SCHOOL OF
COMPUTING

CHANTATI SAI

PURNISHA MAHI

CH.SC.U4CSE24156

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.U4CSE24156 – CHANTATI PURNISHA MAHI*** 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. RESTAURENT MANAGEMENT

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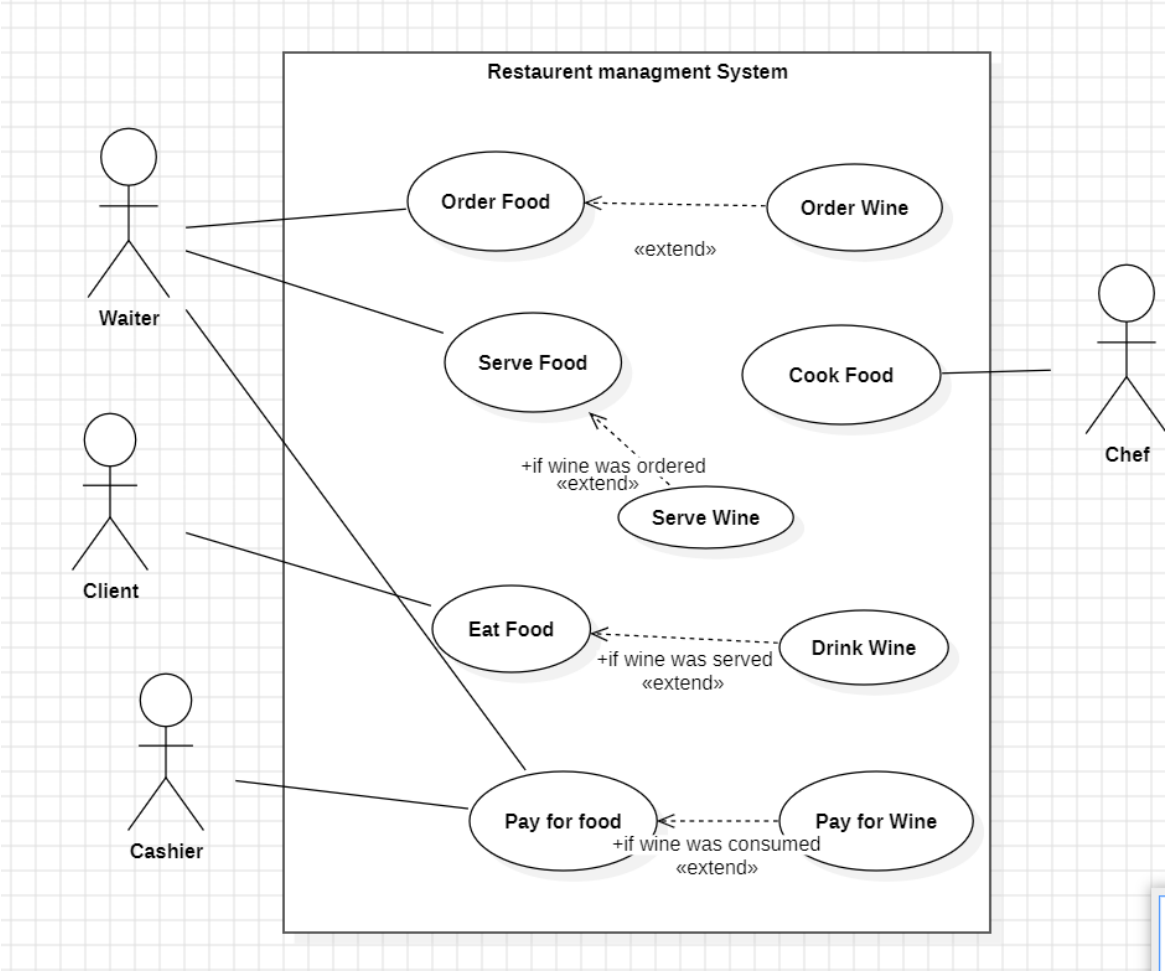
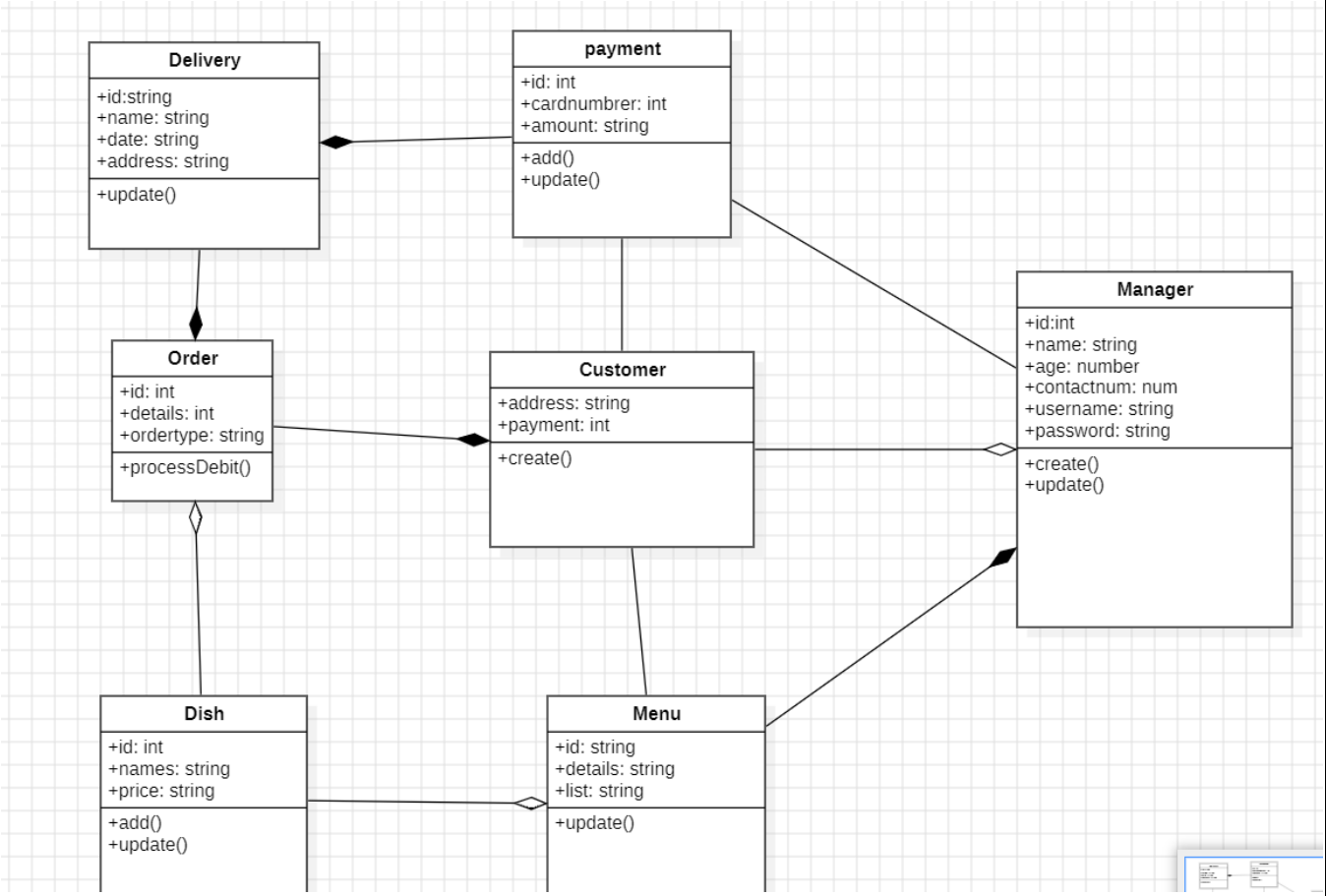
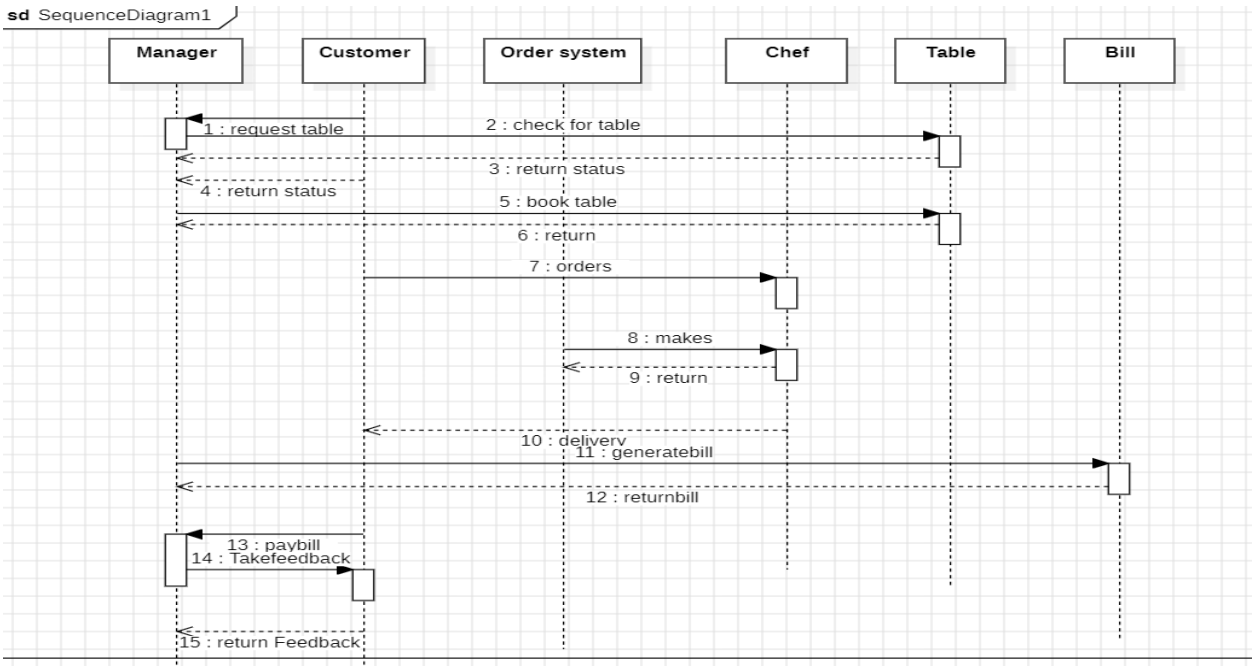


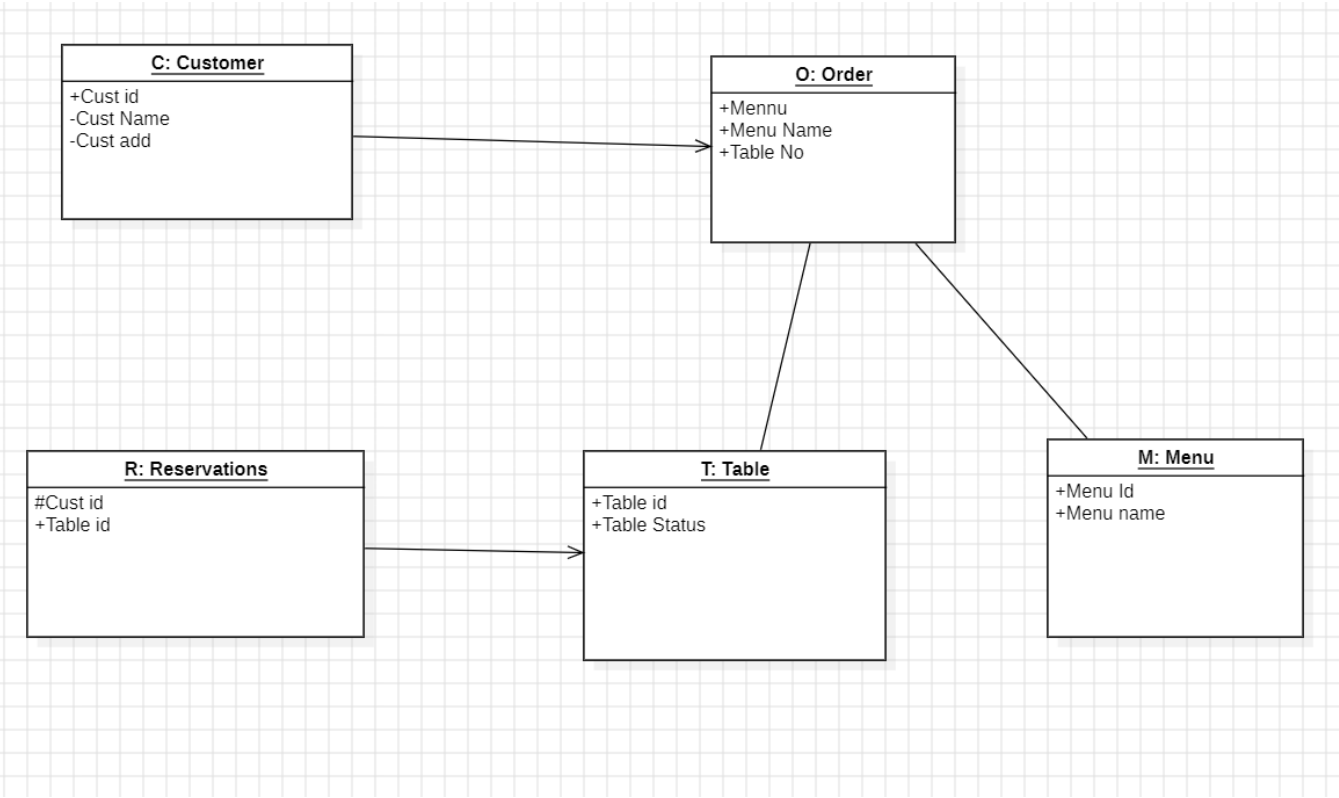
1.b) Class Diagram:



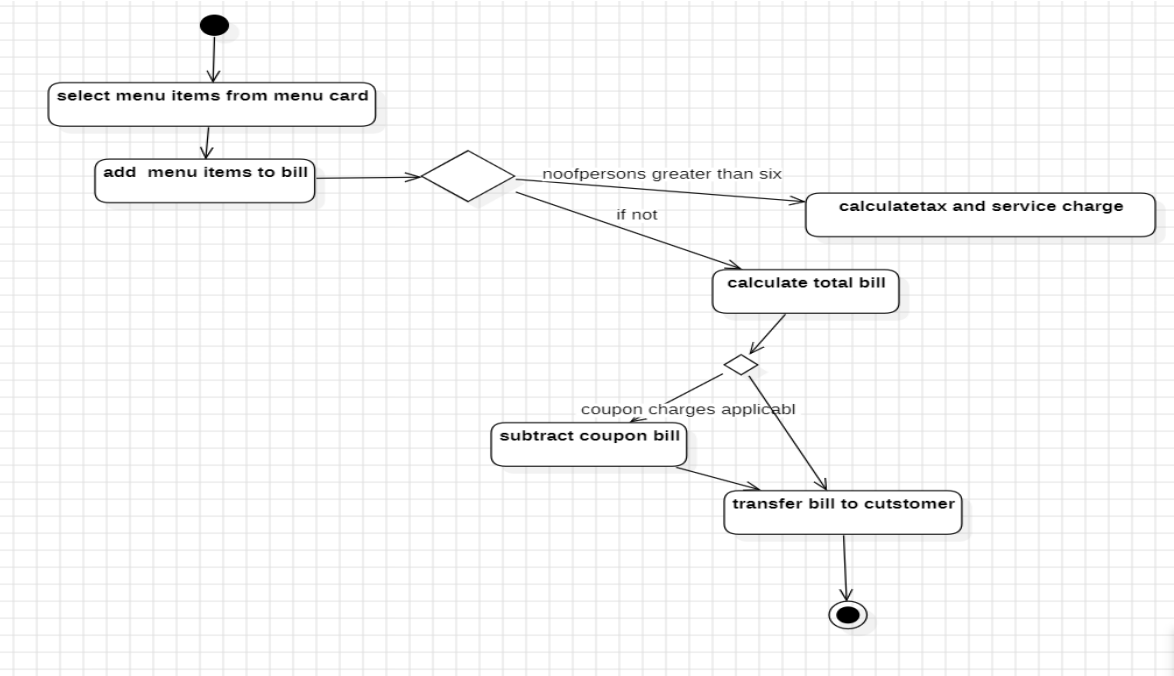
1.c) Sequence Diagram:



1.d) Object Diagram:

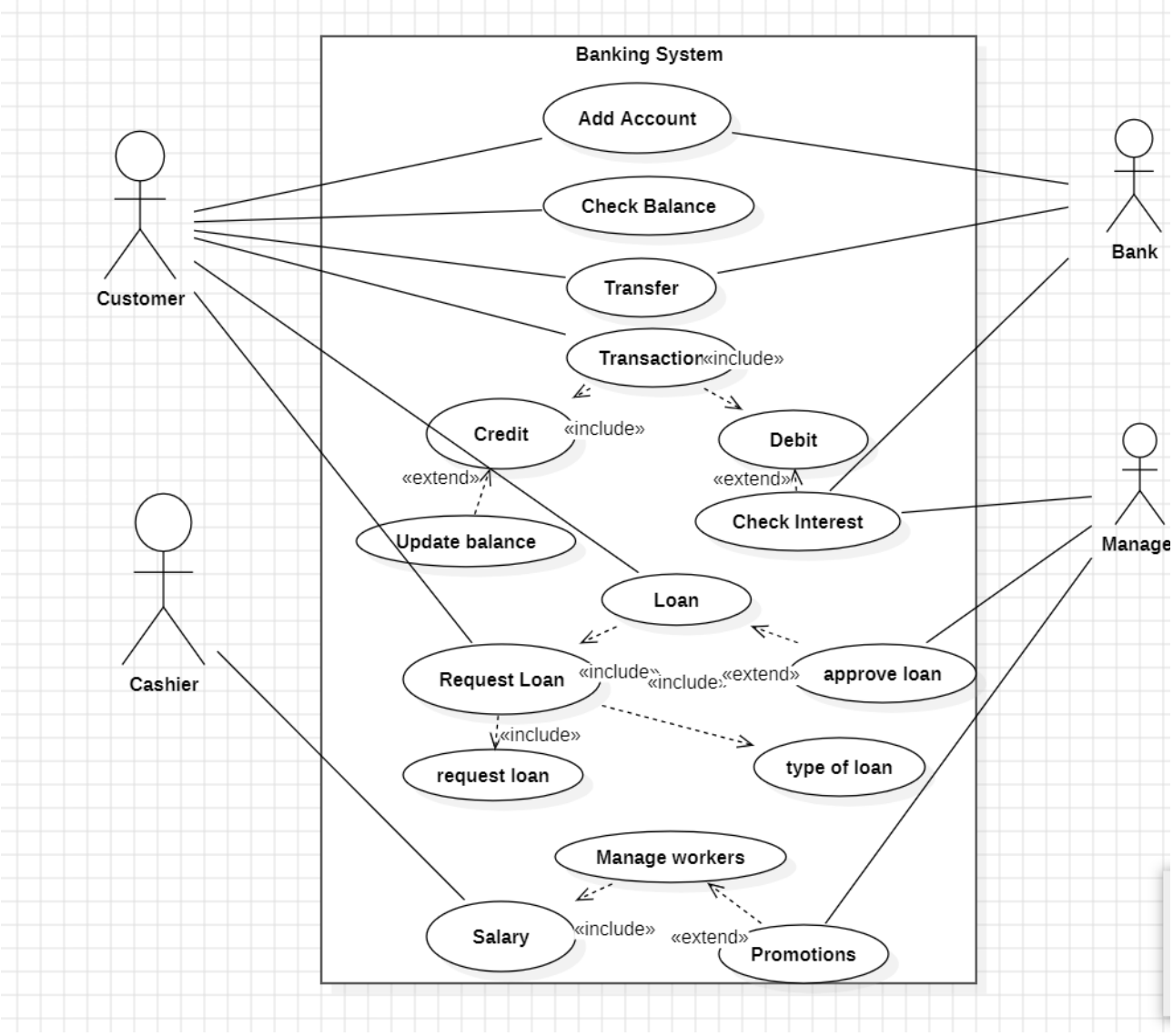


1.e) State-Activity Diagram:

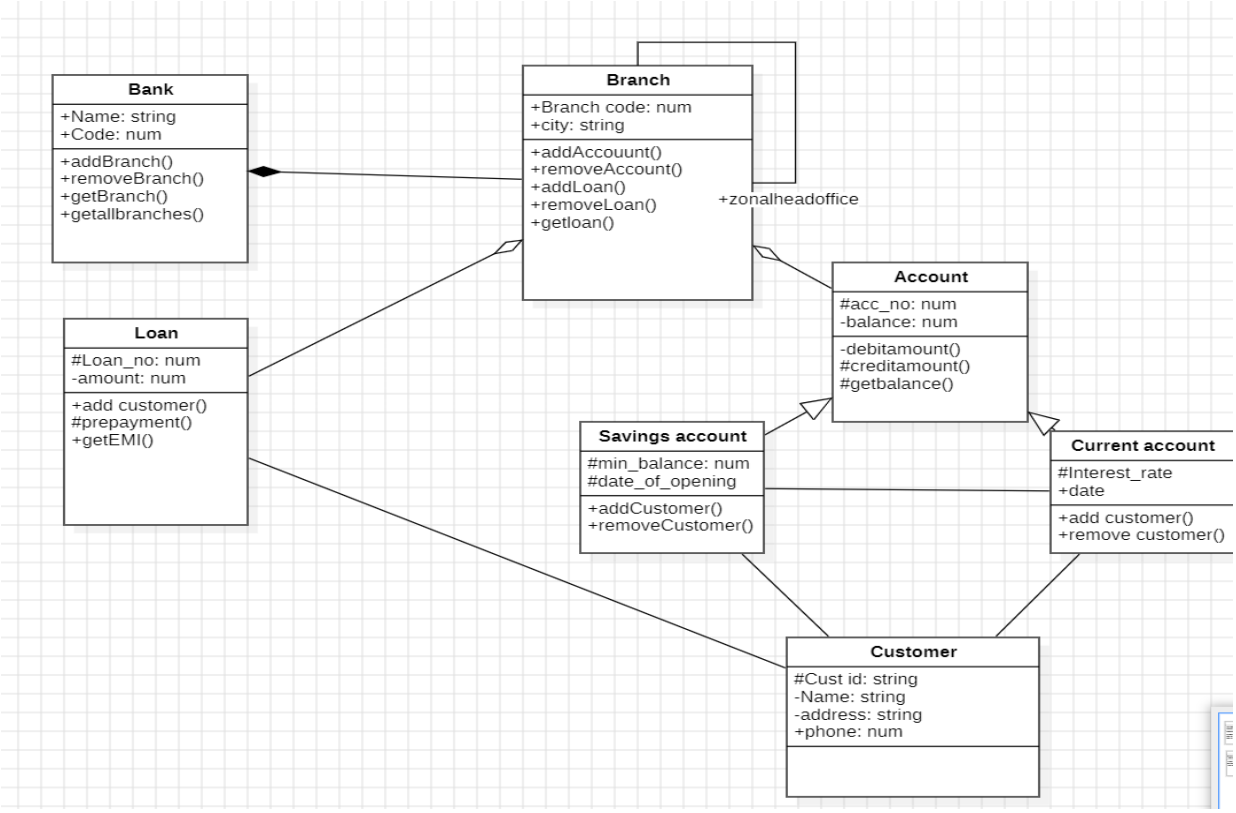


2. BANKING MANAGEMENT SYSTEM

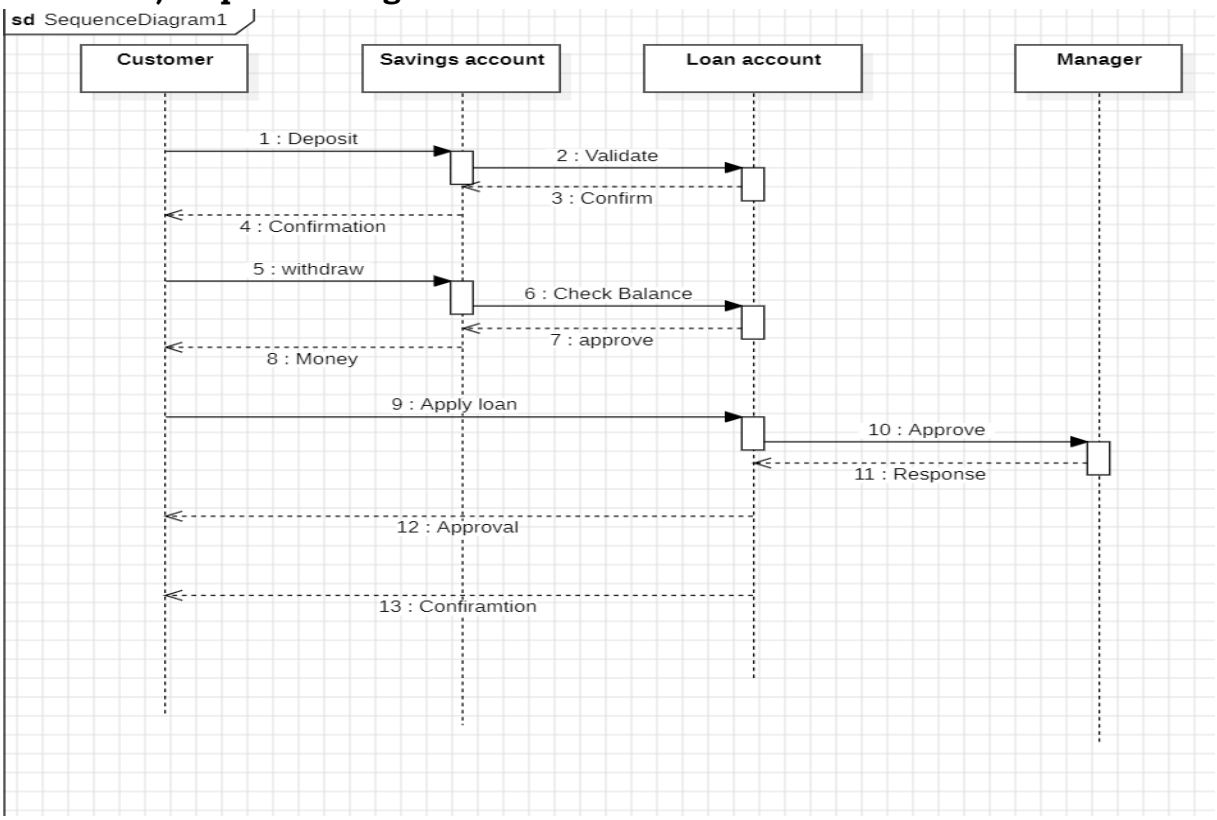
2.a) Use Case Diagram:



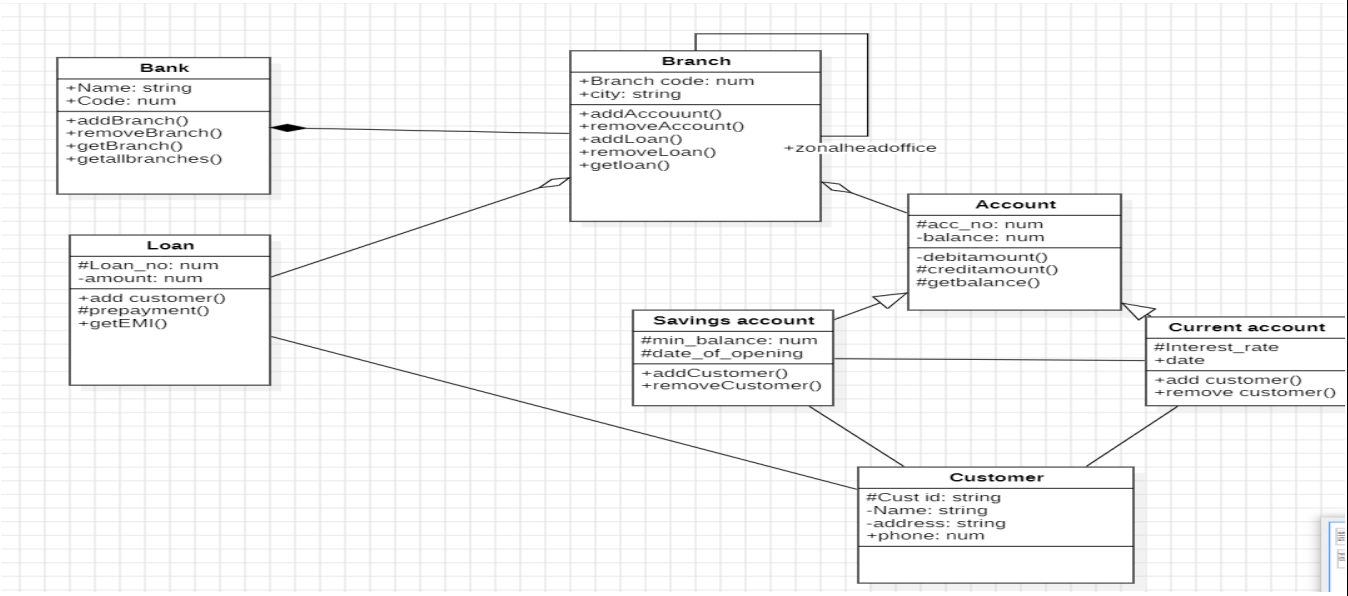
2.b) Class Diagram:



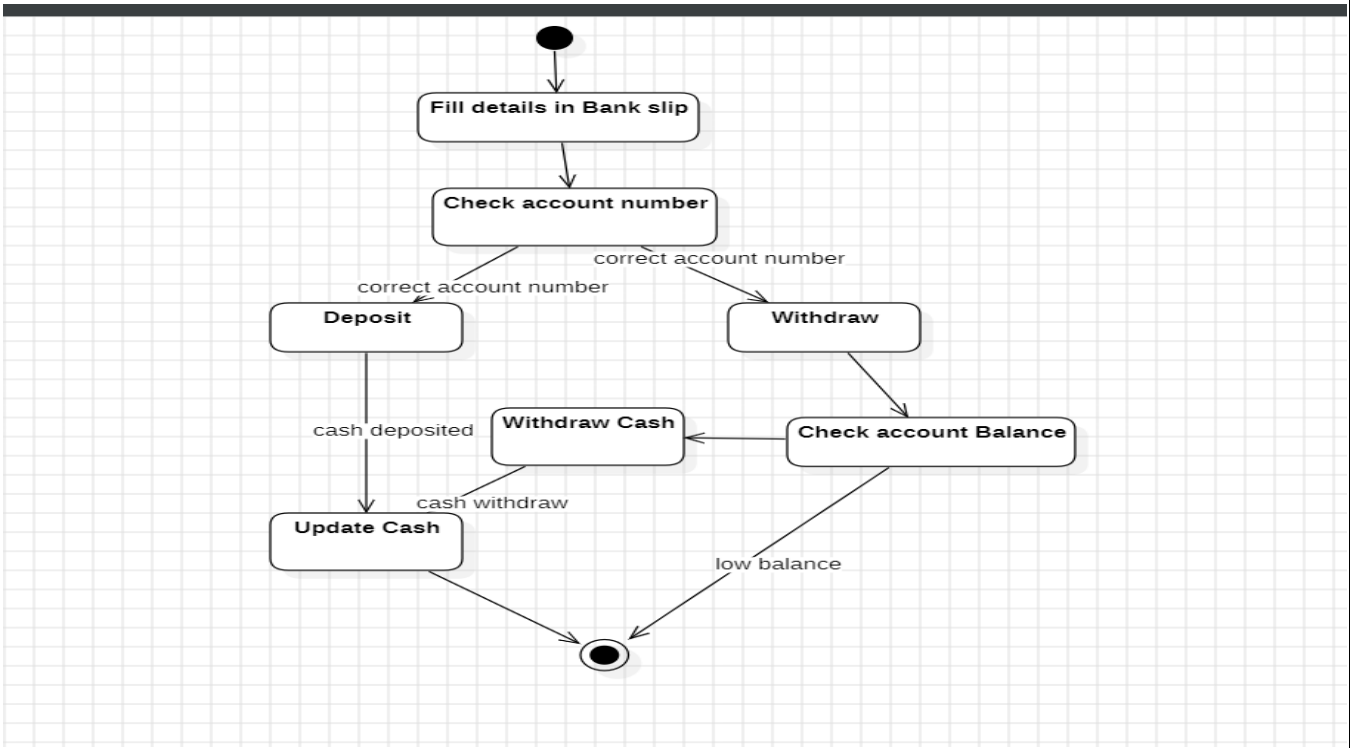
2.c) Sequence Diagram:



2.d) Object Diagram:



2.e) State-Activity Diagram:



3. Basic Java Programs

3.a) 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();

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

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

Output:

```
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> javac Cou
ntDigits.java
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> java Coun
tdigits.java
Enter a number: 3
Number of digits: 1
```

3.b) EvenOddCheck:

Code:

```
import java.util.Scanner;
public class EvenOddCheck {
    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");
        } else {
            System.out.println("Odd");
        }
    }
}
```

Output:

```
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> javac Even
nOddCheck.java
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> java Even
OddCheck.java
Enter a number: 564
Even
```

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 num = sc.nextInt();

        int fact = 1;
        int i = num;
        while (i > 0) {
            fact *= i;
            i--;
        }

        System.out.println("Factorial of " + num + " is: " + fact);
    }
}
```

Output:

```
iven
S C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> javac Fac
torial.java
S C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> java Fact
rial.java
nter a number: 6
actorial of 6 is: 720
```

3.d) 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 first number: ");
        int num1 = sc.nextInt();

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

        System.out.print("Enter third number: ");
        int num3 = sc.nextInt();

        int largest;

        if (num1 >= num2 && num1 >= num3) {
            largest = num1;
        } else if (num2 >= num1 && num2 >= num3) {
            largest = num2;
        } else {
            largest = num3;
        }

        System.out.println("The largest number is: " + largest);
    }

            }
```

Output:

```
Factorial of 6 is: 720
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> javac Lar
gestNumber.java
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> java Larg
estNumber.java
Enter first number: 5
Enter second number: 567
Enter third number: 123444
The largest number is: 123444
```

3.e) LCM :

Code:

```
import java.util.Scanner;


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


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


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


        int max = (num1 > num2) ? num1 : num2;
        while (true) {
            if (max % num1 == 0 && max % num2 == 0) {
                System.out.println("LCM of " + num1 + " and " + num2 + " is:
" + max);
                break;
            }
            max++;
        }
    }
}
```

Output

```
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> javac LCM
.java
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> java LCM.
java
Enter first number: 34
Enter second number: 2
LCM of 34 and 2 is: 34
```

:

3.f) Leap Year check:

Code:

```
import java.util.Scanner;
public class LeapYearCheck {
    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.");
        }
    }
}
```

Output:

```
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> javac Lea
pYearCheck.java
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> java Leap
YearCheck.java
Enter a year: 2024
2024 is a Leap Year.
```

3.g) Palindrome Check:

Code:

```
import java.util.Scanner;
public class PalindromeCheck {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.print("Enter a number: ");
        int num = sc.nextInt();

        int originalNum = num;
        int reversedNum = 0;

        while (num > 0) {
            int digit = num % 10;
            reversedNum = reversedNum * 10 + digit;
            num /= 10;
        }

        if (originalNum == reversedNum) {
            System.out.println(originalNum + " is a Palindrome.");
        } else {
            System.out.println(originalNum + " is NOT a Palindrome.");
        }
    }
}
```

Output:

```
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> javac Pal
indromeCheck.java
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> java Pali
ndromeCheck.java
Enter a number: 2332
2332 is a Palindrome.
```

3.h) Multiplication table:

Code:

```
import java.util.Scanner;

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

        System.out.print("Enter a number: ");
        int num = sc.nextInt();

        System.out.println("Multiplication Table of " + num + ":");
        for (int i = 1; i <= 10; i++) {
            System.out.println(num + " x " + i + " = " + (num * i));
        }
    }
}
```

Output:

```
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> javac Mul
tiplicationTable.java
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> java Mult
iplicationTable.java
Enter a number: 4
Multiplication Table of 4:
4 x 1 = 4
4 x 2 = 8
4 x 3 = 12
4 x 4 = 16
4 x 5 = 20
4 x 6 = 24
4 x 7 = 28
4 x 8 = 32
4 x 9 = 36
4 x 10 = 40
```

3.i) PowerOfNumber:

Code:

```
import java.util.Scanner;

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

        System.out.print("Enter the base number: ");
        int base = sc.nextInt();

        System.out.print("Enter the exponent: ");
        int exponent = sc.nextInt();

        int result = 1;

        for (int i = 1; i <= exponent; i++) {
            result *= base;
        }

        System.out.println(base + "^" + exponent + " = " + result);
    }
}
```

Output:

```
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> javac Pow
erOfNumber.java
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> java Powe
rOfNumber.java
Enter the base number: 4
Enter the exponent: 3
4^3 = 64
```

3.j) Sum of Digits:

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();
        int sum = 0;

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

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

Output:

```
4 3 = 64
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> javac Sum
OfDigits.java
PS C:\Users\Purnishamahi\OneDrive\Documents\Basic Java Programmes> java SumO
fDigits.java
Enter a number: 12234
Sum of digits: 12
```