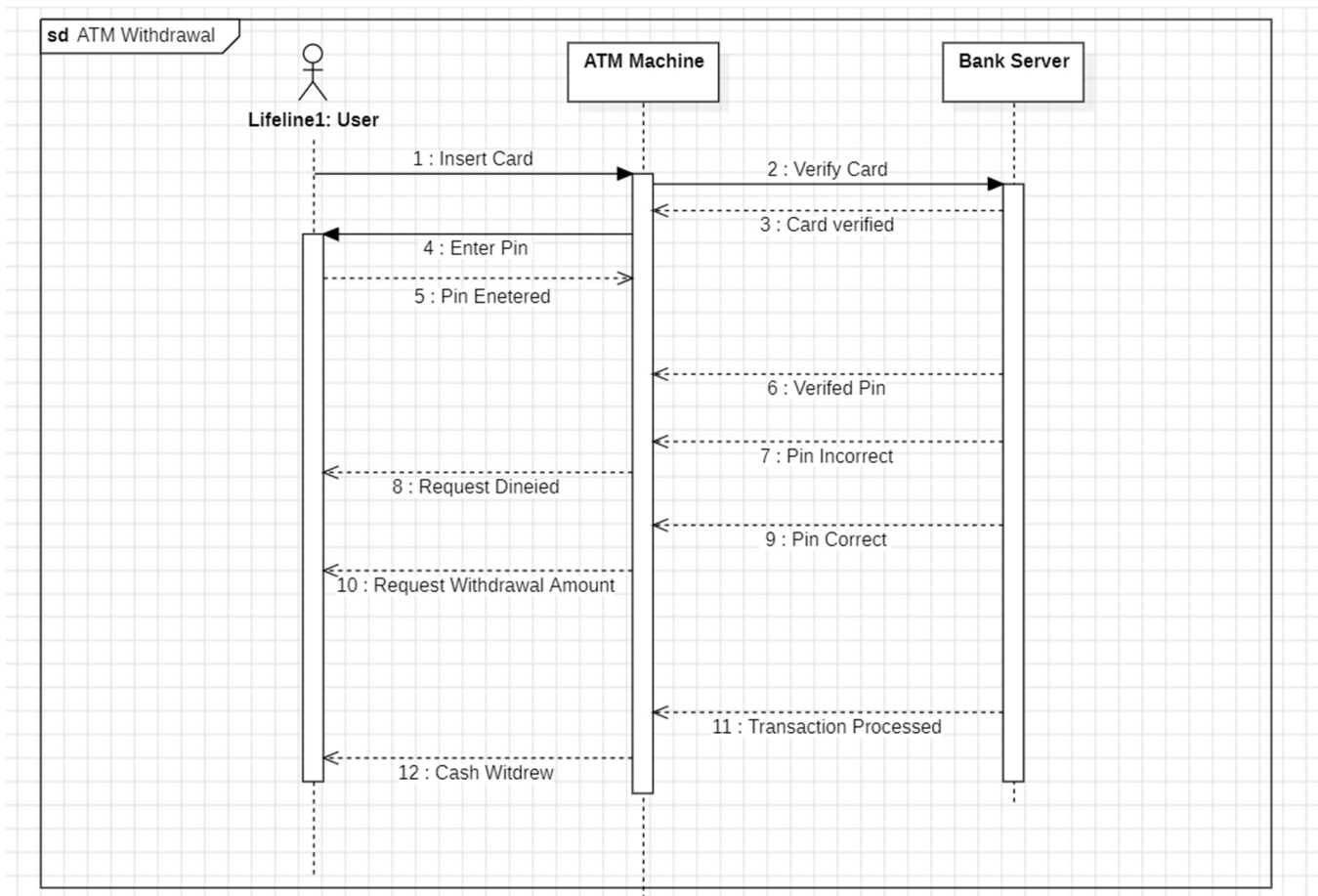
UML DIAGRAMS

1. ATM BANKING SYSTEM

1.a)   Use Case Diagram:

1.b) Class Diagram:

1.c) Sequence Diagram:

1.d)   Object Diagram:

Bank
-code: char
-name: char

Account
-initialBalance: float
-number: char
-overallLimit: int
-Owner: char

Card
-expirationdate: date
-holderName: char
+holderSurName: char
-number: char
-password: char
+bank

Transaction
-amount: float
-currentBalance: int
-time: time
-number: int
-date: date
-done: boolean
+account
+bank
+card

ATMLogin
-password: char
-user: char

ATM
-name: char
-number: char

Money
-value: float

Transfer
-targetAccountNumber: char
-targetBankCode: char

1.e)   State Transition Diagram:

2. LIBRARY MANAGEMENT
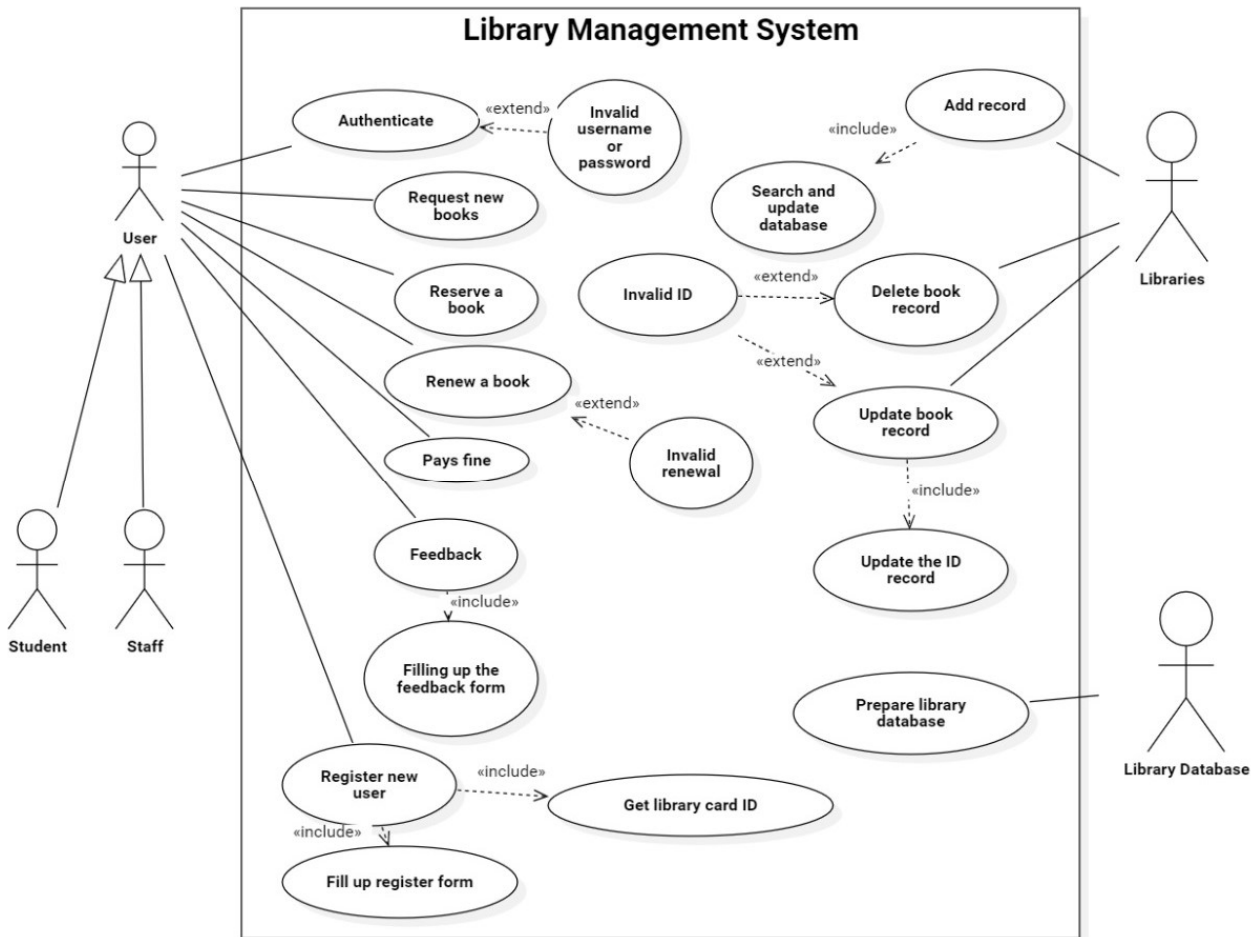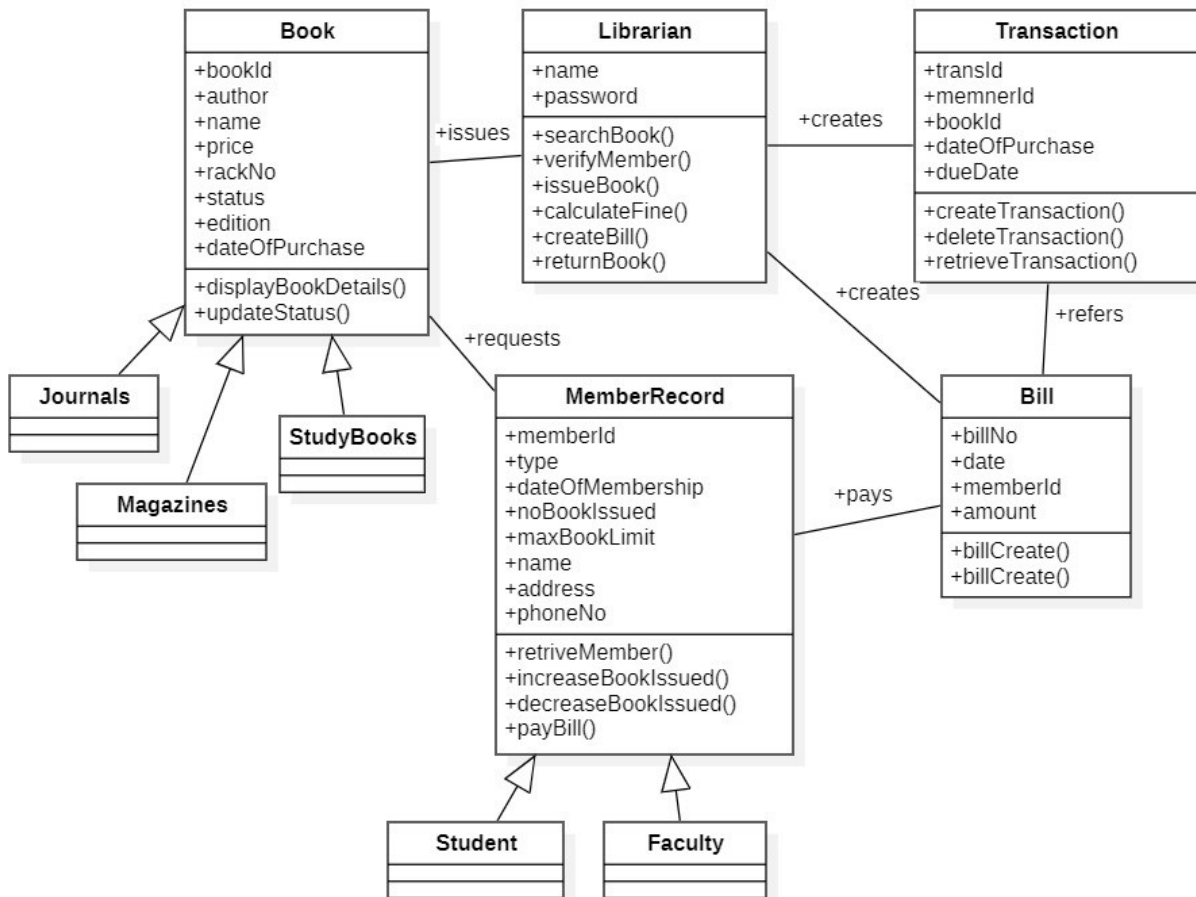
2.a)   Use Case Diagram:
2.b)

2.c)   Class Diagram:

2.d)   Sequence Diagram:
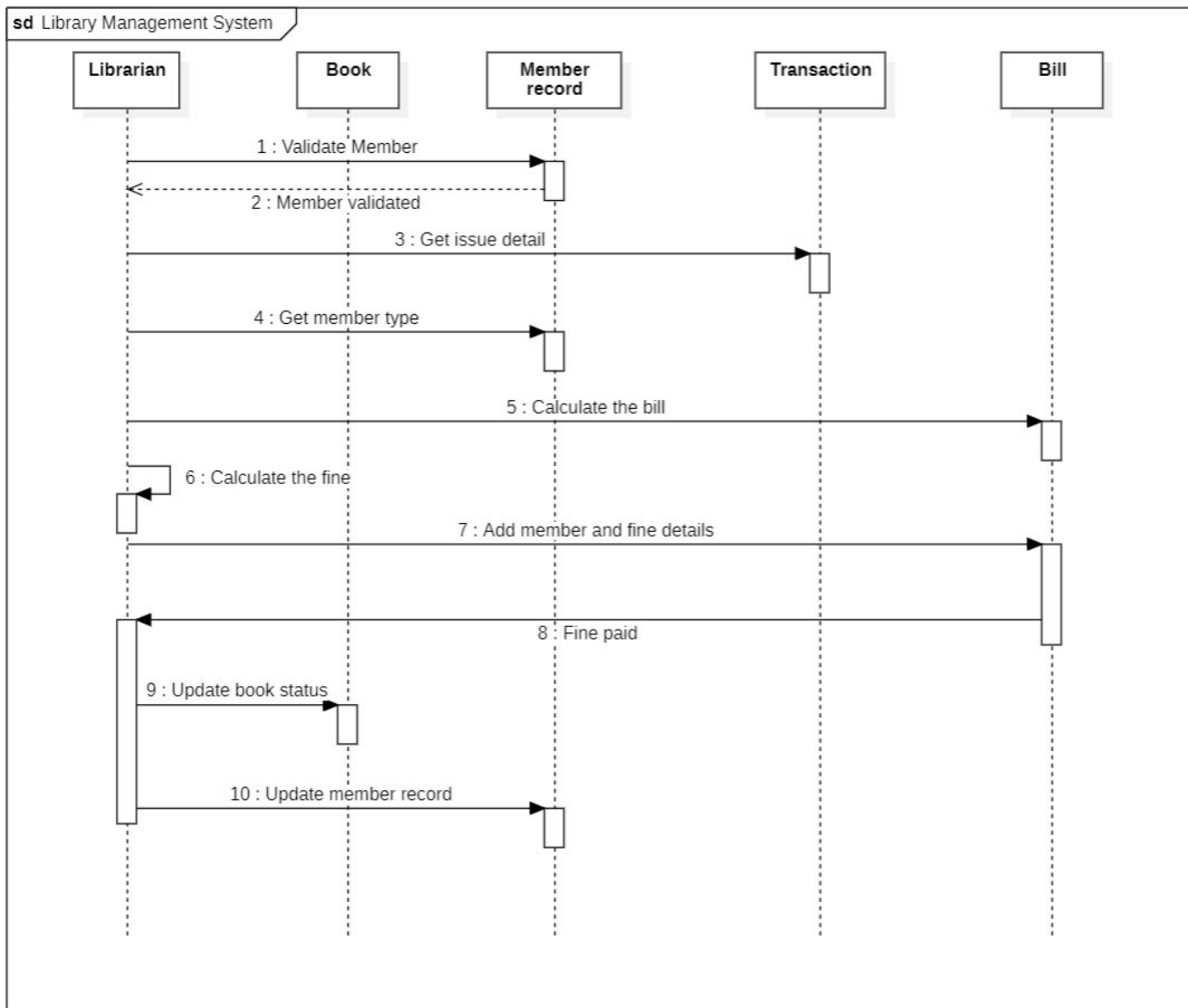
2.e)   Activity Diagram:

2.f)   State Transition Diagram:

Start

student or faculty login

userId or passsword

search book

Found book

request book

request librarian for book

recieve book

rerturn back book

return book and pay fine if any

pay fine if any

profile update and signout

Stop
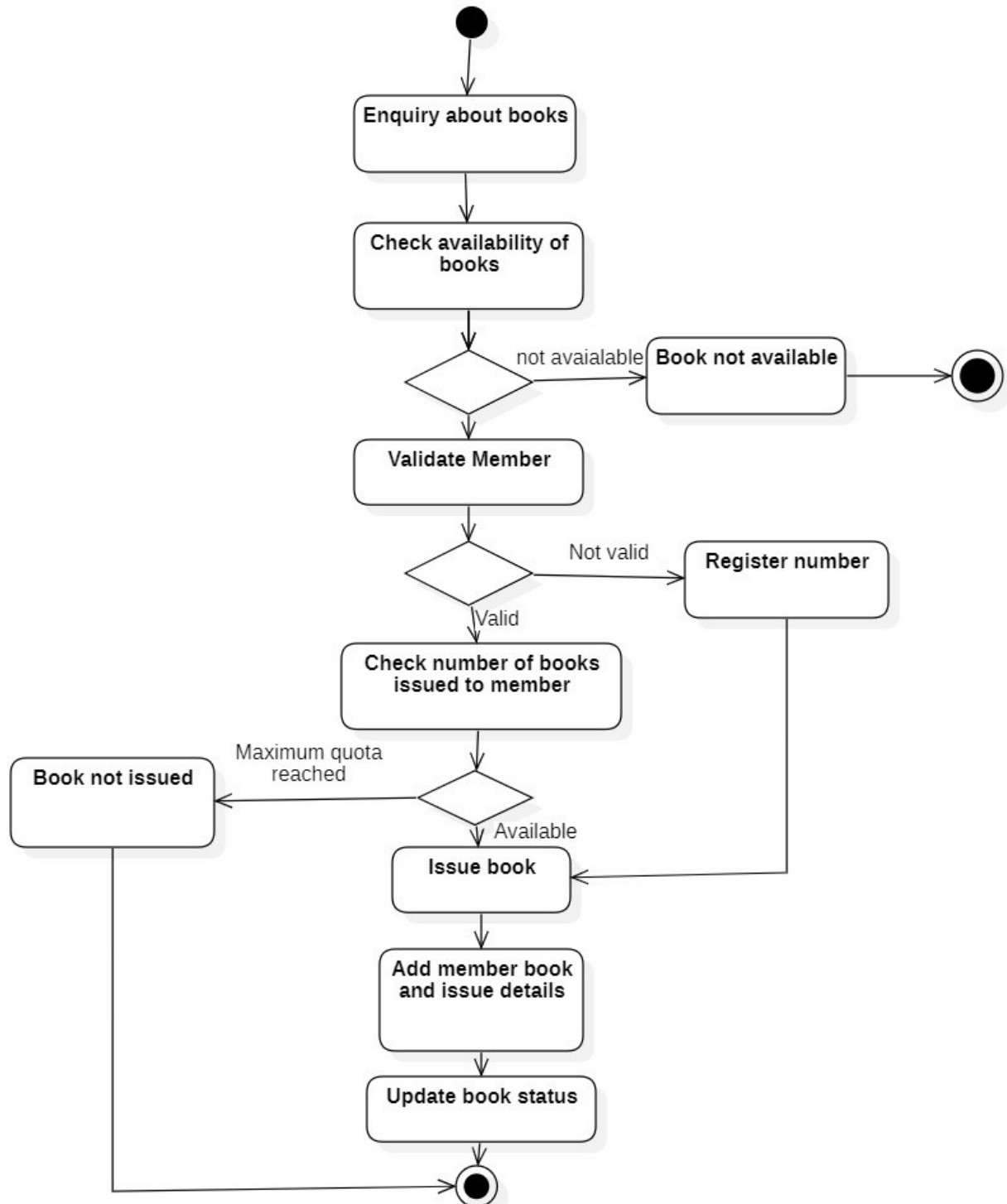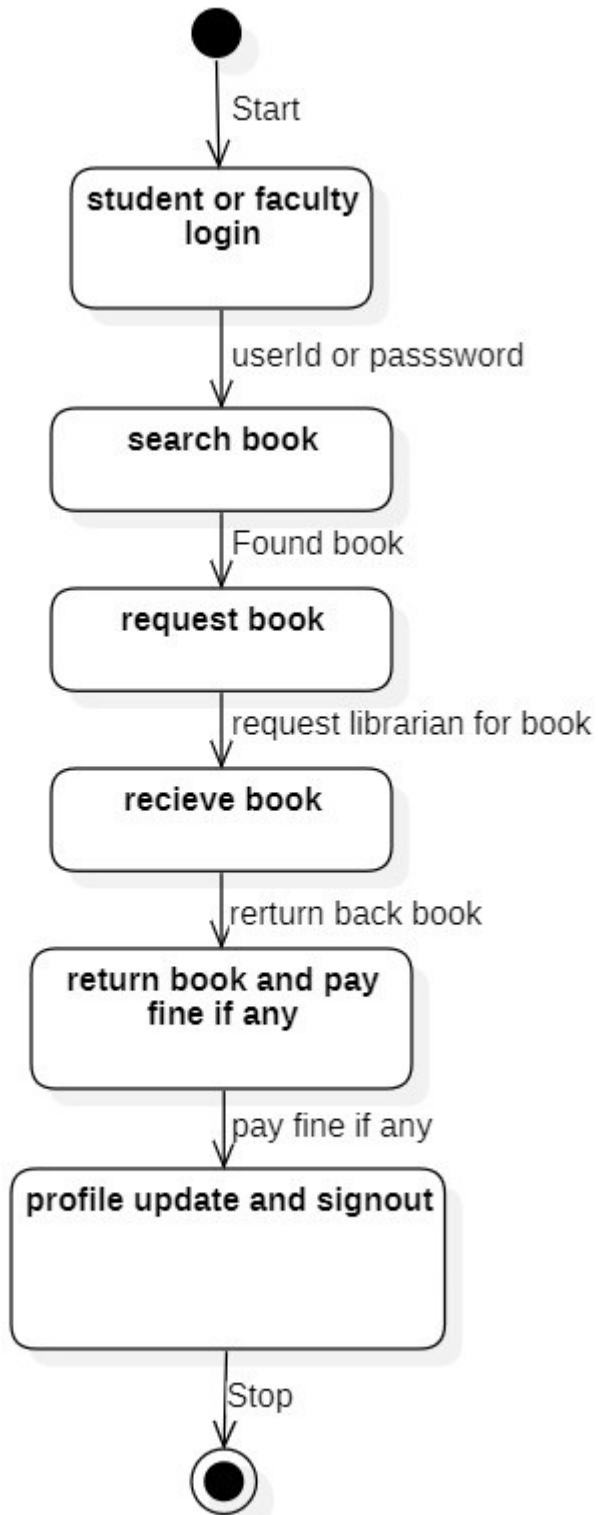
3. Basic Java Programs

3.a) Armstrong Number:

Code:

```java
public class ArmstrongNumber {
    public static void main(String[] args) {
        int num = 153; int original = num; int sum = 0;
        while (num != 0) {
            int digit = num % 10;
            sum += digit * digit * digit;
            num /= 10;
        }
        if (sum == original) {
            System.out.println(original + " is an Armstrong
number.");
        } else {
            System.out.println(original + " is not an Armstrong
number.");
        }
    }
}
```

Output:

```
Enter a number: 123
123 is not an Armstrong Number.
```

3.b) Even Or Odd Checker:

Code:

```java
import java.util.Scanner;

public class EvenOrOdd {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int num = scanner.nextInt();
        if (num % 2 == 0) {
            System.out.println(num + " is even.");
        } else {
            System.out.println(num + " is odd.");
        }
        scanner.close();
    }
}
```

Output:

```
Enter a number: 12345231
12345231 is odd.
```

3.c) Factorial:

Code:

```
public class Factorial {
    public static void main(String[] args) {
        int num = 5;
        int factorial = 1;
        for (int i = 1; i <= num; i++) {
            factorial *= i;
        }
        System.out.println("Factorial of " + num + " is " +
factorial);
    }
}
```

Output:

```
Enter a number: 12
Factorial: 479001600
```

3.d) Fibonacci Series:

Code:

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

Output;

```
Enter the number of terms: 12
Fibonacci Series: 0 1 1 2 3 5 8 13 21 34 55 89
```
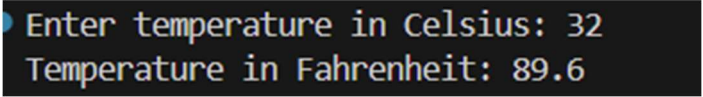
3.e)   Celsius To Farenheit:

Code:

```java
import java.util.Scanner;

public class CelsiusToFarenheit {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter temperature in Celsius: ");
        double celsius = scanner.nextDouble();

        double fahrenheit = (celsius * 9 / 5) + 32;
        System.out.println("Temperature in Fahrenheit: " + fahrenheit);
        scanner.close();
    }
}
```

Output:

```
Enter temperature in Celsius: 32
Temperature in Fahrenheit: 89.6
```
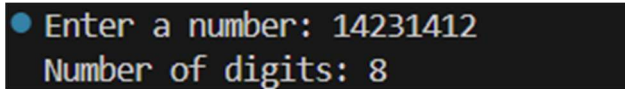
3.f) Count Of Digit:

Code:

```java
import java.util.Scanner;

public class CountOfDigit {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int num = scanner.nextInt();
        int count = 0;

        while (num != 0) {
            num /= 10;
            count++;
        }

        System.out.println("Number of digits: " + count);
        scanner.close();
    }
}
```
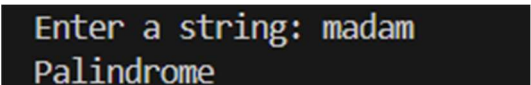
Output:

3.g) Palindrome Check:

Code:

```java
import java.util.Scanner;

public class Palindrome {
    public static boolean isPalindrome(String str) {
        int left = 0, right = str.length() - 1;
        while (left < right) {
            if (str.charAt(left) != str.charAt(right)) {
                return false;
            }
            left++;
            right--;
        }
        return true;
    }

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a string: ");
        String str = scanner.nextLine();
        if (isPalindrome(str)) {
            System.out.println("Palindrome");
        } else {
            System.out.println("Not a palindrome");
        }
        scanner.close();
    }
}
```

Output:

```
Enter a string: madam
Palindrome
```
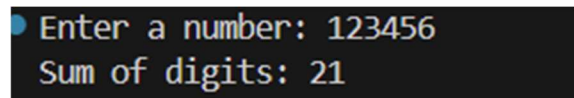
3.h)   Sum Of Digits:

Code:

```java
import java.util.Scanner;

public class SumOfDigit {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int num = scanner.nextInt();
        int sum = 0;

        while (num != 0) {
            sum += num % 10;
            num /= 10;
        }

        System.out.println("Sum of digits: " + sum);
        scanner.close();
    }
}
```

Output:

```
Enter a number: 123456
Sum of digits: 21
```

3.i) Vowels And Consonants Count:

Code:

```java
import java.util.Scanner;

public class VowelConsonantCount {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a string: ");
        String str = scanner.nextLine().toLowerCase();

        int vowels = 0, consonants = 0;
        for (char ch : str.toCharArray()) {
            if (Character.isLetter(ch)) {
                if ("aeiou".indexOf(ch) != -1) vowels++;
                else consonants++;
            }
        }

        System.out.println("Vowels: " + vowels + ", Consonants: " +
consonants);
        scanner.close();
    }
}
```
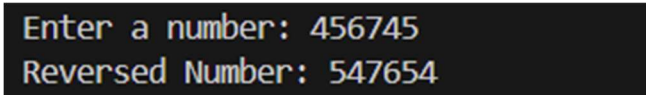
Output:

```
Enter a string: i AM A KUTHU DANCER
Vowels: 7, Consonants: 8
```

3.j) Reverse a Number :

Code:

```java
import java.util.Scanner;

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

Output:

```
Enter a number: 456745
Reversed Number: 547654
```