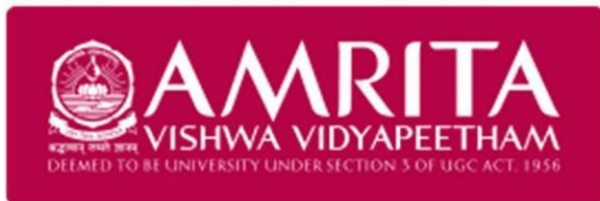


SCHOOL OF  
COMPUTING

**M.REDDY MANISH**  
**CH.SC.U4CSE24129**  
**OBJECT ORIENTED PROGRAMMING**  
**(23CSE111)**  
**LAB RECORD**



**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.U4CSE24129 – M. Reddy Manish** 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

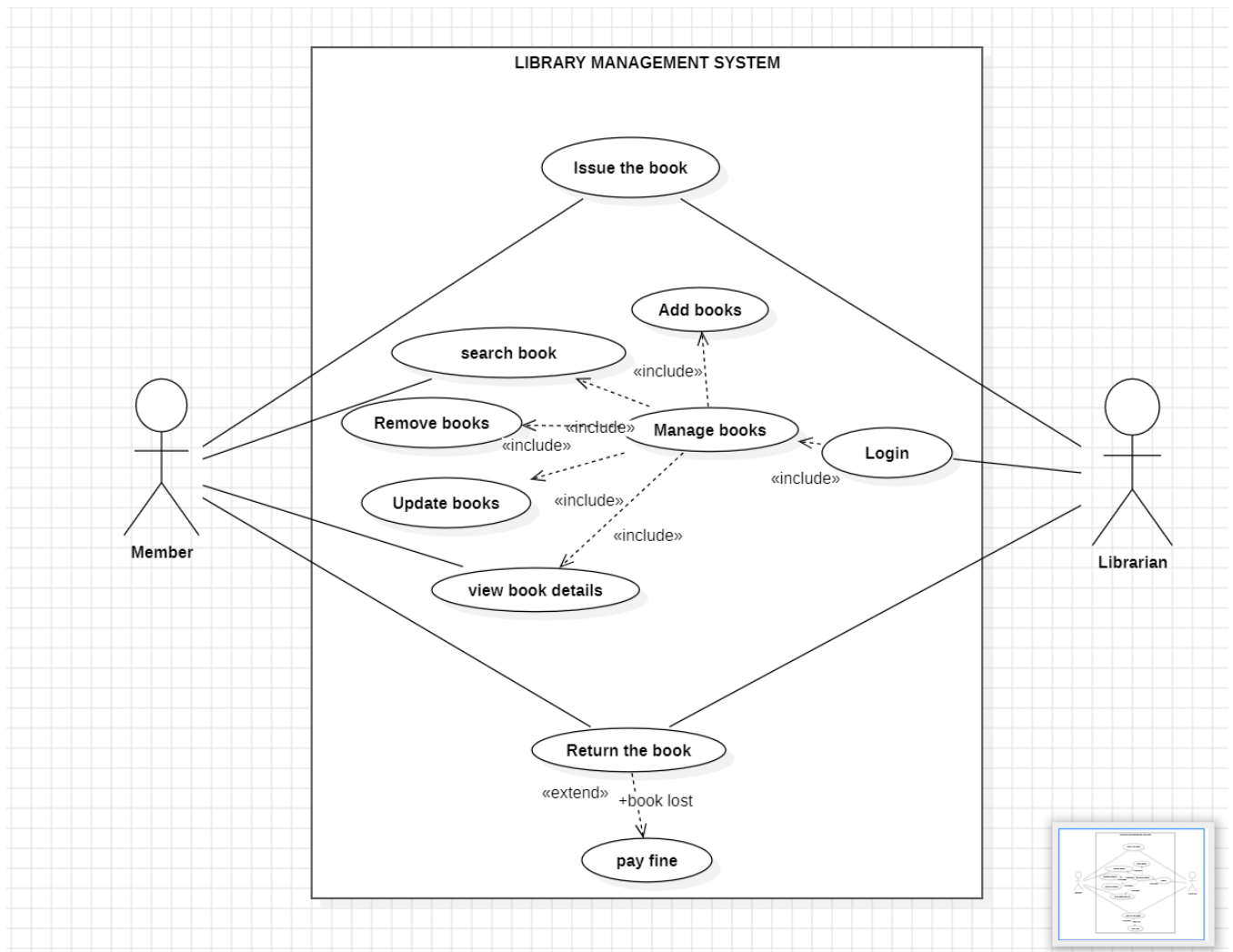
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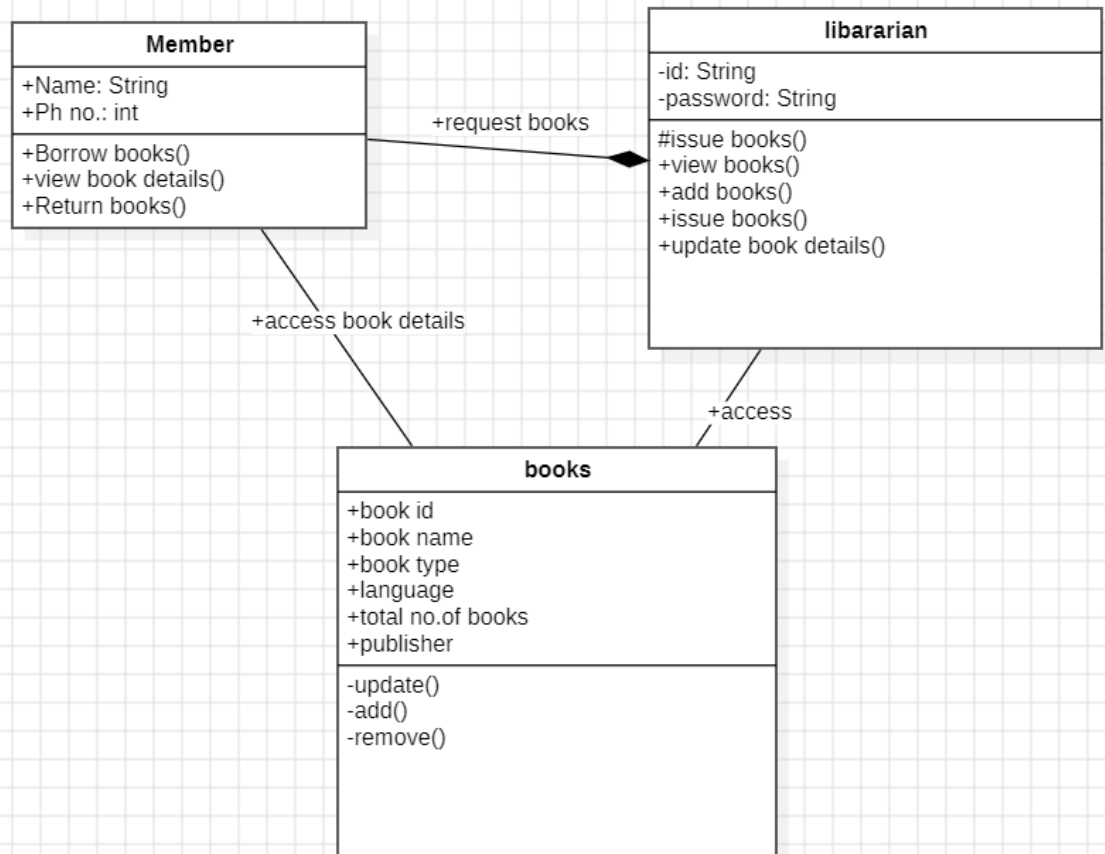
# UML DIAGRAMS

## 1. Library Management system

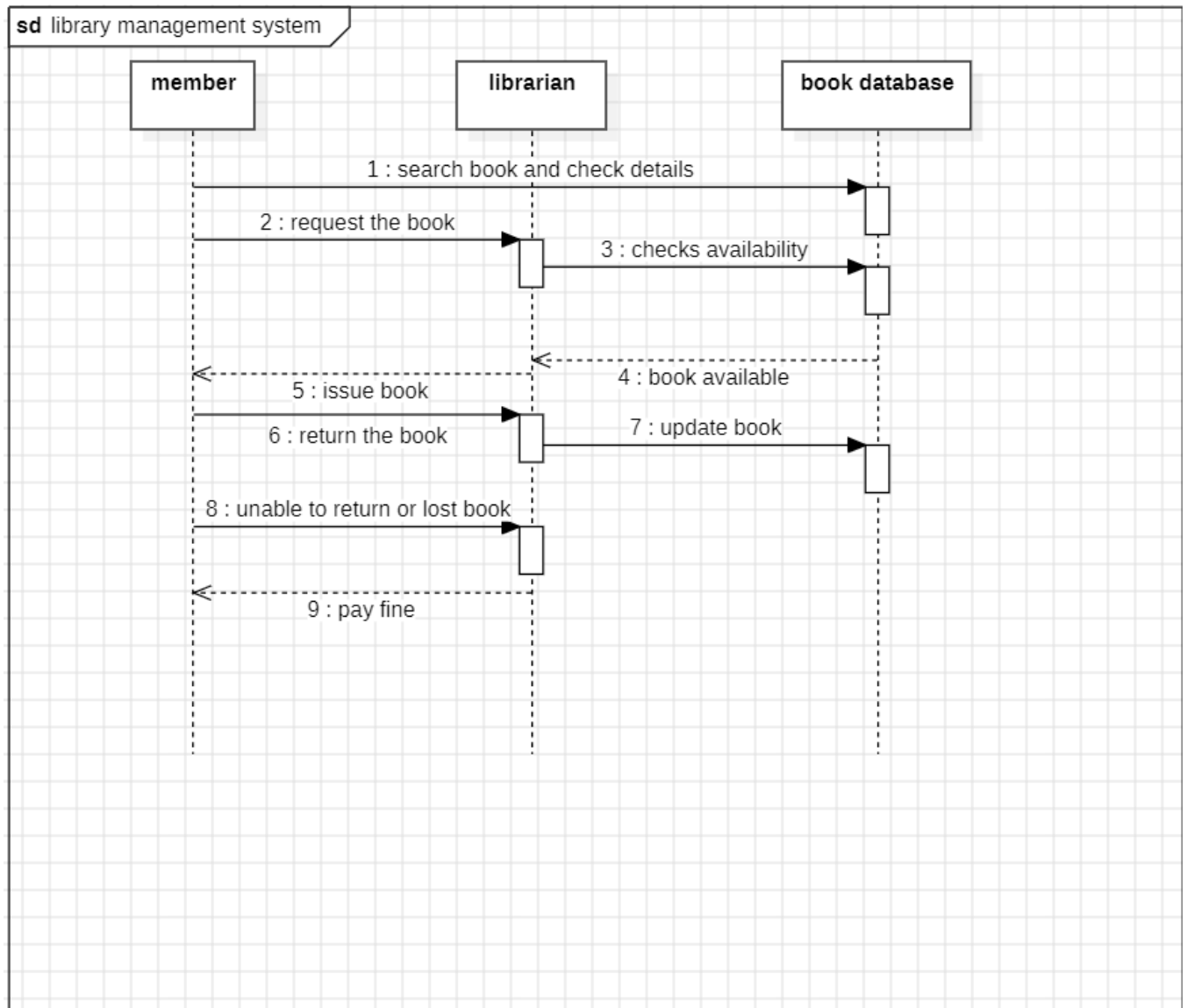
### 1.a) Use Case Diagram



## 1.b) Class Diagram

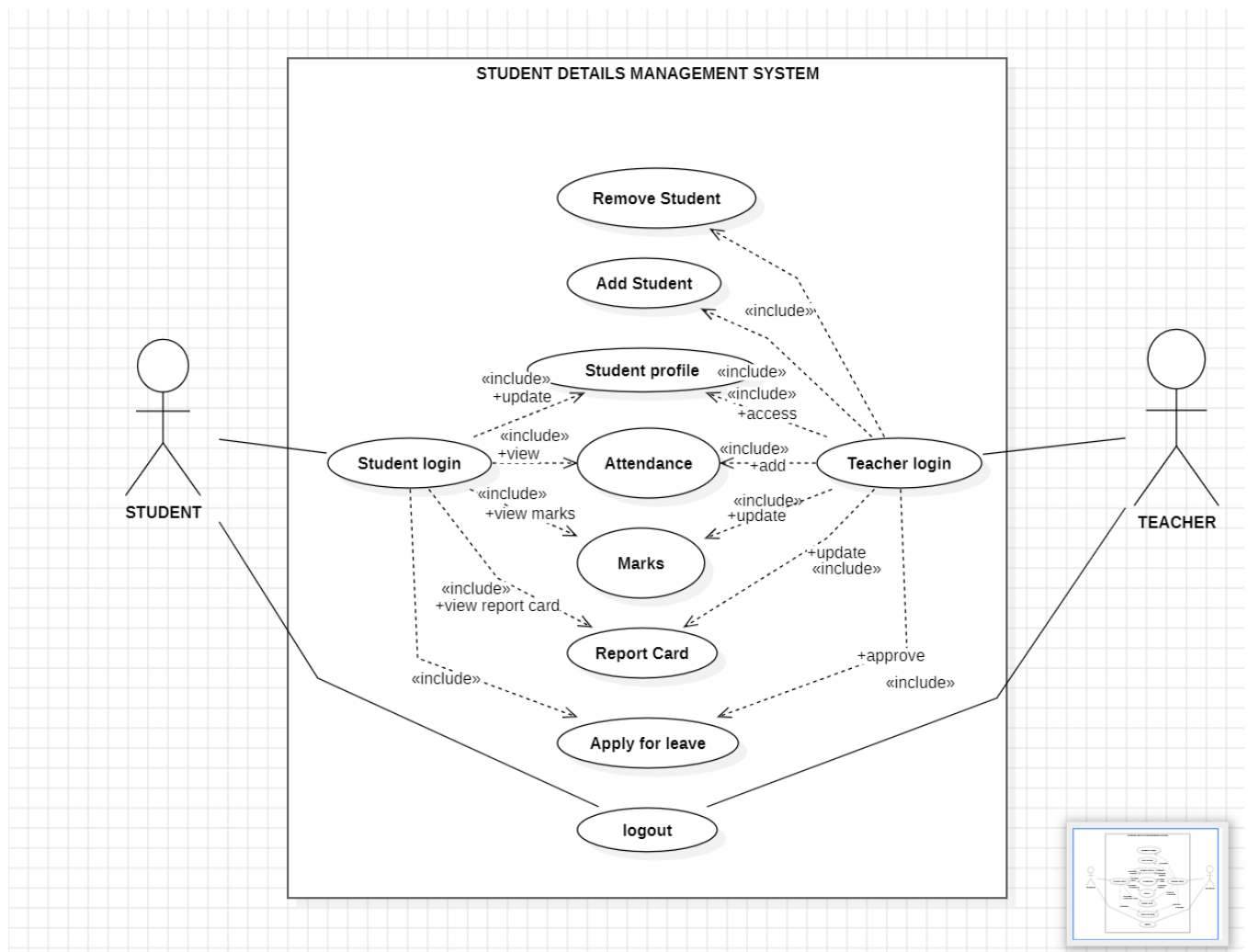


### 1.c) Sequence Diagram

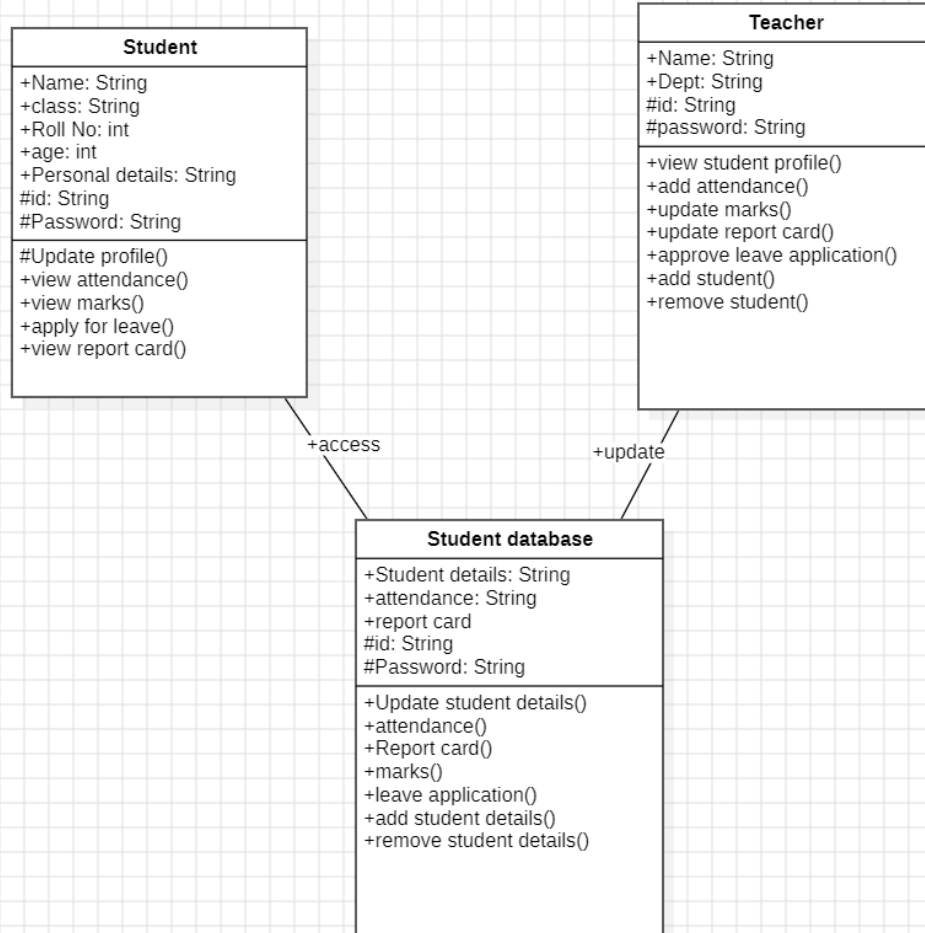


## 2.Student Management system

### 2.a) Use Case Diagram

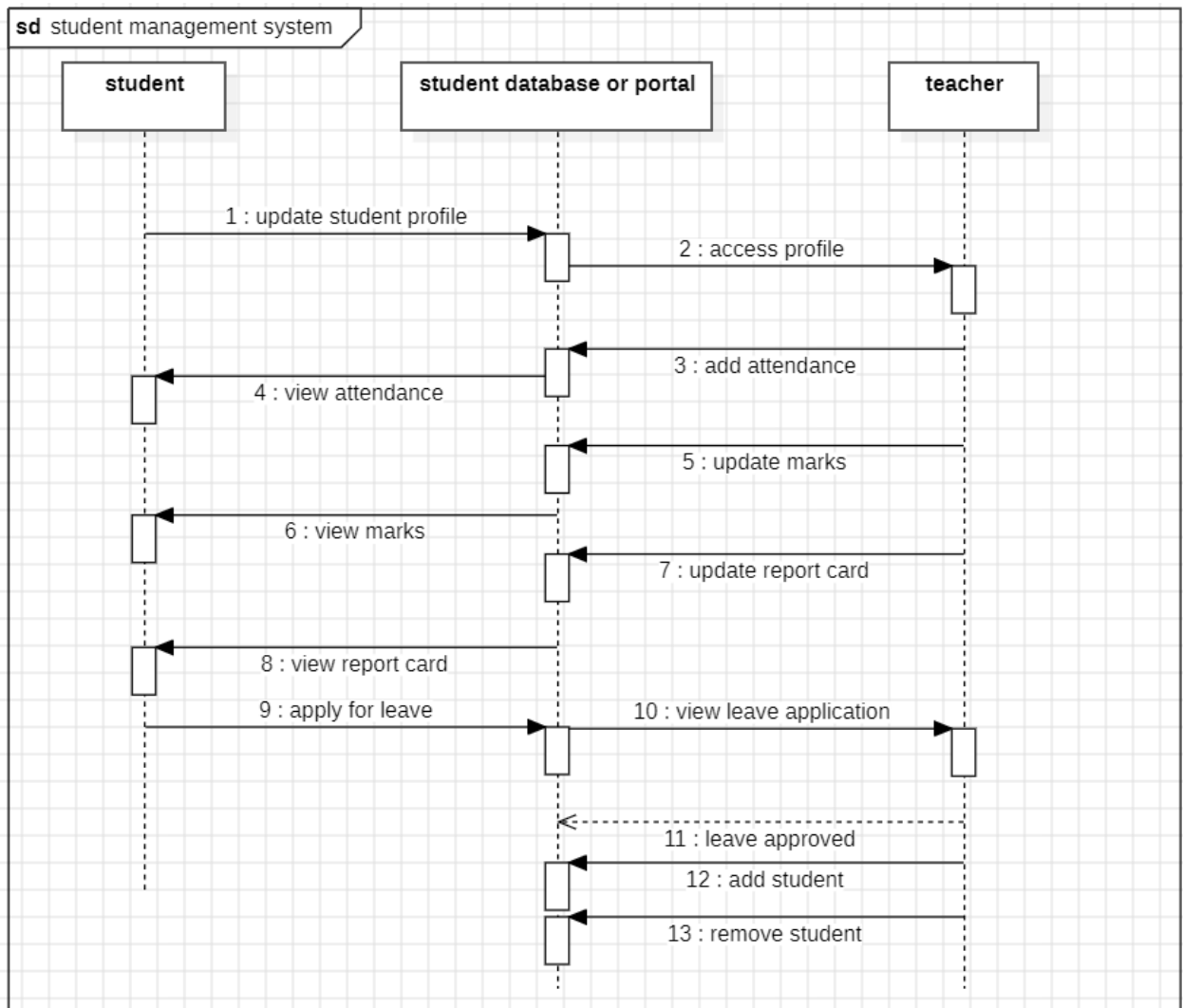


## 2.b) Class Diagram



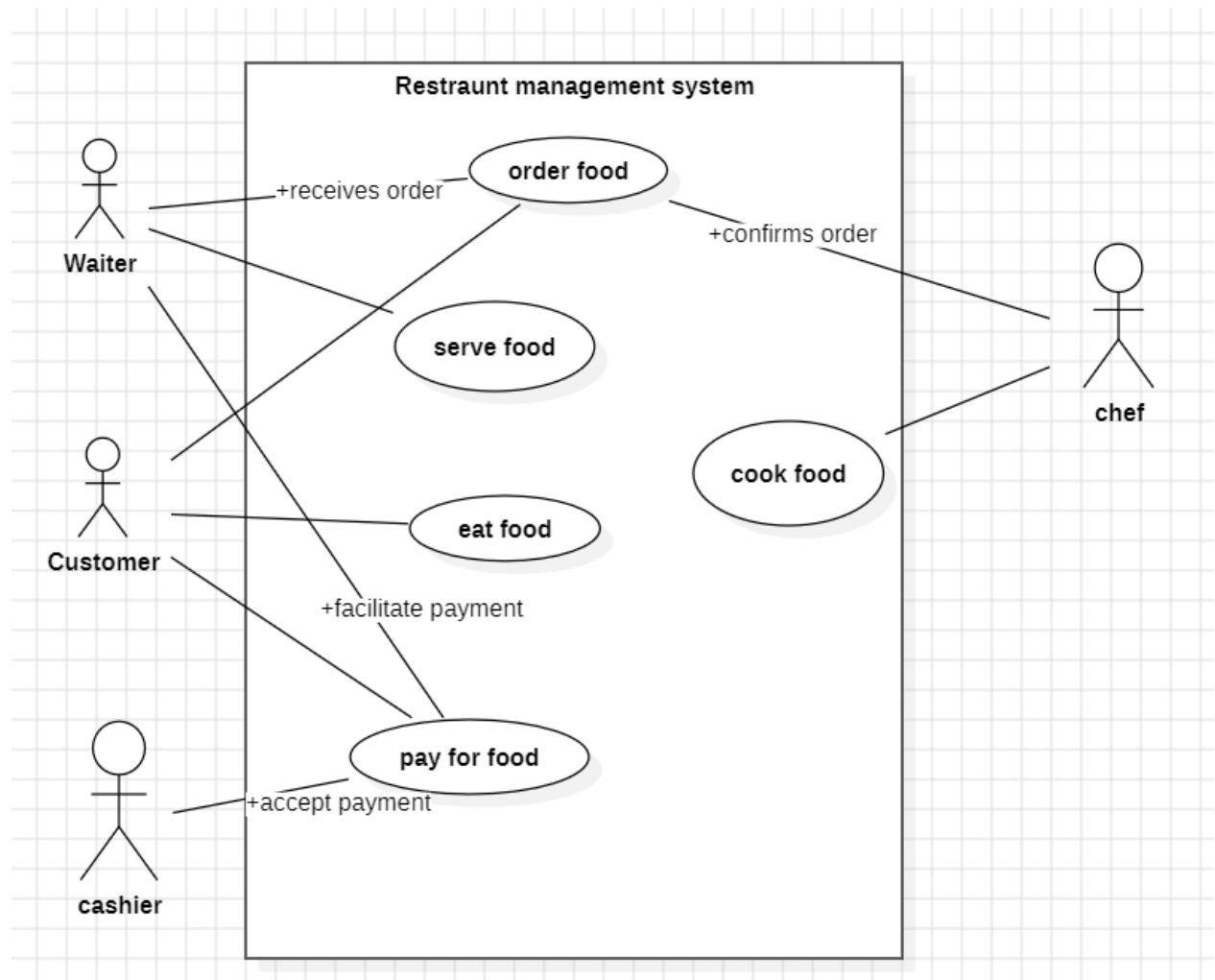


## 2.c) Sequence Diagram

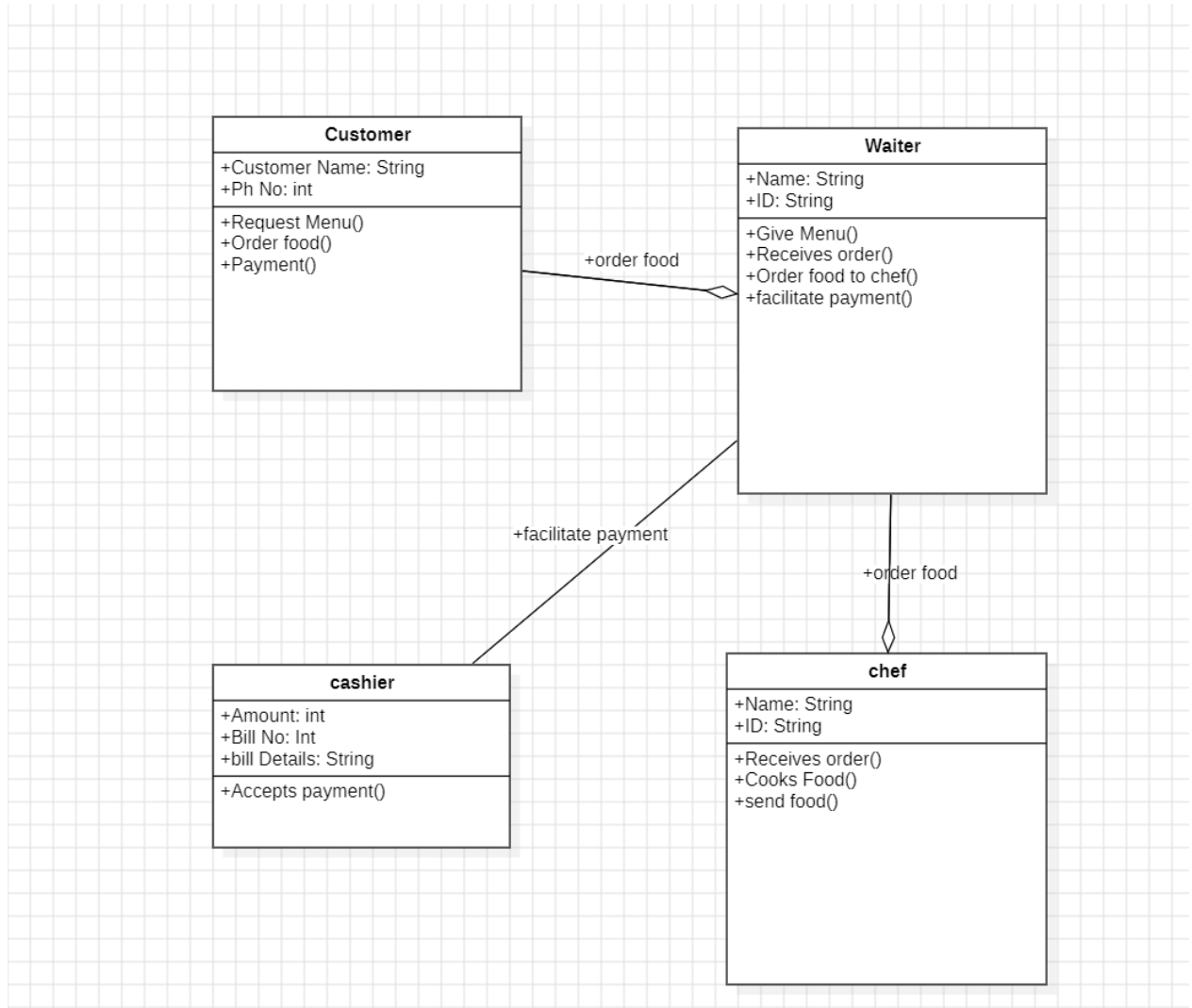


### 3. Restaurent Management system

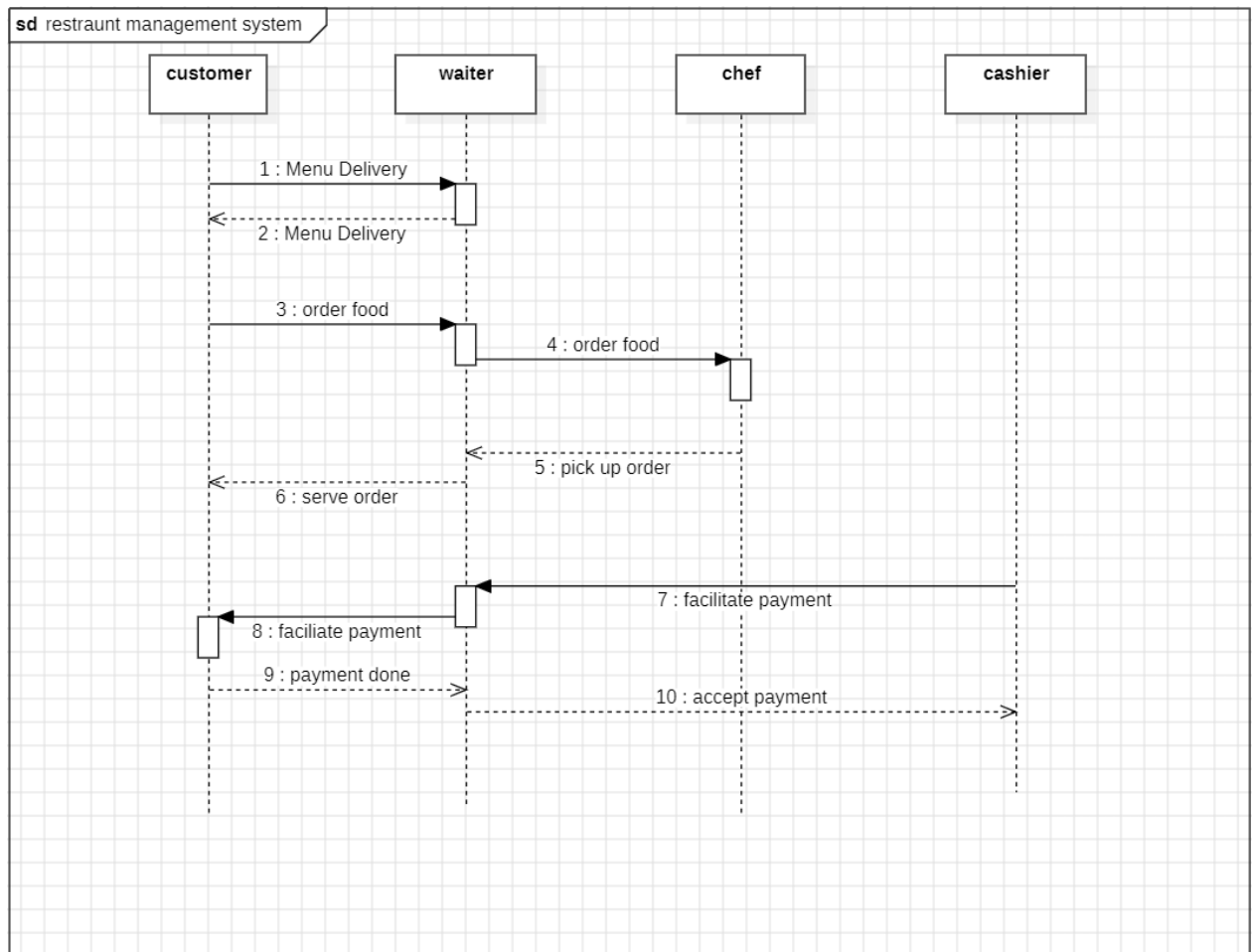
#### 3.a) Use Case Diagram



### 3.b) Class Diagram



### 3.c) Sequence Diagram



## BASIC JAVA PROGRAMS

### 4.a. JAVA PROGRAMME TO FIND HYPOTENUSE OF A TRIANGLE:-

AIM:- To Find Hypotenuse of a Triangle

JAVA CODE:-

```
import java.util.Scanner;

public class Main
{

    public static void main(String[] args) {

        double x;

        double y;

        double z;

        Scanner scanner = new Scanner(System.in);

        System.out.println("Enter side x: ");

        x = scanner.nextDouble();

        System.out.println("Enter side y: ");

        y = scanner.nextDouble();

        z = Math.sqrt((x*x)+(y*y));

        System.out.println("The hypotenuse is: "+z);

        scanner.close();

    }

}
```

SCREENSHOT WITH OUTPUT:-

```
7
8 *****/
9 import java.util.Scanner;
10
11 public class Main
12 {
13
14     public static void main(String[] args) {
15         double x;
16         double y;
17         double z;
18
19         Scanner scanner = new Scanner(System.in);
20
21         System.out.println("Enter side x: ");
22         x = scanner.nextDouble();
23         System.out.println("Enter side y: ");
24         y = scanner.nextDouble();
25
26         z = Math.sqrt((x*x)+(y*y));
27
28         System.out.println("The hypotenuse is: "+z);
29
30         scanner.close();
31     }
32 }
33
```

input

```
Enter side x:
4
Enter side y:
5
The hypotenuse is: 6.4031242374328485

...Program finished with exit code 0
Press ENTER to exit console.
```

#### 4.b.JAVA PROGRAMME WITH SWITCH CASE:-

AIM:- To Explore the switch case Element In the java programe

JAVA CODE:-

```
public class Main
```

```
{
```

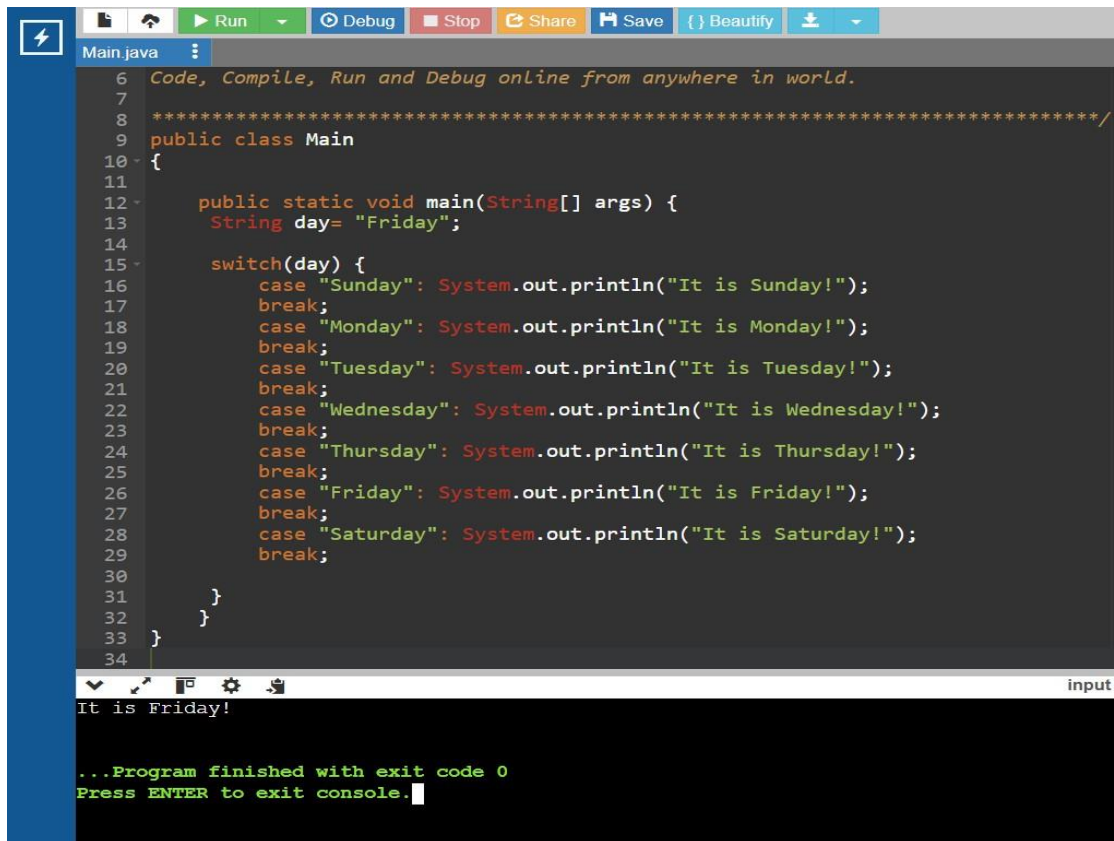
```
    public static void main(String[] args) {
```

```
String day= "Friday";

switch(day) {
    case "Sunday": System.out.println("It is Sunday!");
    break;
    case "Monday": System.out.println("It is Monday!");
    break;
    case "Tuesday": System.out.println("It is Tuesday!");
    break;
    case "Wednesday": System.out.println("It is Wednesday!");
    break;
    case "Thursday": System.out.println("It is Thursday!");
    break;
    case "Friday": System.out.println("It is Friday!");
    break;
    case "Saturday": System.out.println("It is Saturday!");
    break;

}
}
```

**SCREENSHOT WITH OUTPUT:-**

A screenshot of an online Java IDE. The top toolbar includes buttons for Run, Debug, Stop, Share, Save, Beautify, and a download icon. The code editor shows a Java file named 'Main.java' with the following code:

```
6 Code, Compile, Run and Debug online from anywhere in world.
7
8 *****/
9 public class Main
10 {
11
12     public static void main(String[] args) {
13         String day= "Friday";
14
15         switch(day) {
16             case "Sunday": System.out.println("It is Sunday!");
17             break;
18             case "Monday": System.out.println("It is Monday!");
19             break;
20             case "Tuesday": System.out.println("It is Tuesday!");
21             break;
22             case "Wednesday": System.out.println("It is Wednesday!");
23             break;
24             case "Thursday": System.out.println("It is Thursday!");
25             break;
26             case "Friday": System.out.println("It is Friday!");
27             break;
28             case "Saturday": System.out.println("It is Saturday!");
29             break;
30         }
31     }
32 }
33
34
```

The output console at the bottom shows 'It is Friday!' and '...Program finished with exit code 0'. The console also has an 'input' label on the right.

#### 4.c.JAVA PROGRAMME USING IF ELSE STATEMENTS:-

AIM:- To Decode the If else statements in java code

JAVA CODE:-

```
import java.util.Scanner;
```

```
public class Main
```

```
{
```

```
    public static void main(String[] args) {
```

```
        Scanner scanner = new Scanner(System.in);
```

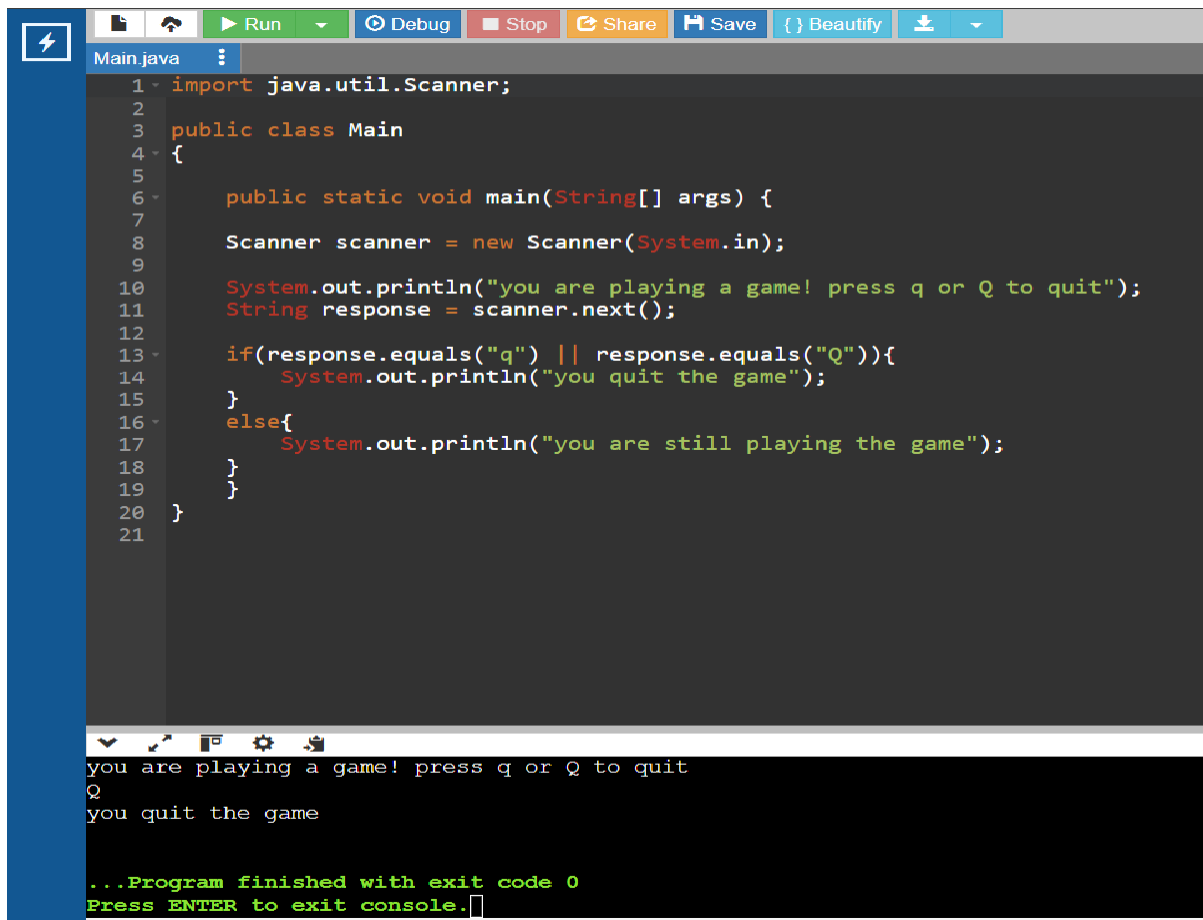


```
System.out.println("you are playing a game! press q or Q to quit");

String response = scanner.next();

if(response.equals("q") || response.equals("Q")){
    System.out.println("you quit the game");
}
else{
    System.out.println("you are still playing the game");
}
}
}
```

### SCREENSHOT WITH OUTPUT:-

A screenshot of an IDE window titled 'Main.java'. The code is a Java program that uses a Scanner to read input. It prints 'you are playing a game! press q or Q to quit' and then reads a string 'response'. If 'response' is 'q' or 'Q', it prints 'you quit the game'. Otherwise, it prints 'you are still playing the game'. The output console at the bottom shows the program's execution: it prints the initial message, reads 'Q', prints 'you quit the game', and then shows '...Program finished with exit code 0' and 'Press ENTER to exit console.'.

```
1 - import java.util.Scanner;
2
3 public class Main
4 {
5
6     public static void main(String[] args) {
7
8         Scanner scanner = new Scanner(System.in);
9
10        System.out.println("you are playing a game! press q or Q to quit");
11        String response = scanner.next();
12
13        if(response.equals("q") || response.equals("Q")){
14            System.out.println("you quit the game");
15        }
16        else{
17            System.out.println("you are still playing the game");
18        }
19    }
20 }
21
```

you are playing a game! press q or Q to quit  
Q  
you quit the game  
...Program finished with exit code 0  
Press ENTER to exit console.

#### 4.D.JAVA PROGRAME USING WHILE LOOP:-

AIM:- To Decode the while loops in java code

#### JAVA CODE:-

```
import java.util.Scanner;

public class Main
{

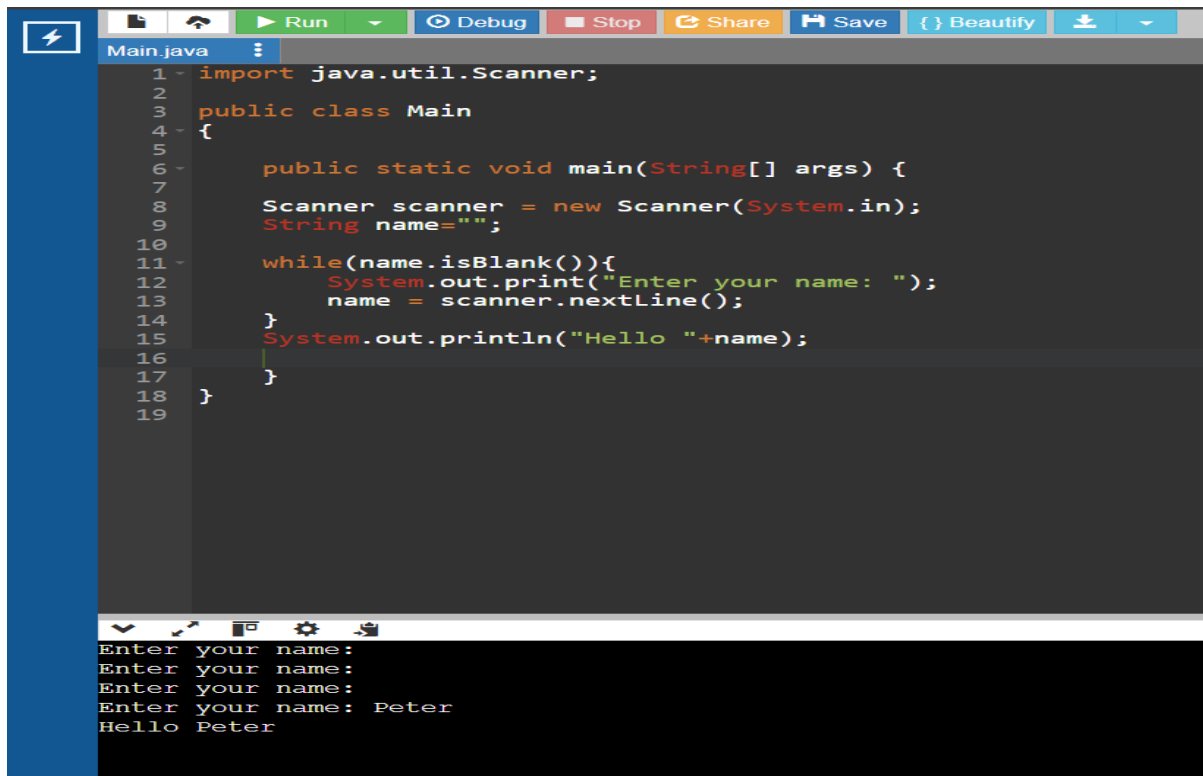
    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);
        String name="";

        while(name.isBlank()){
            System.out.print("Enter your name: ");
            name = scanner.nextLine();
        }
        System.out.println("Hello "+name);

    }
}
```

#### SCREENSHOT WITH OUTPUT:-



The screenshot shows an IDE window titled 'Main.java'. The code is as follows:

```
1 import java.util.Scanner;
2
3 public class Main
4 {
5
6     public static void main(String[] args) {
7
8         Scanner scanner = new Scanner(System.in);
9         String name="";
10
11         while(name.isBlank()){
12             System.out.print("Enter your name: ");
13             name = scanner.nextLine();
14         }
15         System.out.println("Hello "+name);
16     }
17 }
18
19
```

Below the code editor, the output console shows the program's execution:

```
Enter your name:
Enter your name:
Enter your name:
Enter your name: Peter
Hello Peter
```

#### 4.e.JAVA PROGRAMME USING FOR LOOP:-

AIM:- To Decode the For loops in java code

#### JAVA CODE:-

```
public class Main
{

    public static void main(String[] args) {

        for (int i=5; i>=0; i-- ){

            System.out.println(i);

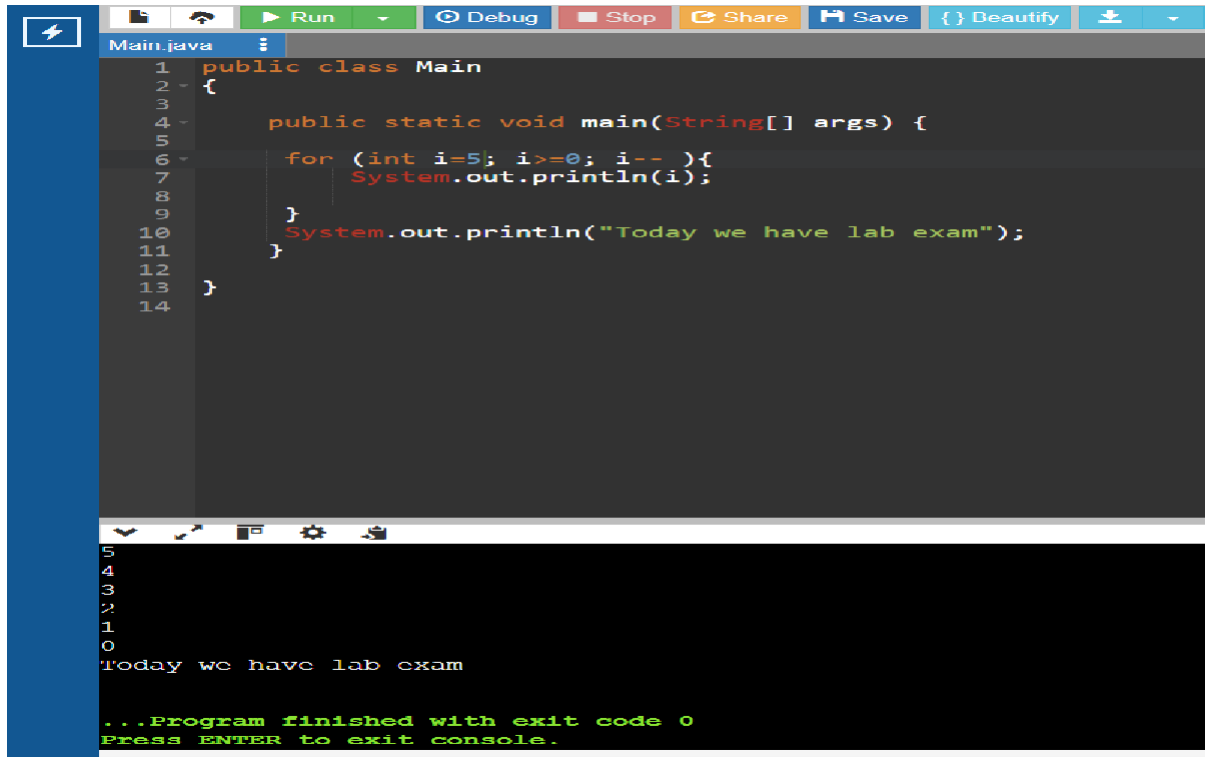
        }

        System.out.println("Today we have lab exam");

    }

}
```

## SCREENSHOT WITH OUTPUT:-

A screenshot of an IDE window titled 'Main.java'. The code defines a public class 'Main' with a static method 'main' that takes a String array 'args'. Inside the 'main' method, there is a for loop that iterates from 'i=5' down to 'i=0', printing the value of 'i' on each iteration. After the loop, it prints the string 'Today we have lab exam'. The IDE's toolbar at the top includes buttons for Run, Debug, Stop, Share, Save, Beautify, and a download icon. The output console at the bottom shows the execution results: the numbers 5, 4, 3, 2, 1, 0 on separate lines, followed by the message 'Today we have lab exam', and a final status message: '...Program finished with exit code 0 Press ENTER to exit console.'

```
1 public class Main
2 {
3
4     public static void main(String[] args) {
5
6         for (int i=5; i>=0; i-- ){
7             System.out.println(i);
8         }
9         System.out.println("Today we have lab exam");
10    }
11
12 }
13
14
```

```
5
4
3
2
1
0
Today we have lab exam
...Program finished with exit code 0
Press ENTER to exit console.
```

## 4.f.JAVA PROGRAMME FOR SHAPE OF A SYMBOL:-

AIM:- To Find the shape of any symbol using java programme.

### JAVA CODE:-

```
import java.util.Scanner;
```

```
public class Main
```

```
{
```

```
    public static void main(String[] args) {
```

```
        Scanner scanner = new Scanner(System.in);
```

```
        int rows;
```

```
        int columns;
```

```
String symbol = "";
```

```
System.out.println("Enter no of rows: ");
```

```
rows = scanner.nextInt();
```

```
System.out.println("Enter no of columns: ");
```

```
columns = scanner.nextInt();
```

```
System.out.println("Enter symbol to use: ");
```

```
symbol = scanner.next();
```

```
for(int i=1; i<=rows; i++){
```

```
    System.out.println();
```

```
    for(int j=1; j<=columns; j++){
```

```
        System.out.println(symbol);
```

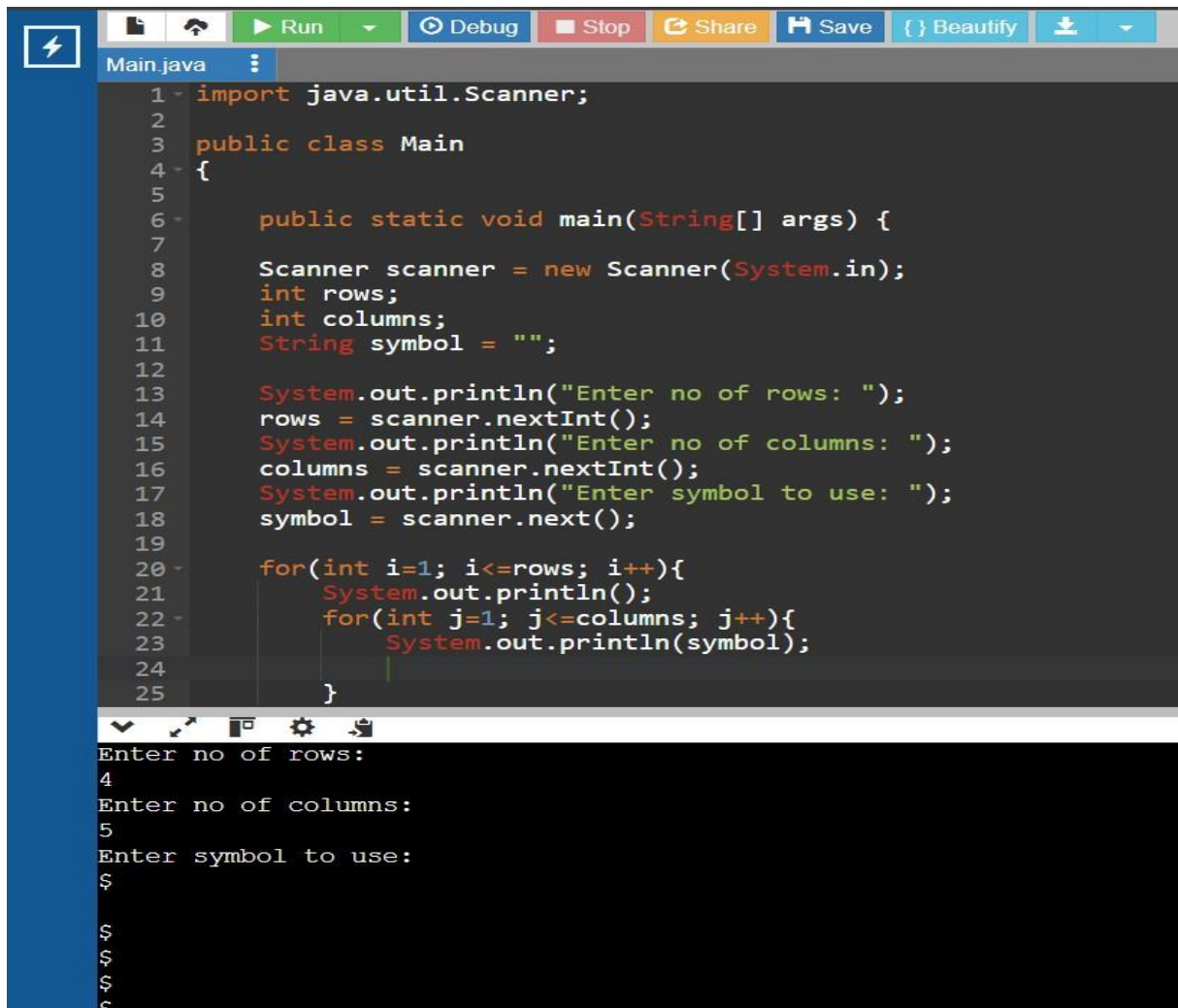
```
    }
```

```
}
```

```
    }
```

```
}
```

**SCREENSHOT WITH OUTPUT:-**



```
1 import java.util.Scanner;
2
3 public class Main
4 {
5
6     public static void main(String[] args) {
7
8         Scanner scanner = new Scanner(System.in);
9         int rows;
10        int columns;
11        String symbol = "";
12
13        System.out.println("Enter no of rows: ");
14        rows = scanner.nextInt();
15        System.out.println("Enter no of columns: ");
16        columns = scanner.nextInt();
17        System.out.println("Enter symbol to use: ");
18        symbol = scanner.next();
19
20        for(int i=1; i<=rows; i++){
21            System.out.println();
22            for(int j=1; j<=columns; j++){
23                System.out.println(symbol);
24            }
25        }
26    }
27 }
```

Enter no of rows:  
4  
Enter no of columns:  
5  
Enter symbol to use:  
\$  
\$  
\$  
\$  
\$

#### 4.g.JAVA PROGRAMME FOR FACTORIAL OF A NUMBER:-

AIM:- To Find the Factorial of a Number

JAVA CODE:-

```
import java.util.Scanner;
```

```
public class Main {
```

```
    public static void main(String[] args) {
```

```
        Scanner scanner = new Scanner(System.in);
```

```
        System.out.print("Enter a number: ");
```

```
        int num = scanner.nextInt();
```

```
long factorial = 1;

for (int i = 1; i <= num; i++) {

    factorial *= i;

}
```

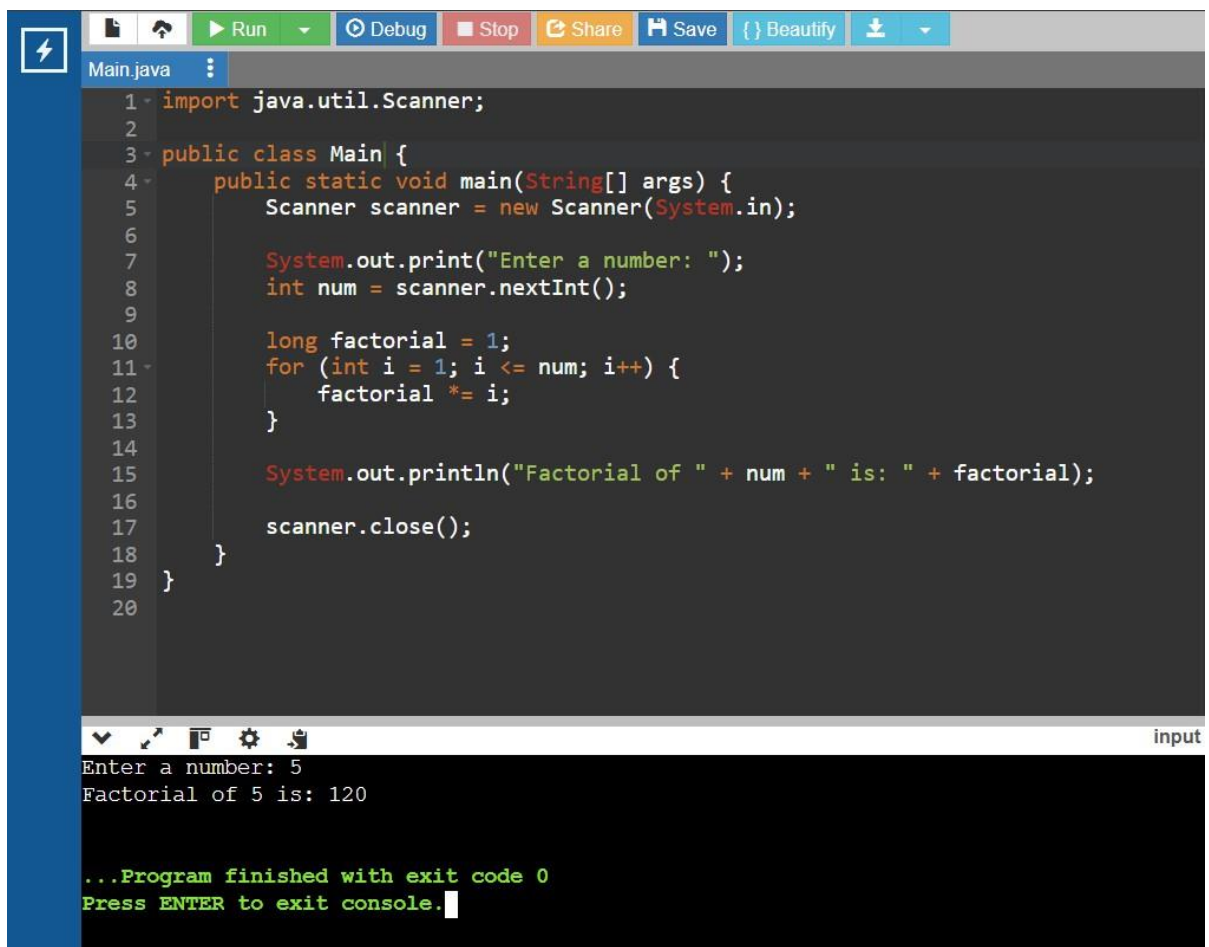
```
System.out.println("Factorial of " + num + " is: " + factorial);
```

```
scanner.close();

}

}
```

### SCREENSHOT WITH OUTPUT:-

A screenshot of an IDE window titled 'Main.java'. The code defines a 'Main' class with a 'main' method. It uses 'Scanner' to take input, calculates the factorial of the input number using a loop, and prints the result. The output console shows the input '5' and the result '120'.

```
1 import java.util.Scanner;
2
3 public class Main {
4     public static void main(String[] args) {
5         Scanner scanner = new Scanner(System.in);
6
7         System.out.print("Enter a number: ");
8         int num = scanner.nextInt();
9
10        long factorial = 1;
11        for (int i = 1; i <= num; i++) {
12            factorial *= i;
13        }
14
15        System.out.println("Factorial of " + num + " is: " + factorial);
16
17        scanner.close();
18    }
19 }
20
```

Enter a number: 5  
Factorial of 5 is: 120

...Program finished with exit code 0  
Press ENTER to exit console.

#### 4.h.JAVA PROGRAMME FOR REVERSING A STRING:-

AIM:- To Reverse any type of string like names or Anything.

#### JAVA CODE:-

```
import java.util.Scanner;

public class Main {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter a string: ");

        String str = scanner.nextLine();

        String reversed = "";

        for (int i = str.length() - 1; i >= 0; i--) {

            reversed += str.charAt(i);

        }

        System.out.println("Reversed string: " + reversed);

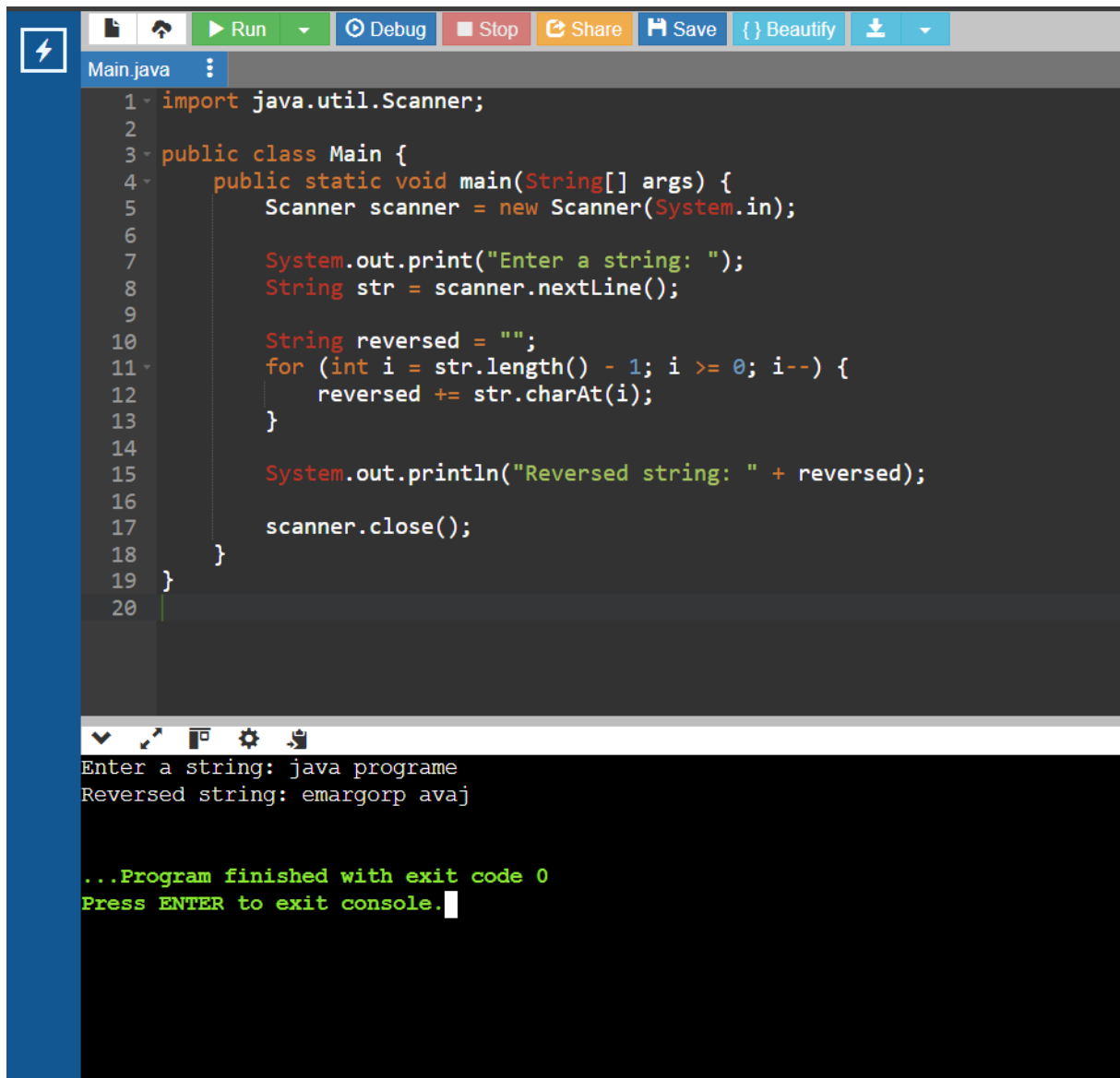
        scanner.close();

    }

}
```

#### SCREENSHOT WITH OUTPUT:-





The screenshot shows an IDE window with a file named 'Main.java'. The code is as follows:

```
1 import java.util.Scanner;
2
3 public class Main {
4     public static void main(String[] args) {
5         Scanner scanner = new Scanner(System.in);
6
7         System.out.print("Enter a string: ");
8         String str = scanner.nextLine();
9
10        String reversed = "";
11        for (int i = str.length() - 1; i >= 0; i--) {
12            reversed += str.charAt(i);
13        }
14
15        System.out.println("Reversed string: " + reversed);
16
17        scanner.close();
18    }
19 }
20
```

Below the code editor, the console output is visible:

```
Enter a string: java programe
Reversed string: emargorp avaj

...Program finished with exit code 0
Press ENTER to exit console.
```

#### 4.i.JAVA PROGRAMME TO IDENTIFY PRIME NUMBER:-

AIM:- To Identify weather the given number Is prime number or not.

JAVA CODE:-

```
import java.util.Scanner;

public class Main{

    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;
if (num <= 1) {
    isPrime = false;
} else {
    for (int i = 2; i <= Math.sqrt(num); 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();
}
```

**SCREENSHOT WITH OUTPUT:-**

```
1 import java.util.Scanner;
2
3 public class Main{
4     public static void main(String[] args) {
5         Scanner scanner = new Scanner(System.in);
6
7         System.out.print("Enter a number: ");
8         int num = scanner.nextInt();
9
10        boolean isPrime = true;
11        if (num <= 1) {
12            isPrime = false;
13        } else {
14            for (int i = 2; i <= Math.sqrt(num); i++) {
15                if (num % i == 0) {
16                    isPrime = false;
17                    break;
18                }
19            }
20        }
21
22        if (isPrime) {
23            System.out.println(num + " is a prime number.");
24        } else {
25            System.out.println(num + " is not a prime number.");
26        }
27
28        scanner.close();
29    }
30 }
31
```

Enter a number: 11  
11 is a prime number.

...Program finished with exit code 0  
Press ENTER to exit console.

#### 4.j.JAVA PROGRAMME FOR PALINDROME:-

AIM:- To find the palindrome of a given string.

JAVA CODE:-

```
import java.util.Scanner;
```

```
public class Main {
```

```
    public static void main(String[] args) {
```

```
        Scanner scanner = new Scanner(System.in);
```

```
System.out.print("Enter a word: ");

String word = scanner.nextLine();

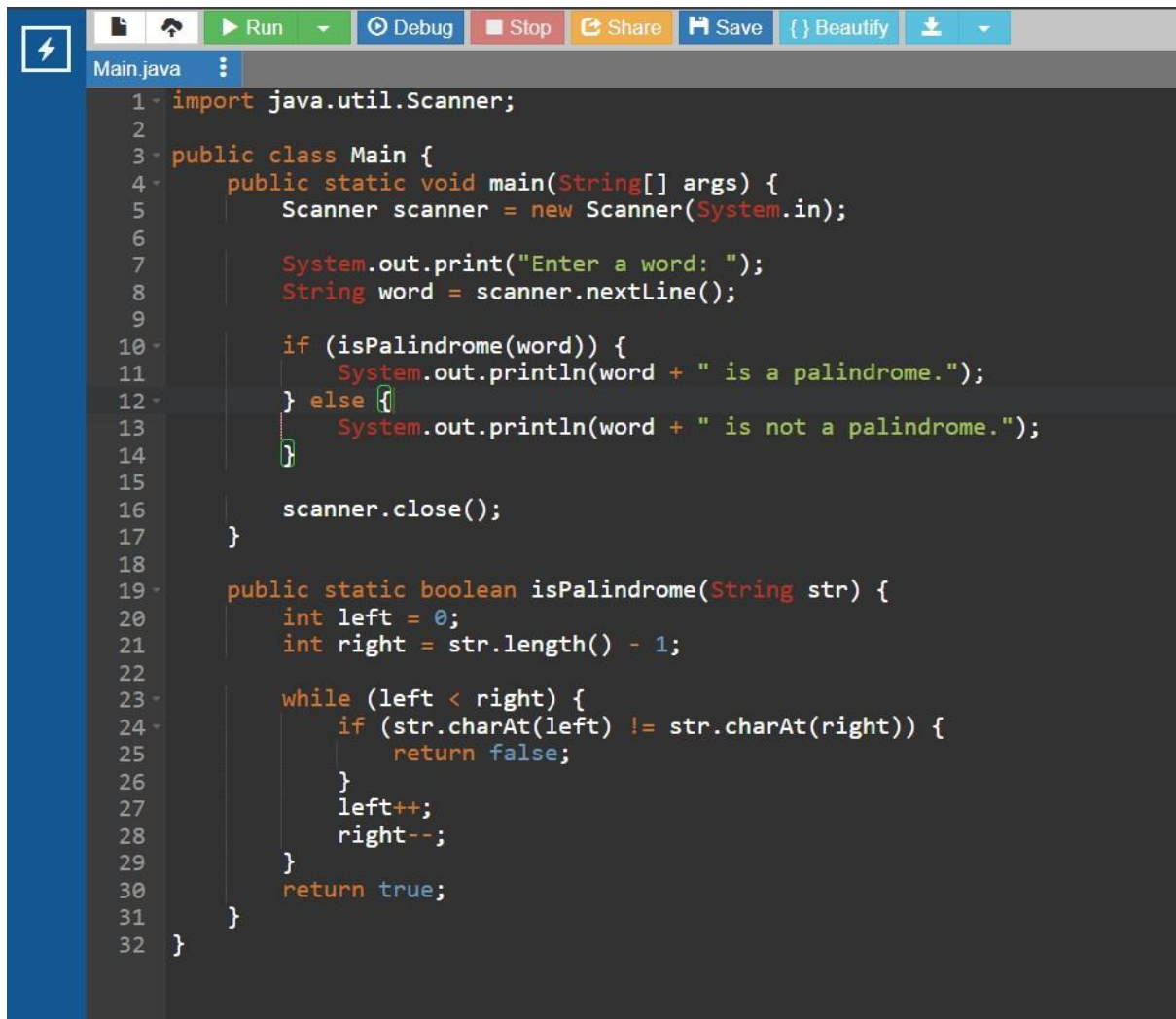
if (isPalindrome(word)) {
    System.out.println(word + " is a palindrome.");
} else {
    System.out.println(word + " is not a palindrome.");
}

scanner.close();
}

public static boolean isPalindrome(String str) {
    int left = 0;
    int right = str.length() - 1;

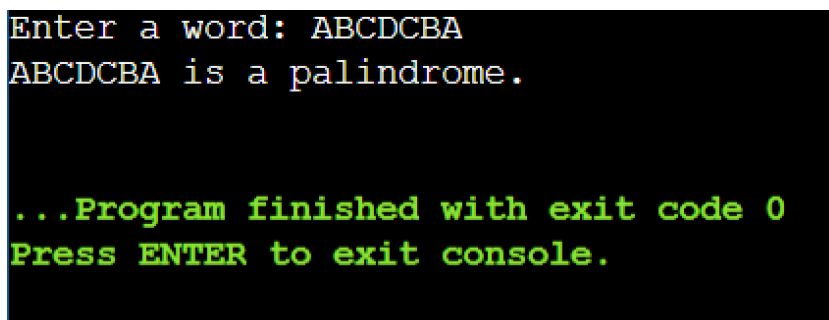
    while (left < right) {
        if (str.charAt(left) != str.charAt(right)) {
            return false;
        }
        left++;
        right--;
    }
    return true;
}
}
```

**SCREENSHOT OF CODE:-**

A screenshot of an IDE window titled 'Main.java'. The code is a Java program to check if a word is a palindrome. It imports java.util.Scanner, defines a Main class with a main method, and a static isPalindrome method. The main method prompts the user to enter a word and prints whether it is a palindrome. The isPalindrome method uses two pointers, left and right, to compare characters from both ends of the string towards the center. The code is as follows:

```
1 import java.util.Scanner;
2
3 public class Main {
4     public static void main(String[] args) {
5         Scanner scanner = new Scanner(System.in);
6
7         System.out.print("Enter a word: ");
8         String word = scanner.nextLine();
9
10        if (isPalindrome(word)) {
11            System.out.println(word + " is a palindrome.");
12        } else {
13            System.out.println(word + " is not a palindrome.");
14        }
15
16        scanner.close();
17    }
18
19    public static boolean isPalindrome(String str) {
20        int left = 0;
21        int right = str.length() - 1;
22
23        while (left < right) {
24            if (str.charAt(left) != str.charAt(right)) {
25                return false;
26            }
27            left++;
28            right--;
29        }
30        return true;
31    }
32 }
```

OUTPUT:-

A screenshot of a console window showing the output of the Java program. The user has entered 'ABCDcba', and the program has printed 'ABCDcba is a palindrome.'. Below this, it says '...Program finished with exit code 0' and 'Press ENTER to exit console.'.

```
Enter a word: ABCDCBA
ABCDcba is a palindrome.

...Program finished with exit code 0
Press ENTER to exit console.
```