Week-1

Introduction and software requirements to run the java programs:

1# What is the software that helps to run java programs.

- The software that helps to run java programs is JDK(java development kit)
  And JRE(java runtime environment).

2# What is JDK and JRE.

- Java Development Kit (JDK)

  A software development kit that includes tools for developing and compiling Java programs. JDK is a superset of JRE, and contains all the tools needed to compile, debug, and run Java programs.

- Java Runtime Environment (JRE)
  A set of software tools that runs Java programs on a system. JRE includes the Java Virtual Machine (JVM) and run-time class libraries.

To run Java applications, you only need JRE. However, if you want to develop Java applications, you need JDK, which includes both the JVM and development tools.

3# What is eclipse IDE.

Eclipse IDE (Integrated Development Environment) is a popular open-source software platform primarily used for programming. It provides a comprehensive environment where developers can write, test, and debug code in various programming languages. Initially designed for Java development, Eclipse has evolved to support a wide range of languages through plugins, including Python, C++, JavaScript, and more.

Key Features of Eclipse IDE:

1. **Code Editing**: It includes advanced features like syntax highlighting, code completion, and error checking.
2. **Debugging**: Offers powerful debugging tools, allowing developers to set breakpoints, inspect variables, and control program execution.
3. **Extensibility**: With a vast plugin ecosystem, Eclipse can be customized to meet different programming needs.
4. **Version Control Integration**: Supports integration with Git, SVN, and other version control systems.

5. **Build Automation**: It can integrate with tools like Maven and Gradle for project building and dependency management.
6. **Cross-Platform**: Available for Windows, macOS, and Linux.

4# How to run the java program in eclipse/NetBeans IDE.

Running a Java Program in Eclipse IDE/NetBeans IDE:

Step 1: Install Eclipse and Set Up Java

- Download and install **Eclipse IDE/**NetBeans IDE **for Java Developers** from the Eclipse website and Apache NetBeans website.
- Ensure that **Java Development Kit (JDK)** is installed and configured on your system. Eclipse/NetBEans typically detects the JDK automatically.

Step 2: Create a New Java Project

1. Open **Eclipse IDE**/NetBeans IDE.
2. Go to **File > New > Java Project**.
3. Name your project and click **Finish**.

Step 3: Create a Java Class

1. Right-click the **src** folder in your project in the **Project Explorer** pane.
2. Select **New > Class**.
3. Give your class a name (e.g., `HelloWorld`), and check the box for **public static void main(String[] args)**.
4. Click **Finish**.

Step 4: Run the Java Program

1. Click the green **Run** button in the toolbar (or press **F6** on your keyboard).
2. The output will appear in the **Output** window at the bottom of the IDE.

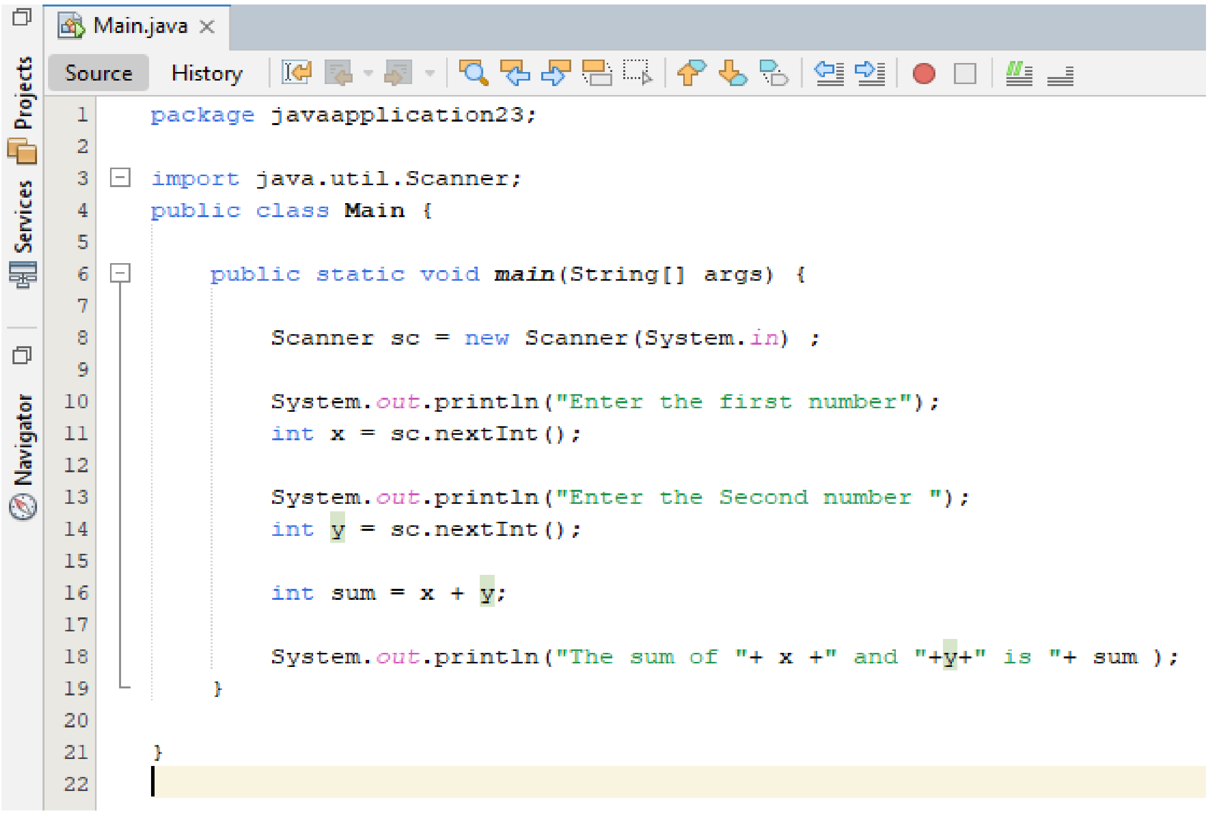
5# What is the software other than eclipse/NetBeans to run the java programs.

- **IntelliJ IDEA**
- **BlueJ**
- **JDeveloper**
- **DrJAVA**
- **JGrasp etc.**

Week-2

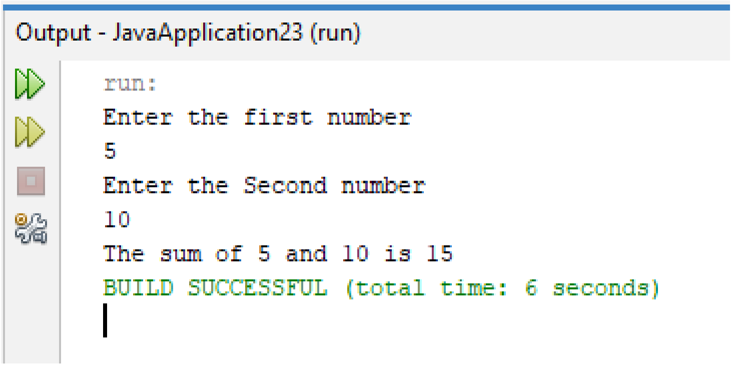
Basics problems in java

1# Write a java program to add the two numbers.



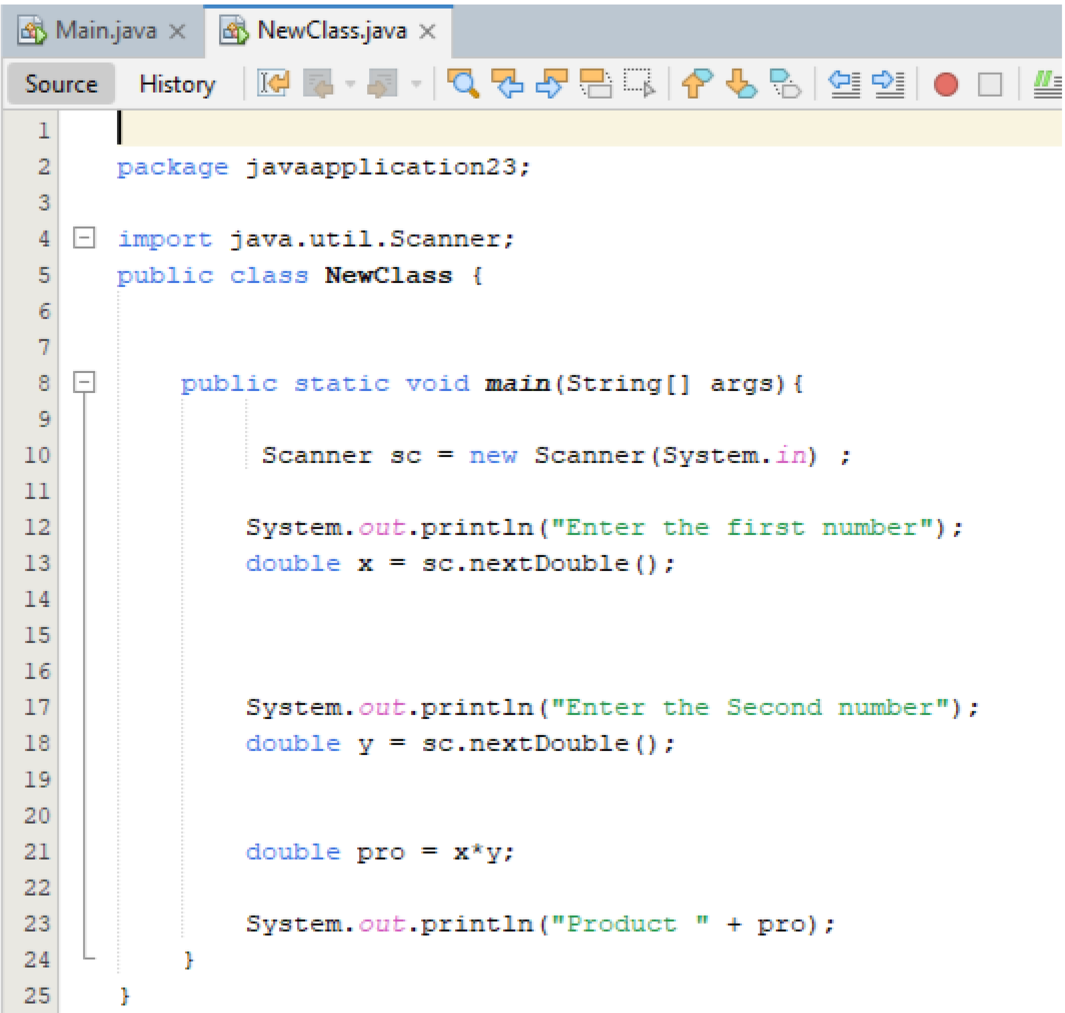
```java
package javaapplication23;

import java.util.Scanner;
public class Main {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in) ;

        System.out.println("Enter the first number");
        int x = sc.nextInt();

        System.out.println("Enter the Second number ");
        int y = sc.nextInt();

        int sum = x + y;

        System.out.println("The sum of "+ x +" and "+y+" is "+ sum );
    }

}

```

Output:



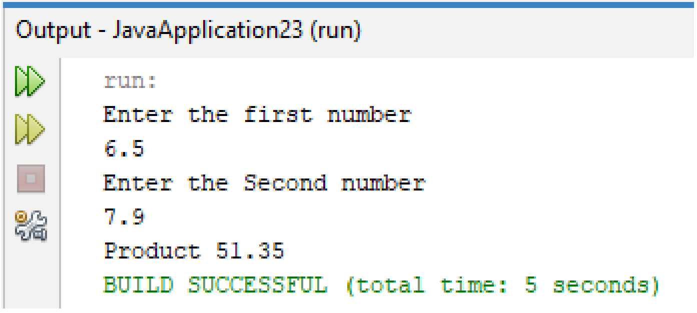
```
run:
Enter the first number
5
Enter the Second number
10
The sum of 5 and 10 is 15
BUILD SUCCESSFUL (total time: 6 seconds)
```

2# Write a java program to multiply two floating numbers.



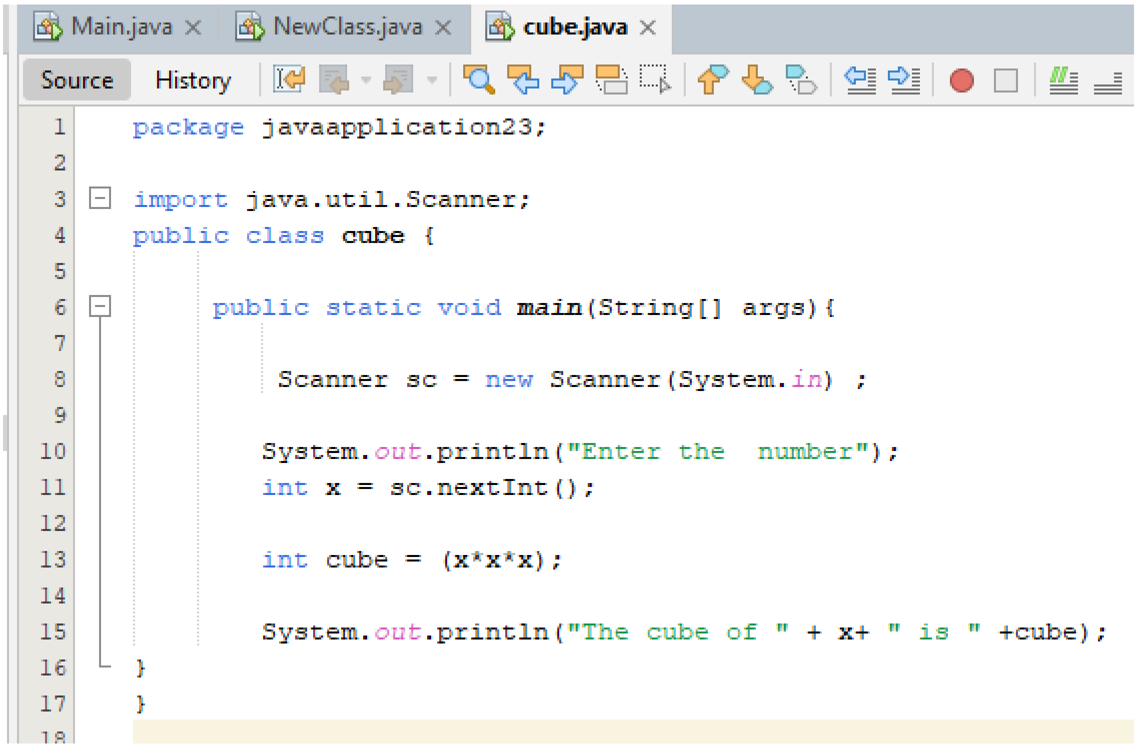
```java

package javaapplication23;

import java.util.Scanner;
public class NewClass {


    public static void main(String[] args){

        Scanner sc = new Scanner(System.in)  ;

        System.out.println("Enter the first number");
        double x = sc.nextDouble();



        System.out.println("Enter the Second number");
        double y = sc.nextDouble();


        double pro = x*y;

        System.out.println("Product " + pro);
    }
}
```

Output:



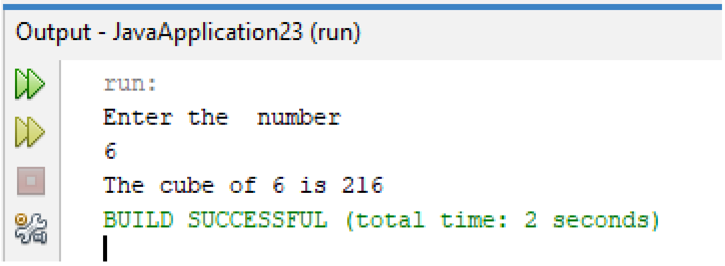
```
run:
Enter the first number
6.5
Enter the Second number
7.9
Product 51.35
BUILD SUCCESSFUL (total time: 5 seconds)
```

3# Write a java program to display a cube of a number.



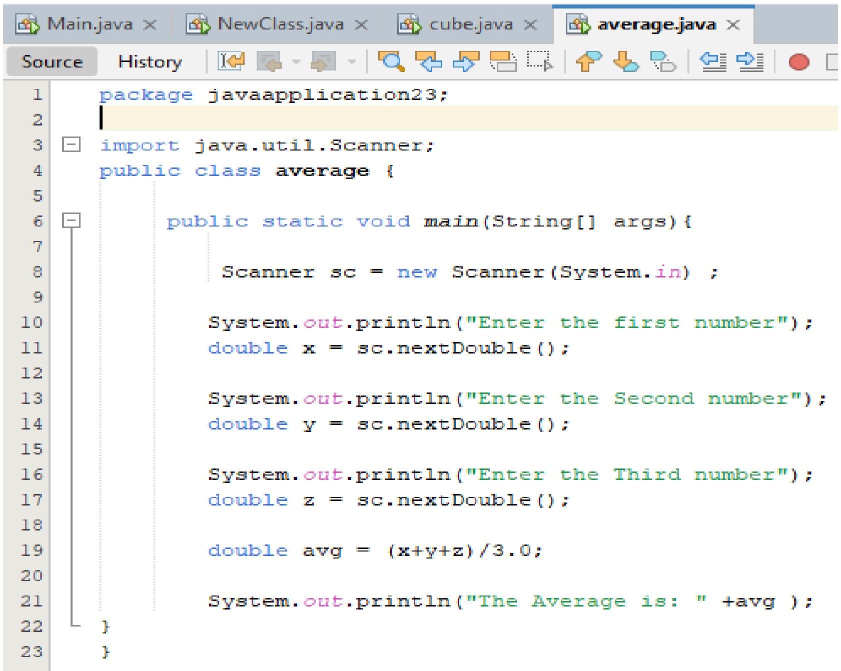
```java
package javaapplication23;

import java.util.Scanner;
public class cube {

     public static void main(String[] args){

         Scanner sc = new Scanner(System.in) ;

        System.out.println("Enter the  number");
        int x = sc.nextInt();

        int cube = (x*x*x);

        System.out.println("The cube of " + x+ " is " +cube);
}
}
```

Output:



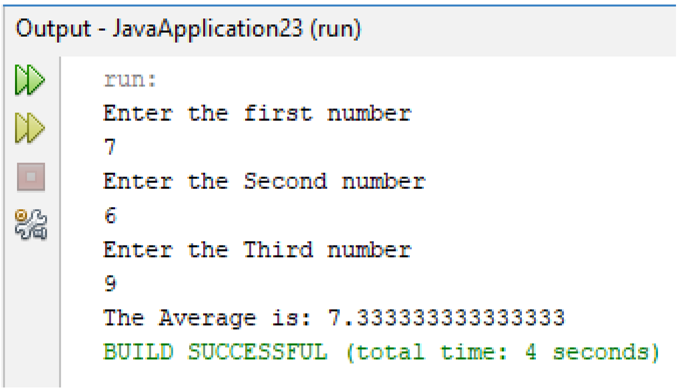
```
run:
Enter the  number
6
The cube of 6 is 216
BUILD SUCCESSFUL (total time: 2 seconds)
```

4# Write a Java program that takes three numbers as input to calculate and print the average of the numbers.



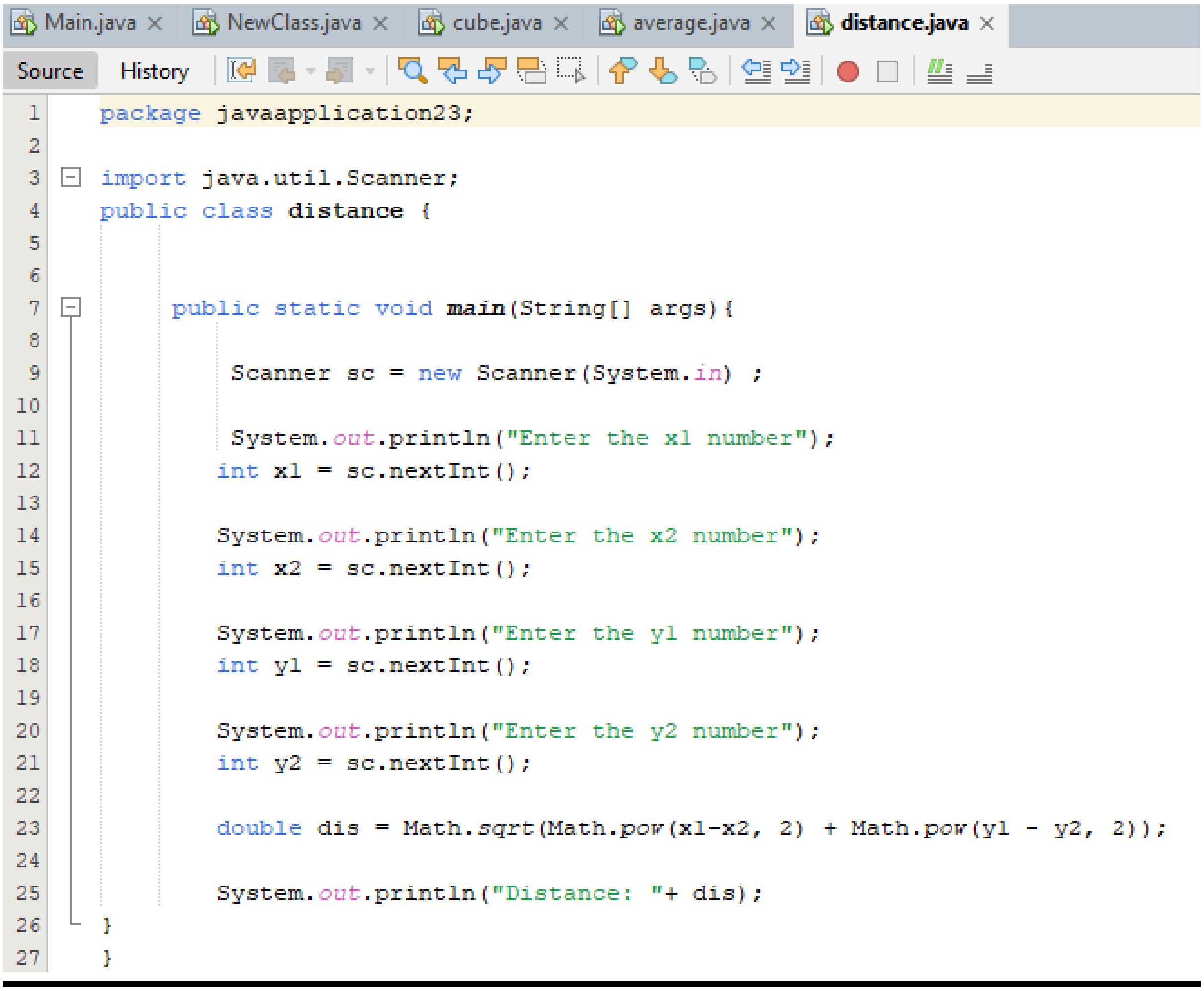
```java
package javaapplication23;

import java.util.Scanner;
public class average {

     public static void main(String[] args){

         Scanner sc = new Scanner(System.in) ;

        System.out.println("Enter the first number");
        double x = sc.nextDouble();

        System.out.println("Enter the Second number");
        double y = sc.nextDouble();

        System.out.println("Enter the Third number");
        double z = sc.nextDouble();

        double avg = (x+y+z)/3.0;

        System.out.println("The Average is: " +avg );
}
}
```

Output:



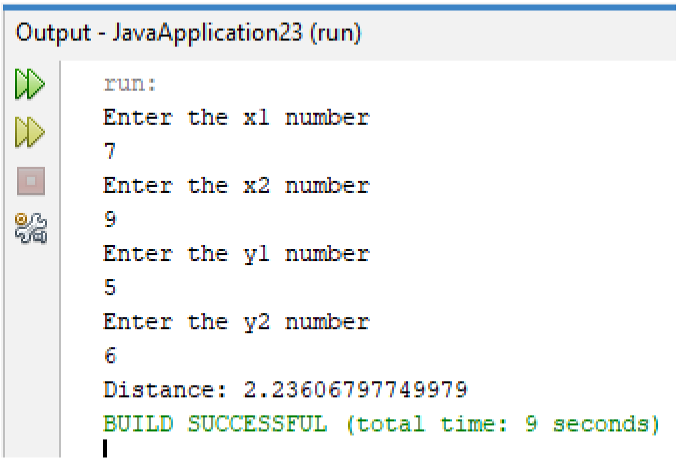
```
run:
Enter the first number
7
Enter the Second number
6
Enter the Third number
9
The Average is: 7.333333333333333
BUILD SUCCESSFUL (total time: 4 seconds)
```

5# Write a Java program to compute the distance between two points.



```java
package javaapplication23;

import java.util.Scanner;
public class distance {


    public static void main(String[] args){

         Scanner sc = new Scanner(System.in) ;

         System.out.println("Enter the x1 number");
        int x1 = sc.nextInt();

        System.out.println("Enter the x2 number");
        int x2 = sc.nextInt();

        System.out.println("Enter the y1 number");
        int y1 = sc.nextInt();

        System.out.println("Enter the y2 number");
        int y2 = sc.nextInt();

        double dis = Math.sqrt(Math.pow(x1-x2, 2) + Math.pow(y1 - y2, 2));

        System.out.println("Distance: "+ dis);
}
}
```

Output:

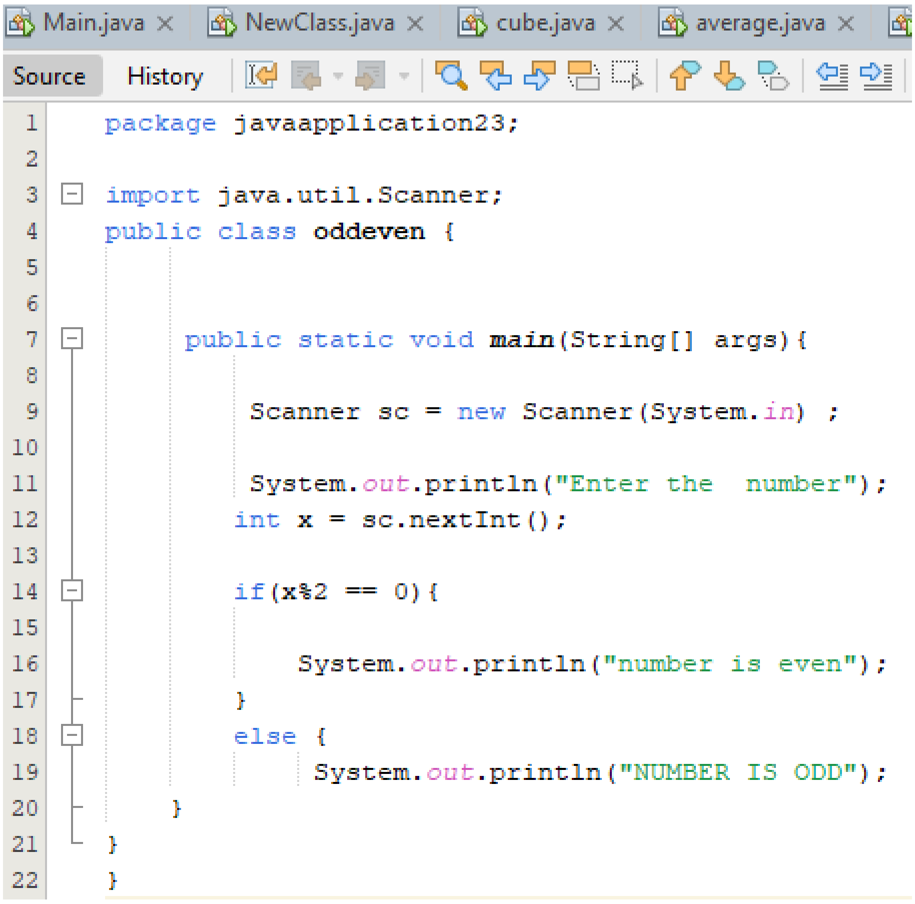


```
run:
Enter the x1 number
7
Enter the x2 number
9
Enter the y1 number
5
Enter the y2 number
6
Distance: 2.23606797749979
BUILD SUCCESSFUL (total time: 9 seconds)
```

Week-3

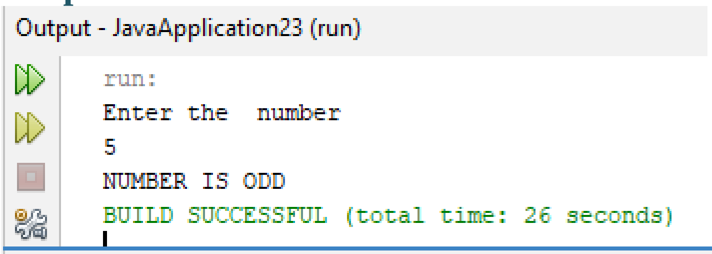
Problems Based on if statement/Looping in JAVA

1# Write a java program to check whether the given number is odd or even.

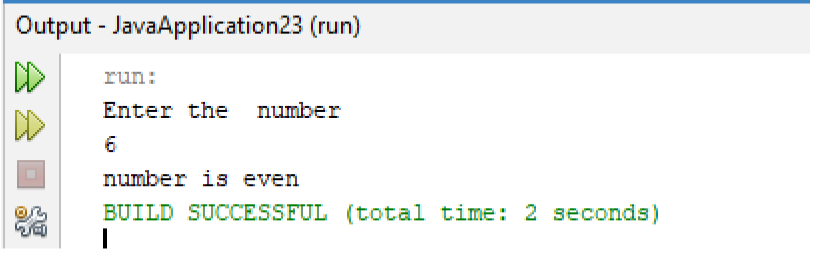


```
package javaapplication23;

import java.util.Scanner;
public class oddeven {


     public static void main(String[] args){

         Scanner sc = new Scanner(System.in) ;

         System.out.println("Enter the  number");
        int x = sc.nextInt();

        if(x%2 == 0){

            System.out.println("number is even");
        }
        else {
             System.out.println("NUMBER IS ODD");
    }
}
}
```

Output:

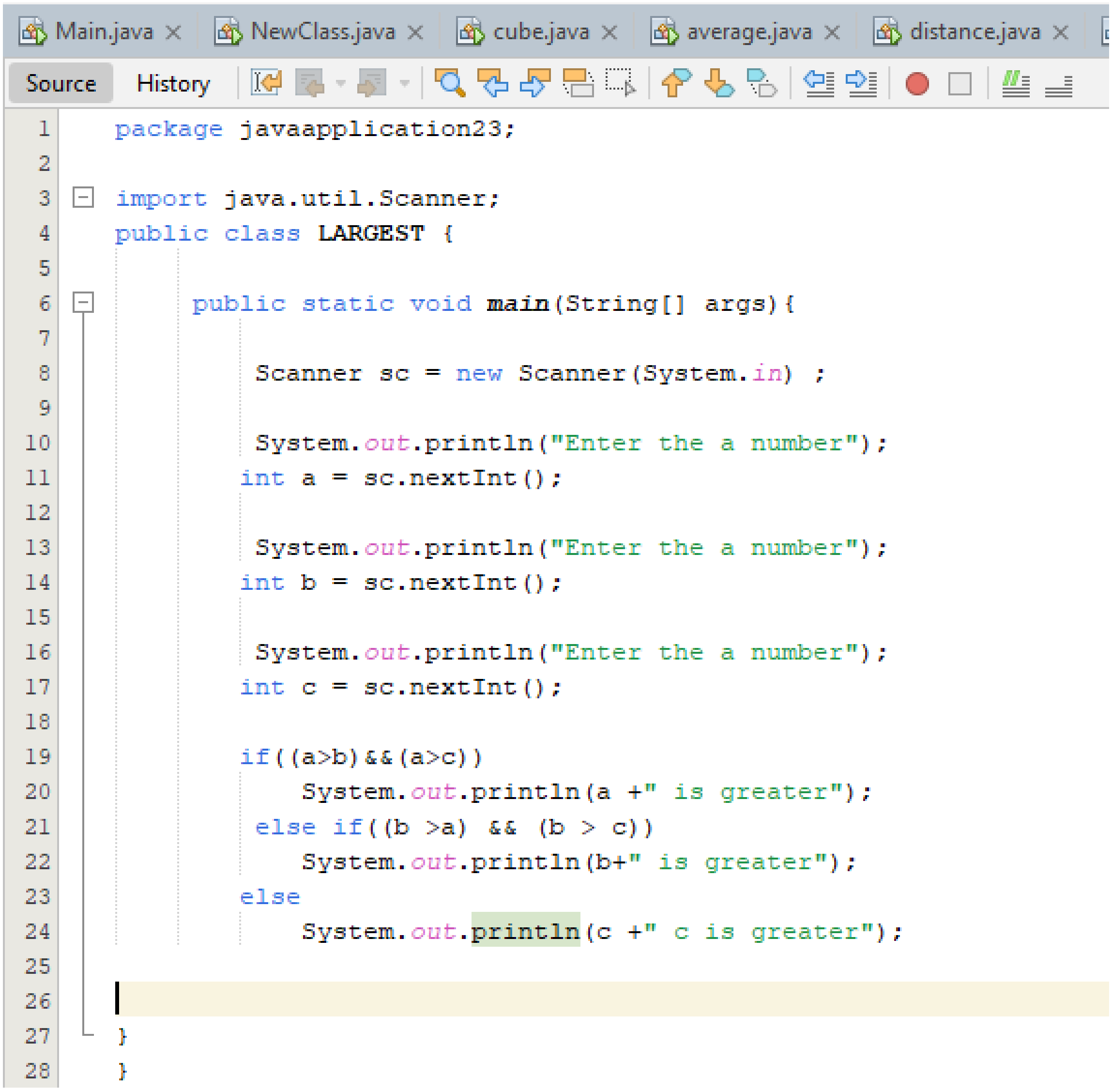


```
run:
Enter the  number
5
NUMBER IS ODD
BUILD SUCCESSFUL (total time: 26 seconds)
```



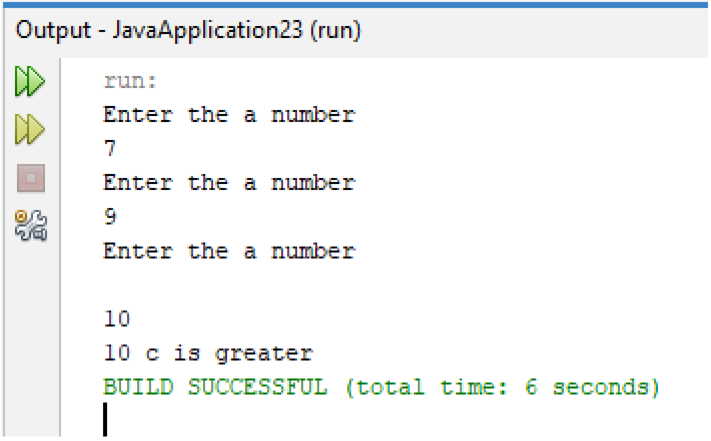
```
run:
Enter the  number
6
number is even
BUILD SUCCESSFUL (total time: 2 seconds)
```

2# Write a java program to find the largest number among the three numbers.



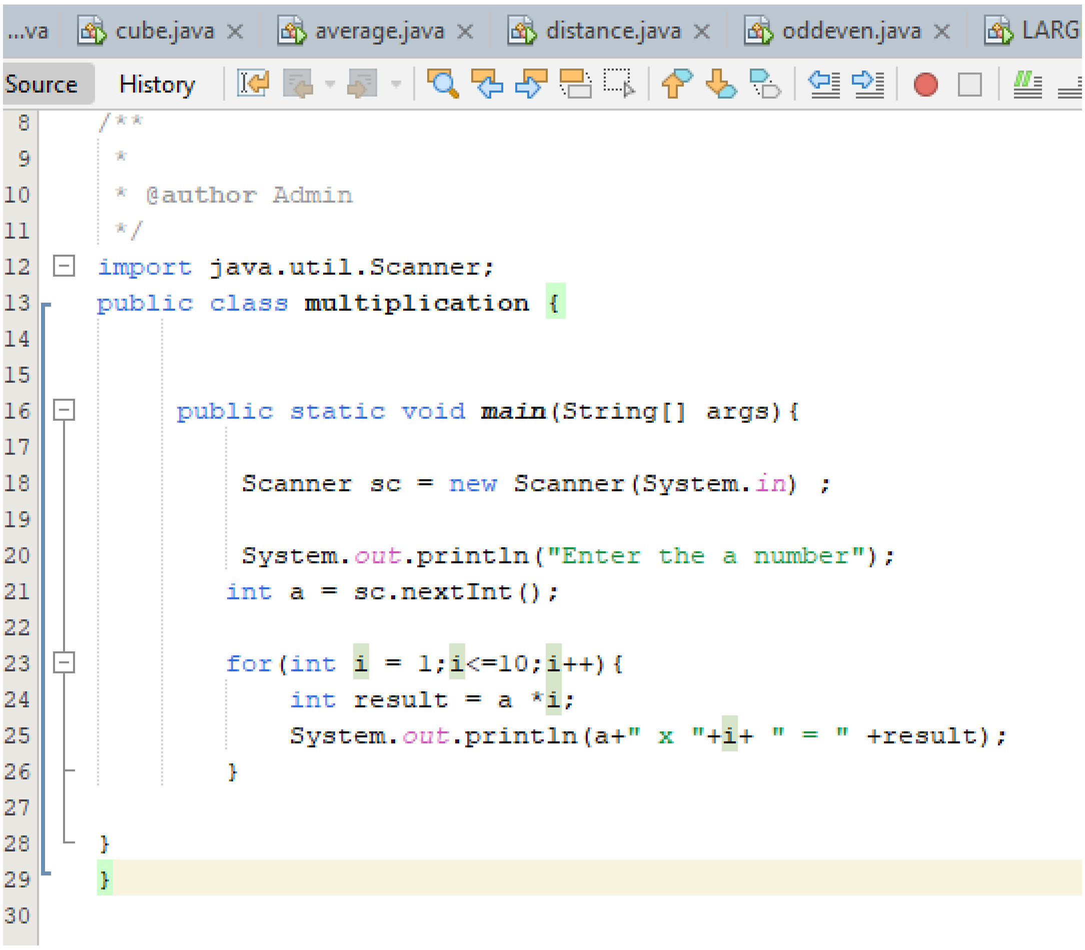
```java
package javaapplication23;

import java.util.Scanner;
public class LARGEST {

        public static void main(String[] args){

            Scanner sc = new Scanner(System.in) ;

            System.out.println("Enter the a number");
           int a = sc.nextInt();

            System.out.println("Enter the a number");
           int b = sc.nextInt();

            System.out.println("Enter the a number");
           int c = sc.nextInt();

           if((a>b)&&(a>c))
               System.out.println(a +" is greater");
            else if((b >a)  &&  (b > c))
               System.out.println(b+" is greater");
           else
               System.out.println(c +" c is greater");


    }
}
```

Output:



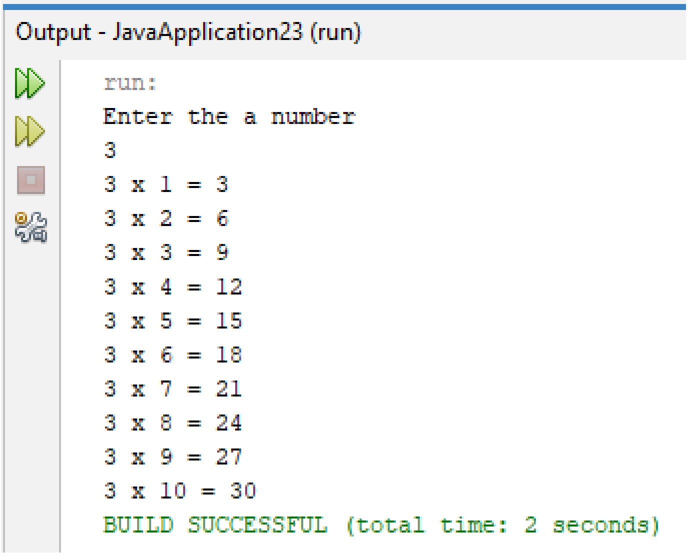
```
run:
Enter the a number
7
Enter the a number
9
Enter the a number

10
10 c is greater
BUILD SUCCESSFUL (total time: 6 seconds)
```

3# Write a Java program that takes a number as input and prints its multiplication table upto 10.



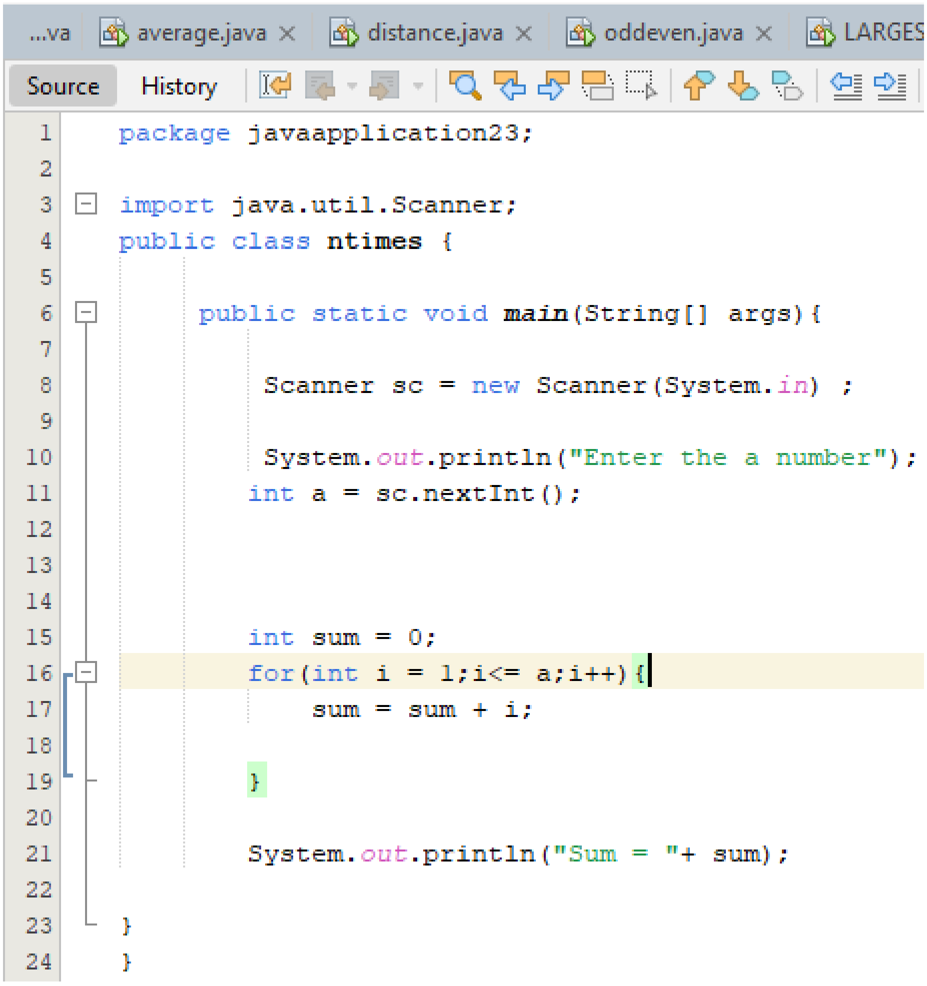
```
/**
 *
 * @author Admin
 */
import java.util.Scanner;
public class multiplication {


    public static void main(String[] args){

        Scanner sc = new Scanner(System.in) ;

        System.out.println("Enter the a number");
        int a = sc.nextInt();

        for(int i = 1;i<=10;i++){
            int result = a *i;
            System.out.println(a+" x "+i+ " = " +result);
        }

}
}
```

Output:



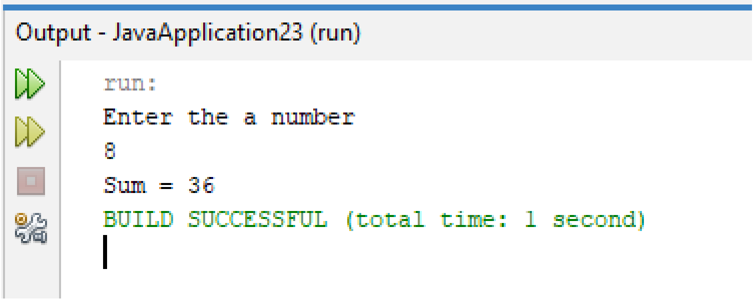
```
run:
Enter the a number
3
3 x 1 = 3
3 x 2 = 6
3 x 3 = 9
3 x 4 = 12
3 x 5 = 15
3 x 6 = 18
3 x 7 = 21
3 x 8 = 24
3 x 9 = 27
3 x 10 = 30
BUILD SUCCESSFUL (total time: 2 seconds)
```

4# Write a Java program to calculate the sum of following series: 1 + 2 + 3 + 4 + ………. + N



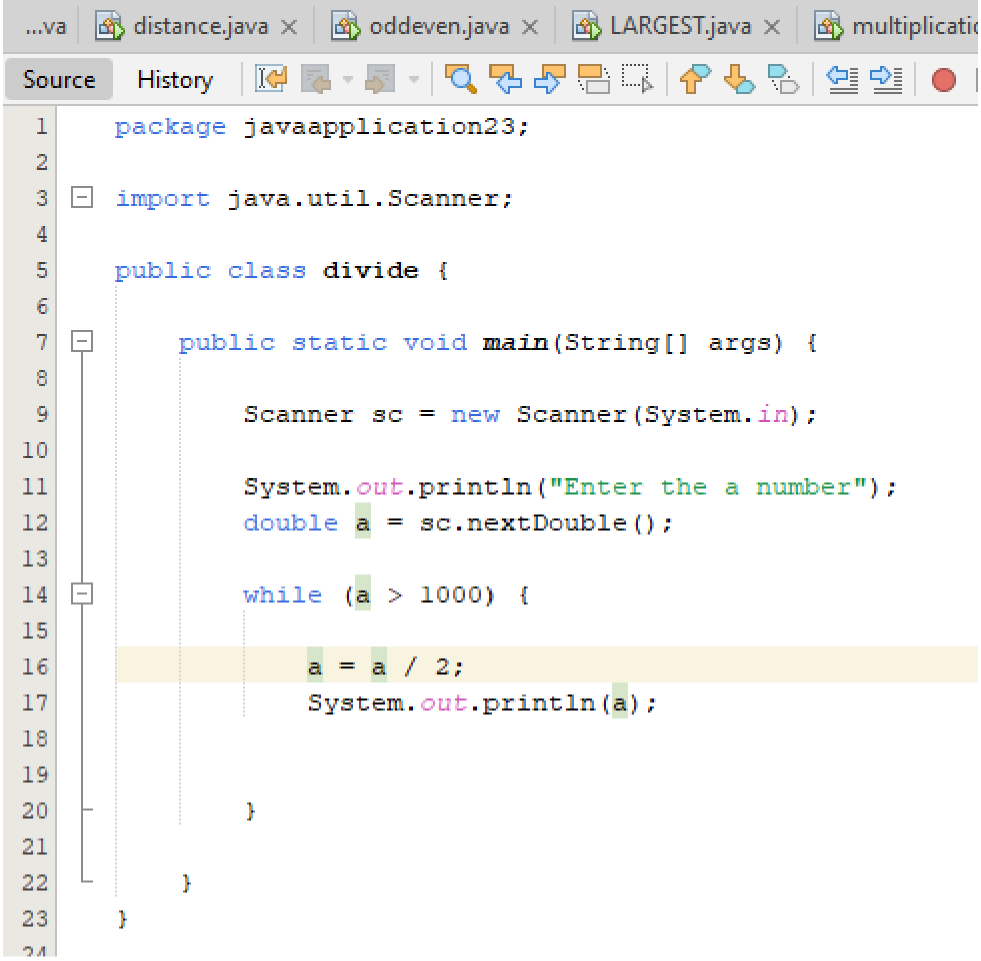
```
package javaapplication23;

import java.util.Scanner;
public class ntimes {

        public static void main(String[] args){

            Scanner sc = new Scanner(System.in) ;

            System.out.println("Enter the a number");
           int a = sc.nextInt();



           int sum = 0;
           for(int i = 1;i<= a;i++){
               sum = sum + i;

           }

           System.out.println("Sum =  "+ sum);

}
}
```

Output:



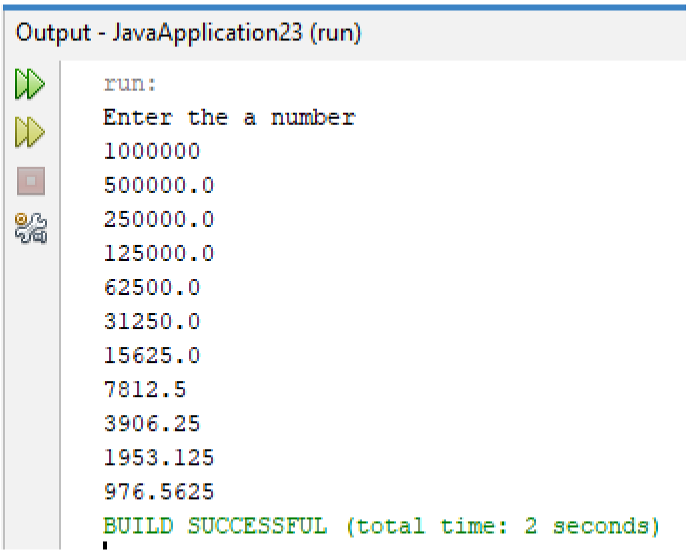
```
run:
Enter the a number
8
Sum = 36
BUILD SUCCESSFUL (total time: 1 second)
```

5# Write a Java program to take a number, divide it by 2 and print the result until the number becomes less than 10.



```java
package javaapplication23;

import java.util.Scanner;

public class divide {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter the a number");
        double a = sc.nextDouble();

        while (a > 1000) {

            a = a / 2;
            System.out.println(a);


        }

    }
}
```

Output:

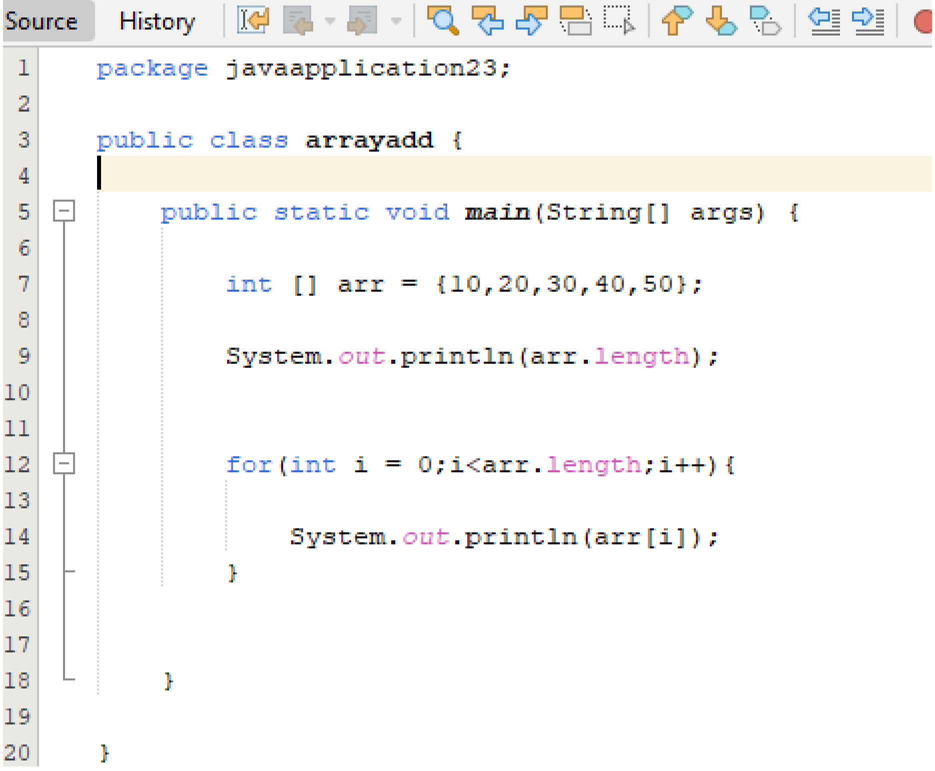


```
run:
Enter the a number
1000000
500000.0
250000.0
125000.0
62500.0
31250.0
15625.0
7812.5
3906.25
1953.125
976.5625
BUILD SUCCESSFUL (total time: 2 seconds)
```

Week-4

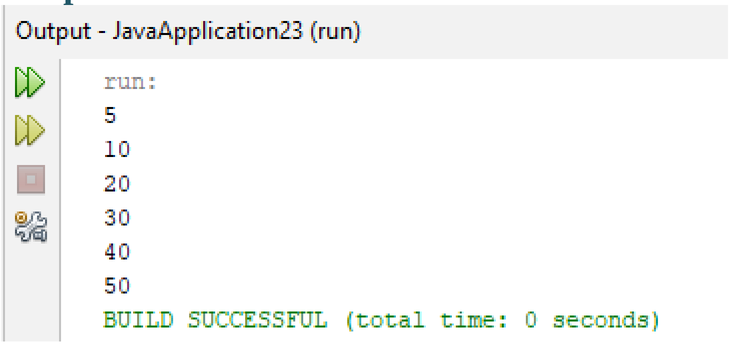
Problems Based on Array in JAVA

1# Write a Java program to insert 10, 20, 30 .... in an array and display them.



```java
package javaapplication23;

public class arrayadd {

    public static void main(String[] args) {

        int [] arr = {10,20,30,40,50};

        System.out.println(arr.length);


        for(int i = 0;i<arr.length;i++){

            System.out.println(arr[i]);
        }



    }

}
```

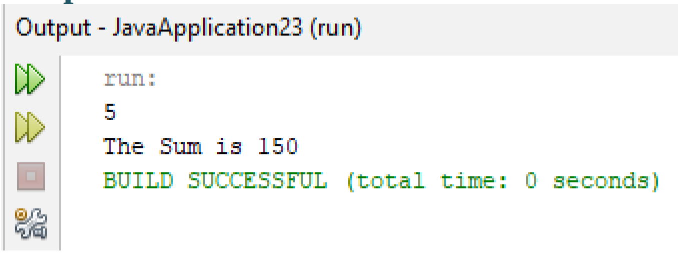
Output:



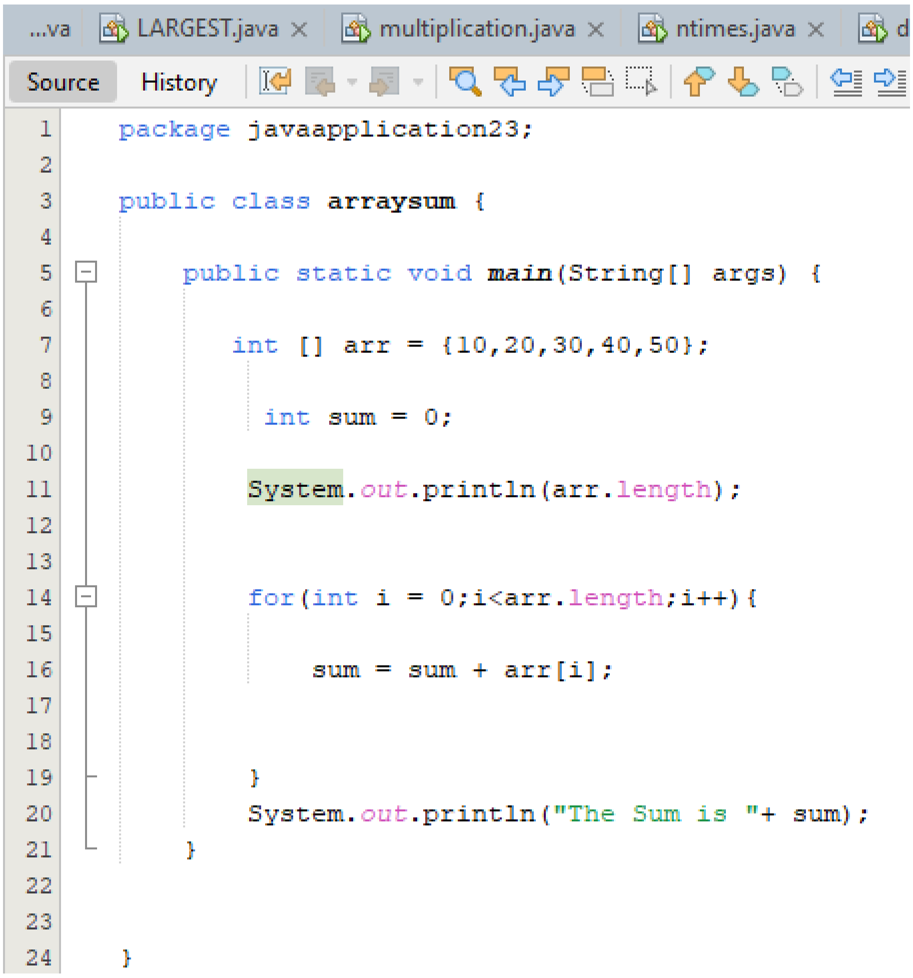
```
run:
5
10
20
30
40
50
BUILD SUCCESSFUL (total time: 0 seconds)
```

2# Write a Java program to calculate the sum of all the array elements.

Output:



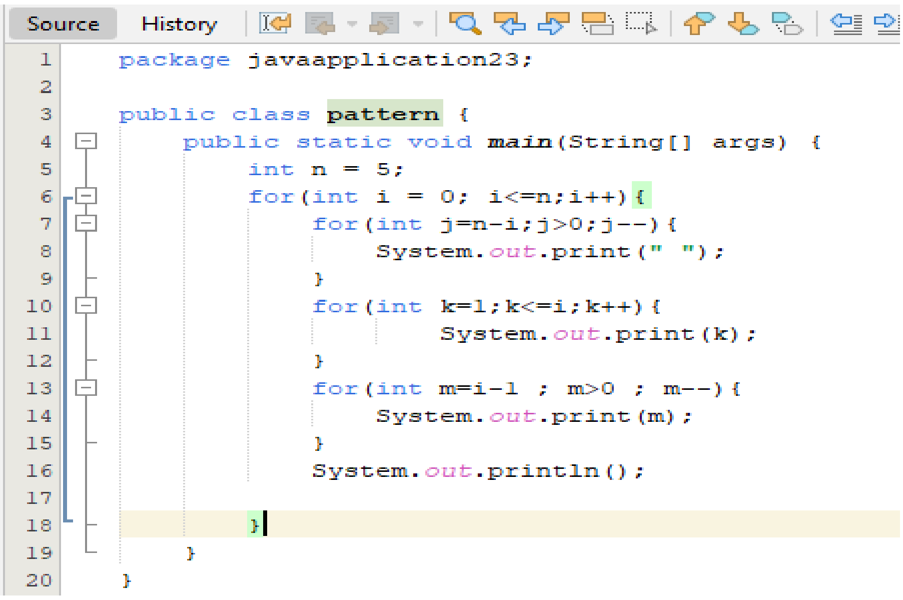
```
run:
5
The Sum is 150
BUILD SUCCESSFUL (total time: 0 seconds)
```



```java
package javaapplication23;

public class arraysum {

    public static void main(String[] args) {

       int [] arr = {10,20,30,40,50};

         int sum = 0;

        System.out.println(arr.length);


        for(int i = 0;i<arr.length;i++){

            sum = sum + arr[i];


        }
        System.out.println("The Sum is "+ sum);
    }


}
```

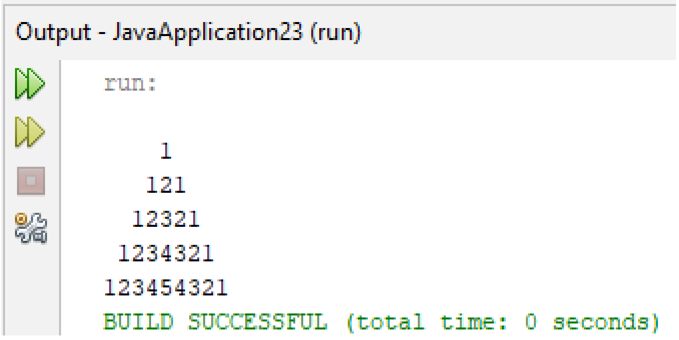
3# Write a java program to print the following pattern.

```
    1
   121
  12321
 1234321
123454321
```



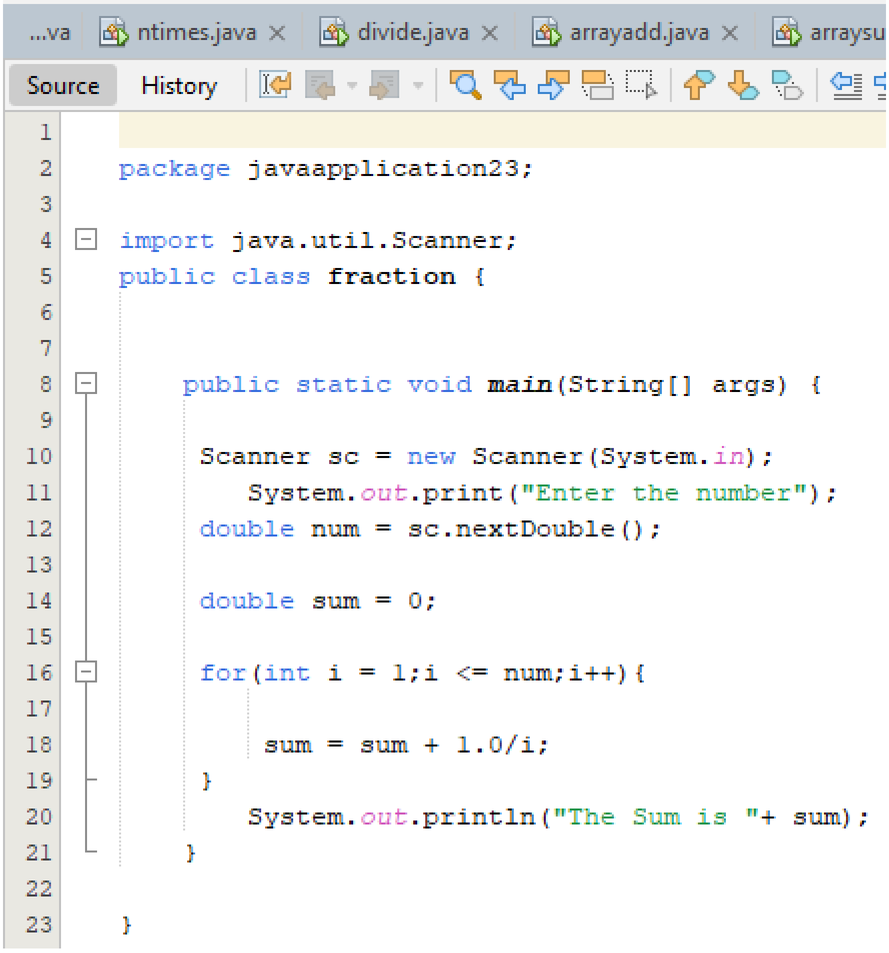
```java
package javaapplication23;

public class pattern {
    public static void main(String[] args) {
        int n = 5;
        for(int i = 0; i<=n;i++){
            for(int j=n-i;j>0;j--){
                System.out.print(" ");
            }
            for(int k=1;k<=i;k++){
                    System.out.print(k);
            }
            for(int m=i-1 ; m>0 ; m--){
                System.out.print(m);
            }
            System.out.println();

        }
    }
}
```

Output:



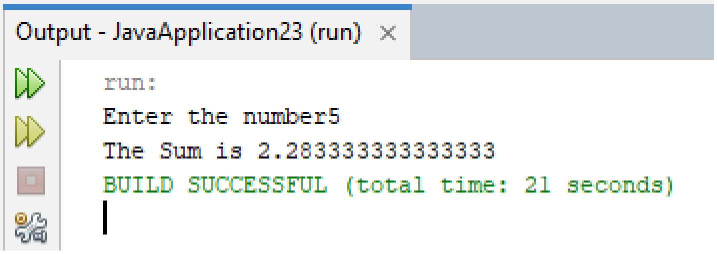
```
run:

    1
   121
  12321
 1234321
123454321
BUILD SUCCESSFUL (total time: 0 seconds)
```

4# Write a java program to find the sum of following series where n is input by the user. 1+1/2+1/3+1/4+..............+1/n.



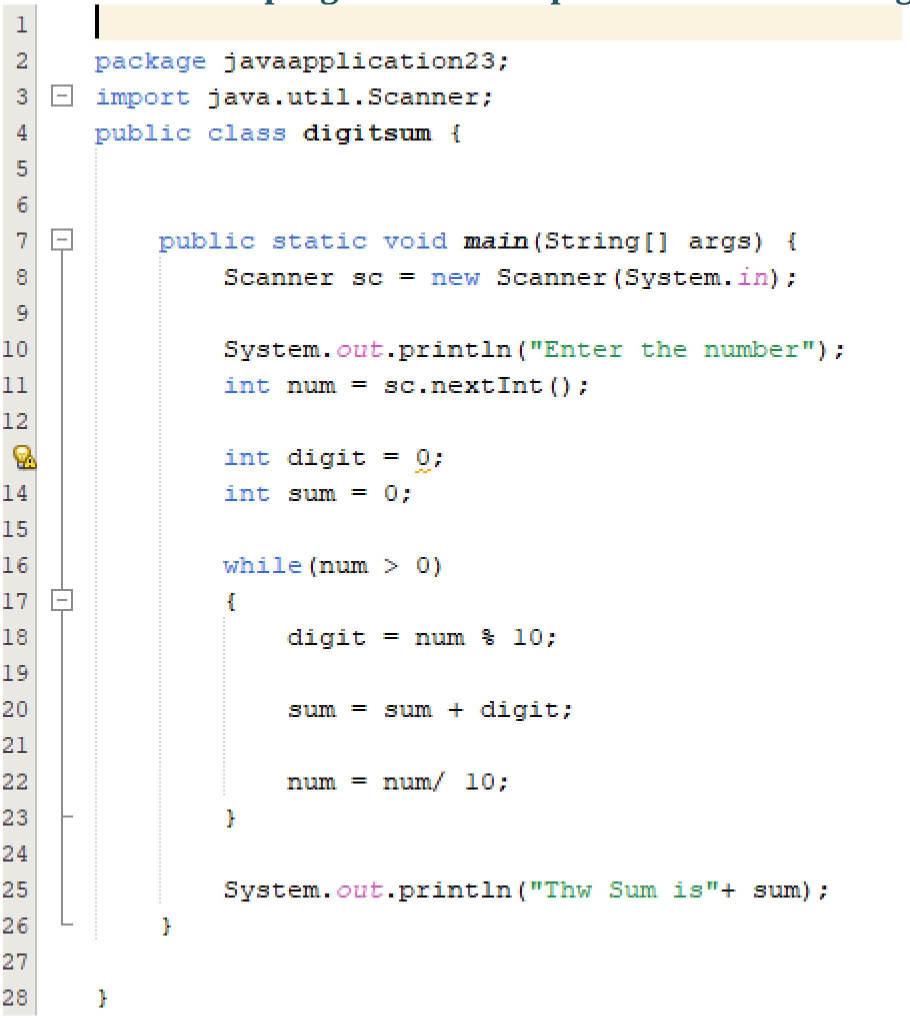
```java

package javaapplication23;

import java.util.Scanner;
public class fraction {


    public static void main(String[] args) {

     Scanner sc = new Scanner(System.in);
        System.out.print("Enter the number");
     double num = sc.nextDouble();

     double sum = 0;

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

         sum = sum + 1.0/i;
     }
        System.out.println("The Sum is "+ sum);
    }

}
```

Output:



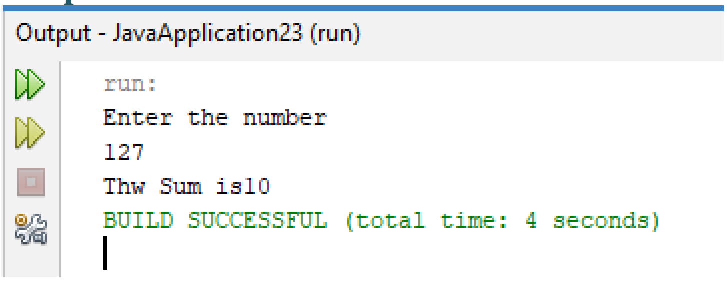
```
run:
Enter the number5
The Sum is 2.283333333333333
BUILD SUCCESSFUL (total time: 21 seconds)
```

5# Write a Java program and compute the sum of the digits of an integer.



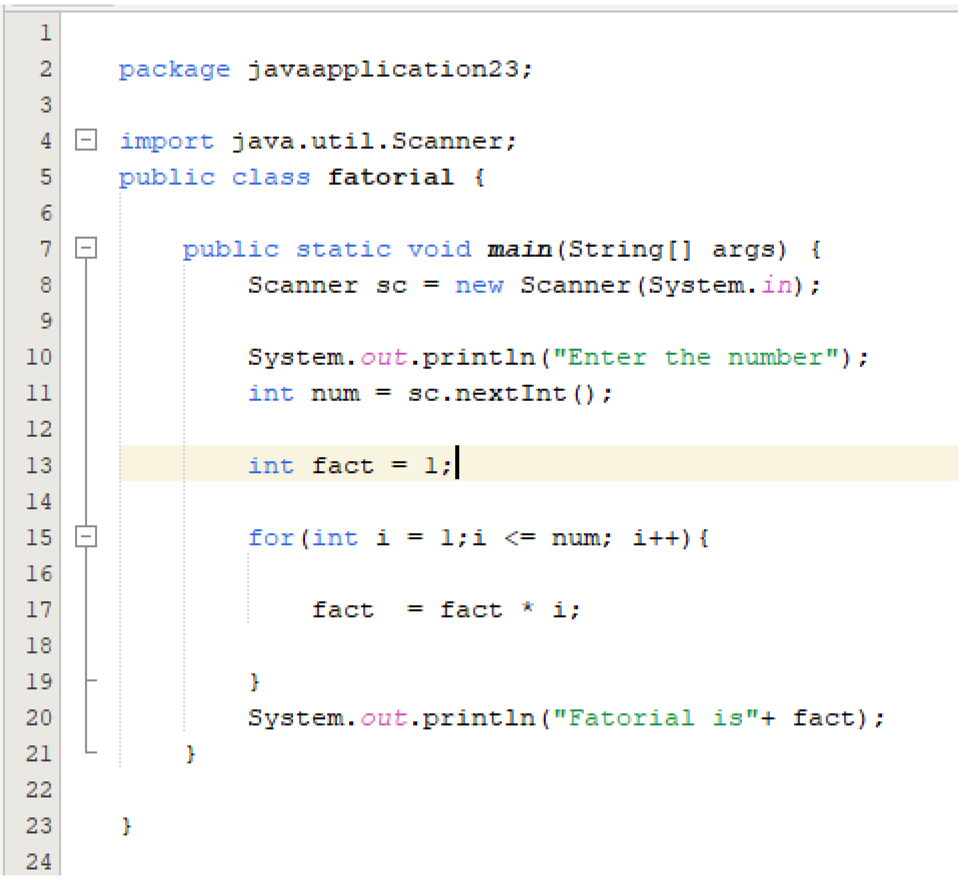
```java

package javaapplication23;
import java.util.Scanner;
public class digitsum {


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

        System.out.println("Enter the number");
        int num = sc.nextInt();

        int digit = 0;
        int sum = 0;

        while(num > 0)
        {
            digit = num % 10;

            sum = sum + digit;

            num = num/ 10;
        }

        System.out.println("Thw Sum is"+ sum);
    }

}
```

Output:



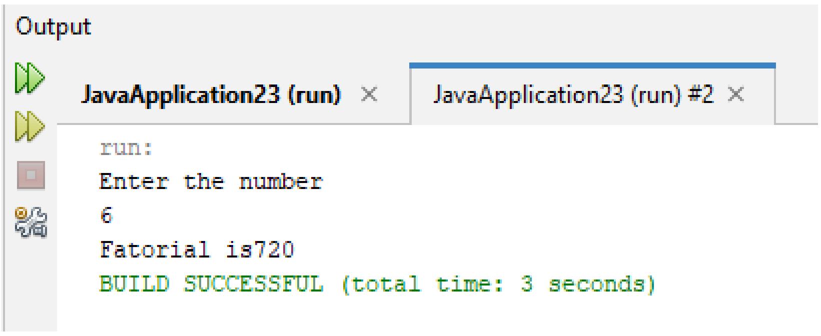
```
run:
Enter the number
127
Thw Sum is10
BUILD SUCCESSFUL (total time: 4 seconds)
```

6# Write a Java program to calculate the factorial of a number.



```java

package javaapplication23;

import java.util.Scanner;
public class fatorial {

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

        System.out.println("Enter the number");
        int num = sc.nextInt();

        int fact = 1;

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

            fact  = fact * i;

        }
        System.out.println("Fatorial is"+ fact);
    }

}

```

Output:

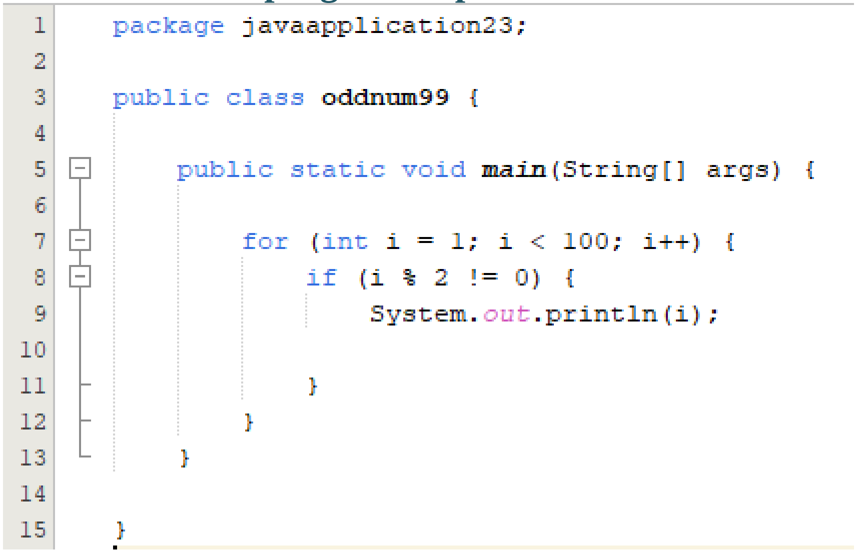


```
run:
Enter the number
6
Fatorial is720
BUILD SUCCESSFUL (total time: 3 seconds)
```

Week-5

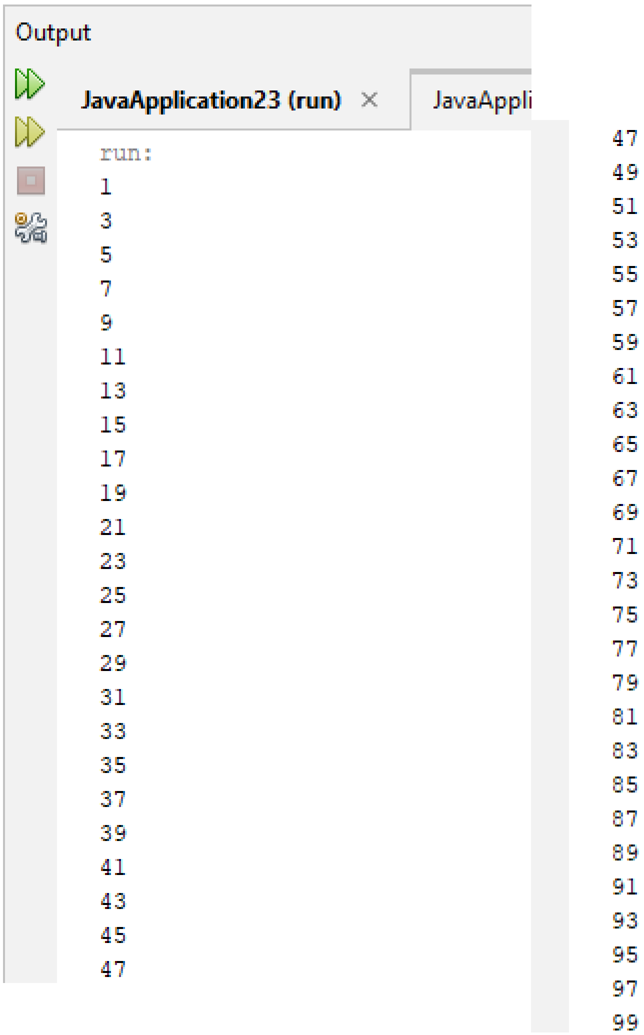
Problems Based on If statement/Looping/Array in JAVA

1# Write a Java program to print the odd numbers from 1 to 99.



```java
package javaapplication23;

public class oddnum99 {

    public static void main(String[] args) {

        for (int i = 1; i < 100; i++) {
            if (i % 2 != 0) {
                System.out.println(i);

            }
        }
    }

}
```

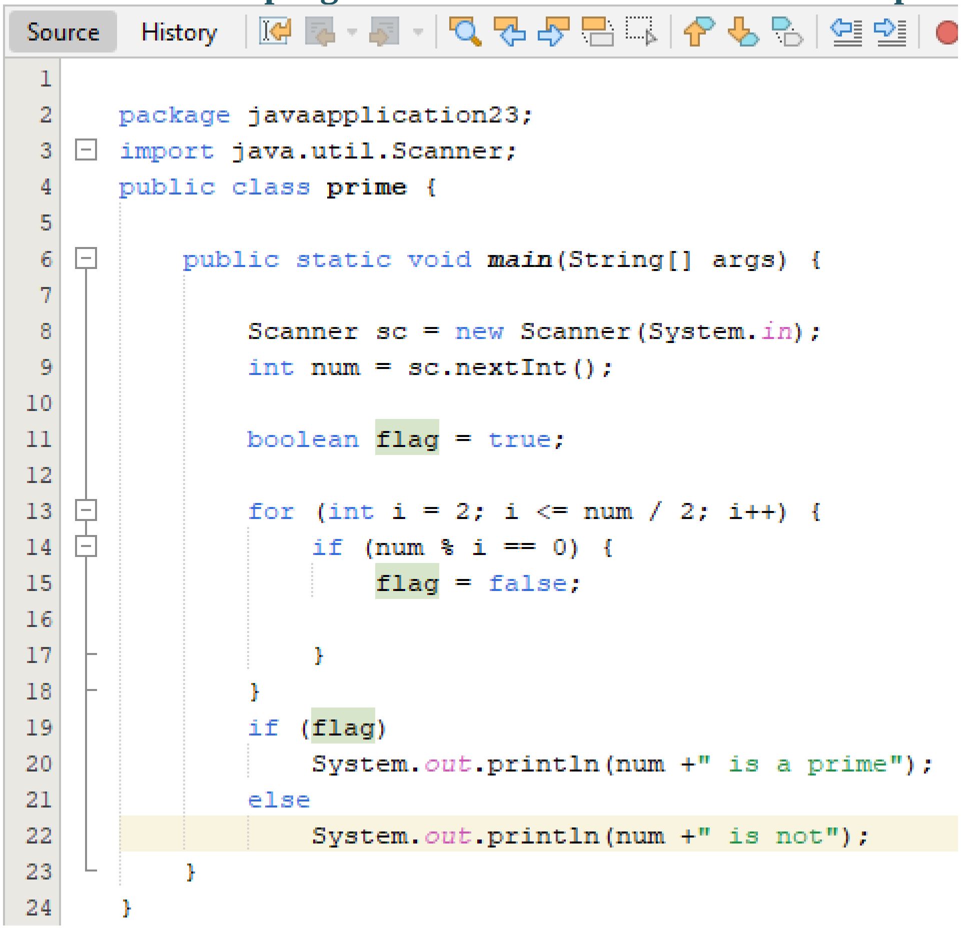
Output:



```
run:
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
37
39
41
43
45
47
```

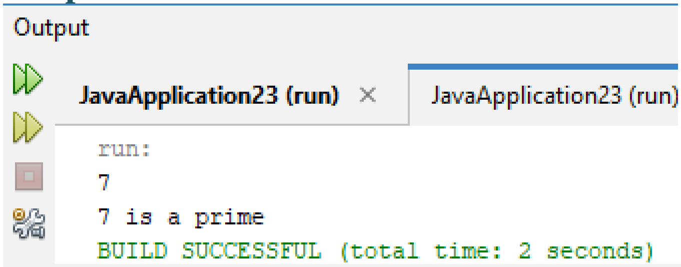
```
47
49
51
53
55
57
59
61
63
65
67
69
71
73
75
77
79
81
83
85
87
89
91
93
95
97
99
```

2# Write a Java program to check whether a number is prime or not.

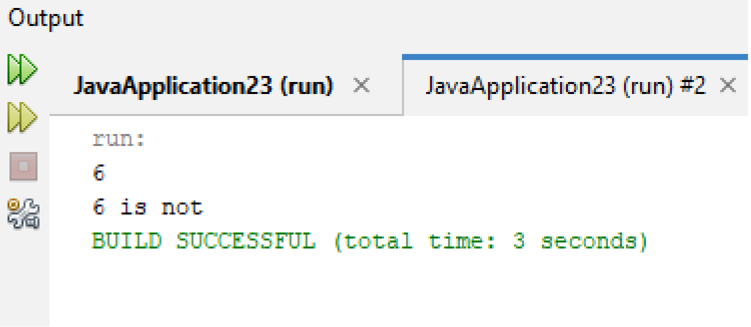


```java

package javaapplication23;
import java.util.Scanner;
public class prime {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);
        int num = sc.nextInt();

        boolean flag = true;

        for (int i = 2; i <= num / 2; i++) {
            if (num % i == 0) {
                flag = false;

            }
        }
        if (flag)
            System.out.println(num +" is a prime");
        else
            System.out.println(num +" is not");
    }
}
```

Output:

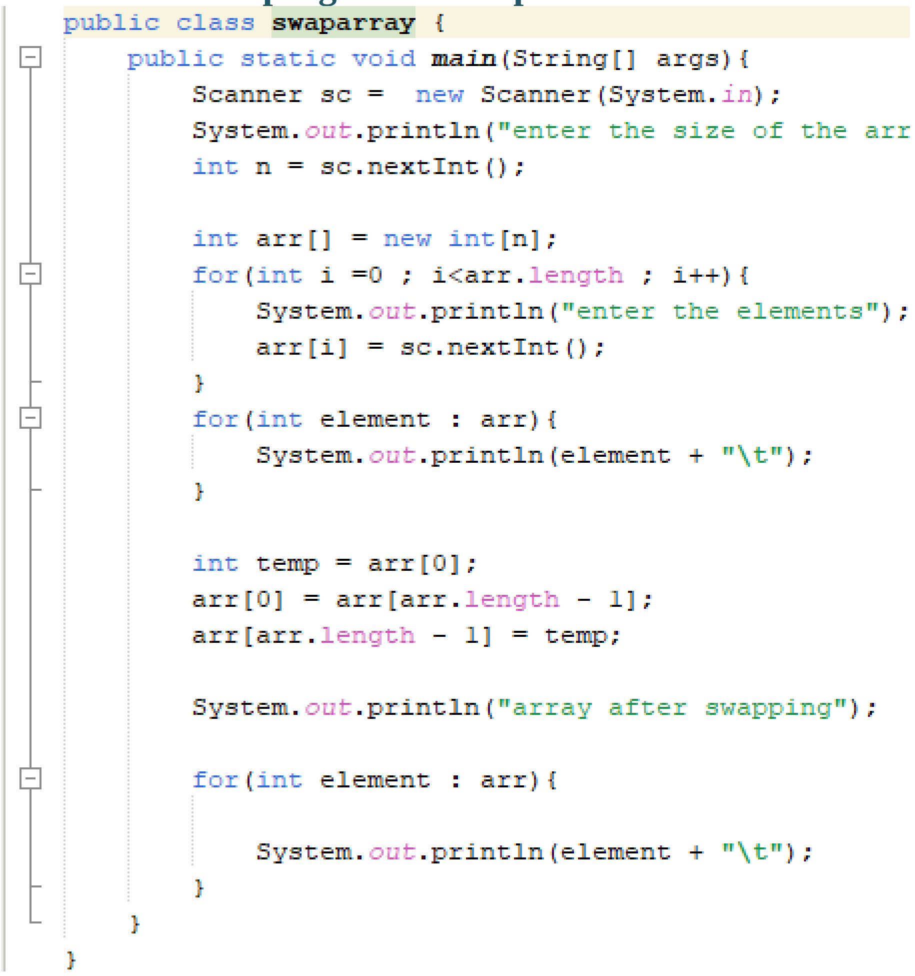


```
run:
7
7 is a prime
BUILD SUCCESSFUL (total time: 2 seconds)
```



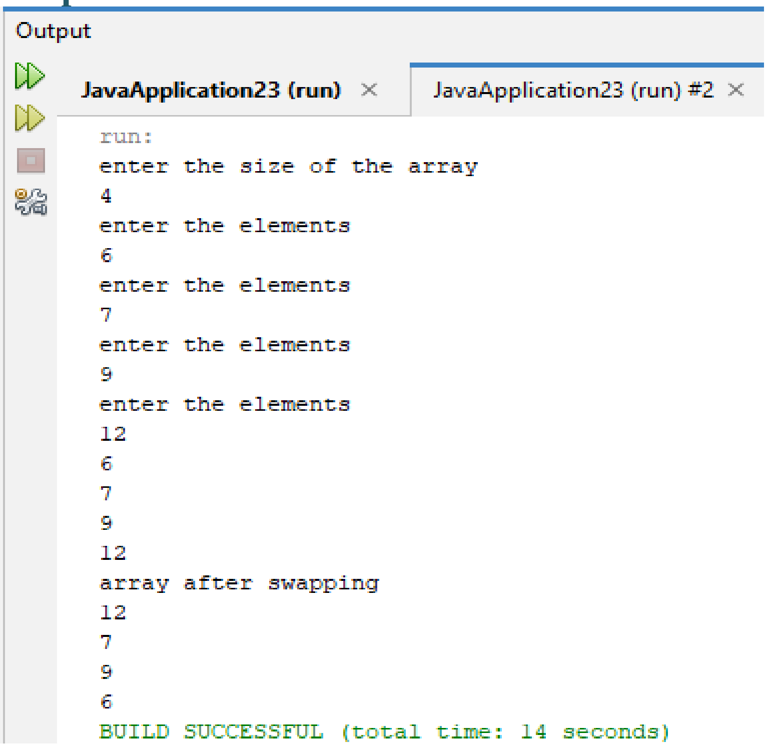
```
run:
6
6 is not
BUILD SUCCESSFUL (total time: 3 seconds)
```

3# Write a Java program to swap the first and last elements of an array.



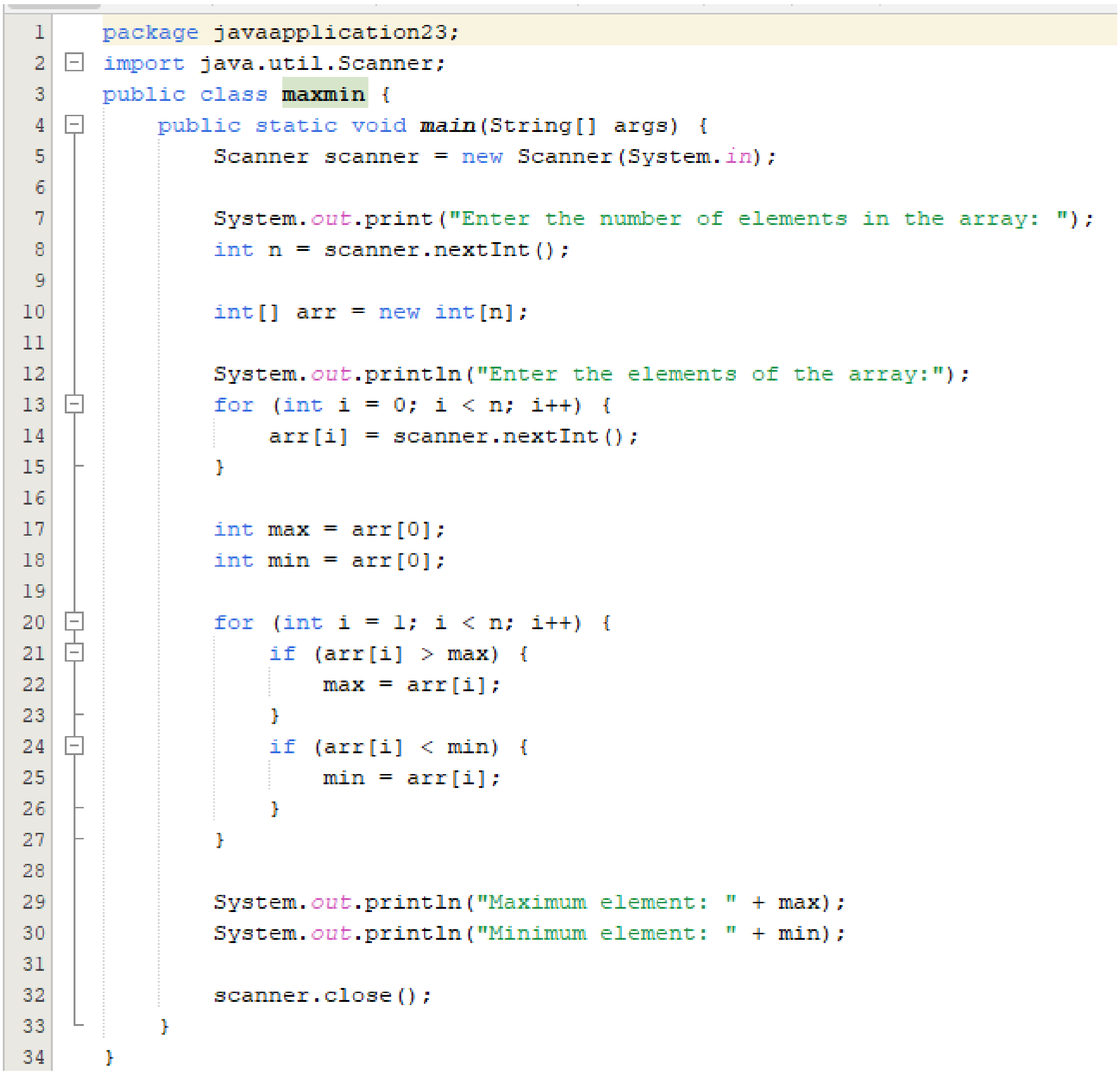
```
public class swaparray {
    public static void main(String[] args){
        Scanner sc =  new Scanner(System.in);
        System.out.println("enter the size of the arr
        int n = sc.nextInt();

        int arr[] = new int[n];
        for(int i =0 ; i<arr.length ; i++){
            System.out.println("enter the elements");
            arr[i] = sc.nextInt();
        }
        for(int element : arr){
            System.out.println(element + "\t");
        }

        int temp = arr[0];
        arr[0] = arr[arr.length - 1];
        arr[arr.length - 1] = temp;

        System.out.println("array after swapping");

        for(int element : arr){

            System.out.println(element + "\t");
        }
    }
}
```

Output:



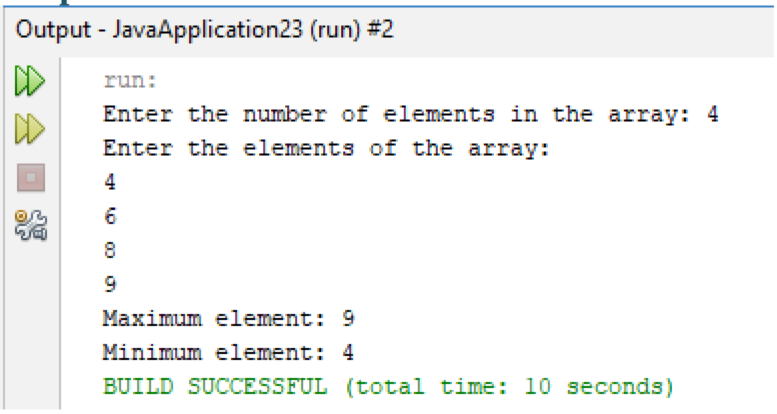
```
run:
enter the size of the array
4
enter the elements
6
enter the elements
7
enter the elements
9
enter the elements
12
6
7
9
12
array after swapping
12
7
9
6
BUILD SUCCESSFUL (total time: 14 seconds)
```

4# Write a Java program to find the maximum and minimum among array elements.



```java
package javaapplication23;
import java.util.Scanner;
public class maxmin {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the number of elements in the array: ");
        int n = scanner.nextInt();

        int[] arr = new int[n];

        System.out.println("Enter the elements of the array:");
        for (int i = 0; i < n; i++) {
            arr[i] = scanner.nextInt();
        }

        int max = arr[0];
        int min = arr[0];

        for (int i = 1; i < n; i++) {
            if (arr[i] > max) {
                max = arr[i];
            }
            if (arr[i] < min) {
                min = arr[i];
            }
        }

        System.out.println("Maximum element: " + max);
        System.out.println("Minimum element: " + min);

        scanner.close();
    }
}
```

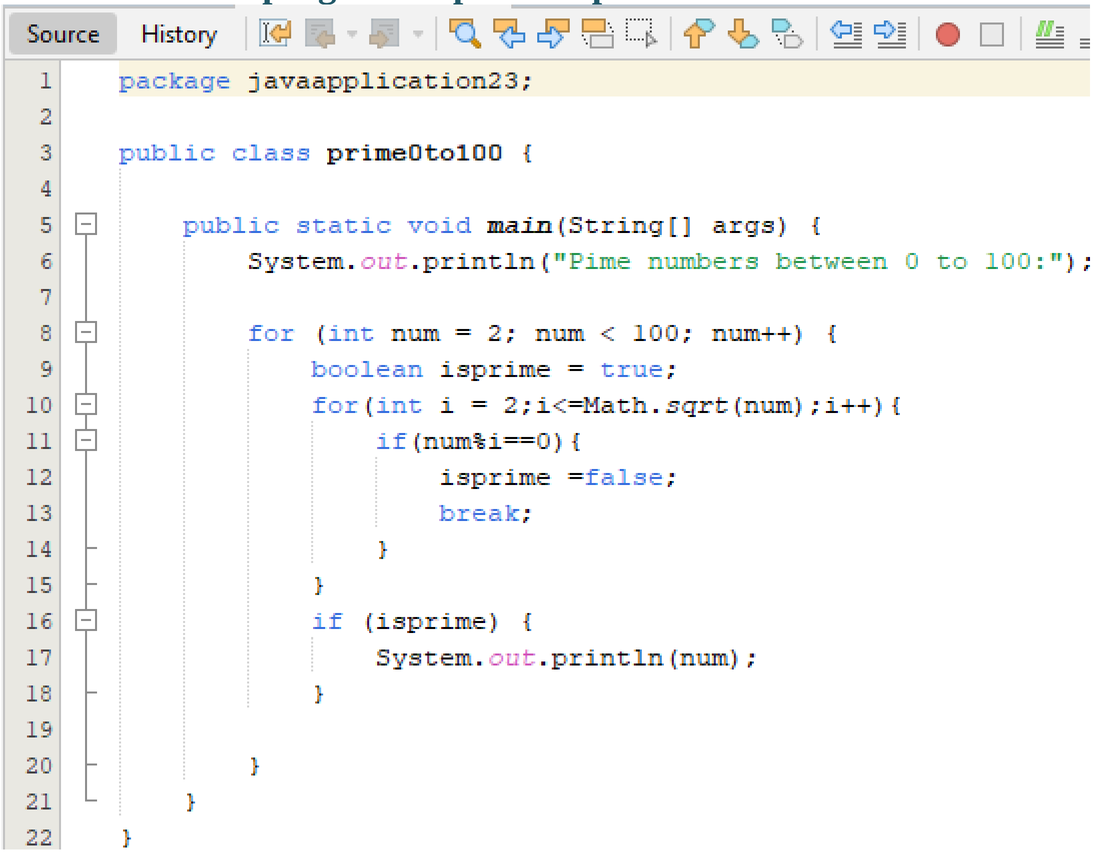
Output



Output - JavaApplication23 (run) #2

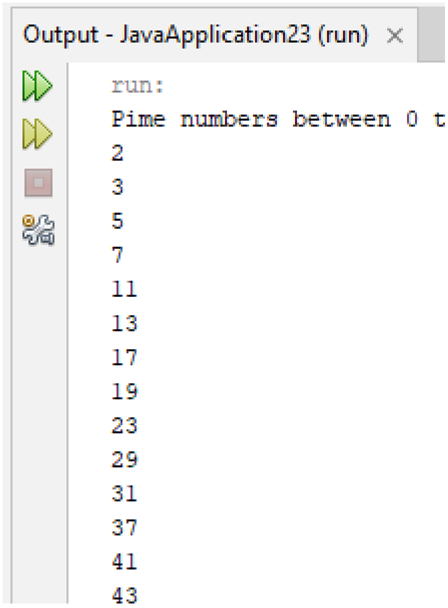
```
run:
Enter the number of elements in the array: 4
Enter the elements of the array:
4
6
8
9
Maximum element: 9
Minimum element: 4
BUILD SUCCESSFUL (total time: 10 seconds)
```

5# Write a Java program to print all prime numbers between 0 to 100

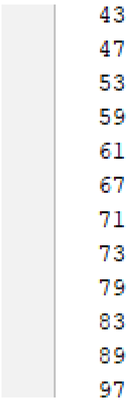


```
package javaapplication23;

public class prime0to100 {

    public static void main(String[] args) {
        System.out.println("Pime numbers between 0 to 100:");

        for (int num = 2; num < 100; num++) {
            boolean isprime = true;
            for(int i = 2;i<=Math.sqrt(num);i++){
                if(num%i==0){
                    isprime =false;
                    break;
                }
            }
            if (isprime) {
                System.out.println(num);
            }

        }
    }
}
```

Output:

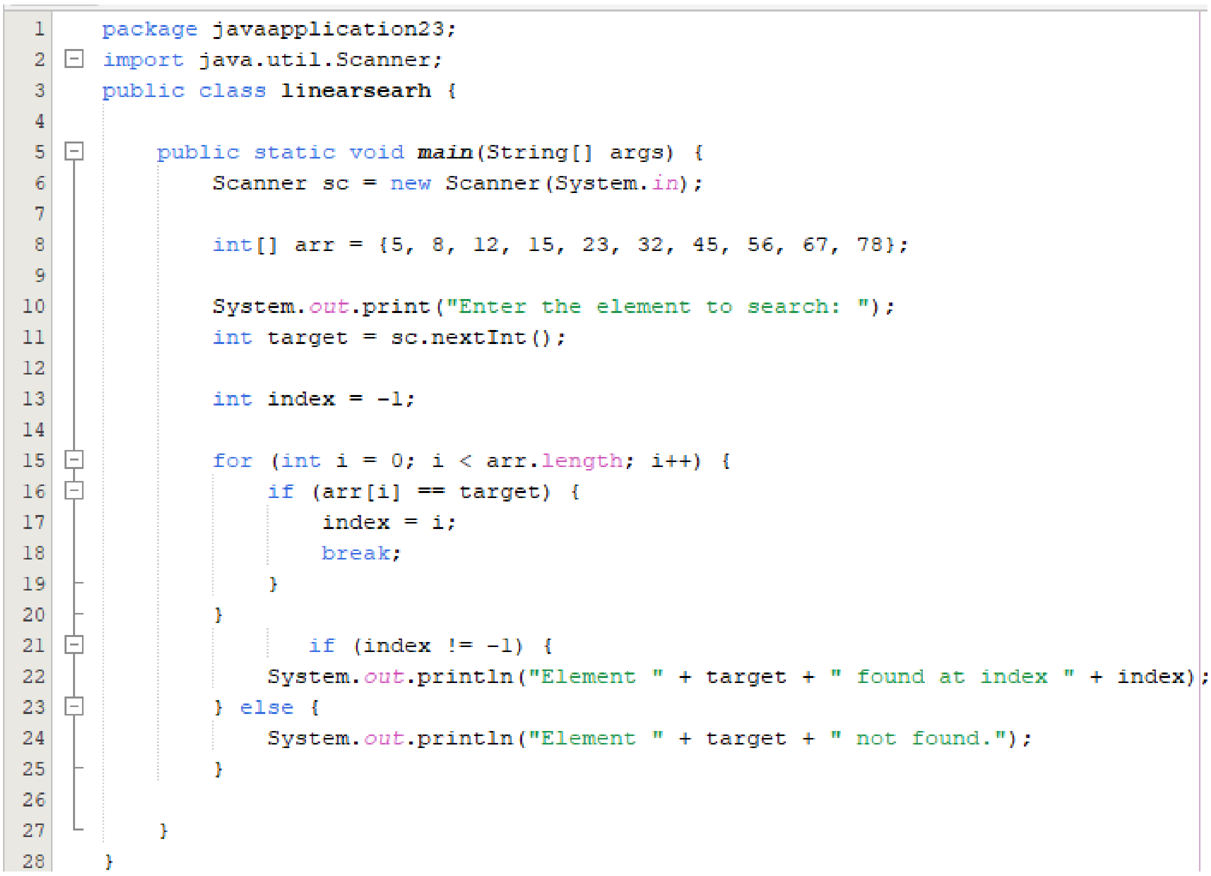


```
run:
Pime numbers between 0 t
2
3
5
7
11
13
17
19
23
29
31
37
41
43
```



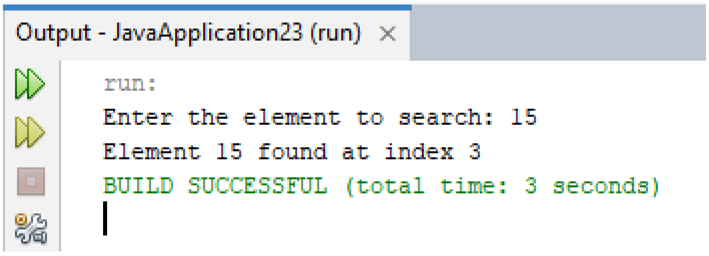
```
43
47
53
59
61
67
71
73
79
83
89
97
```

6# Write a Java program to implement linear search.



```java
package javaapplication23;
import java.util.Scanner;
public class linearsearh {

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

        int[] arr = {5, 8, 12, 15, 23, 32, 45, 56, 67, 78};

        System.out.print("Enter the element to search: ");
        int target = sc.nextInt();

        int index = -1;

        for (int i = 0; i < arr.length; i++) {
            if (arr[i] == target) {
                index = i;
                break;
            }
        }
               if (index != -1) {
            System.out.println("Element " + target + " found at index " + index);
        } else {
            System.out.println("Element " + target + " not found.");
        }

    }
}
```

Output:



```
run:
Enter the element to search: 15
Element 15 found at index 3
BUILD SUCCESSFUL (total time: 3 seconds)
```