



SCHOOL OF  
COMPUTING

# LAB RECORD

23CSE111 – Object Oriented Programming

*Submitted by*

CH.SC.U4CSE24115 – Dhaksin Kaarthick

BACHELOR OF TECHNOLOGY  
IN  
COMPUTER SCIENCE AND ENGINEERING

AMRITA VISHWA VIDYAPEETHAM  
AMRITA SCHOOL OF COMPUTING

CHENNAI



SCHOOL OF  
COMPUTING

AMRITA VISHWA VIDYAPEETHAM  
AMRITA SCHOOL OF COMPUTING, CHENNAI

**BONAFIDE CERTIFICATE**

This is to certify that the Lab Record work for 23CSE111-Object Oriented Programming Subject submitted by **CH.SC.U4CSE24115 – Dhaksin Kaarthick S.U** 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.

Internal Examiner 1

Internal Examiner 2

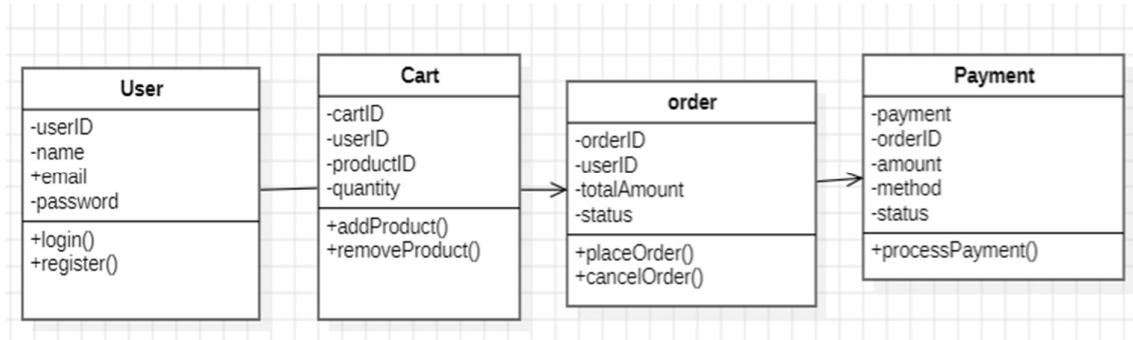
# Index

S.NO	Experiment Name	Page Number
1.	UML DIAGRAM	4
	Online Shopping <ul style="list-style-type: none"> <li>• Class Diagram</li> <li>• Use Case Diagram</li> <li>• Sequence Diagram</li> <li>• State Activity Diagram</li> <li>• Object Diagram</li> </ul>	4
2.	Library Management <ul style="list-style-type: none"> <li>• Class Diagram</li> <li>• Use Case Diagram</li> <li>• Sequence Diagram</li> <li>• State Activity Diagram</li> <li>• Object Diagram</li> </ul>	8
3.	Java Basic Programs	12
i)	Armstrong Number:	12
ii)	Count Digits	13
iii)	Even or Odd:	14
iv)	Factorial	15
v)	Fibonacci	16
vi)	Palindrome Check	17
vii)	Prime Check	18
viii)	Print Number	19
xi)	Reverse Number:	20
x)	Sum Of Natural Number	21

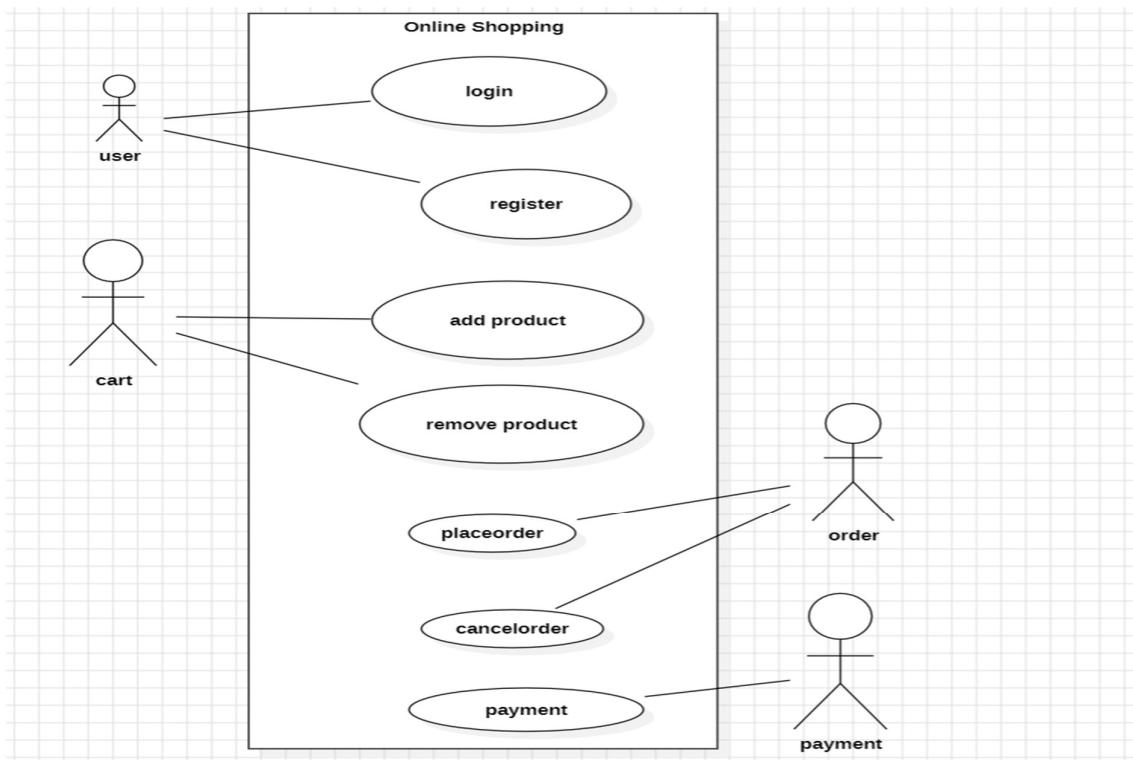
# UML DIAGRAM

## 1. Online Shopping

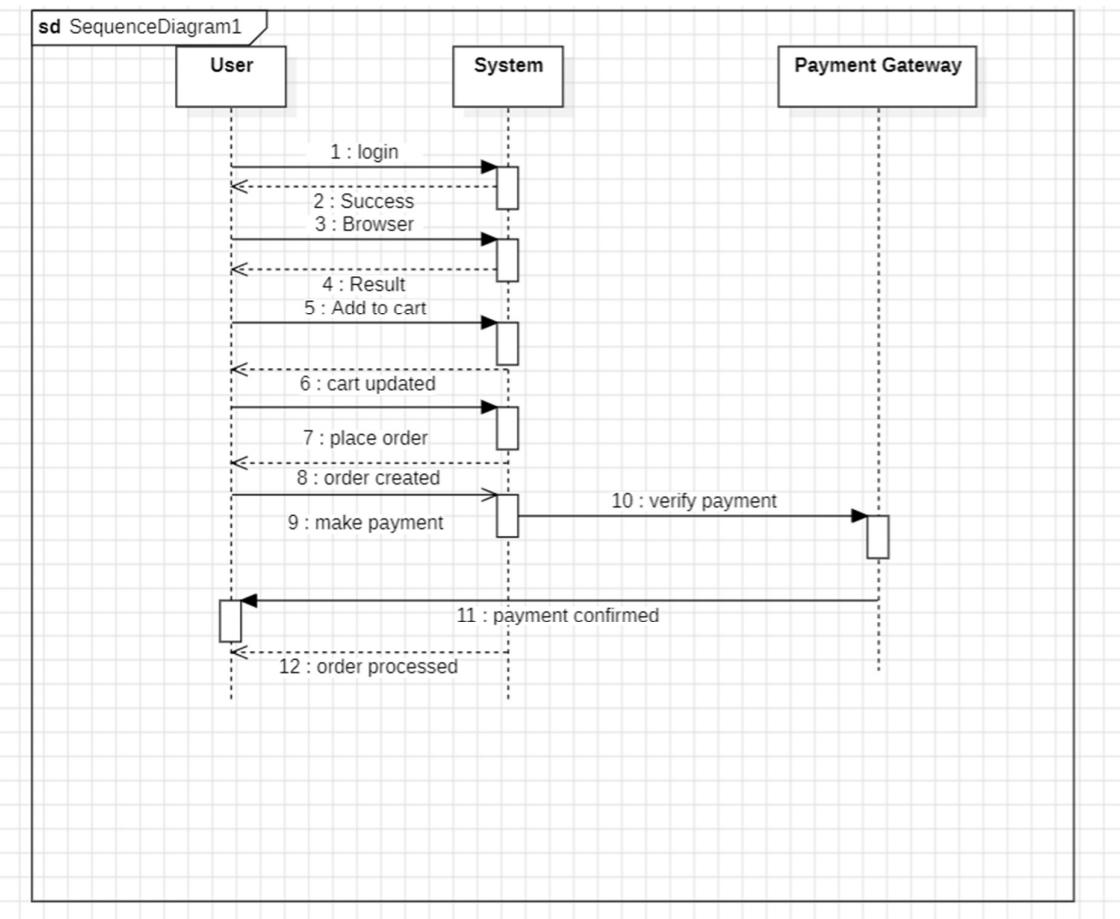
### i. Class Diagram:



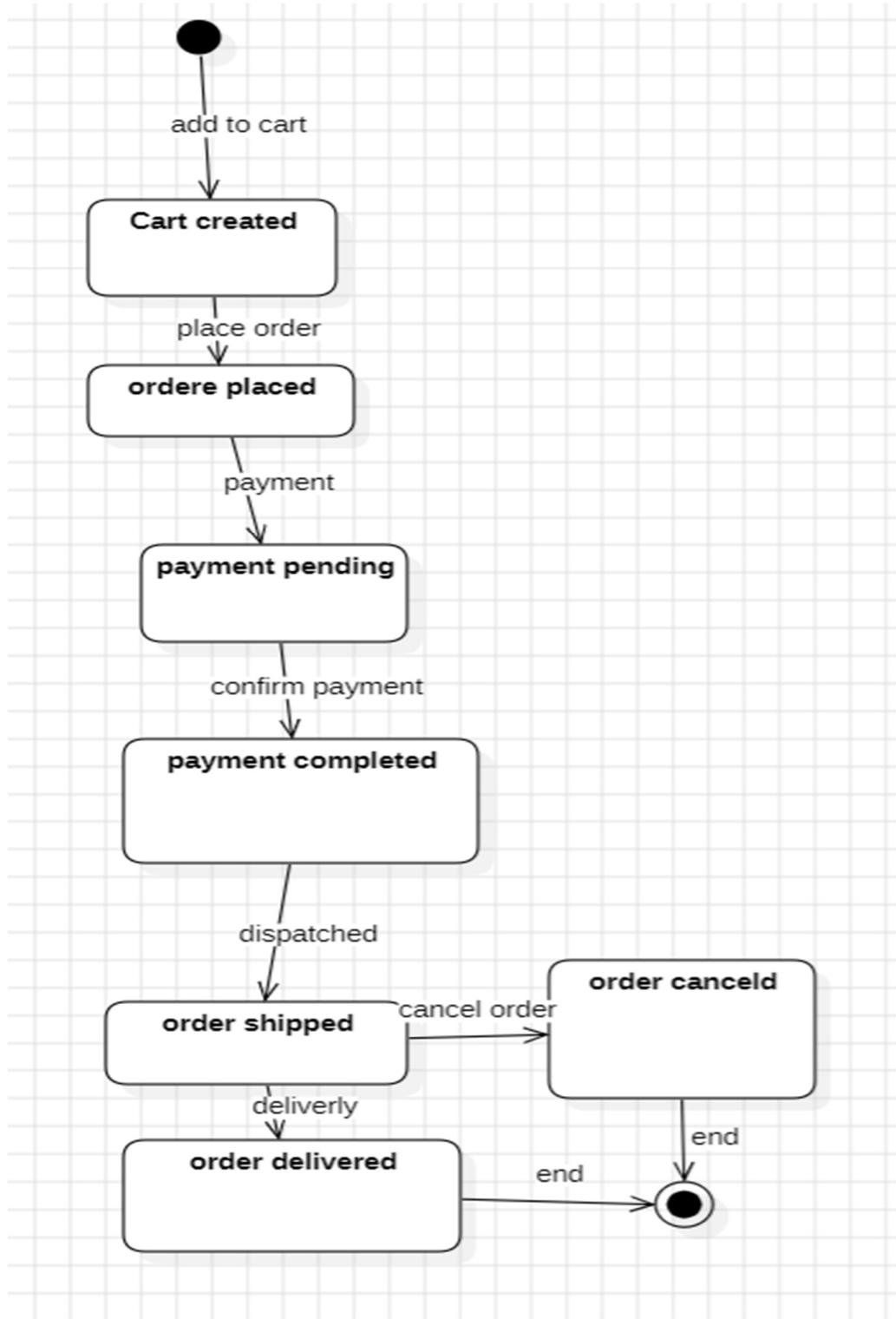
### ii. Use Case Diagram:



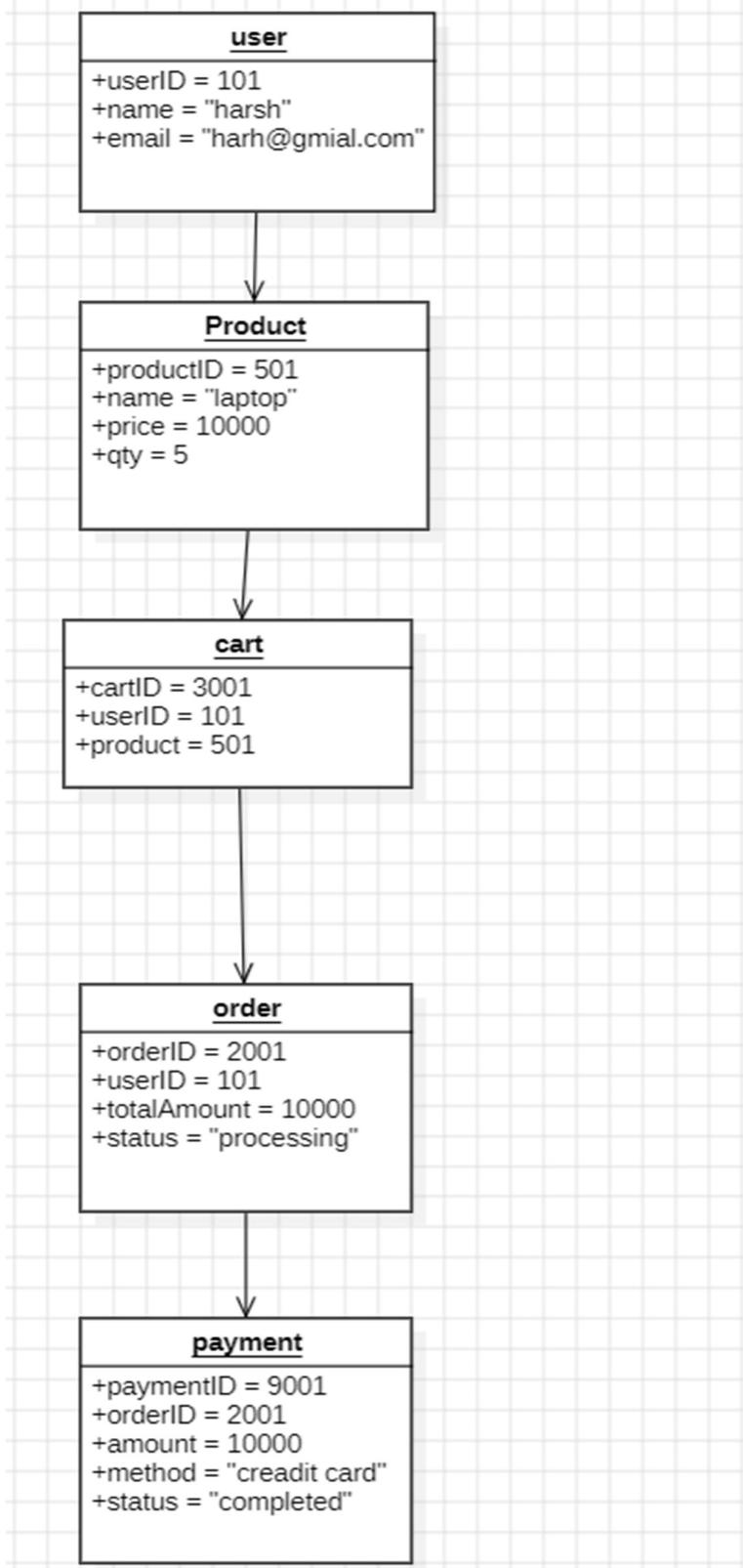
### iii. Sequence Diagram:



iv. State Activity Diagram:

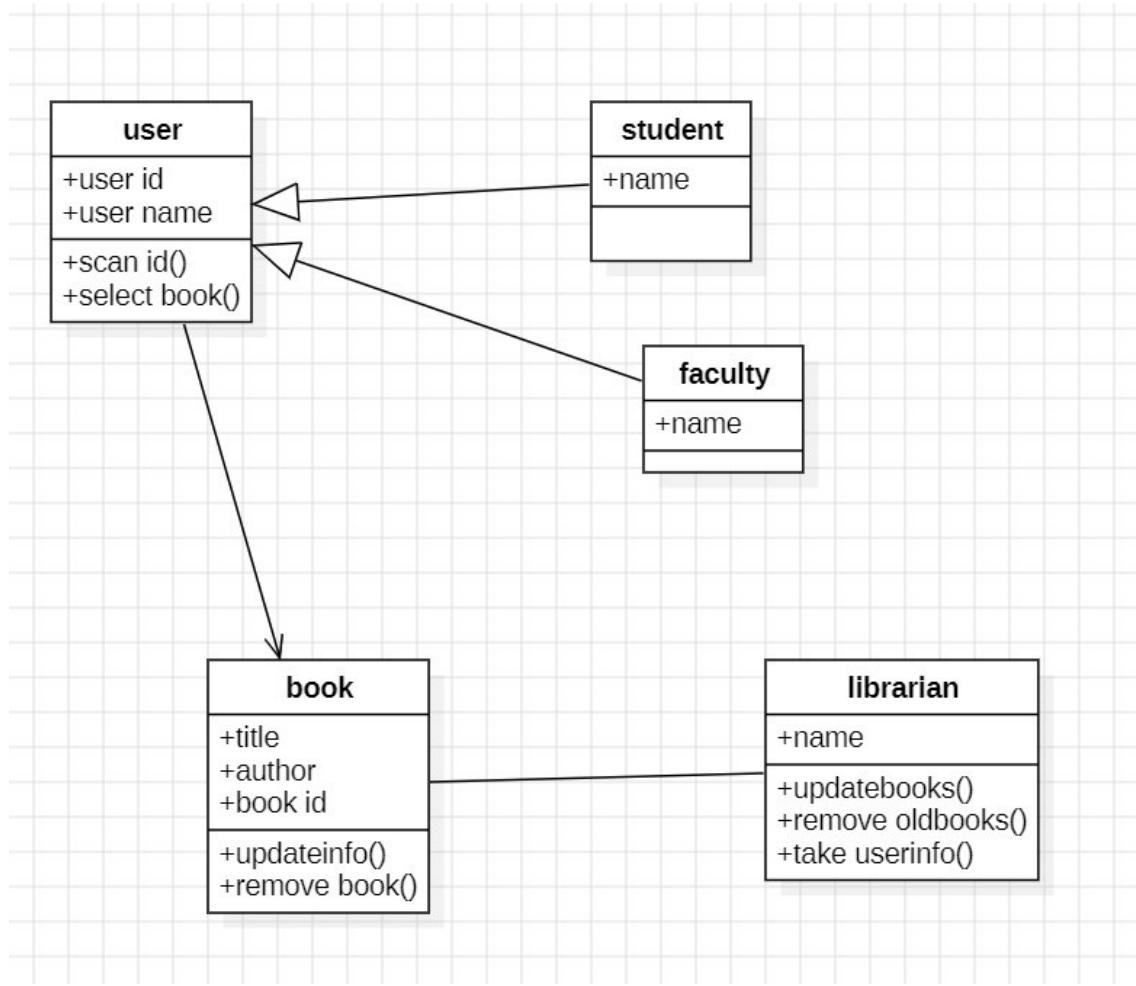


## v. Object Diagram:

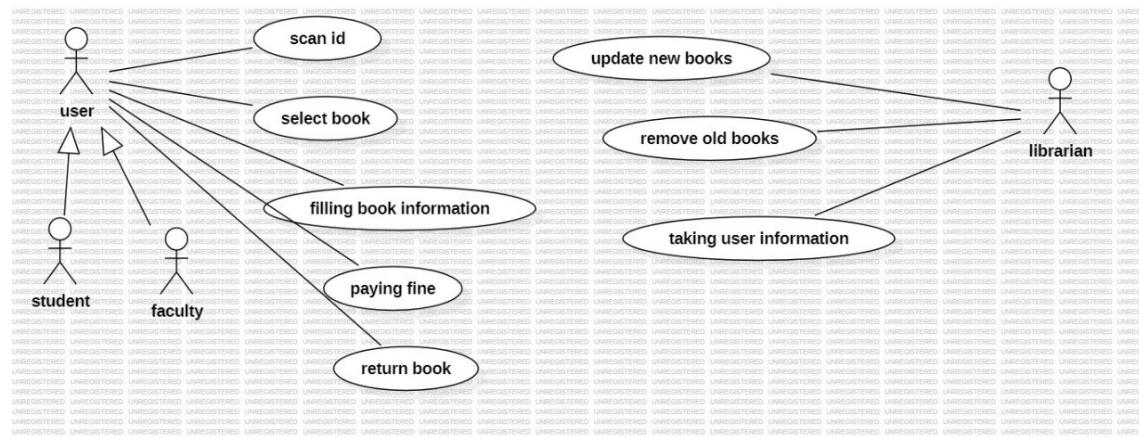


## 2. Library Management:

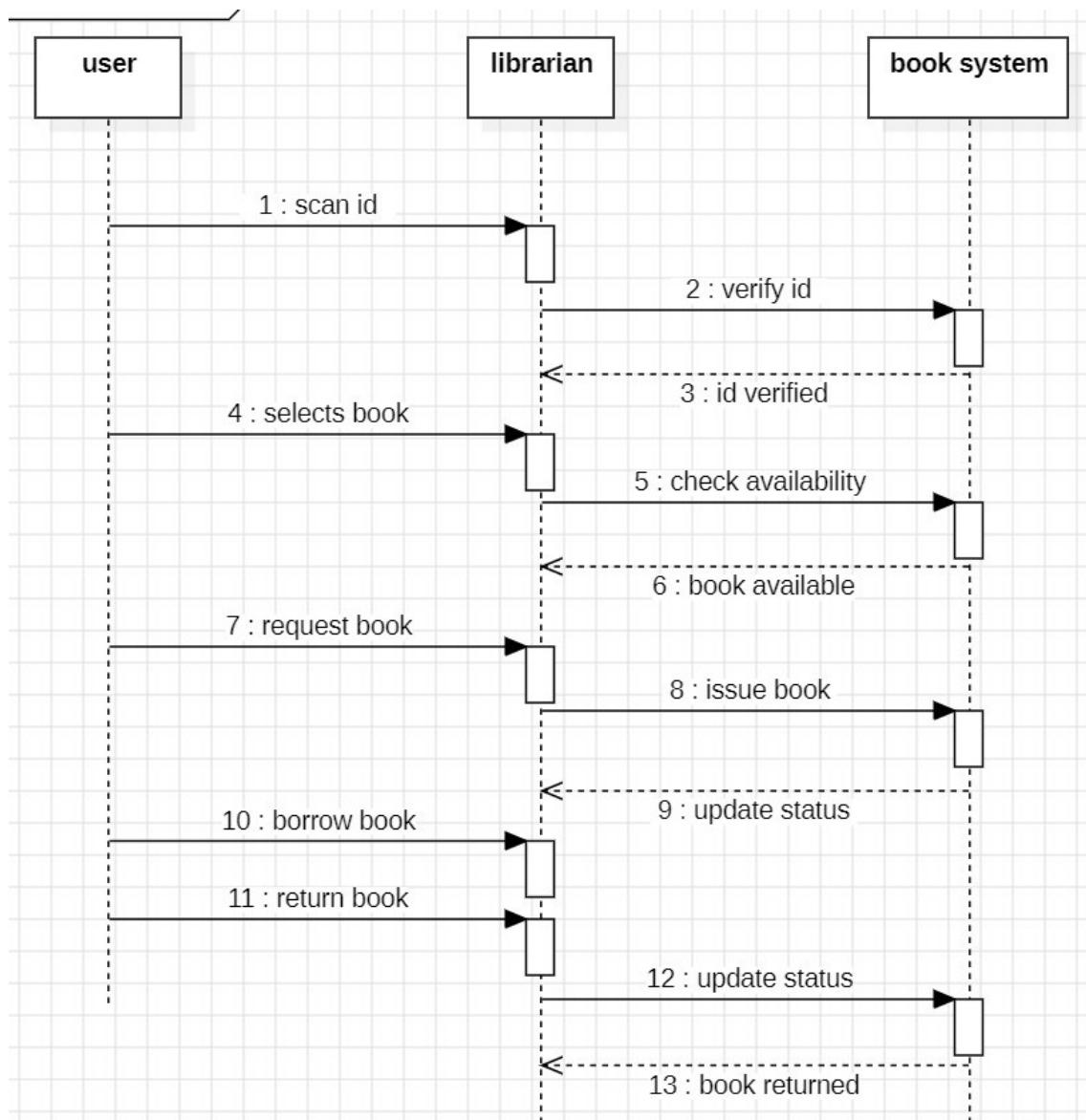
### i. Class Diagram:



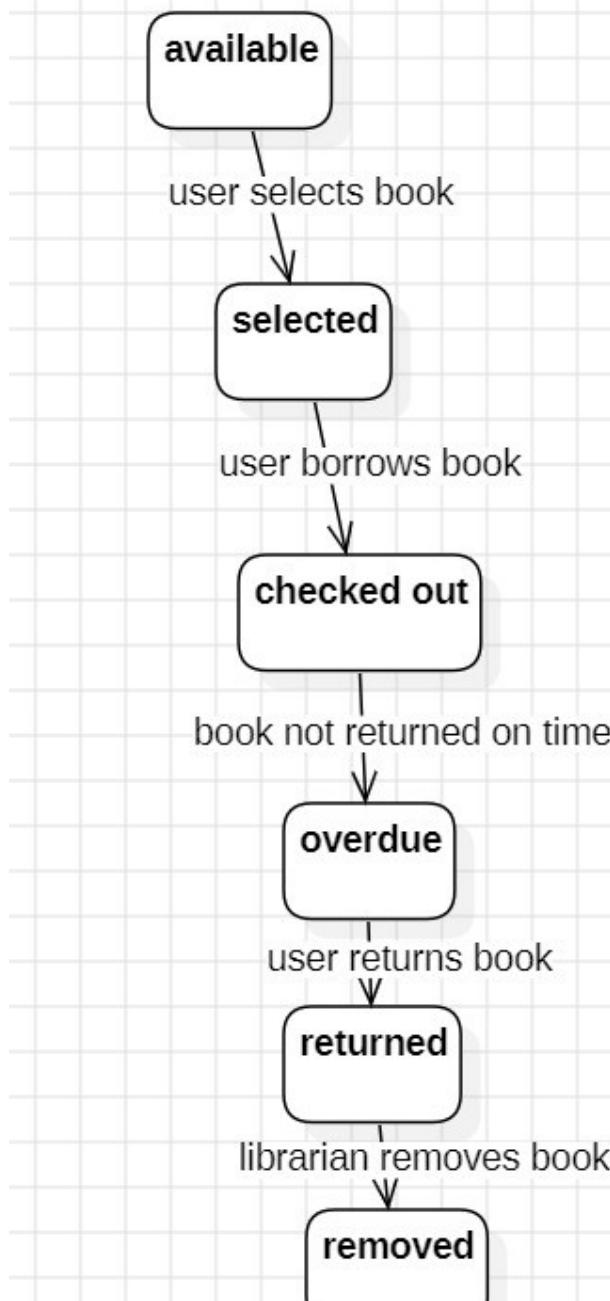
### ii. Use Case Diagram:



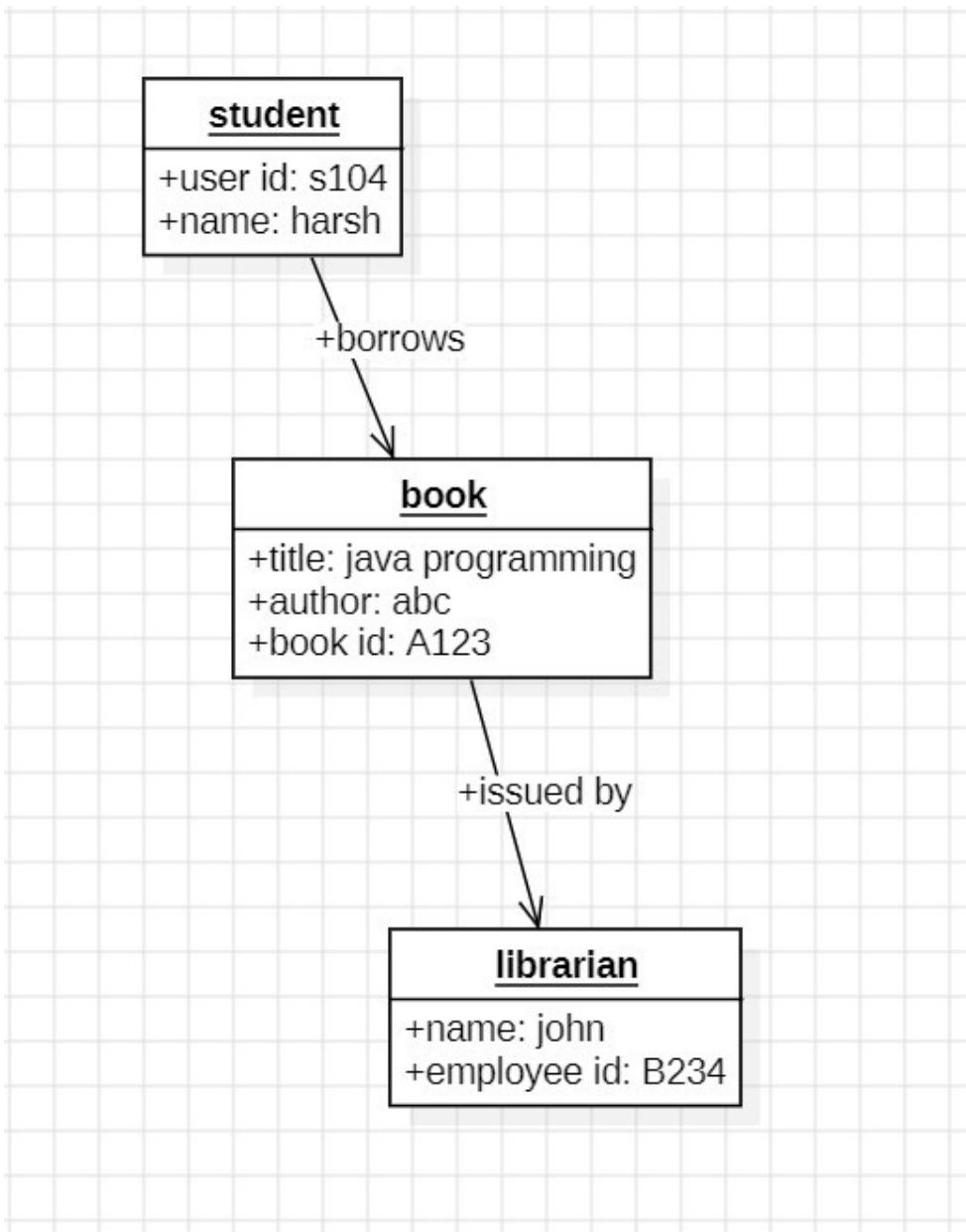
### iii. Sequence Diagram:



#### iv. State Activity Diagram:



## v. Object Diagram:



# Java Basic Programs

## 1. Armstrong Number:

Code:

```
import java.util.Scanner;

public class ArmstrongNumber {
    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, digit;

        while (num > 0) {
            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.");
        }

        sc.close();
    }
}
```

Output:

```
PS D:\Code\Basic Java Program> javac ArmstrongNumber.java
PS D:\Code\Basic Java Program> java ArmstrongNumber
Enter a number: 11
11 is not an Armstrong Number.
PS D:\Code\Basic Java Program> |
```

## 2.Count Digits:

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);
        sc.close();
    }
}
```

Output:

```
PS D:\Code\Basic Java Program> javac CountDigits.java
PS D:\Code\Basic Java Program> java CountDigits
Enter a number: 11223344
Number of digits: 8
PS D:\Code\Basic Java Program> |
```

### 3. 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:

```
PS D:\Code\Basic Java Program> javac EvenOdd.java
PS D:\Code\Basic Java Program> java EvenOdd
Enter a number: 23
23 is Odd.
PS D:\Code\Basic Java Program> |
```

## 4. 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();
        int fact = 1;

        for (int i = 1; i <= n; i++) {
            fact *= i;
        }

        System.out.println("Factorial: " + fact);
        sc.close();
    }
}
```

Output:

```
PS D:\Code\Basic Java Program> javac Factorial.java
PS D:\Code\Basic Java Program> java Factorial
Enter a number: 5
Factorial: 120
PS D:\Code\Basic Java Program> |
```

## 5.Fibonacci:

Code:

```
import java.util.Scanner;

public class Fibonacci {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the number of terms: ");
        int n = sc.nextInt();
        int a = 0, b = 1, next;

        System.out.print("Fibonacci Series: " + a + " " + b);

        for (int i = 2; i < n; i++) {
            next = a + b;
            System.out.print(" " + next);
            a = b;
            b = next;
        }

        sc.close();
    }
}
```

Output:

```
PS D:\Code\Basic Java Program> javac Fibonacci.java
PS D:\Code\Basic Java Program> java Fibonacci
Enter the number of terms: 10
Fibonacci Series: 0 1 1 2 3 5 8 13 21 34
PS D:\Code\Basic Java Program> |
```

## 6. 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 original = num, rev = 0;

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

        if (original == rev) {
            System.out.println(original + " is a Palindrome.");
        } else {
            System.out.println(original + " is not a Palindrome.");
        }
        sc.close();
    }
}
```

Output:

```
PS D:\Code\Basic Java Program> javac PalindromeCheck.java
PS D:\Code\Basic Java Program> java PalindromeCheck
Enter a number: 123098
123098 is not a Palindrome.
PS D:\Code\Basic Java Program> |
```

## 7. Prime Check:

Code:

```
import java.util.Scanner;

public class PrimeCheck {
    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 <= 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.");
        }
        sc.close();
    }
}
```

Output:

```
PS D:\Code\Basic Java Program> javac PrimeCheck.java
PS D:\Code\Basic Java Program> java PrimeCheck
Enter a number: 2
2 is a Prime Number.
PS D:\Code\Basic Java Program> |
```

## 8. Print Number:

Code:

```
import java.util.Scanner;

public class PrintNumbers {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int n = sc.nextInt();

        for (int i = 1; i <= n; i++) {
            System.out.print(i + " ");
        }
        sc.close();
    }
}
```

Output:

```
PS D:\Code\Basic Java Program> javac PrintNumbers.java
PS D:\Code\Basic Java Program> java PrintNumbers
Enter a number: 31
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
PS D:\Code\Basic Java Program> |
```

## 9.Reverse Number:

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();
        int rev = 0;

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

        System.out.println("Reversed Number: " + rev);
        sc.close();
    }
}
```

Output:

```
PS D:\Code\Basic Java Program> javac ReverseNumber.java
PS D:\Code\Basic Java Program> java ReverseNumber
Enter a number: 123456789
Reversed Number: 987654321
PS D:\Code\Basic Java Program> |
```

## 10. Sum Of Natural Number:

Code:

```
import java.util.Scanner;

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

        for (int i = 1; i <= n; i++) {
            sum += i;
        }

        System.out.println("Sum: " + sum);
        sc.close();
    }
}
```

Output:

```
PS D:\Code\Basic Java Program> javac SumNaturalNumbers.java
PS D:\Code\Basic Java Program> java SumNaturalNumbers
Enter a number: 50
Sum: 1275
PS D:\Code\Basic Java Program> |
```