

SCHOOL OF
COMPUTING

D. Surya Kiran
CH.SC.U4CSE24116
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 23CSE113 –
OBJECT ORIENTED PROGRAMMING by
CH.SC.U4CSE24116 – D. Surya Kiran 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

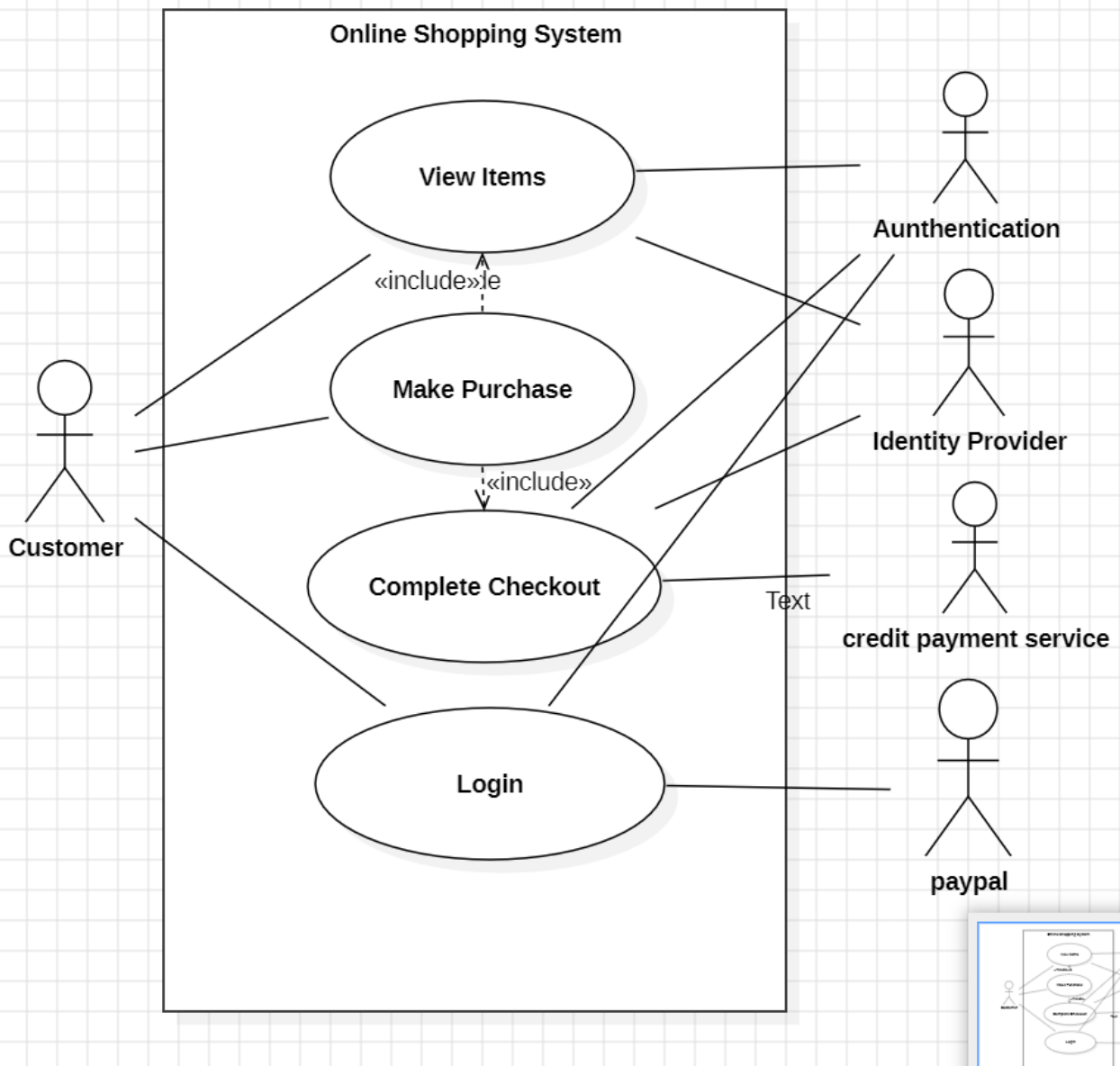
INDEX

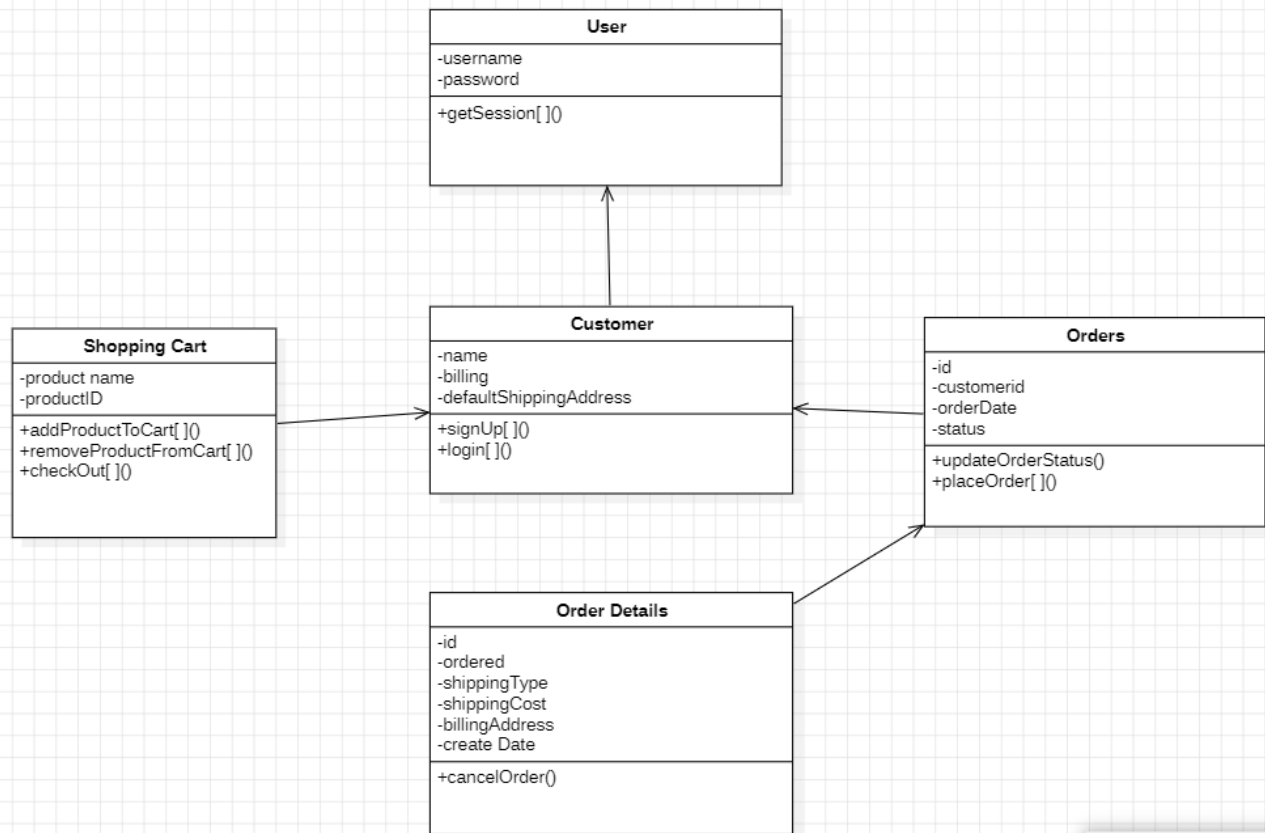
S.NO	TITLE	PAGE.NO
UML DIAGRAM		
1.	ONLINE SHOPPING SYSTEM	
	1.a) Use Case Diagram	4
	1.b) Class Diagram	5
	1.c) Sequence Diagram	6
	1.d) Object Diagram	7
	1.e) State-Activity Diagram	8
2.	TRAVEL AGENCY	
	2.a) Use Case Diagram	9
	2.b) Class Diagram	10
	2.c) Sequence Diagram	10
	2.d) Object Diagram	11
	2.e) State-Activity Diagram	12
3.	BASIC JAVA PROGRAMS	
	3.a) Pascal Triangle	13
	3.b) Factorial	14
	3.c) Some Natural Numbers	15
	3.d) Reverse Numbers	16
	3.e) Fibonacci	17
	3.f) BMI Calculator	17
	3.g) Sum Of Digits	18
	3.h) Positive Negative	19
	3.i) Largest Number	20
	3.j) Biggest Number	21

UML DIAGRAMS

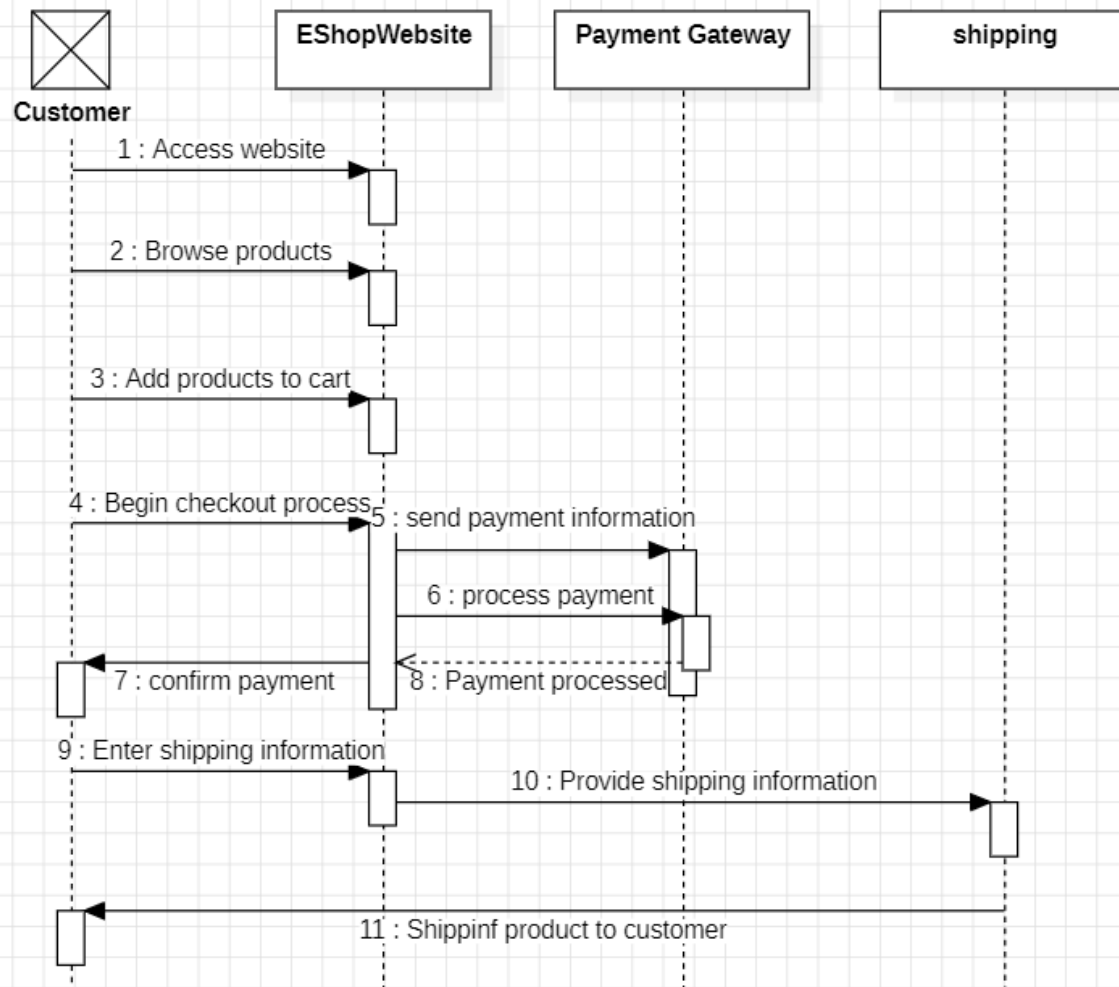
1. ONLINE SHOPPING SYSTEM

1.a) Use Case Diagram:

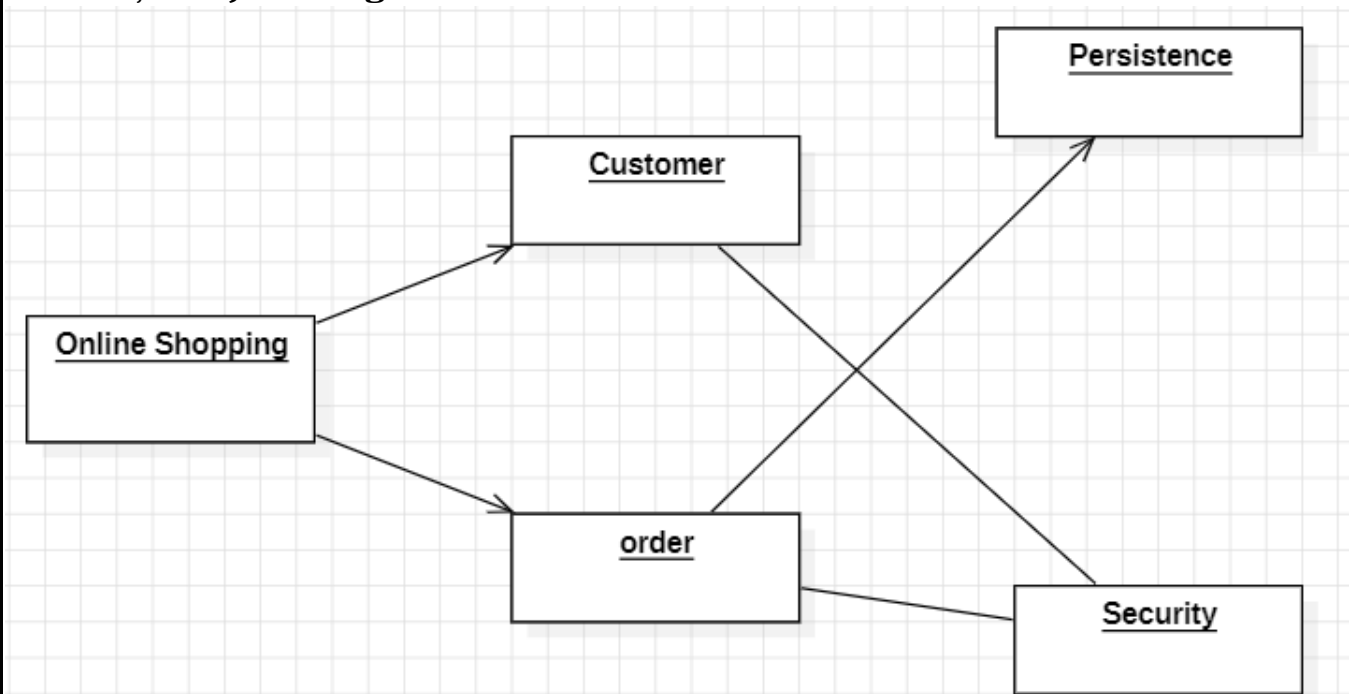


1.b) Class Diagram:**1.c) Sequence Diagram:**

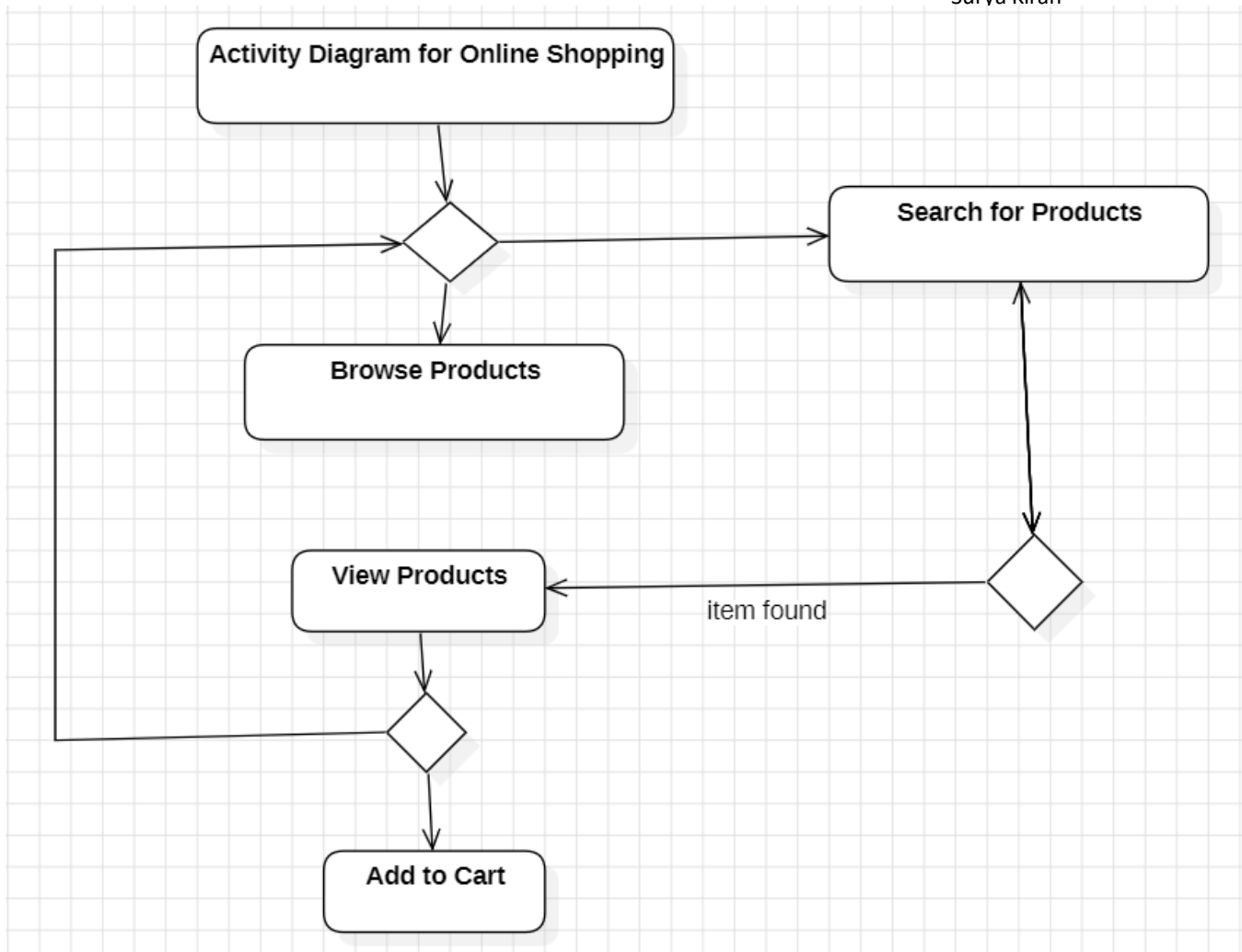
sd SequenceDiagram1



1.d) **Object Diagram:**

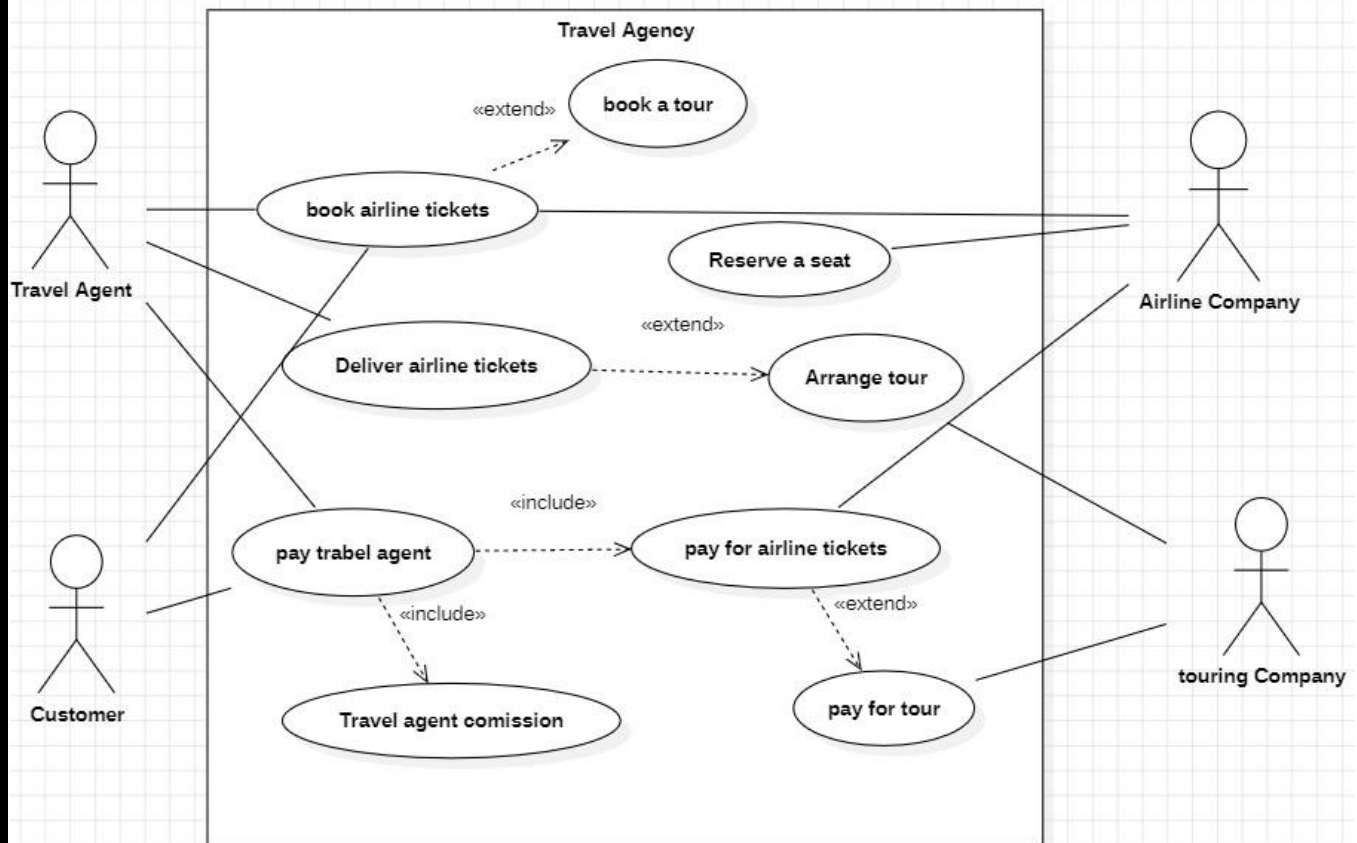


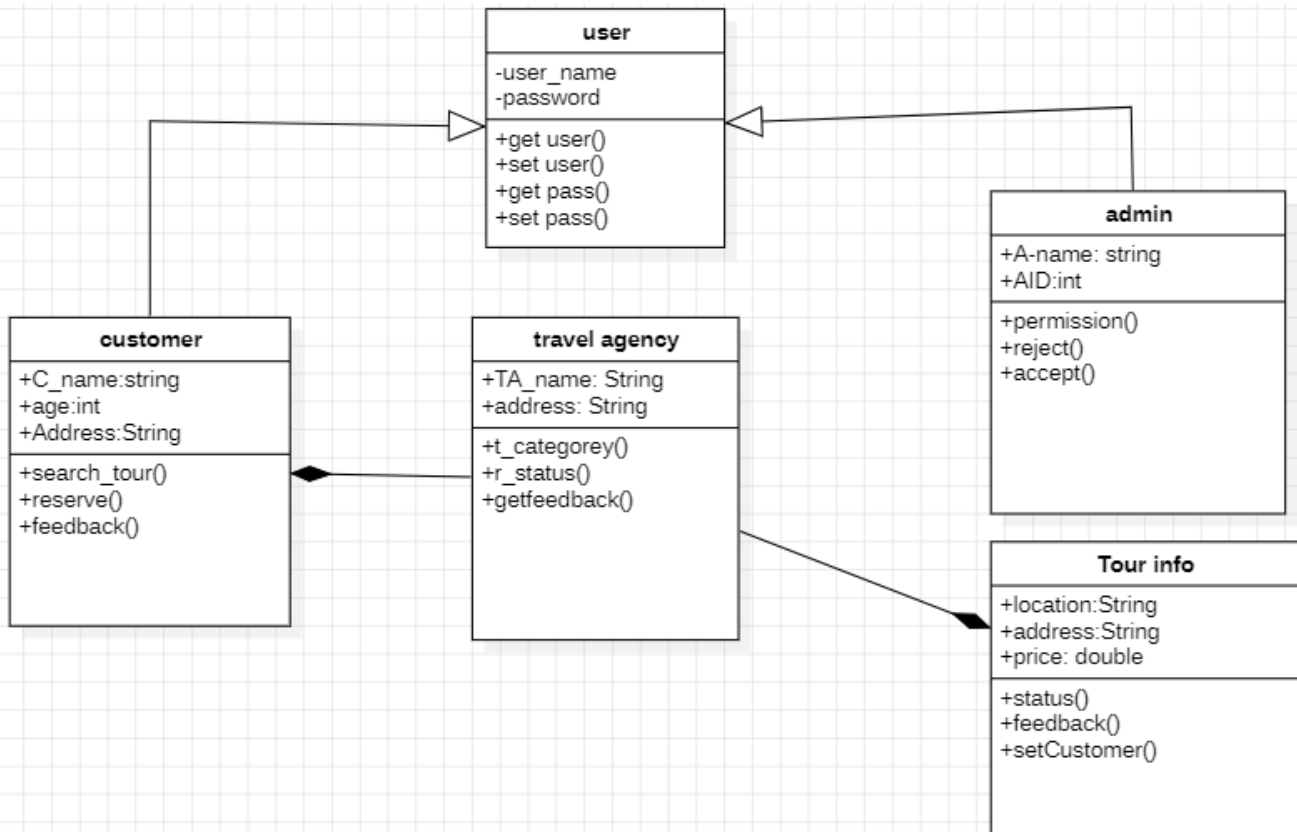
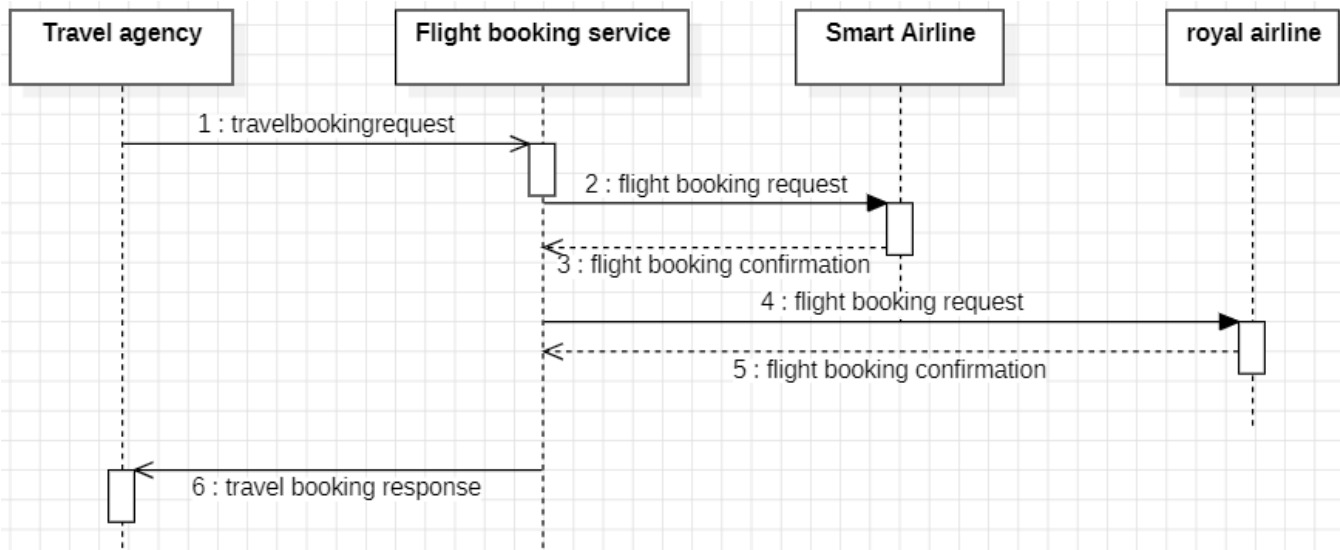
1.e) **State-Activity Diagram:**

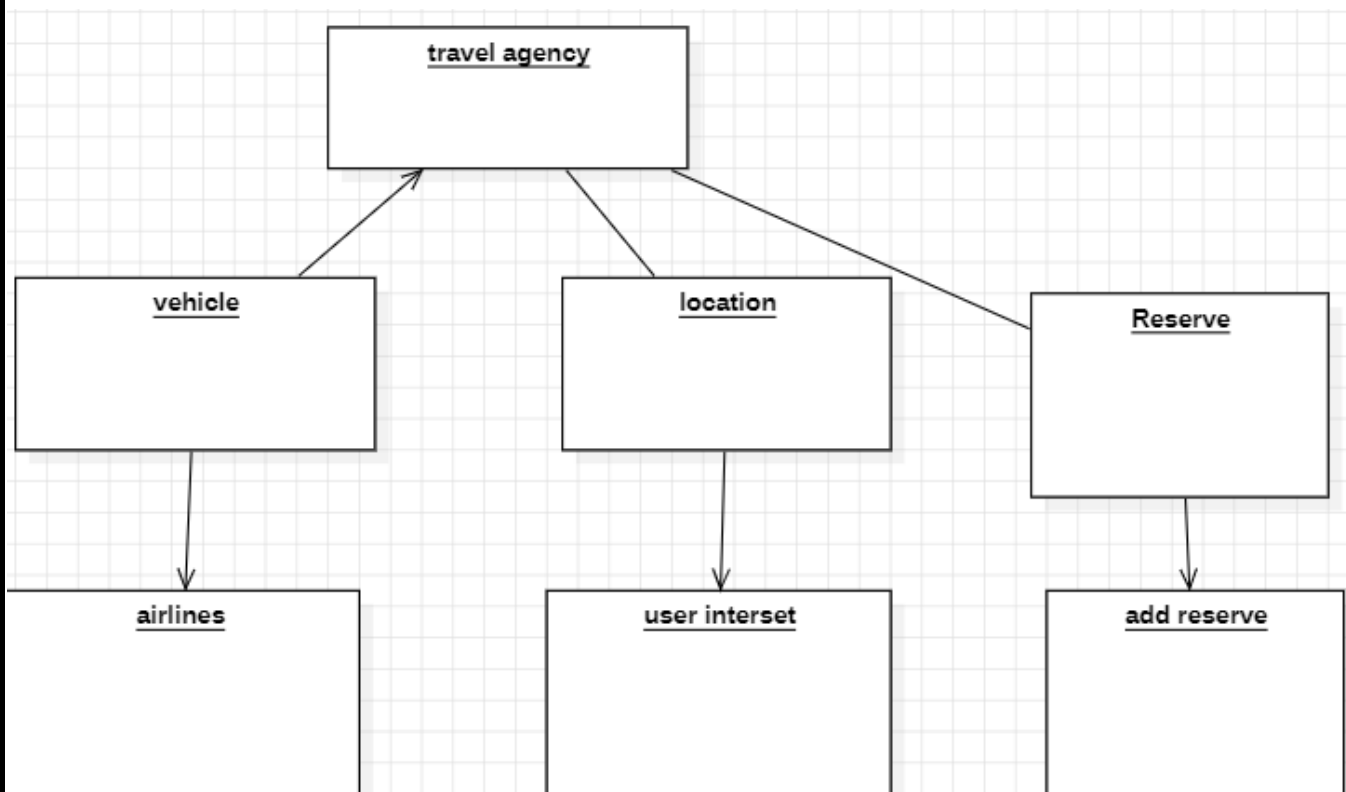


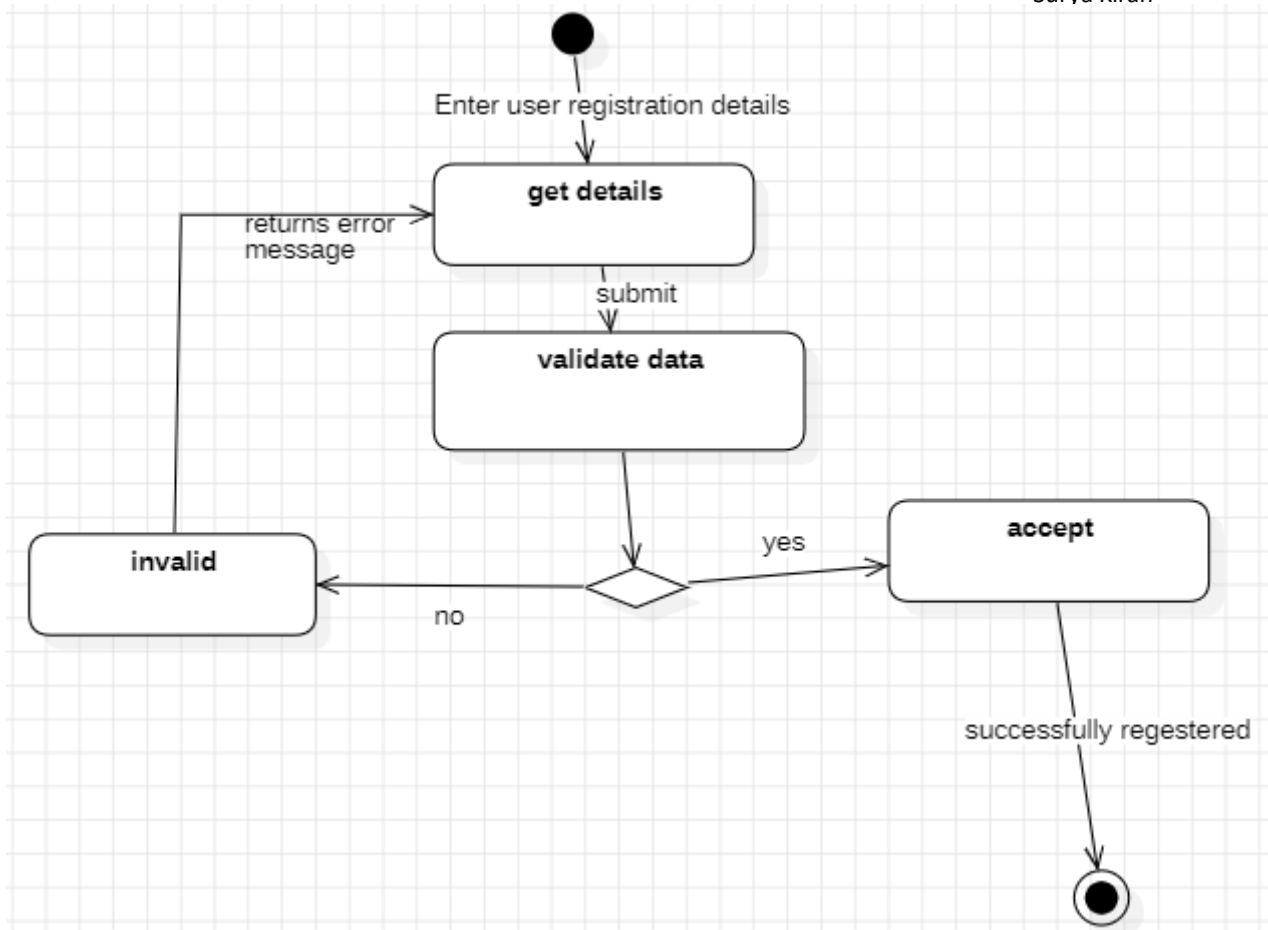
2. TRAVEL AGENCY

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) PascalTriangle :

Code:

```
public class PascalTriangle {  
    public static void main(String[] args) {  
        int rows = 5;  
        for (int i = 0; i < rows; i++) {  
            int number = 1;  
            for (int j = 0; j < rows - i; j++)  
                System.out.print(" ");  
            for (int j = 0; j <= i; j++) {  
                System.out.print(number + " ");  
                number = number * (i - j) / (j + 1);  
            }  
            System.out.println();  
        }  
    }  
}
```

Output:

```
C:\Users\DELL\Downloads\java programs>javac PascalTriangle.java  
  
C:\Users\DELL\Downloads\java programs>java PascalTriangle  
    1  
   1 1  
  1 2 1  
 1 3 3 1  
1 4 6 4 1  
  
C:\Users\DELL\Downloads\java programs>
```

3.b) Factorial :**Code:**

```
public class Factorial {  
    public static void main(String[] args) {  
        int num = 5, fact = 1;  
        for (int i = 1; i <= num; i++) {  
            fact *= i; // Multiplying i with fact  
        }  
        System.out.println("Factorial: " + fact);  
    }  
}
```

Output:

```
C:\Users\DELL\Downloads\java programs>javac Factorial.java  
  
C:\Users\DELL\Downloads\java programs>java Factorial  
Factorial: 120  
  
C:\Users\DELL\Downloads\java programs>|
```

3.c) Sum Natural Numbers :**Code:**

```
public class SumNaturalNumbers {  
    public static void main(String[] args) {  
        int n = 10, sum = 0, i = 1;  
  
        while (i <= n) {  
            sum += i;  
            i++; // Increments i  
        }  
  
        System.out.println("Sum: " + sum);  
    }  
}
```

Output:

```
C:\Users\DELL\Downloads\java programs>javac SumNaturalNumbers.java  
  
C:\Users\DELL\Downloads\java programs>java SumNaturalNumbers  
Sum: 55  
  
C:\Users\DELL\Downloads\java programs>|
```

4.

**3.d) Reverse
Numbers :****Code:**

```
public class ReverseNumbers {  
    public static void main(String[] args) {  
        for (int i = 10; i >= 1; i--) {  
            System.out.print(i + " ");  
        }  
    }  
}
```

Output;

```
C:\Users\DELL\Downloads\java programs>javac ReverseNumbers.java  
C:\Users\DELL\Downloads\java programs>java ReverseNumbers  
10 9 8 7 6 5 4 3 2 1  
C:\Users\DELL\Downloads\java programs>
```


3.e) Fibonacci :**Code:**

```
public class Fibonacci {  
    public static void main(String[] args) {  
        int n = 10, a = 0, b = 1, c;  
  
        for (int i = 1; i <= n; i++) {  
            System.out.print(a + " ");  
            c = a + b;  
            a = b;  
            b = c;  
        }  
    }  
}
```

Output:

```
C:\Users\DELL\Downloads\java programs>javac Fibonacci.java  
  
C:\Users\DELL\Downloads\java programs>java Fibonacci  
0 1 1 2 3 5 8 13 21 34  
C:\Users\DELL\Downloads\java programs>|
```

3.f) BMI Calculator :

Code:

```
import java.util.Scanner;
public class BMICalculator {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter weight in kilograms: ");
        double weight = scanner.nextDouble();
        System.out.print("Enter height in meters: ");
        double height = scanner.nextDouble();
        double bmi = weight / (height * height);
        System.out.printf("Your BMI is: %.2f\n", bmi);
        if (bmi < 18.5) {
            System.out.println("Category: Underweight");
        } else if (bmi < 24.9) {
            System.out.println("Category: Normal weight");
        } else if (bmi < 29.9) {
            System.out.println("Category: Overweight");
        } else {
            System.out.println("Category: Obese");
        }
        scanner.close();
    }
}
```

Output:

```
C:\Users\DELL\Downloads\java programs>javac BMICalculator.java
C:\Users\DELL\Downloads\java programs>java BMICalculator
Enter weight in kilograms: 50
Enter height in meters: 6
Your BMI is: 1.39
Category: Underweight
C:\Users\DELL\Downloads\java programs>
```

3.g) 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 four-digit number: ");
        int number = scanner.nextInt();
        if (number < 1000 || number > 9999) {
            System.out.println("Please enter a valid four-digit number.");
        } else {
            int sum = 0, temp = number;
            while (temp > 0) {
                sum += temp % 10;
                temp /= 10;
            }
            System.out.println("Sum of digits: " + sum);
        }
        scanner.close();
    }
}
```

Output:

```
C:\Users\DELL\Downloads\java programs>javac SumOfDigits.java
C:\Users\DELL\Downloads\java programs>java SumOfDigits
Enter a four-digit number: 7831
Sum of digits: 19
C:\Users\DELL\Downloads\java programs>|
```

3.h) **positive**
Negative :

Code:

```
import java.util.Scanner;
public class Positive_Negative {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int n = scanner.nextInt();
        if (n > 0) {
            System.out.println(n + " is Positive");
        } else if (n < 0) {
            System.out.println(n + " is Negative");
        } else {
            System.out.println(n + " is Zero");
        }
    }
}
```

Output:

```
C:\Users\DELL\Downloads\java programs>javac Positive_Negative.java
C:\Users\DELL\Downloads\java programs>java Positive_Negative
Enter a number: 8
8 is Positive
C:\Users\DELL\Downloads\java programs>|
```

3.i) Largest Number :

Code:

```
import java.util.Scanner;
public class Largest_Number {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter number of elements: ");
        int n = scanner.nextInt();
        int a[] = new int[n];
        System.out.println("Enter elements: ");
        for (int i = 0; i < n; i++) {
            a[i] = scanner.nextInt();
        }
        int max = a[0];
        for (int i = 0; i < n; i++) {
            if (max < a[i]) {
                max = a[i];
            }
        }
        System.out.println("Maximum value: " + max);
    }
}
```

Output:

```
C:\Users\DELL\Downloads\java programs>javac Largest_Number.java
C:\Users\DELL\Downloads\java programs>java Largest_Number
Enter number of elements: 10
Enter elements:
5
5
5
5
```

3.j) Biggest Number :

Code:

```
import java.util.Scanner;

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

        System.out.print("Enter three numbers: ");
        int x = scanner.nextInt();
        int y = scanner.nextInt();
        int z = scanner.nextInt();

        int largest;
        if (x > y && x > z) {
            largest = x;
        } else if (y > z) {
            largest = y;
        } else {
            largest = z;
        }

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

        scanner.close();
    }
}
```

Output:

```
C:\Users\DELL\Downloads\java programs>javac BiggestNumber.java

C:\Users\DELL\Downloads\java programs>java BiggestNumber
Enter three numbers: 7 8 9
Largest number is: 9

C:\Users\DELL\Downloads\java programs>|
```