SCHOOL OF
COMPUTING

Deepak SN

CH.SC.U4CSE24112

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.U4CSE24112 – D e e p a k S N*** 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

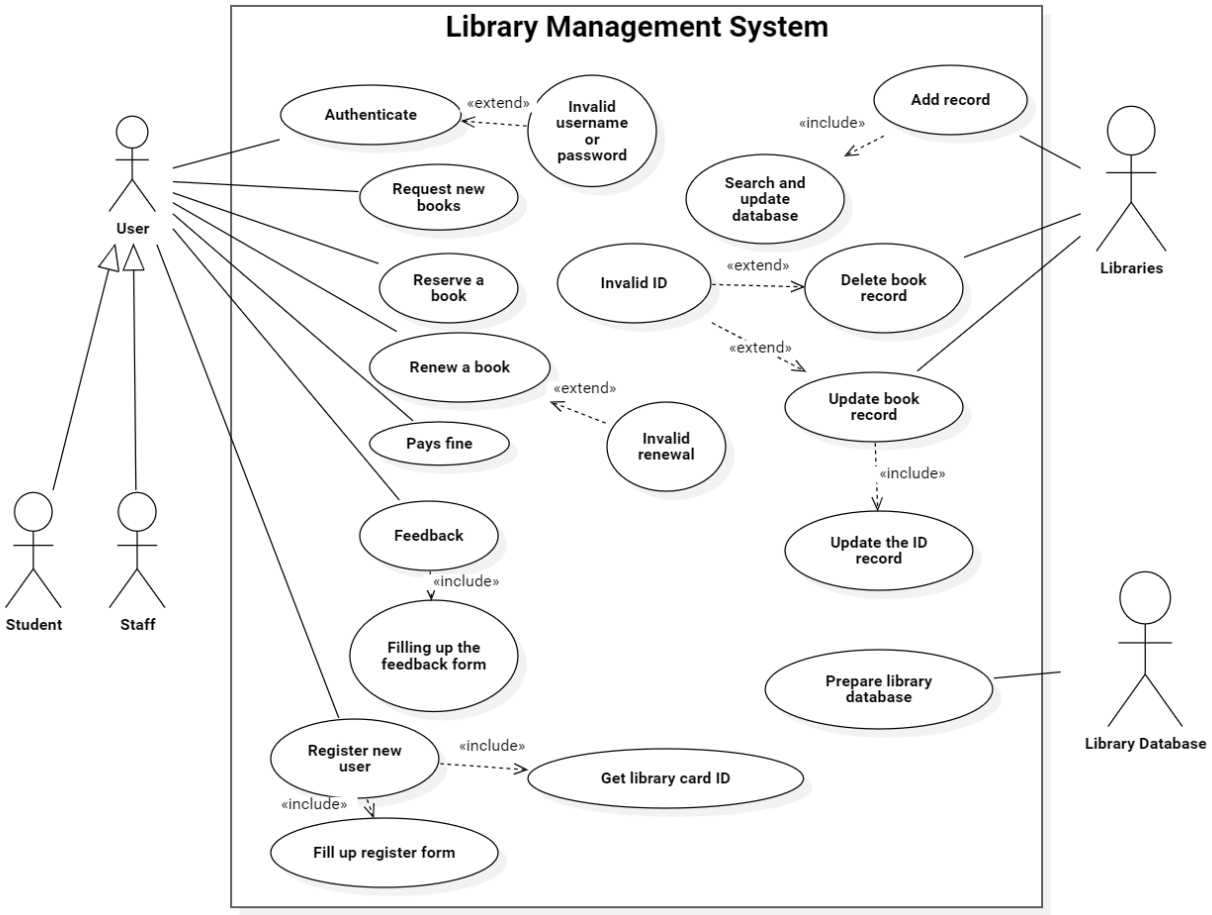
Internal Examiner 1 Internal Examiner 2

INDEX

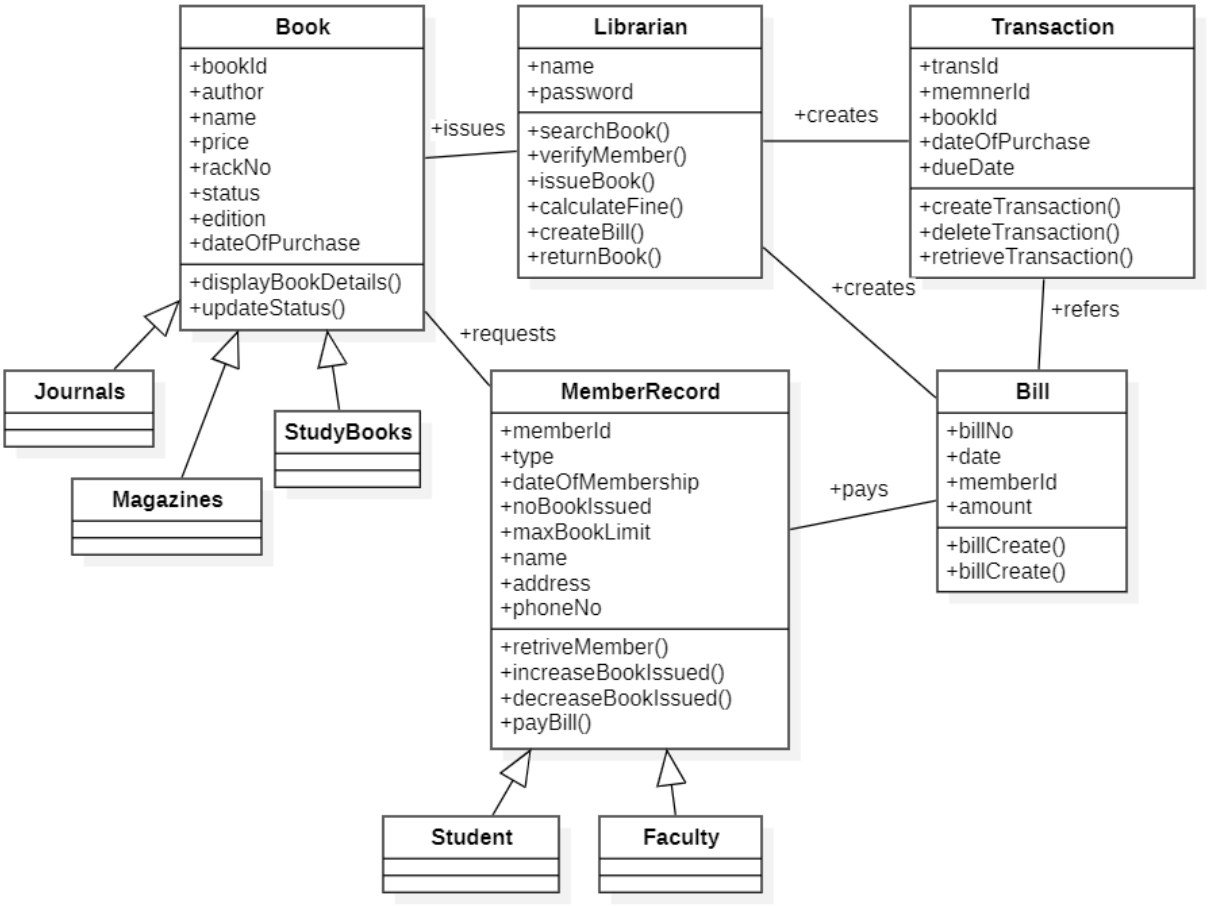
UML DIAGRAMS

1. LIBRARY MANAGEMENT SYSTEM

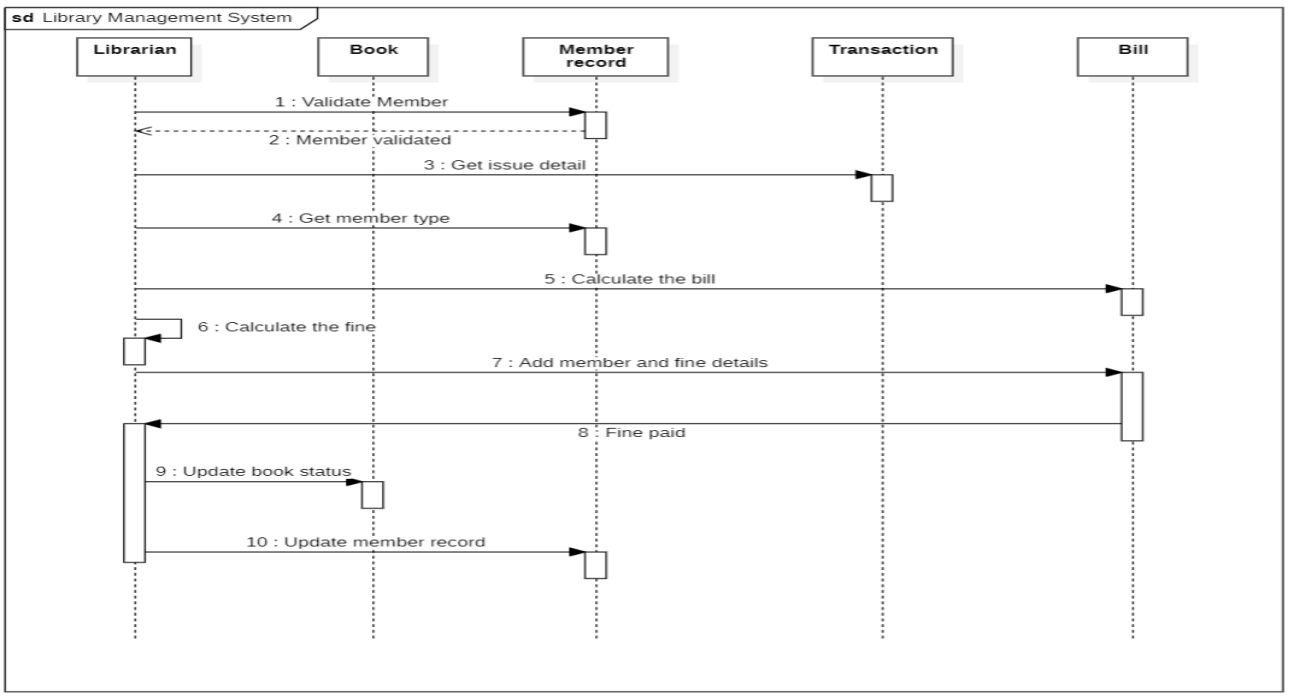
1.a) Use Case Diagram:



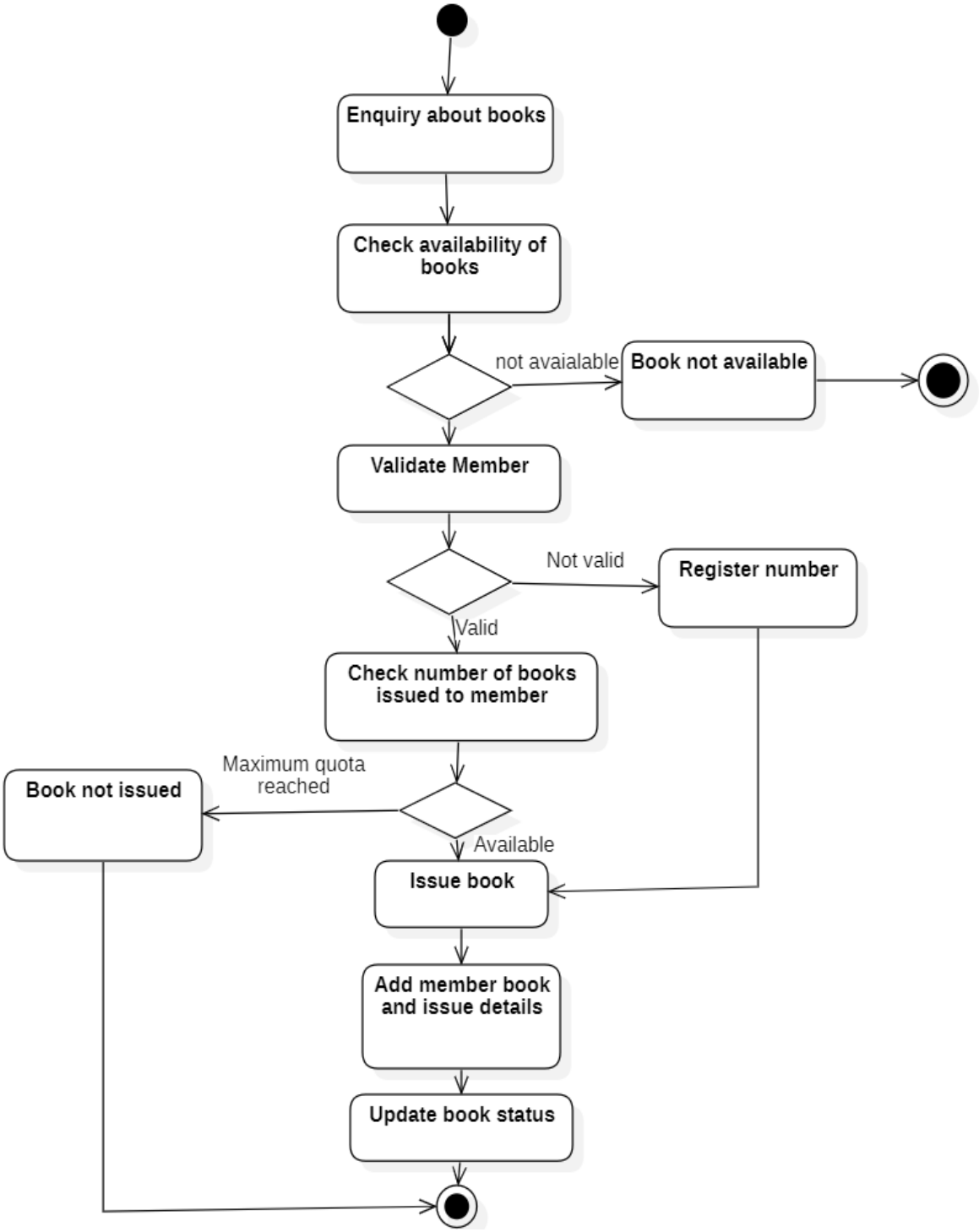
1.b) Class Diagram:



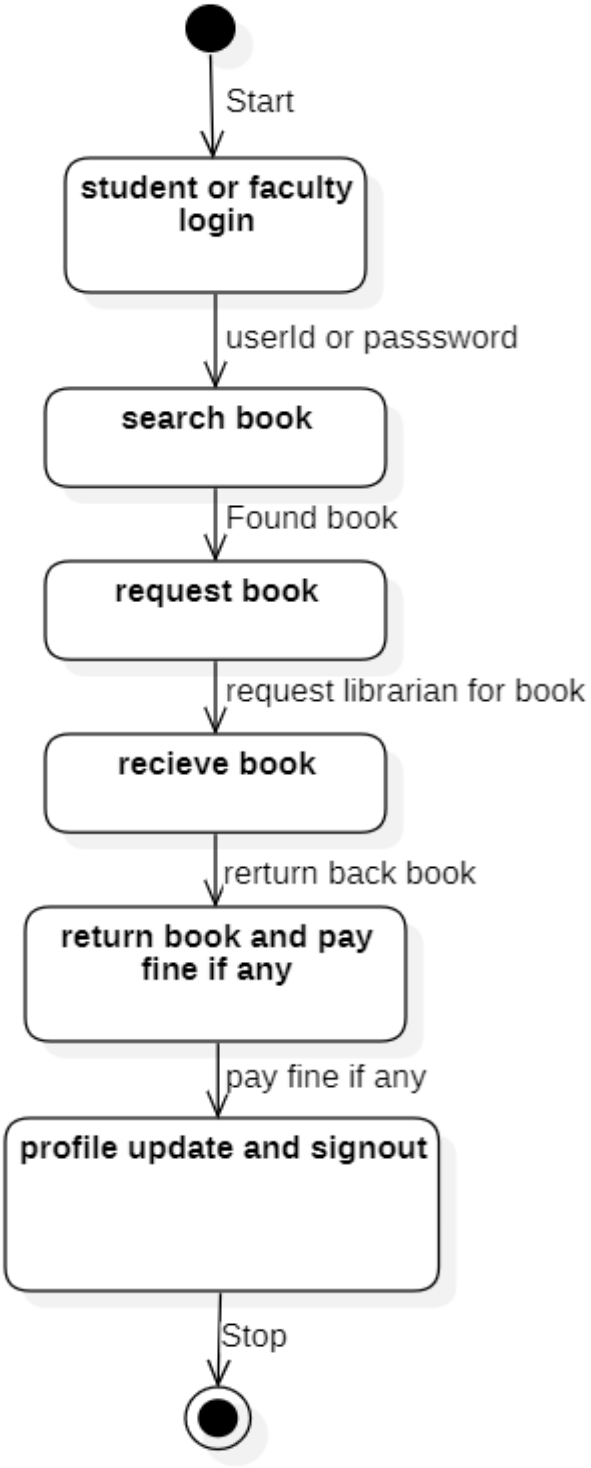
1.c) Sequence Diagram:



1.d) Activity Diagram:

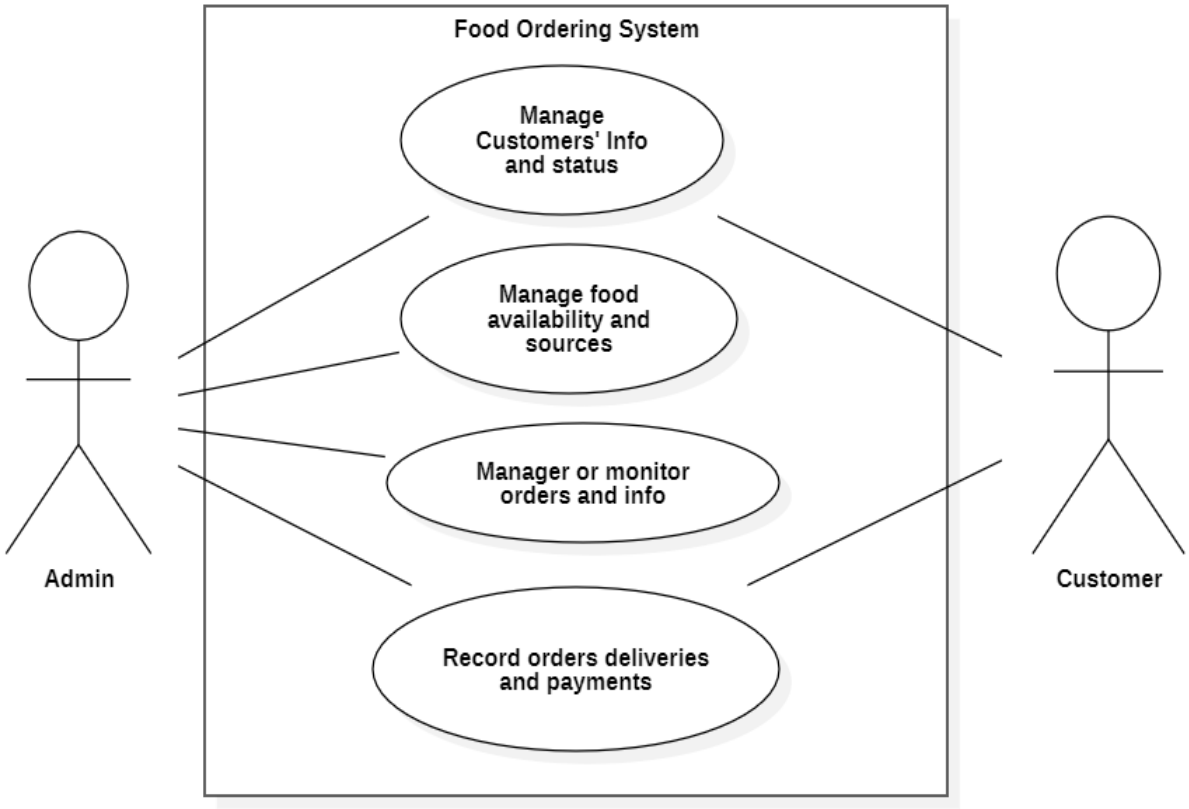


1.e) State Diagram:

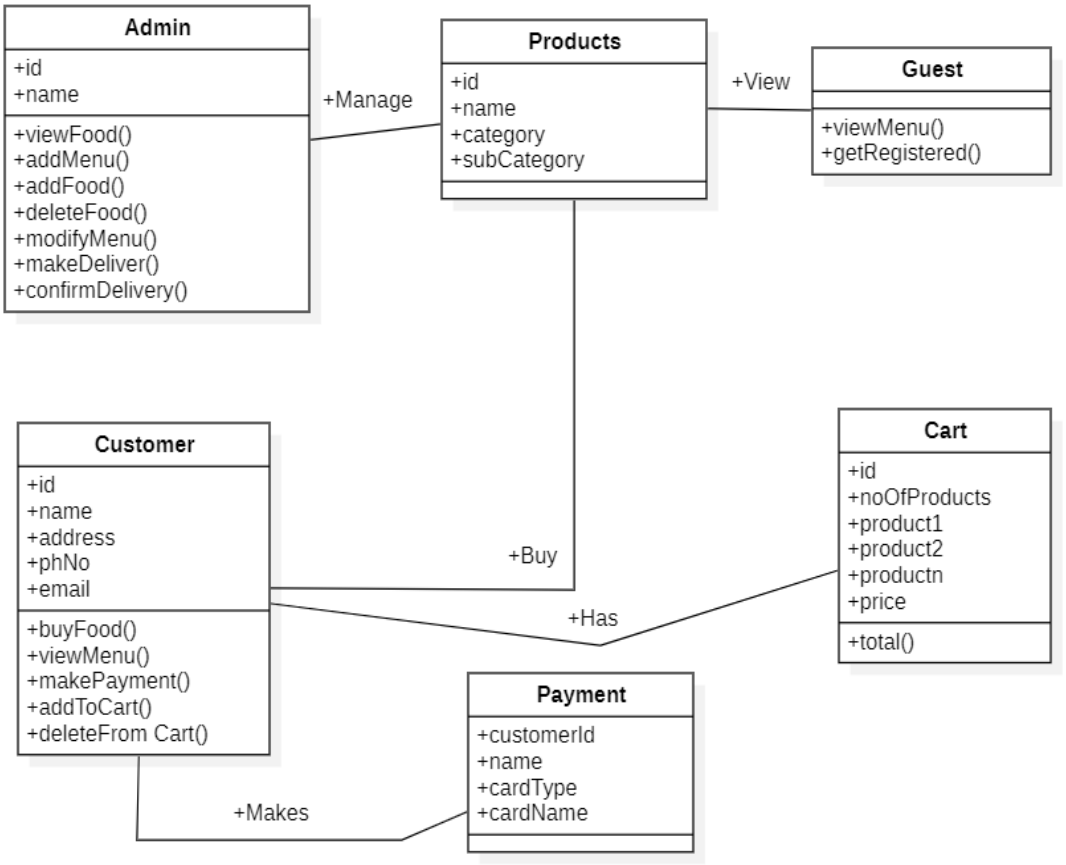


2. ONLINE FOOD ORDERING SYSTEM

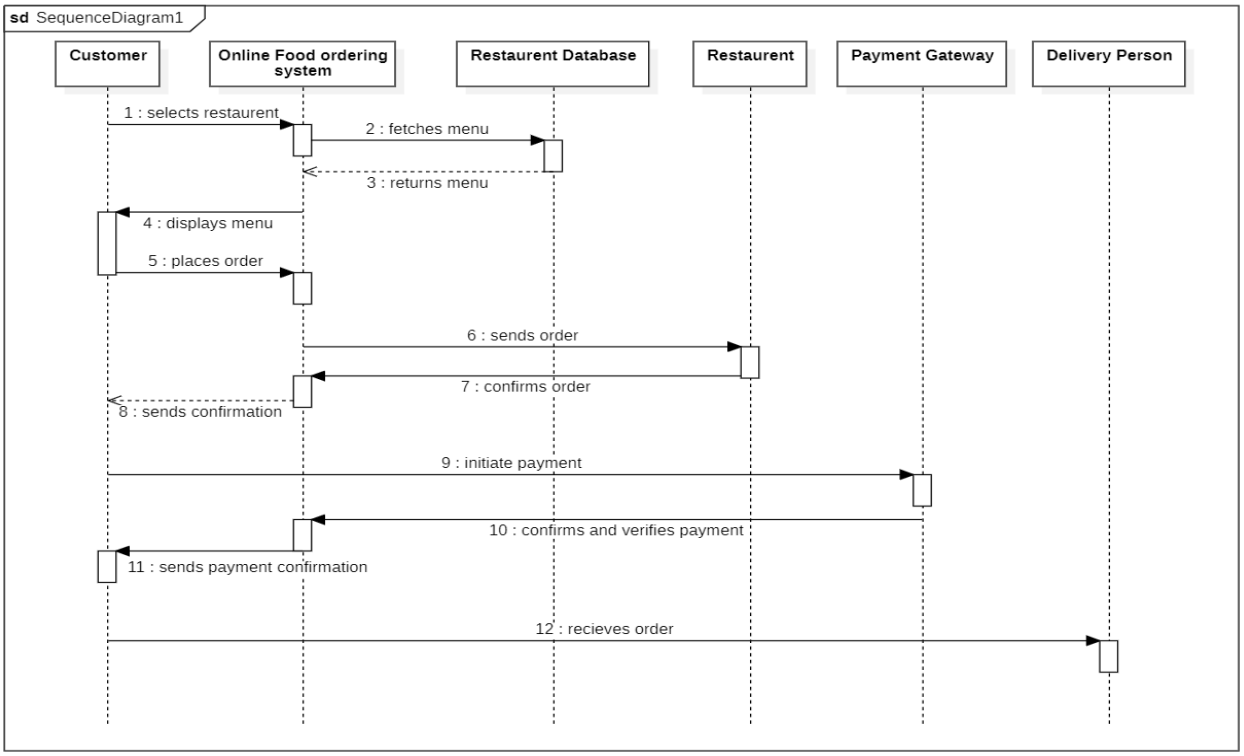
2.a) Use Case Diagram:



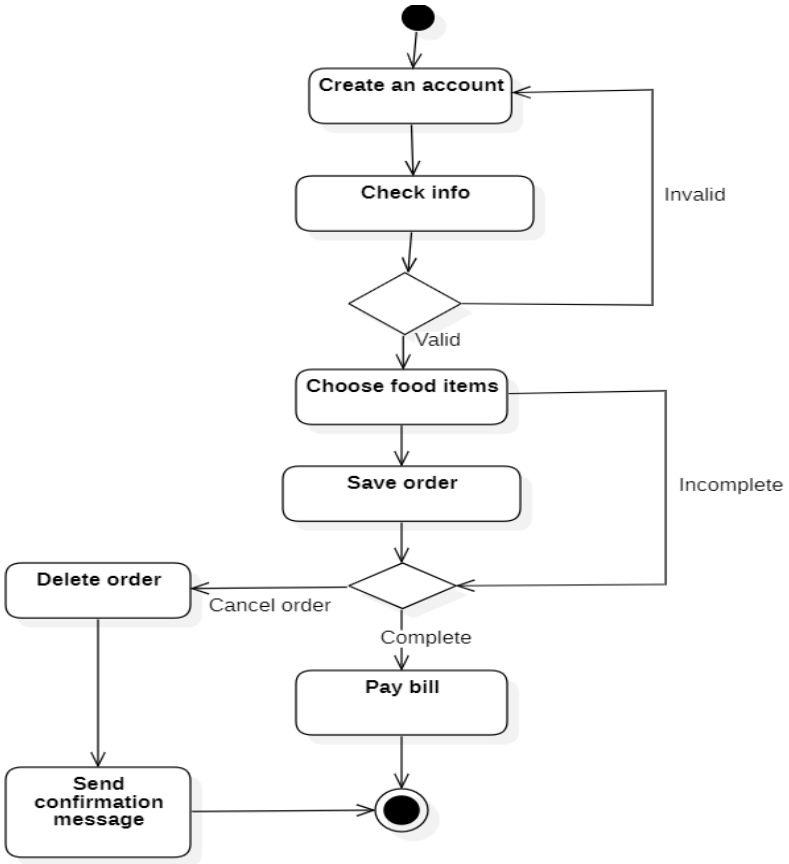
2.b) Class Diagram:



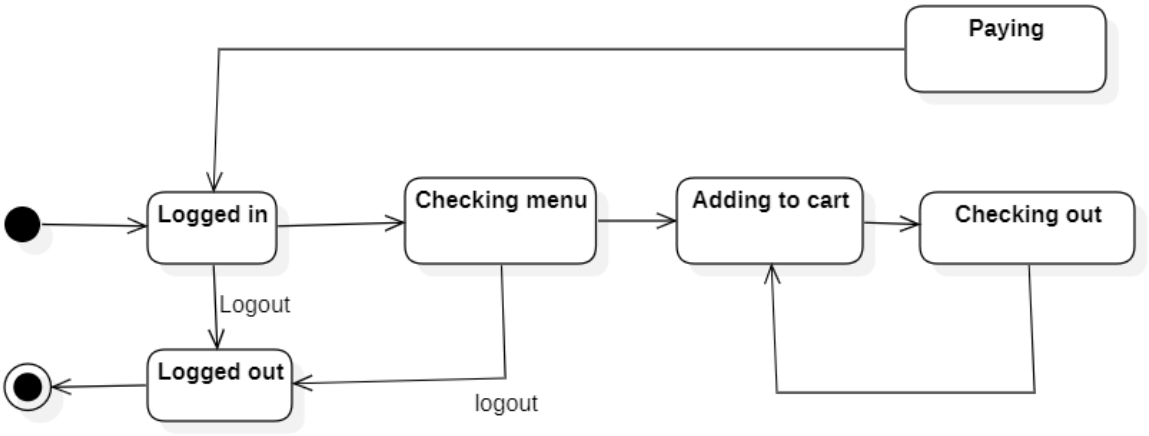
Sequence Diagram:



2.c) Activity Diagram:



2.d) State Diagram:



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();
        int original = num, sum = 0, digits = 0, temp = num;
        while (temp > 0) {
            temp /= 10;
            digits++;
        }
        temp = num;
        while (temp > 0) {
            int digit = temp % 10;
            sum += Math.pow(digit, digits);
            temp /= 10;
        }
        if (sum == original) {
            System.out.println(original + " is an Armstrong number.");
        } else {
            System.out.println(original + " is not an Armstrong number.");
        }
        sc.close();
    }
}
```

Output:

```
Enter a number: 789
789 is not an Armstrong number.
```

3.b) Checking of Even or Odd:

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(num + " is even");
        } else {
            System.out.println(num + " is odd");
        }
        sc.close();
    }
}
```

Output:

```
Enter a number: 1869
1869 is odd
```

3.c) 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 n = sc.nextInt();
        long fact = 1;
        for (int i = 1; i <= n; i++) {
            fact *= i;
        }
        System.out.println("Factorial of " + n + " is: " + fact);
        sc.close();
    }
}
```

Output:

```
Enter a number: 6
Factorial of 6 is: 720
```

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 number of terms: ");
        int n = sc.nextInt();
        int a = 0, b = 1, c;
        if (n <= 0) {
            System.out.println("Please enter a positive number.");
        } else if (n == 1) {
            System.out.println(a);
        } else {
            System.out.print(a + " " + b + " ");
            for (int i = 2; i < n; i++) {
                c = a + b;
                System.out.print(c + " ");
                a = b;
                b = c;
            }
        }
        sc.close();
    }
}
```

Output:

```
Enter number of terms: 8
0 1 1 2 3 5 8 13
```

3.e) Finding Largest number:

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

Output:

```
Enter three numbers: 2323 343 948437
948437 is the largest
```

3.f) Finding Leap year:

Code:

```
import java.util.Scanner;
public class Leap {
public static void main(String[] args) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter a year: ");
            int year = sc.nextInt();
      if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
            System.out.println(year + " is a leap year.");
      } else {
            System.out.println(year + " is not a leap year.");
      }
      sc.close();
      }
}
```

Output:

```
Enter a year: 2025
2025 is not a leap year.
```

3.g) Number Check:

Code:

```
import java.util.Scanner;
public class NumberCheck {
public static void main(String[] args) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter a number: ");
      int num = sc.nextInt();
      if (num > 0) {
            System.out.println("The number is positive");
      } else if (num < 0) {
            System.out.println("The number is negative");
      } else {
            System.out.println("The number is zero");
      }
      sc.close();
      }
}
```

Output:

```
Enter a number: -10
The number is negative
```

3.h) Palindrome Checker:

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();
        int original = num, rev = 0;
        while (num > 0) {
            int digit = num % 10;
            rev = rev * 10 + digit;
            num /= 10;
        }
        if (original == rev)
            System.out.println(original + " is a palindrome.");
        else
            System.out.println(original + " is not a palindrome.");
        sc.close();
    }
}
```

Output:

```
Enter a number: 767
767 is a palindrome.
```

3.i) Prime Number:

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 = true;
        if (num <= 1) {
            isPrime = false;
        } else {
            for (int i = 2; i * i <= num; i++) {
                if (num % i == 0) {
                    isPrime = false;
                    break;
                }
            }
        }
        if (isPrime)
            System.out.println(num + " is a prime number.");
        else
            System.out.println(num + " is not a prime number.");

        sc.close();
    }
}
```

Output:

```
Enter a number: 8
8 is not a prime number.
```

3.j) Multiplication Table:

Code:

```
import java.util.Scanner;
public class Table {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int num = sc.nextInt();
        for (int i = 1; i <= 10; i++) {
            System.out.println(num + " x " + i + " = " + (num * i));
        }
        sc.close();
    }
}
```

Output:

```
Enter a number: 8
8 x 1 = 8
8 x 2 = 16
8 x 3 = 24
8 x 4 = 32
8 x 5 = 40
8 x 6 = 48
8 x 7 = 56
8 x 8 = 64
8 x 9 = 72
8 x 10 = 80
```