B Lohith Krishnan

CH.SC.U4CSE24153

OBJECT ORIENTED PROGRAMMING (23CSE111)

LAB RECORD

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.U4CSE24151 – B LOHITH KRISHNAN*** 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

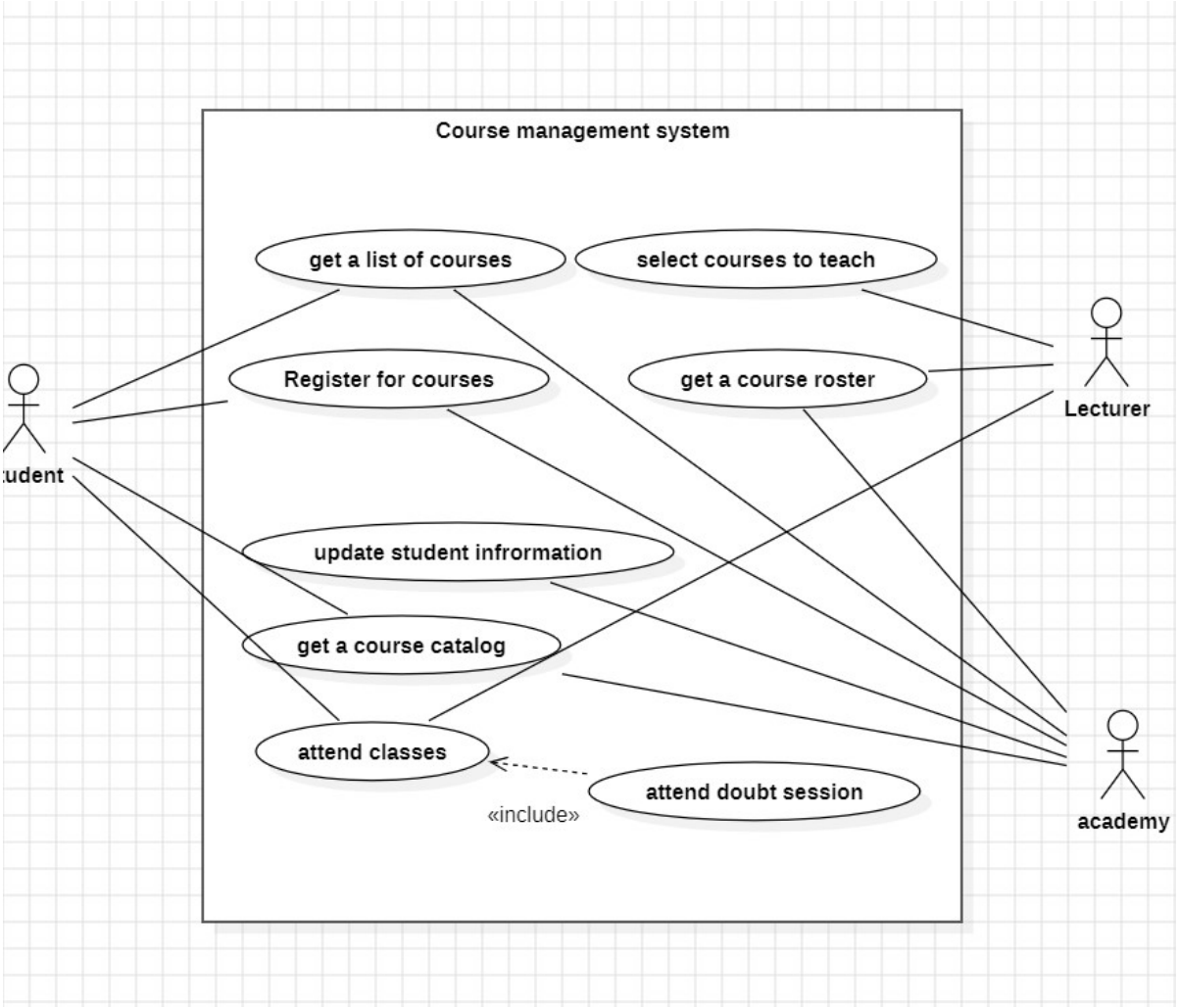
Internal Examiner 1 Internal Examiner 2

INDEX

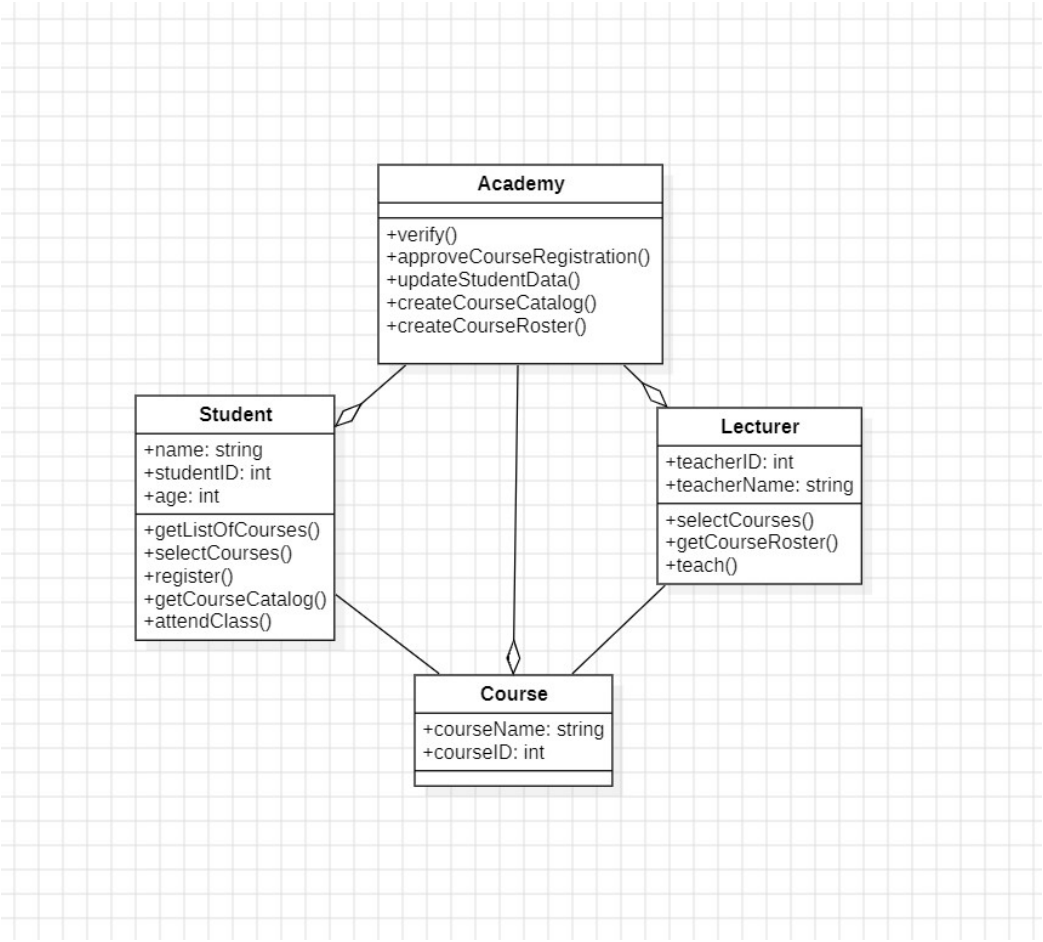
UML DIAGRAMS

1. COURSE MANAGEMENT SYSTEM

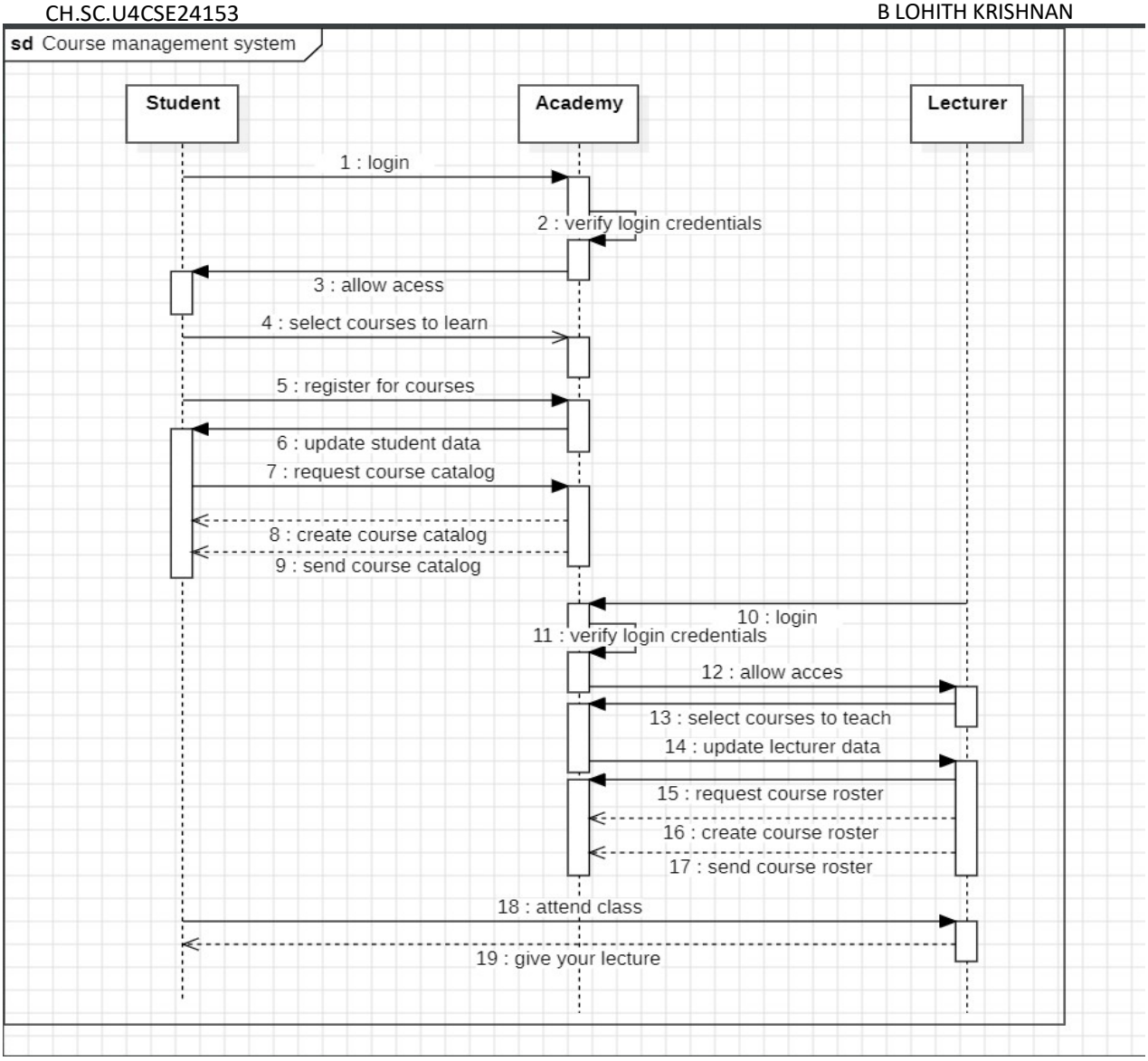
1.a) Use Case Diagram:



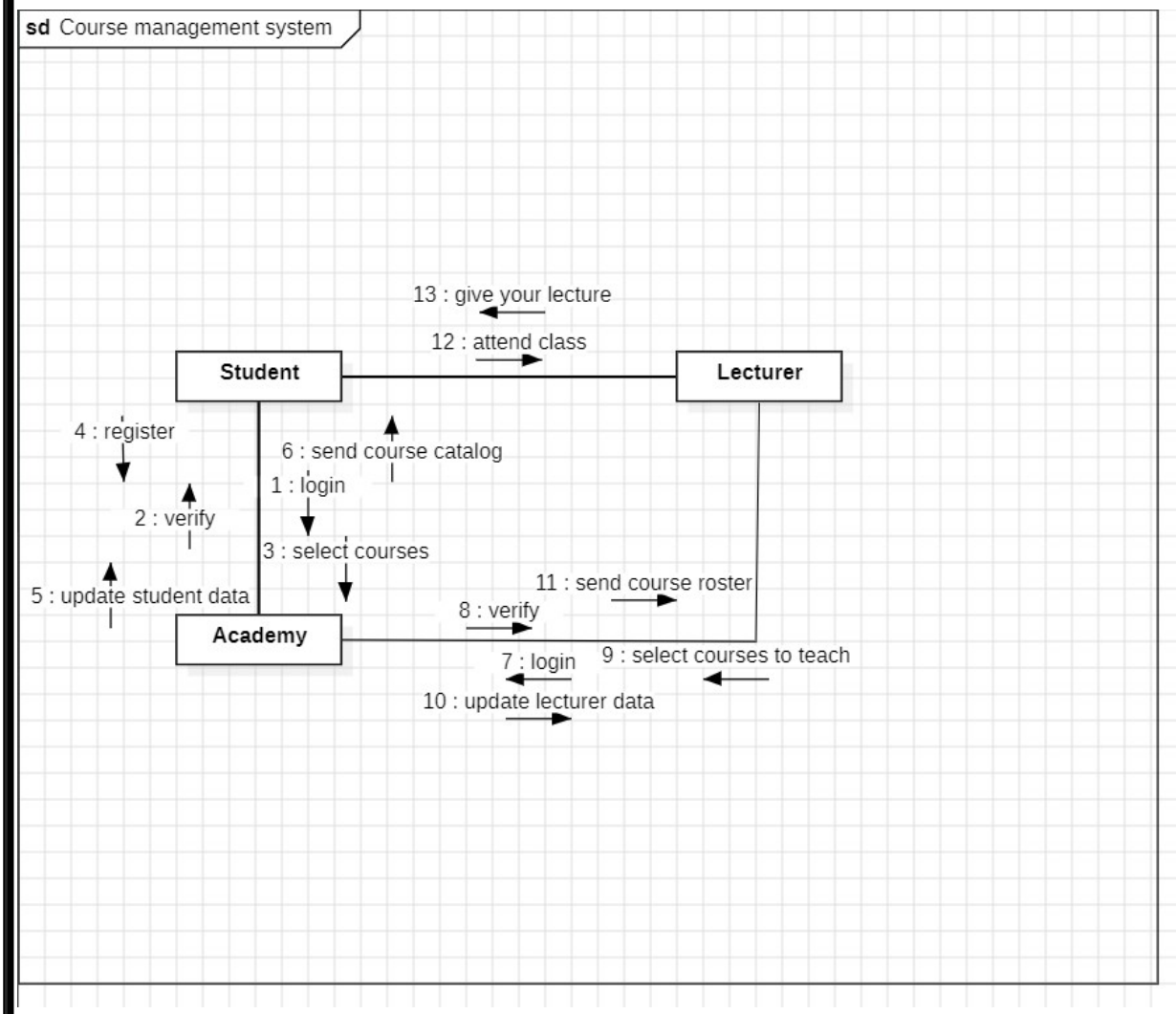
1.b) Class Diagram:



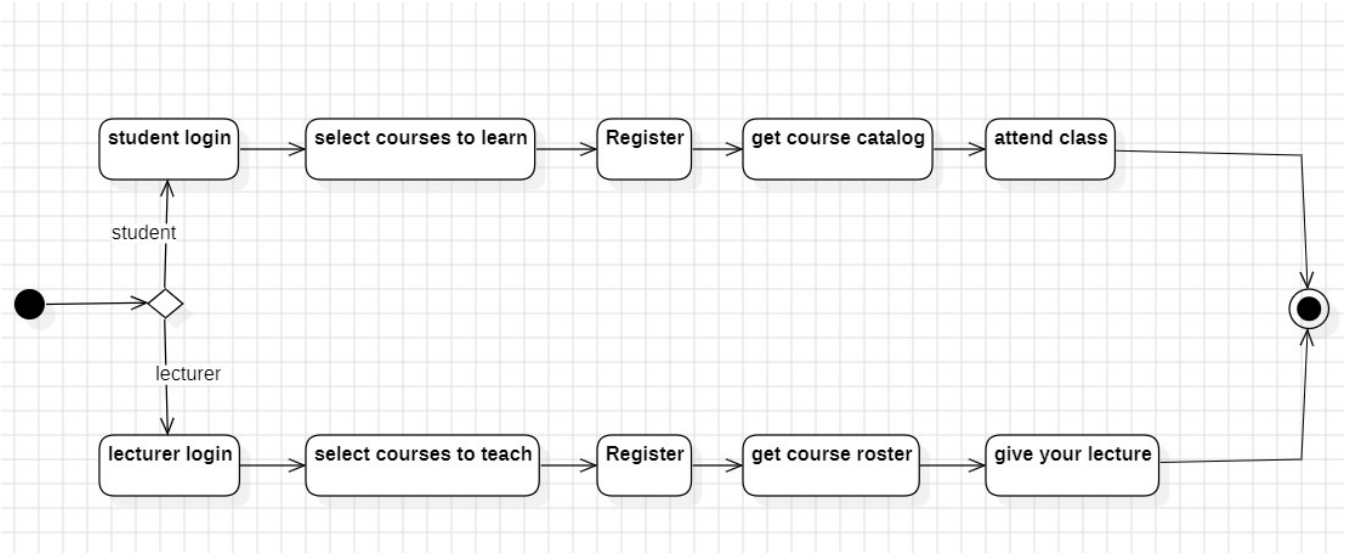
1.c) Sequence Diagram:


sd Course management system
Student
Academy
Lecturer
1 : login
2 : verify login credentials
3 : allow acess
4 : select courses to learn
5 : register for courses
6 : update student data
7 : request course catalog
8 : create course catalog
9 : send course catalog
10 : login
11 : verify login credentials
12 : allow acces
13 : select courses to teach
14 : update lecturer data
15 : request course roster
16 : create course roster
17 : send course roster
18 : attend class
19 : give your lecture

1.d) Communication Diagram:

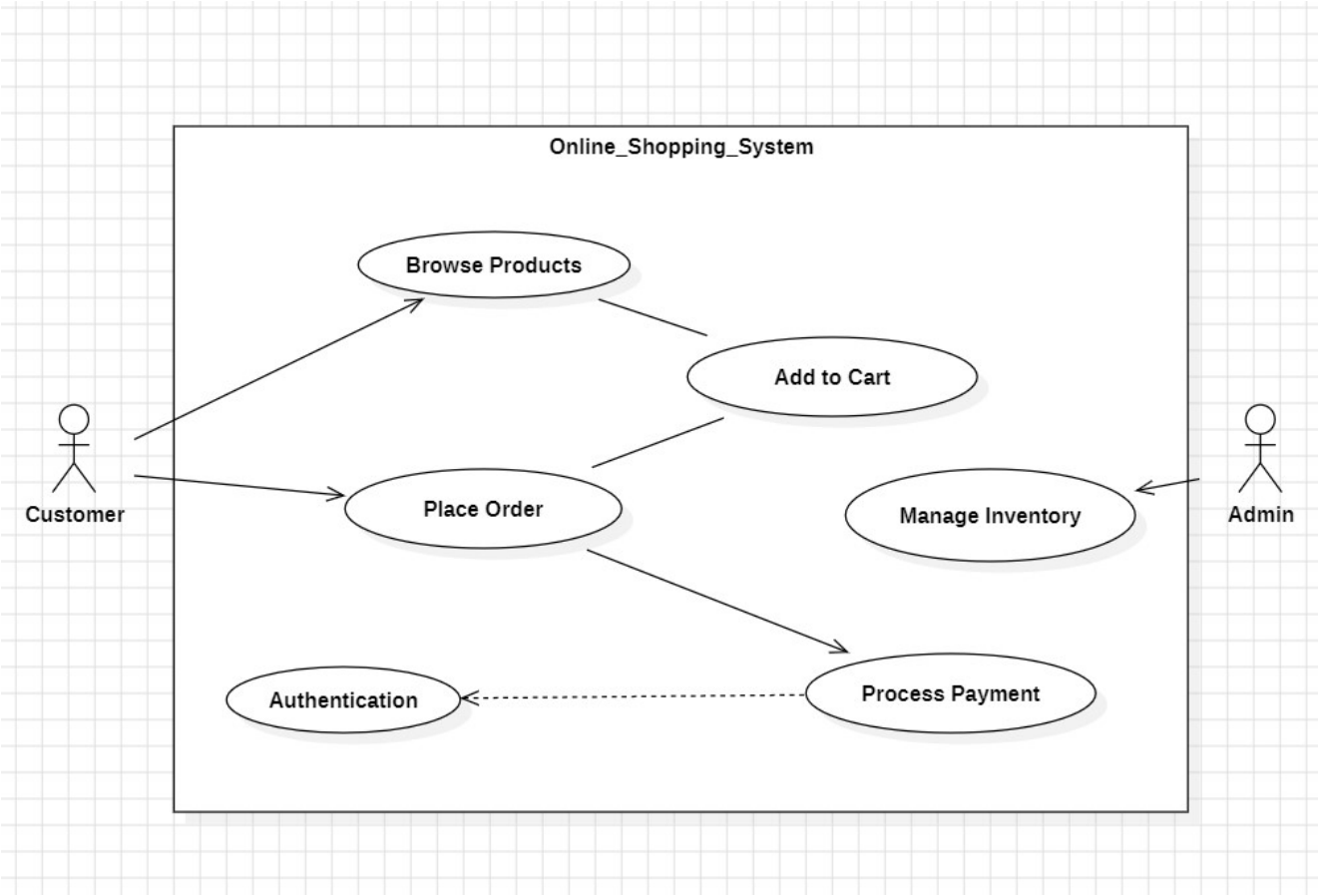


1.e) State-Activity Diagram:

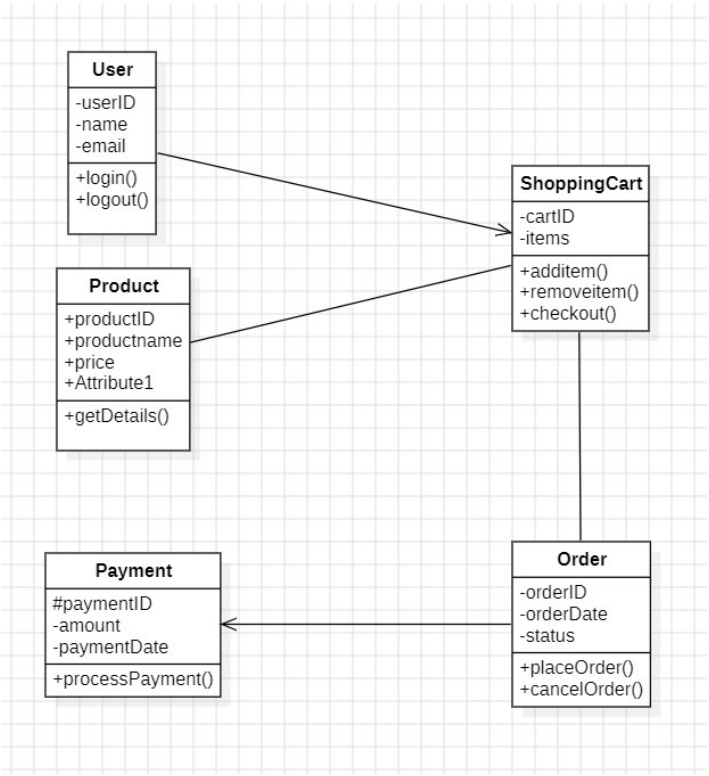


2. ONLINE SH0PPING SYSTEM

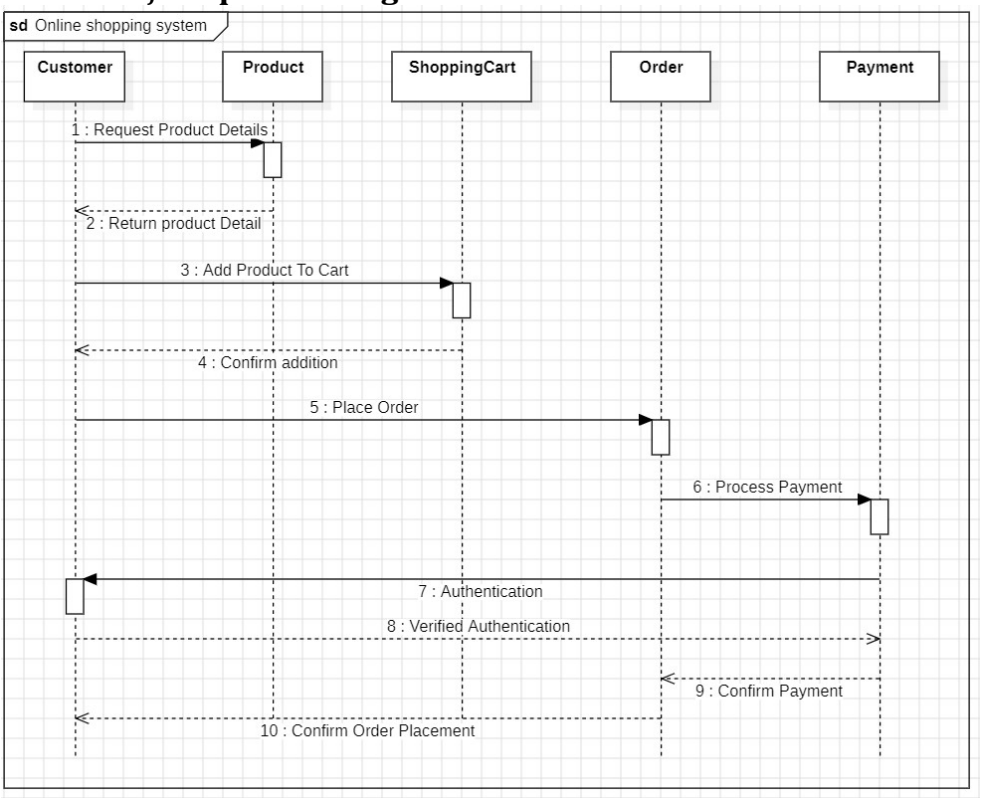
2.a) Use Case Diagram:



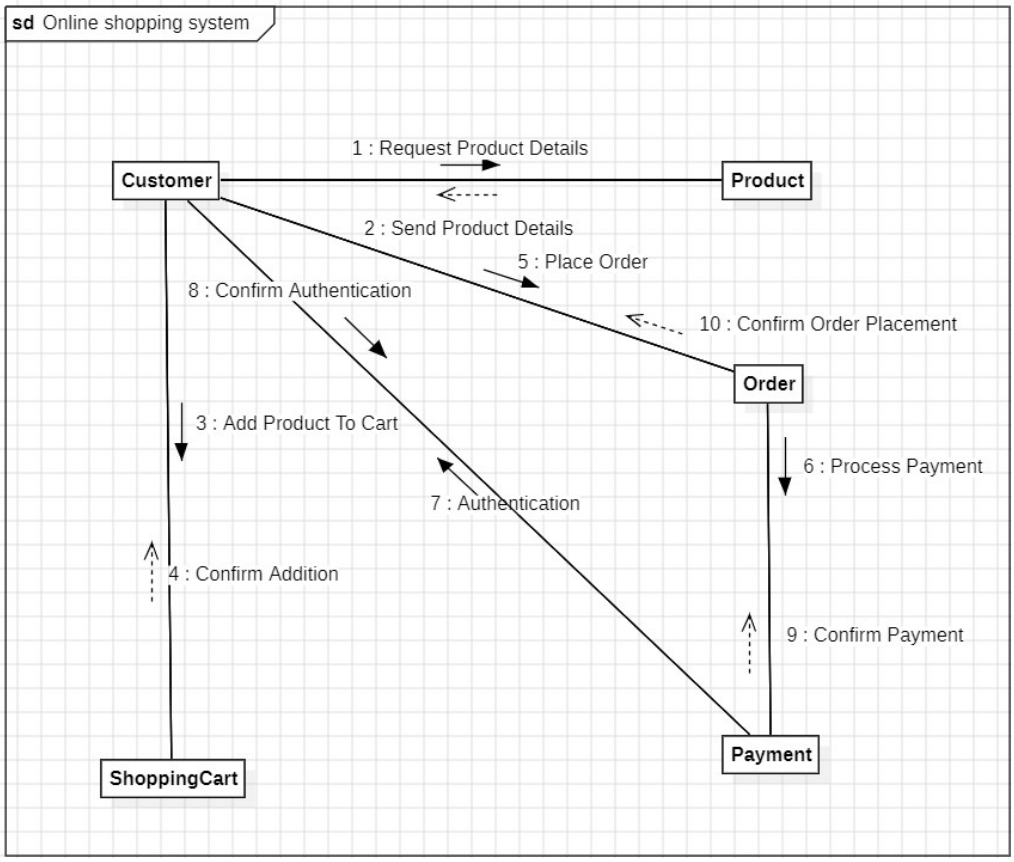
2.b) Class Diagram:



2.c) Sequence Diagram:



2.d) Communication Diagram:



2.e) State-Activity Diagram:

3. Basic Java Programs

3.a) SumOfNaturalNumbers:

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 positive integer: ");

        int n = scanner.nextInt();
        scanner.close();

        int sum = 0;

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

        System.out.println("The sum of the first " + n + " natural numbers is " +
sum);
    }
}
```

Output:

```
C:\Users\lohit\OneDrive\Documents\opps program>javac SumOfNaturalNumbers.java

C:\Users\lohit\OneDrive\Documents\opps program>java SumOfNaturalNumbers
Enter a positive integer: 8
The sum of the first 8 natural numbers is 36

C:\Users\lohit\OneDrive\Documents\opps program>
```

3.b) 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 positive integer: ");
            int n = scanner.nextInt();
            int fact = 1;
      for (int i = 1; i <= n; i++) {
        fact = fact * i;
        }
      System.out.println("Factorial: "+ fact);
    }
}
```

Output:

```
C:\Users\lohit\OneDrive\Documents\opps program>javac factorial.java

C:\Users\lohit\OneDrive\Documents\opps program>java factorial
Enter a positive integer: 5
Factorial: 120

C:\Users\lohit\OneDrive\Documents\opps program>
```

3.c) Fibonacci:

Code:

```
import java.util.Scanner;

    public class fibonacci {
      public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);
      System.out.print("Enter a positive integer: ");
      int n=scanner.nextInt();
      int a = 0;
      int b=1;
      System.out.print(a+" "+b);
      for (int i=2; i<n; i++) {
      int next = a + b;
      System.out.print(" " + next);
      a=b;
      b=next;
      }
    }
}
```

Output:

```
C:\Users\lohit\OneDrive\Documents\opps program>javac fibonacci.java

C:\Users\lohit\OneDrive\Documents\opps program>java fibonacci
Enter a positive integer: 9
0 1 1 2 3 5 8 13 21
C:\Users\lohit\OneDrive\Documents\opps program>
```

3.d) ReversedNumber:

Code:

```
import java.util.Scanner;

    public class ReversedNumber {
      public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);
      System.out.print("Enter a positive integer: ");
      int n = scanner.nextInt();
      int reversed = 0;
```

```
      while (n != 0) {
      int digit = n % 10;
      reversed = reversed * 10 + digit;
      n /= 10;
      }
      System.out.println("Reversed Number: " + reversed);
     }
}
```

Output:

```
C:\Users\lohit\OneDrive\Documents\opps program>javac ReversedNumber.java

C:\Users\lohit\OneDrive\Documents\opps program>java ReversedNumber
Enter a positive integer: 53278
Reversed Number: 87235

C:\Users\lohit\OneDrive\Documents\opps program>
```

3.e) CheckPalindrome:

Code:

```
import java.util.Scanner;

   public class CheckPalindrome {
      public static boolean isPalindrome(String s) {
      s = s.toLowerCase();
      String rev = "";
      for (int i = s.length() -1; i >= 0; i--) {
      rev = rev + s.charAt(i);
      }
      return s.equals(rev);
      }

      public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);
      System.out.print("Enter a word: ");
      String s = scanner.nextLine();
      boolean res = isPalindrome(s);
      if (res) {
      System.out.println("\"" + s + "\" is a palindrome.");
      } else {
      System.out.println("\"" + s + "\" is not a palindrome.");
      }
   }
}
```

Output:

```
C:\Users\lohit\OneDrive\Documents\opps program>javac CheckPalindrome.java

C:\Users\lohit\OneDrive\Documents\opps program>java CheckPalindrome
Enter a word: racecar
"racecar" is a palindrome.

C:\Users\lohit\OneDrive\Documents\opps program>
```

3.f) OddOrEven:

Code:

```
import java.util.Scanner;

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

   if (n % 2 == 0) {
   System.out.println("Entered Number is Even");
   }
   else {
   System.out.println("Entered Number is Odd");
   }
   }
}
```

Output:

```
C:\Users\lohit\OneDrive\Documents\opps program>javac OddOrEven.java

C:\Users\lohit\OneDrive\Documents\opps program>java OddOrEven
Enter a integer: 7
Entered Number is Odd

C:\Users\lohit\OneDrive\Documents\opps program>
```

3.g) SquareSum:

Code:

```
import java.util.Scanner;

public class squaresum {
   public static int squaresum(int n) {
   int sum = 0;
   for (int i = 1; i <= n; i++)
   sum += (i* i);
```

```
    return sum;
    }

    public static void main(String args[]) {
    Scanner scanner = new Scanner(System.in);
    System.out.print("Enter a integer: ");
    int n = scanner.nextInt();
    System.out.println(squaresum(n));
    }
}
```

Output:

```
C:\Users\lohit\OneDrive\Documents\opps program>javac squaresum.java

C:\Users\lohit\OneDrive\Documents\opps program>java squaresum
Enter a integer: 8
204

C:\Users\lohit\OneDrive\Documents\opps program>
```

3.h) CheckPerfectSquare:

Code:

```
import java.util.Scanner;

   public class CheckPerfectSquare {
     public static void main(String[] args) {
     Scanner scanner = new Scanner(System.in);
     System.out.println("Enter an integer:");
     int number = scanner.nextInt();
     int sqrt = (int) Math.sqrt(number);

     if (sqrt*sqrt == number) {
     System.out.println(number + " is a perfect square.");
     }
     else {
     System.out.println(number + " is not a perfect square.");
     }
   }
}
```

Output:

```
C:\Users\lohit\OneDrive\Documents\opps program>javac CheckPerfectSquare.java

C:\Users\lohit\OneDrive\Documents\opps program>java CheckPerfectSquare
Enter an integer:
64
64 is a perfect square.

C:\Users\lohit\OneDrive\Documents\opps program>
```

3.i) AreaOfTriangle:

Code:

```
import java.util.Scanner;

public class AreaOfTriangle {
   static double area (double h, double b) {
   return (h*b)/2;
   }

   public static void main(String[] args) {
   Scanner scanner = new Scanner(System.in);
   System.out.println("Enter height:");
   double h = scanner.nextDouble();
   System.out.println("Enter breadth:");
   double b = scanner.nextDouble();
   System.out.println("Area of the triangle: "+ area(h,b));
   }
}
```

Output:

```
C:\Users\lohit\OneDrive\Documents\opps program>javac AreaOfTriangle.java

C:\Users\lohit\OneDrive\Documents\opps program>java AreaOfTriangle
Enter height:
8
Enter breadth:
4
Area of the triangle: 16.0

C:\Users\lohit\OneDrive\Documents\opps program>
```

3.j) PositveOrNegative:

Code:

```
import java.util.Scanner;

public class PositveOrNegative {
   public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);
      System.out.println("Enter an integer:");
      int number = scanner.nextInt();

      if (number > 0) {
      System.out.println(number + " is positive.");
      }
      else if (number < 0) {
      System.out.println(number + " is negative.");
      }
      else {
      System.out.println(number + " is zero.");
      }
   }
}
```

Output:

```
C:\Users\lohit\OneDrive\Documents\opps program>javac PositveOrNegative.java

C:\Users\lohit\OneDrive\Documents\opps program>java PositveOrNegative
Enter an integer:
-5
-5 is negative.

C:\Users\lohit\OneDrive\Documents\opps program>
```