

**Q1) Print the following pattern using nested for loop:**

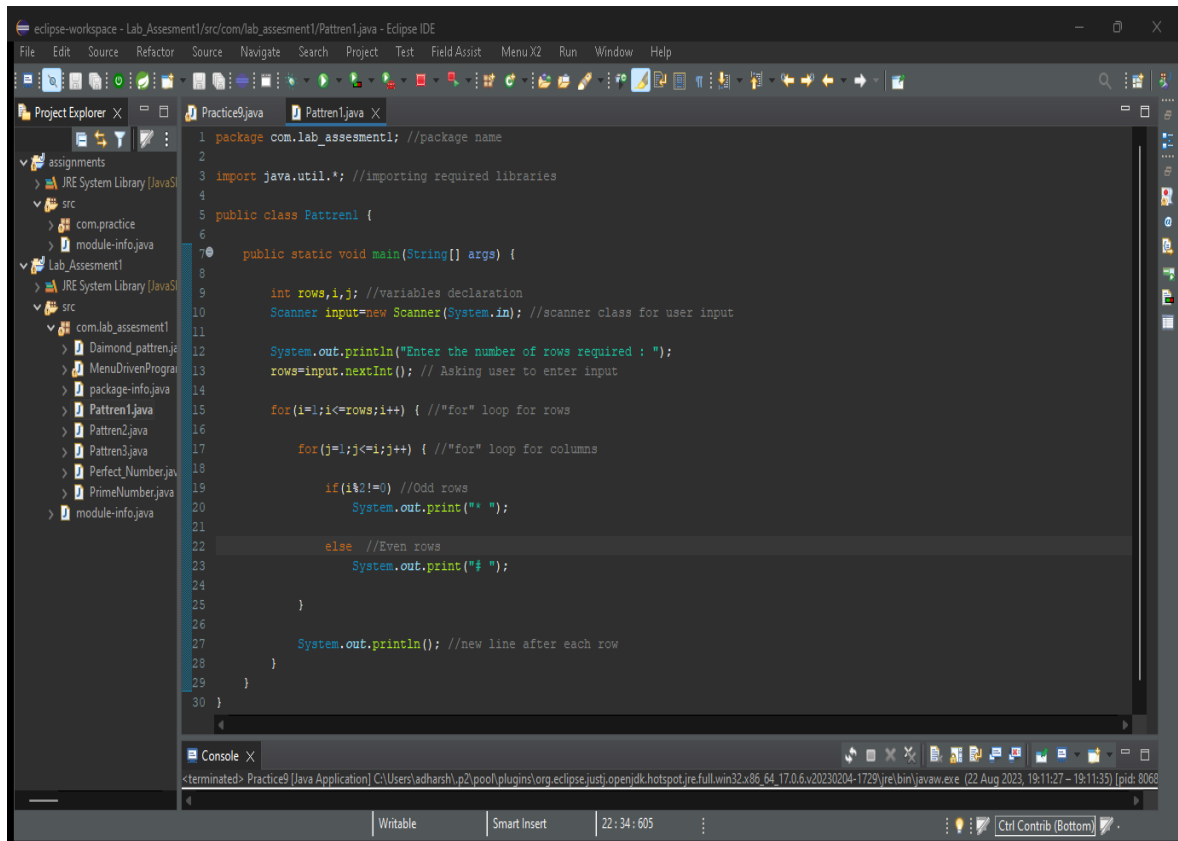
a) \*

# #

\* \* \*

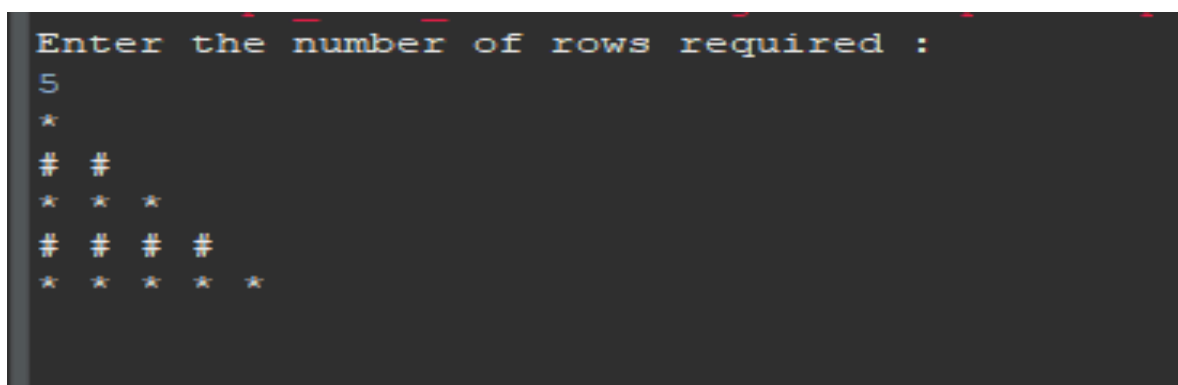
# # # #

**Program:**



```
1 package com.lab_assessment1; //package name
2
3 import java.util.*; //importing required libraries
4
5 public class Pattern1 {
6
7     public static void main(String[] args) {
8
9         int rows,i,j; //variables declaration
10        Scanner input=new Scanner(System.in); //scanner class for user input
11
12        System.out.println("Enter the number of rows required : ");
13        rows=input.nextInt(); // Asking user to enter input
14
15        for(i=1;i<=rows;i++) { //"for" loop for rows
16
17            for(j=1;j<=i;j++) { //"for" loop for columns
18
19                if(i%2!=0) //Odd rows
20                    System.out.print("* ");
21
22                else //Even rows
23                    System.out.print("# ");
24
25            }
26
27            System.out.println(); //new line after each row
28        }
29    }
30 }
```

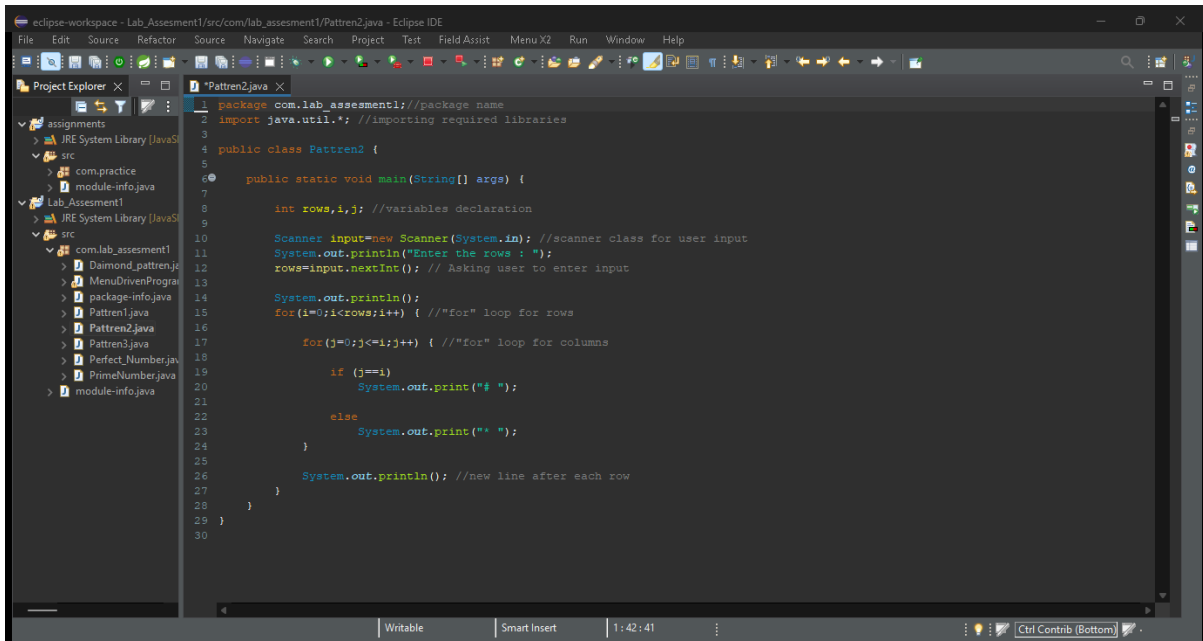
**Output of this program is:**



```
Enter the number of rows required :
5
*
# #
* * *
# # # #
* * * * *
```

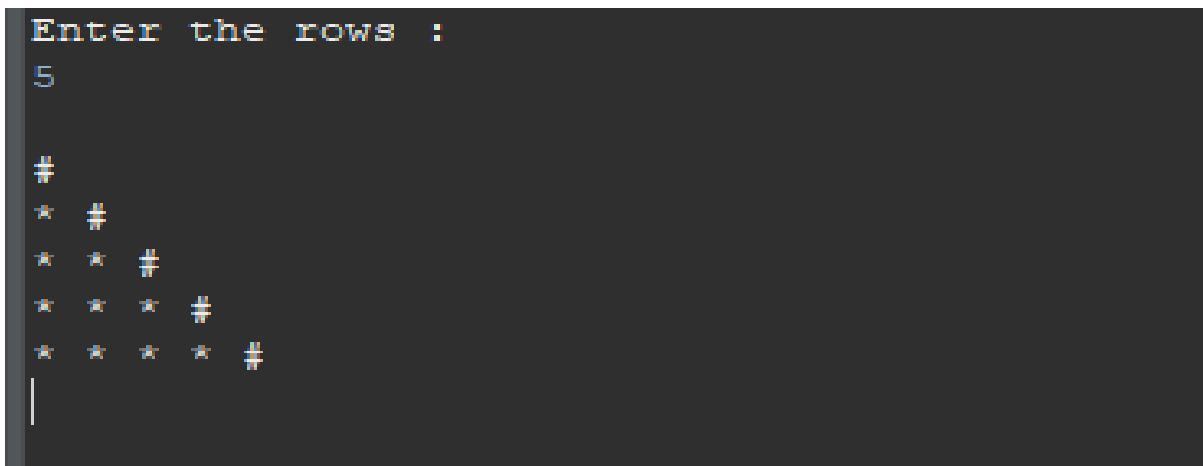
b) #  
\* #  
\* \* #  
\* \* \* #  
\* \* \* \* #

Program:



```
1 package com.lab_assessment1; //package name
2 import java.util.*; //importing required libraries
3
4 public class Pattern2 {
5
6     public static void main(String[] args) {
7
8         int rows, i, j; //variables declaration
9
10        Scanner input=new Scanner(System.in); //scanner class for user input
11        System.out.println("Enter the rows : ");
12        rows=input.nextInt(); // Asking user to enter input
13
14        System.out.println();
15        for(i=0;i<rows;i++) { //"for" loop for rows
16
17            for(j=0;j<=i;j++) { //"for" loop for columns
18
19                if (j==i)
20                    System.out.print("# ");
21
22                else
23                    System.out.print("* ");
24            }
25
26            System.out.println(); //new line after each row
27        }
28    }
29 }
30
```

Output of this program is:

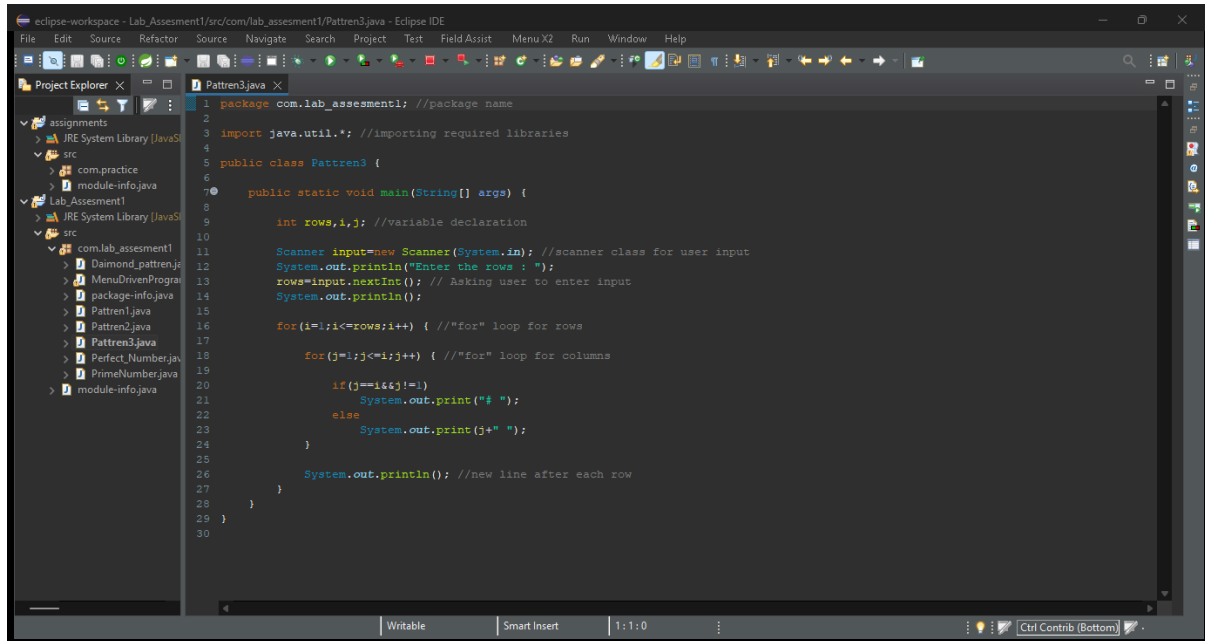


```
Enter the rows :
5

#
* #
* * #
* * * #
* * * * #
```

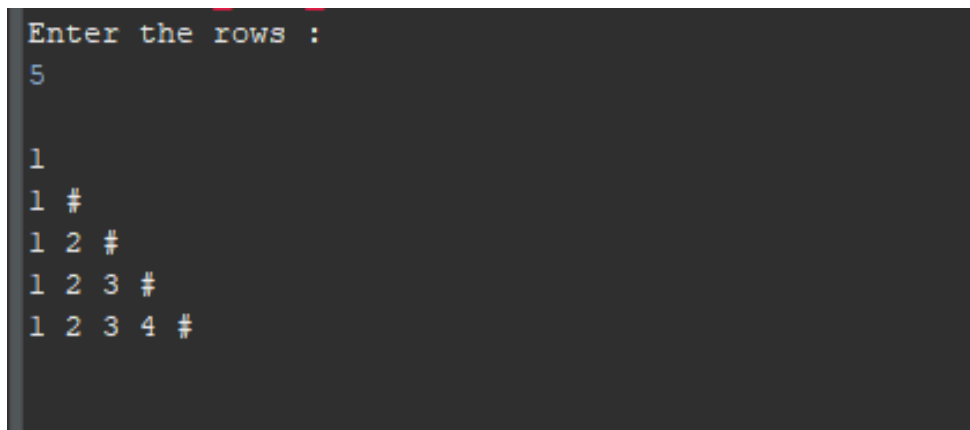
c) 1  
1 #  
1 2 #  
1 2 3 #

Program:



```
1 package com.lab_assessment1; //package name
2
3 import java.util.*; //importing required libraries
4
5 public class Pattern3 {
6
7     public static void main(String[] args) {
8
9         int rows, i, j; //variable declaration
10
11         Scanner input = new Scanner(System.in); //scanner class for user input
12         System.out.println("Enter the rows : ");
13         rows = input.nextInt(); // Asking user to enter input
14         System.out.println();
15
16         for(i=1; i<=rows; i++) { // "for" loop for rows
17
18             for(j=1; j<=i; j++) { // "for" loop for columns
19
20                 if(j==1 && j!=i)
21                     System.out.print("# ");
22                 else
23                     System.out.print(j+" ");
24             }
25
26             System.out.println(); //new line after each row
27         }
28     }
29 }
30
```

Output of this program is:



```
Enter the rows :
5

1
1 #
1 2 #
1 2 3 #
1 2 3 4 #
```

d)

```

      *
     * *
    * * *
   * * * *
  * * *
 * *
*
```

### Program:

```

package com.lab_assesment1; //package name

import java.util.*; //importing required libraries

public class Daimond_pattren {

    public static void main(String[] args) {

        int rows,i,j,k; //variable declaration

        Scanner input=new Scanner(System.in); //scanner class for user input
        System.out.println("Enter the rows : ");
        rows=input.nextInt(); // Asking user to enter input
        System.out.println();

        // Upper Triangle
        for(i=1;i<=rows;i++) {

            for(k=1;k<=rows-i;k++) //for space
                System.out.print(" ");

            for(j=1;j<=i;j++)
                System.out.print(" *");
            System.out.println();
        }
        // Lower Triangle
        for(i=rows-1;i>0;i--) {

            for(k=1;k<=rows-i;k++) //for space
                System.out.print(" ");

            for(j=1;j<=i;j++)
                System.out.print(" *");
            System.out.println();
        }
    }
}

```

### Output of this program is:

```

Enter the rows :
5
|
  *
 * *
* * *
* * * *
 * * *
  * *
   *
```

**Q2) Read a number and check whether its prime number or not**

```
package com.lab assesment1; //package name
import java.util.Scanner; //importing scanner class from "util package"

public class PrimeNumber {

    public static void main(String[] args) {
        int num,i; //variables declaration
        boolean condition=true; // assuming all numbers as prime

        Scanner input=new Scanner(System.in); //creating object for scanner
class

        // asking user to input
        System.out.print("Enter the number : ");
        num=input.nextInt();
        input.close();
        System.out.println();

        //if number is 0 or 1 say not prime or number is 2 say prime number
        if(num==0 || num==1) {
            System.out.println(num+" is not prime number");
        }
        else if(num==2)
            System.out.println(num+" is prime number");

        //implementation for number other than 0 or 1 or 2;
        else {
            //the number is always divisible within half of it's
            for(i=2;i<=num/2;i++) {
                if(num%i==0)
                    condition=false;
            }
            // printing outputs according to condition
            if(condition)
                System.out.println(num+" is prime number");
            else
                System.out.println(num+" is not prime number");
        }
    }
}
```

**Output of this program is:**

```
Enter the number : 5

5 is prime number

Picked up _JAVA_OPTIONS: -Djava.net.preferIPv4stack=tru
Enter the number : 9

9 is not prime number
|
```

**Q3) Program to read a number and check given number is perfect number or not**

```
package com.lab_assesment1; // package name

import java.util.Scanner; //importing Scanner class form util package
public class Perfect_Number {

    public static void main(String[] args) {
        //variables declaration
        int num,sum=0,i;

        //creating object for scanner class
        Scanner input=new Scanner(System.in);

        //reading input form user
        System.out.print("Enter the number : ");
        num=input.nextInt();
        input.close();
        System.out.println();

        //adding all the divisors for the number
        for(i=1;i<=num/2;i++) {
            if(num%i==0) {
                sum+=i;
            }
        }

        //printing output with respect to sum of all divisors
        if(sum==num)
            System.out.println(num+" is a perfect number");
        else
            System.out.println(num+" is not a perfect number");
    }
}
```

**Output of this program is:**

```
Enter the number : 4
4 is not a perfect number
```

```
Enter the number : 6
6 is a perfect number
```