SCHOOL OF COMPUTING

LAB RECORD

OBJECT ORIENTED PROGRAMMING

(23CSE111)

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SECTION: B

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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.U4CSE24122 – LEENA K*** 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

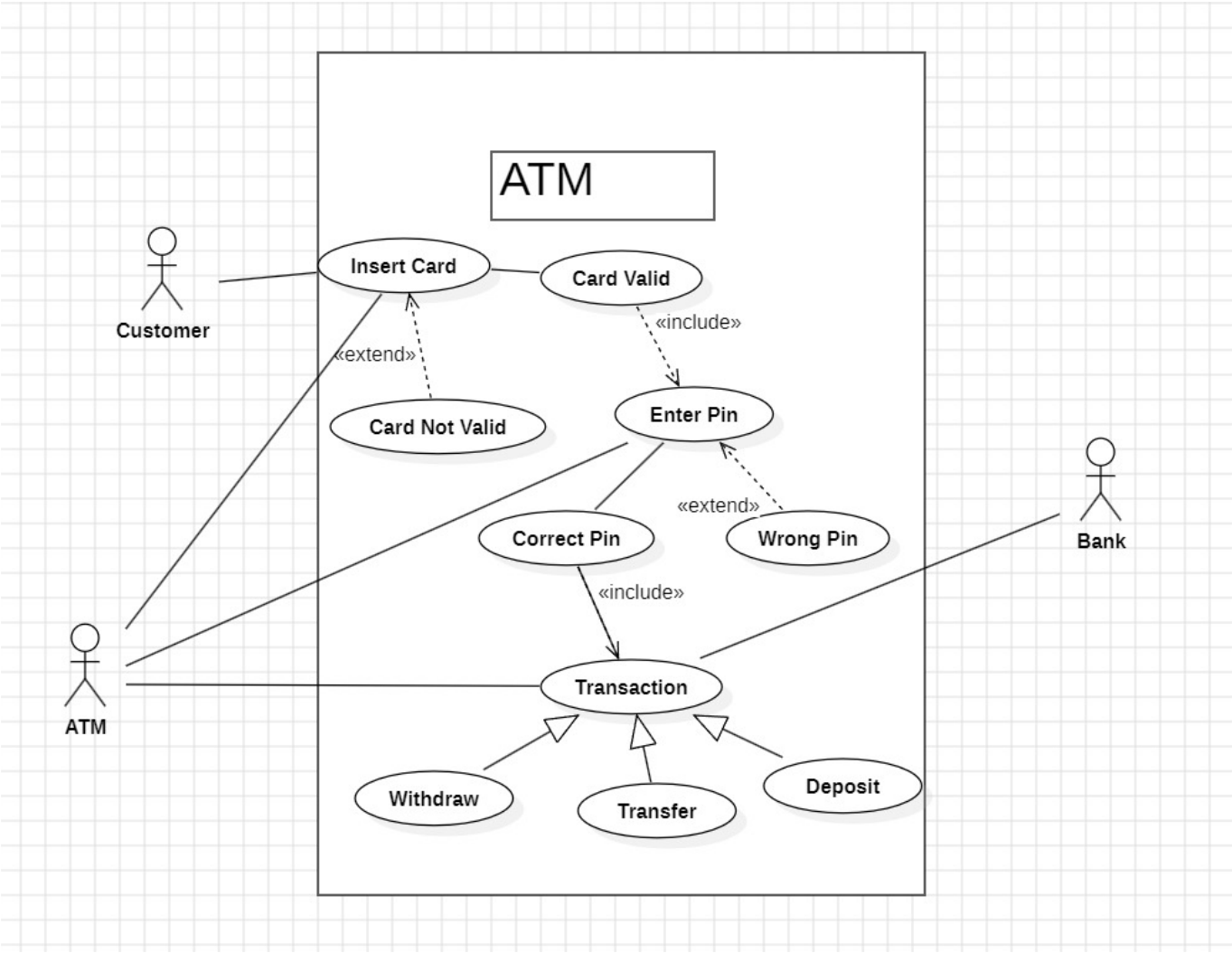
Internal Examiner 1 Internal Examiner 2

INDEX

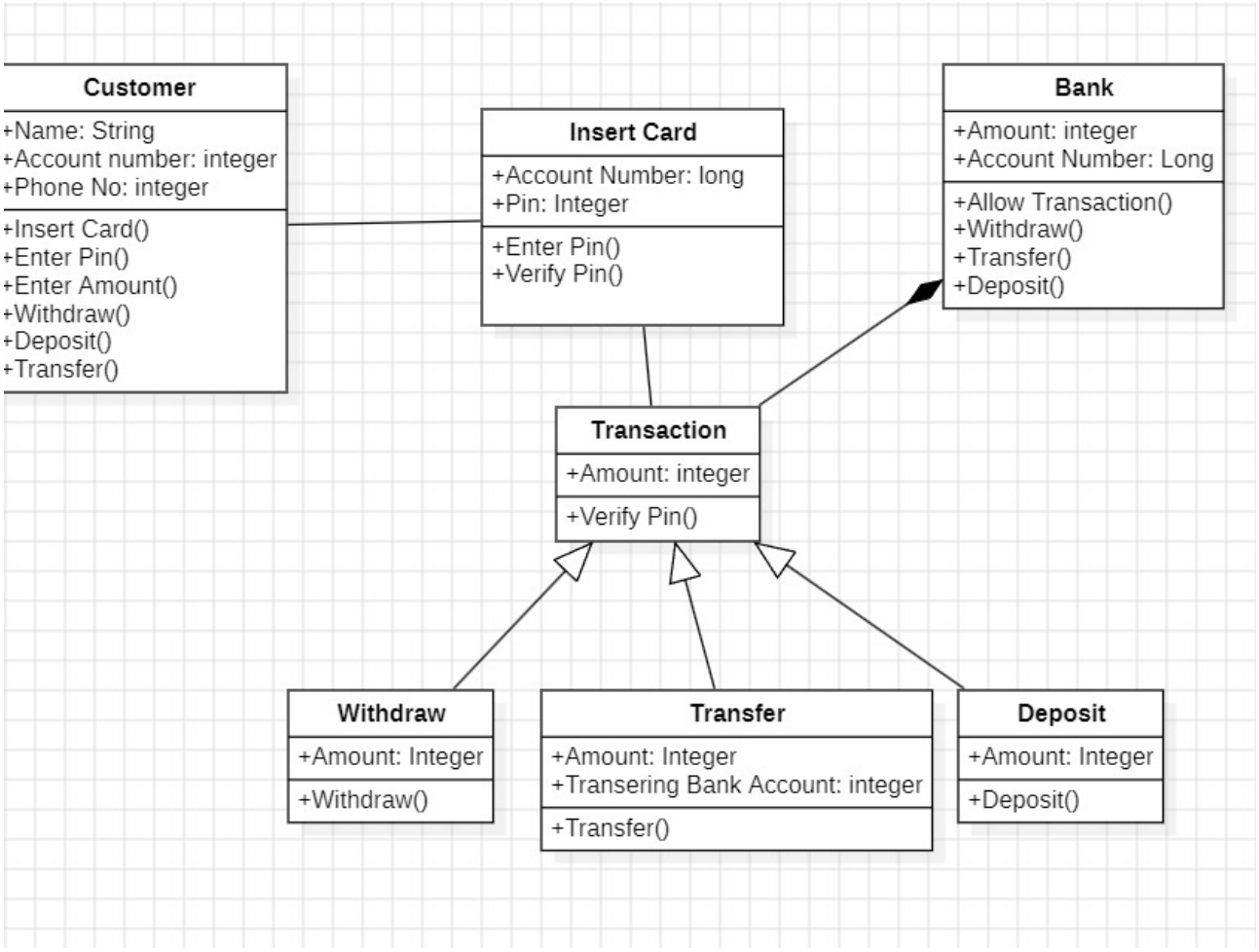
UML DIAGRAMS

1.ATM SYSTEM

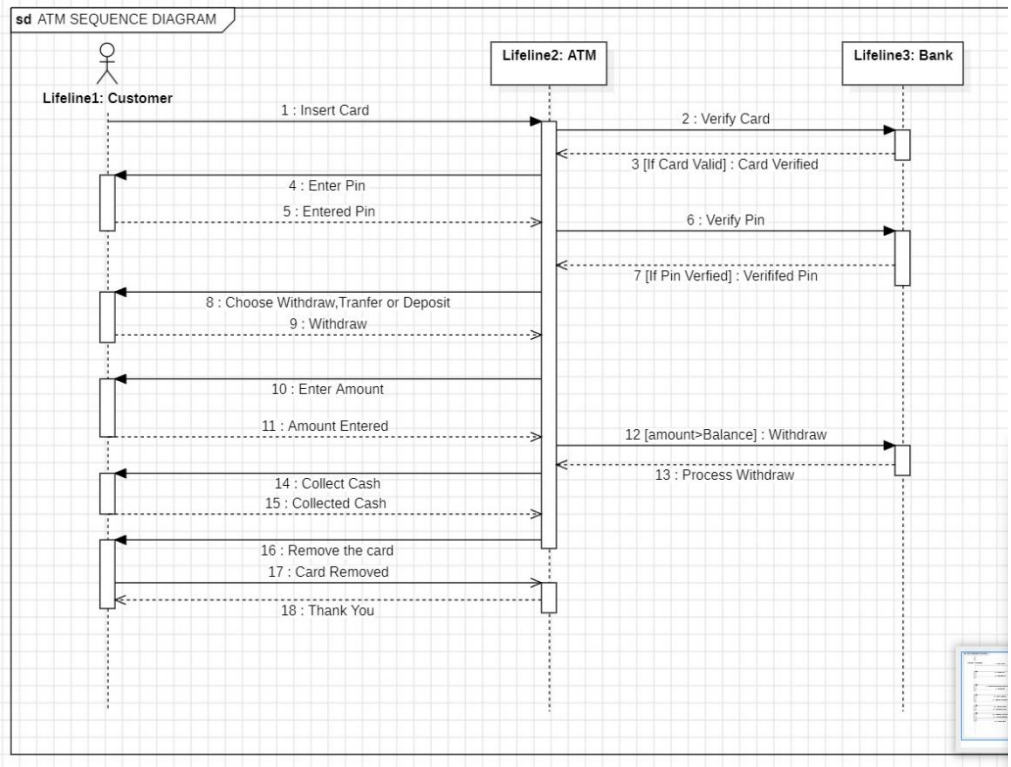
1.a) Use Case Diagram:



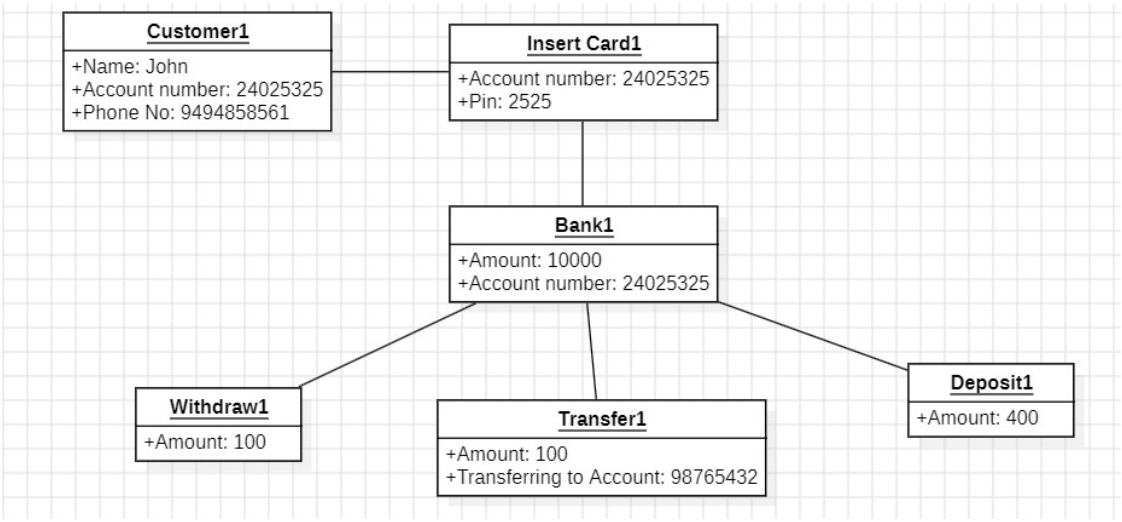
1.b) Class Diagram:



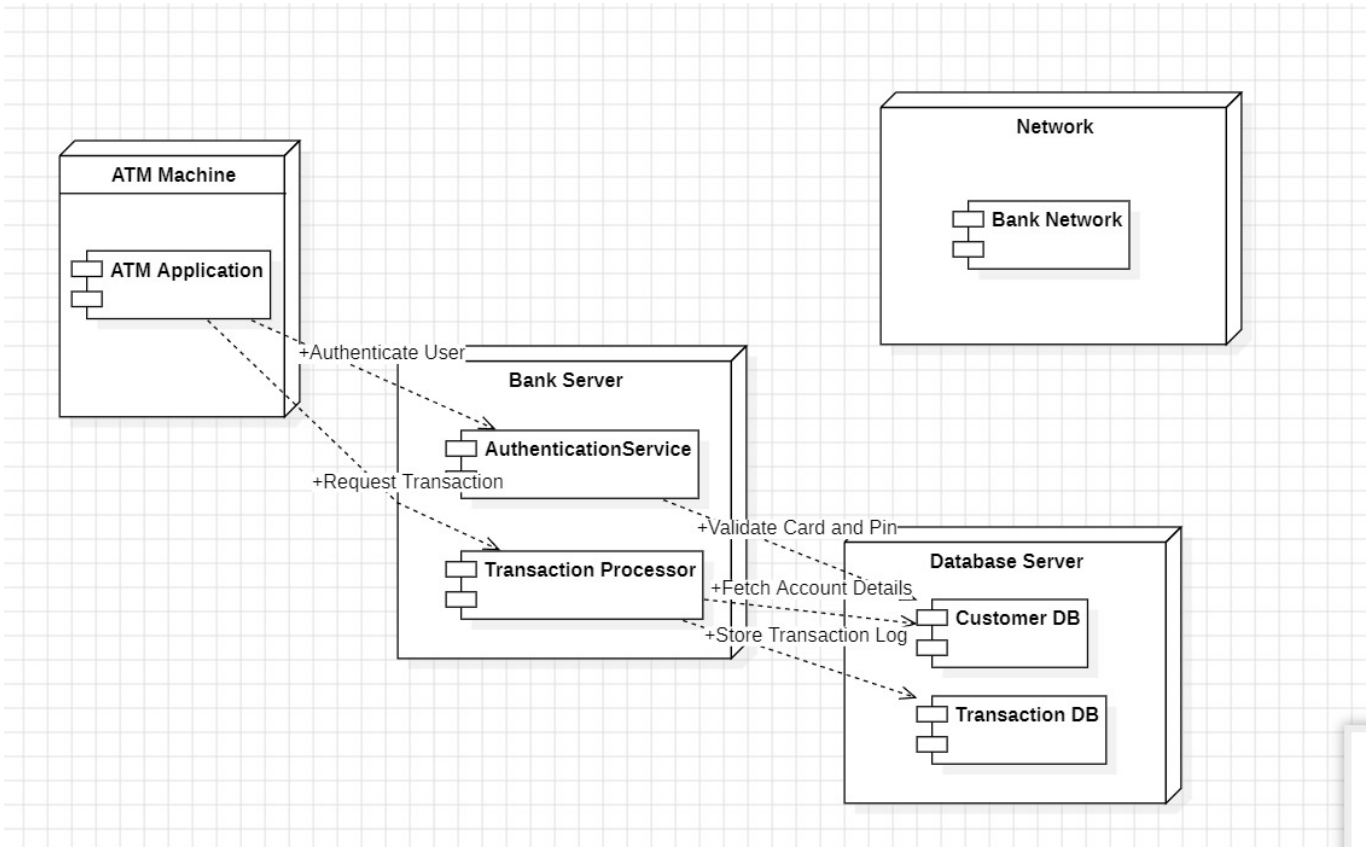
1.c) Sequence Diagram:



1.d) Object Diagram:

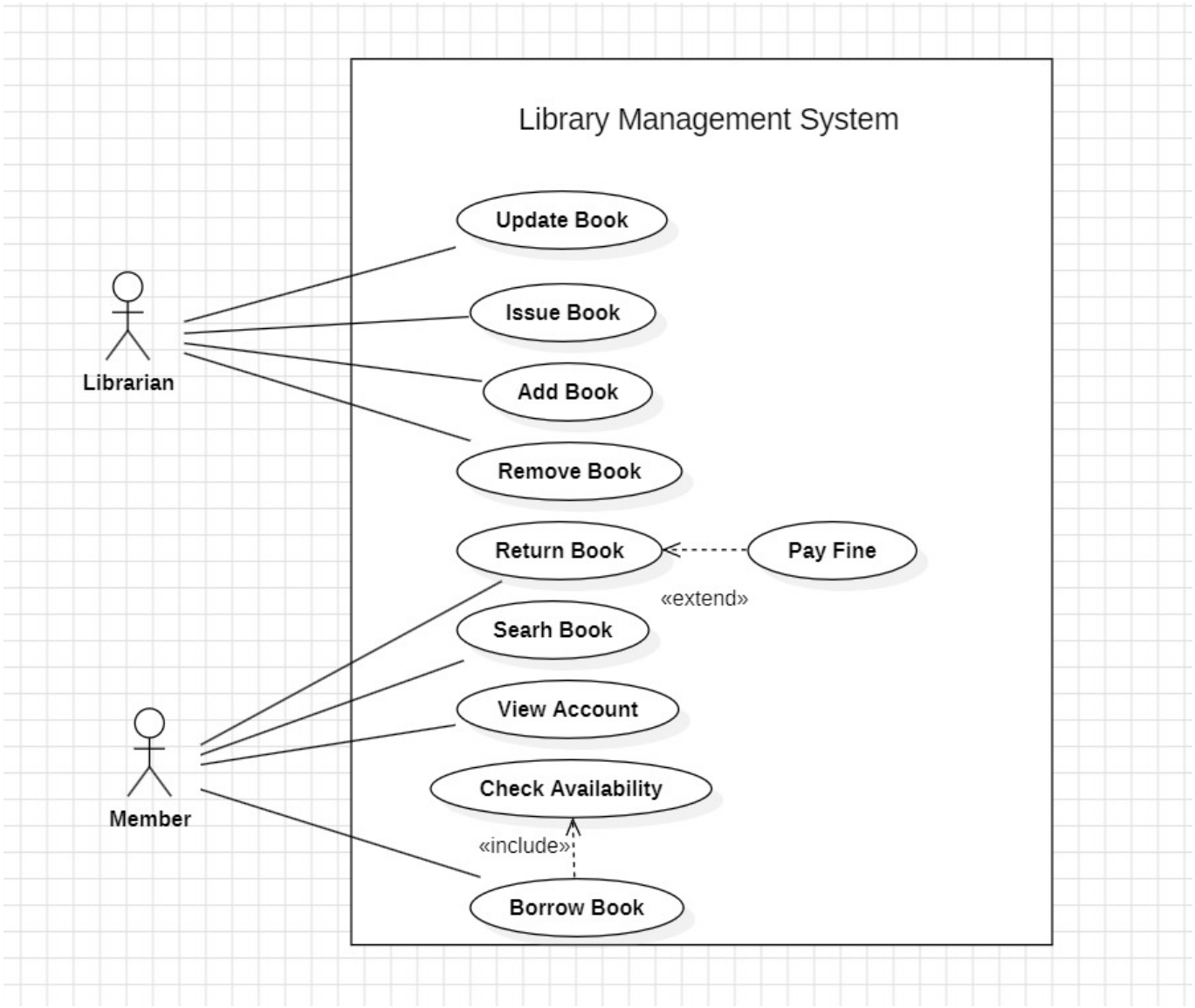


1.e) Deployment Diagram:

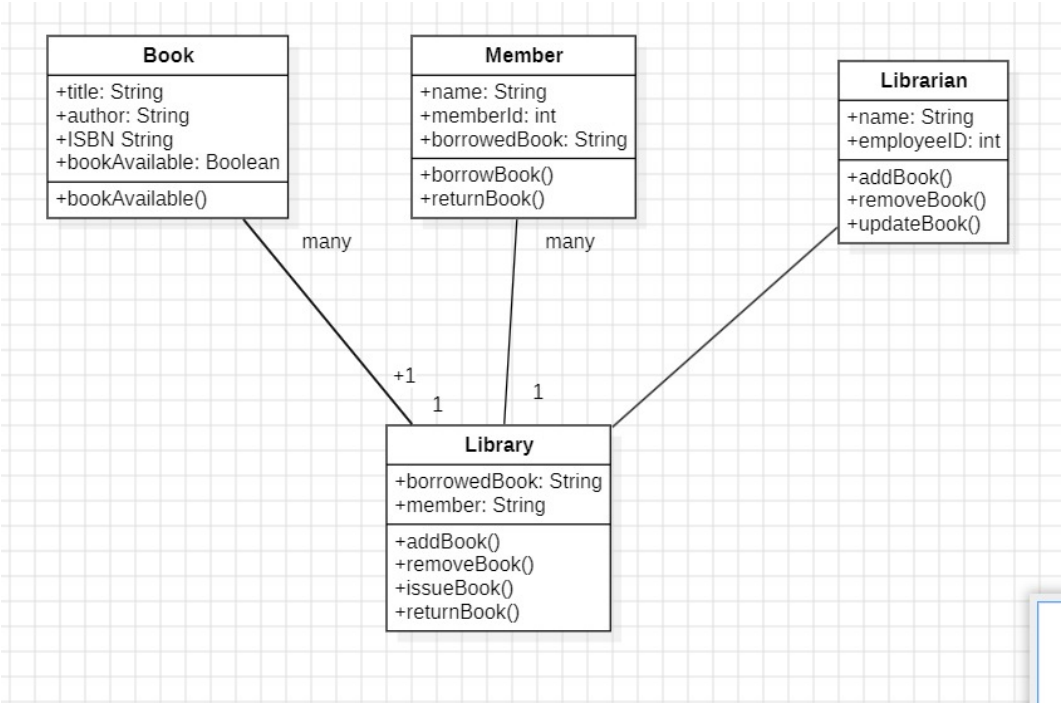


2. LIBRARY MANAGEMENT SYSTEM

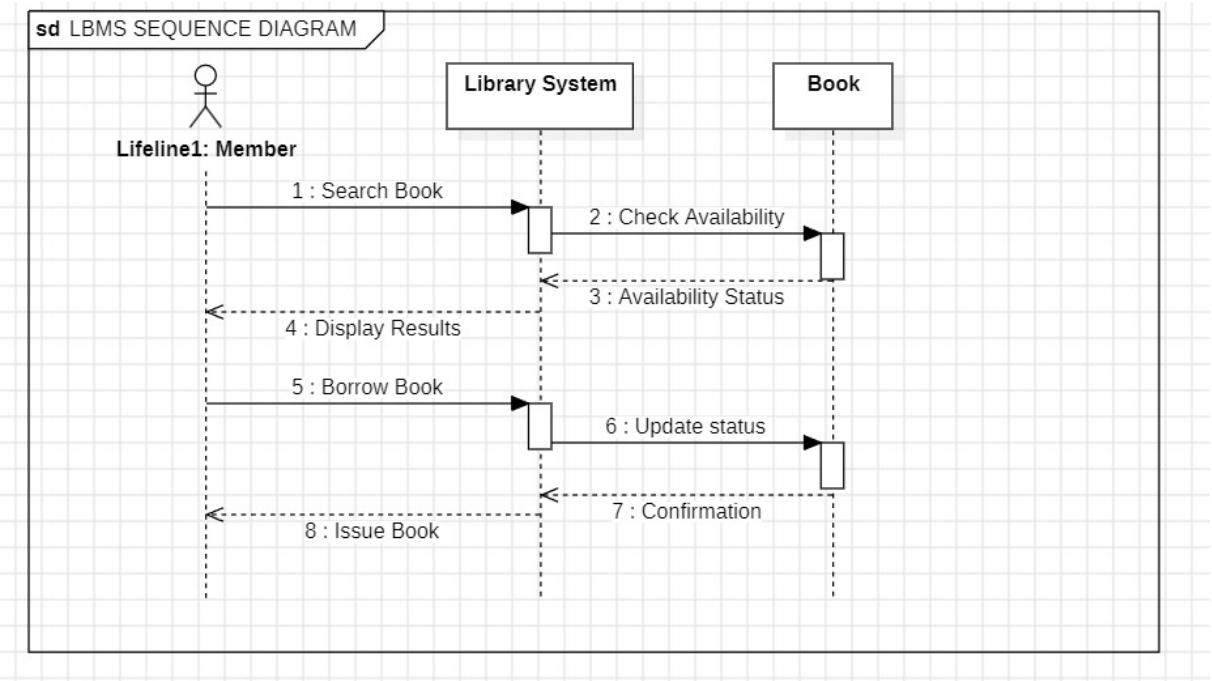
2.a) Use Case Diagram:



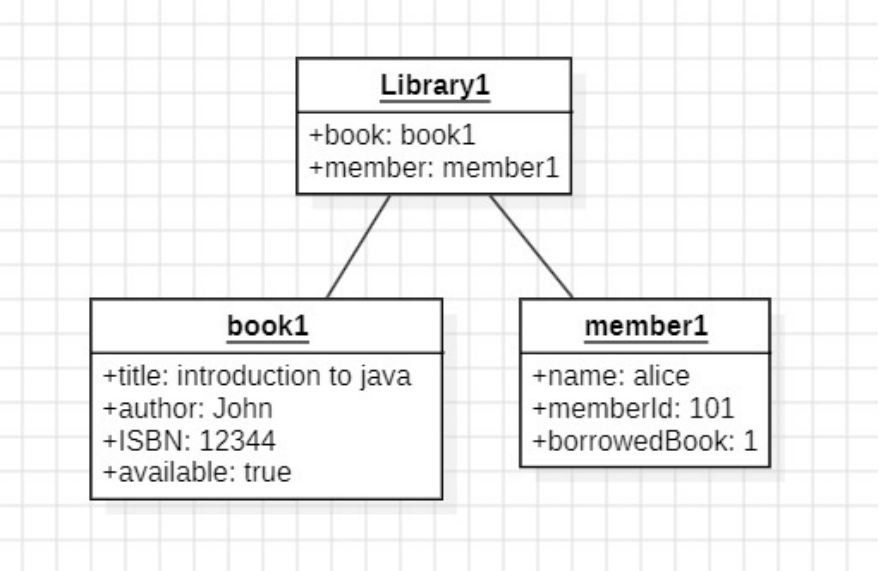
2.b) Class Diagram:



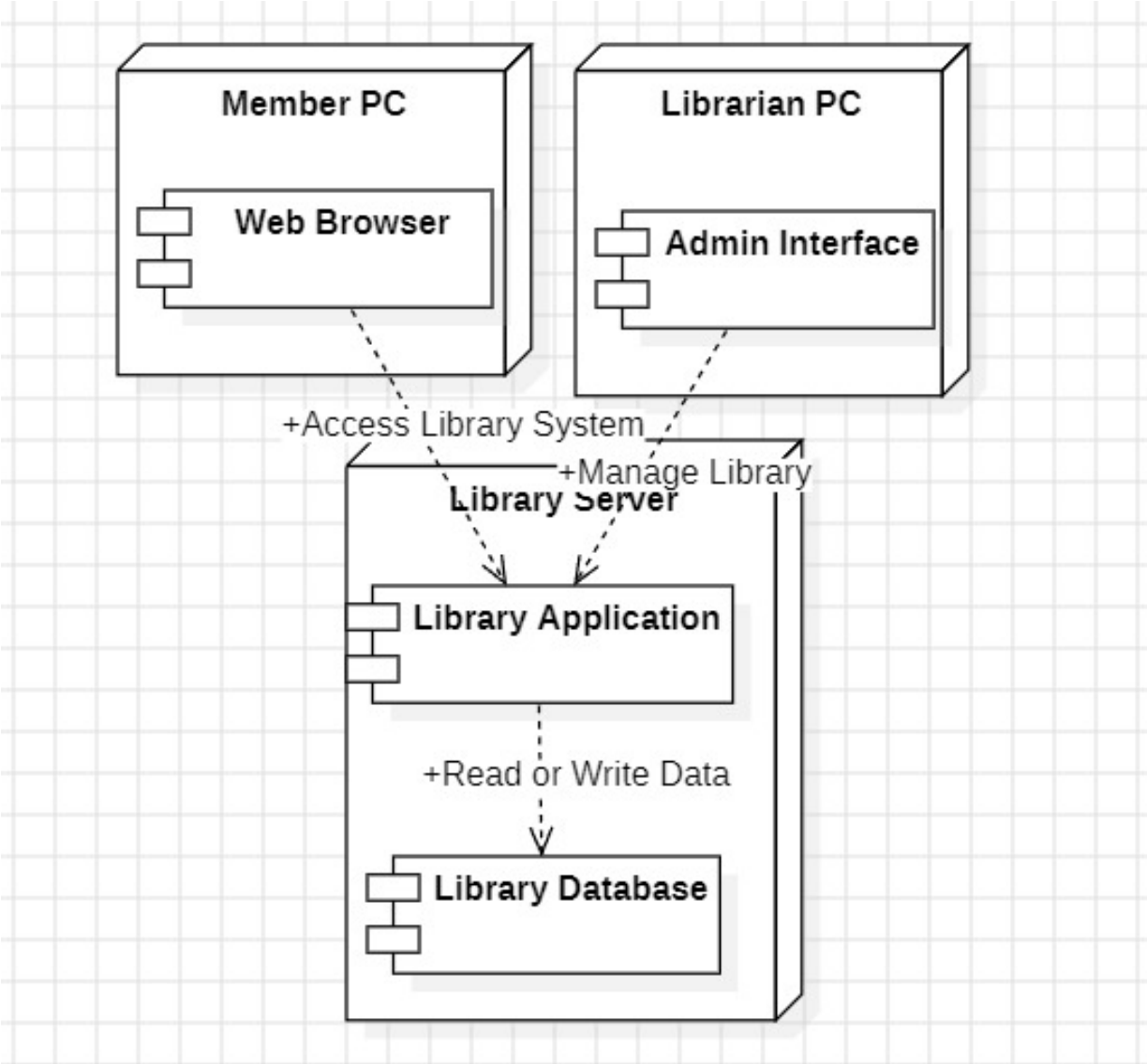
2.c) Sequence Diagram:



2.d) Object Diagram:



2.e)Deployment Diagram:



3.Basic Java Programs

3.a) Check Number Nature:

Code:

```
import java.util.Scanner;

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

Output:

```
C:\Users\kpriy\Downloads>

C:\Users\kpriy\Downloads>java CheckNumber.java
Enter a number: -15
-15 is negative.
```

3.b) Even or Odd:

Code:

```
import java.util.Scanner;

public class EvenOdd {
    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:

```
C:\Users\kpriy\Downloads>javac EvenOdd.java

C:\Users\kpriy\Downloads>java EvenOdd
Enter a number: 3
3 is Odd
```

3.c) Factorial:

Code:

```
import java.util.Scanner;

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

Output:

```
C:\Users\kpriy\Downloads>javac Factorial.java

C:\Users\kpriy\Downloads>java Factorial
Enter a number: 3
Factorial of 3 is: 6
```

3.d) Fibonacci Series:

Code:

```
import java.util.Scanner;

public class Fibonacci{
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter the number of terms: ");
        int n = scanner.nextInt();
        int firstTerm = 0, secondTerm = 1;
        System.out.println("Fibonacci Series:");
        for (int i = 1; i <= n; i++) {
            System.out.print(firstTerm + " ");
            int nextTerm = firstTerm + secondTerm;
            firstTerm = secondTerm;
            secondTerm = nextTerm;
        }
        scanner.close();
    }
}
```

Output;

```
C:\Users\kpriy\Downloads>javac Fibonacci.java

C:\Users\kpriy\Downloads>java Fibonacci
Enter the number of terms: 4
Fibonacci Series:
0 1 1 2
```

3.e) Leap Year:

Code:

```
import java.util.Scanner;

public class LeapYear {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a year: ");
        int year = scanner.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.");
        }
        scanner.close();
    }
}
```

Output:

```
C:\Users\kpriy\Downloads>javac LeapYear.java

C:\Users\kpriy\Downloads>java LeapYear
Enter a year: 2016
2016 is a leap year.
```

3.f) Multiplication Table:

Code:

```
import java.util.Scanner;

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

Output:

```
C:\Users\kpriy\Downloads>javac MultiplicationTable.java

C:\Users\kpriy\Downloads>java MultiplicationTable
Enter a number: 5
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
```

3.g) Palindrome No:

Code:

```
import java.util.Scanner;

public class PalindromeNo{
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int num = scanner.nextInt();
        int reversed = 0, original = num;
        while (num != 0) {
            int digit = num % 10;
            reversed = reversed * 10 + digit;
            num /= 10;
        }
        if (original == reversed) {
            System.out.println(original + " is a palindrome.");
        } else {
            System.out.println(original + " is not a palindrome.");
        }
        scanner.close();
    }
}
```

Output:

```
C:\Users\kpriy\Downloads>javac PalindromeNo.java

C:\Users\kpriy\Downloads>java PalindromeNo
Enter a number: 33
33 is a palindrome.
```

3.h) Prime No:

Code:

```
import java.util.Scanner;

public class PrimeNo{
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int num = scanner.nextInt();
        boolean isPrime = true;
        for (int i = 2; i <= num / 2; 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.");
        }
        scanner.close();
    }
}
```

Output:

```
C:\Users\kpriy\Downloads>javac PrimeNo.java

C:\Users\kpriy\Downloads>java PrimeNo
Enter a number: 9
9 is not a prime number.
```

3.i) Sum of Digits:

Code:

```
import java.util.Scanner;

public class SumOfDigits{
    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:

```
C:\Users\kpriy\Downloads>javac SumOfDigits.java

C:\Users\kpriy\Downloads>java SumOfDigits
Enter a number: 3
Sum of digits: 3
```

3.j) Sum of Natural Number:

Code:

```
import java.util.Scanner;

public class SumOfNaturalNumbers {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int n = scanner.nextInt();
        int sum = 0;
        for (int i = 1; i <= n; i++) {
            sum += i;
        }
        System.out.println("Sum of first " + n + " natural numbers is: " + sum);
        scanner.close();
    }
}
```

Output:

```
C:\Users\kpriy\Downloads>javac SumOfNaturalNumbers.java

C:\Users\kpriy\Downloads>java SumOfNaturalNumbers
Enter a number: 4
Sum of first 4 natural numbers is: 10
```