# WEEK - 01

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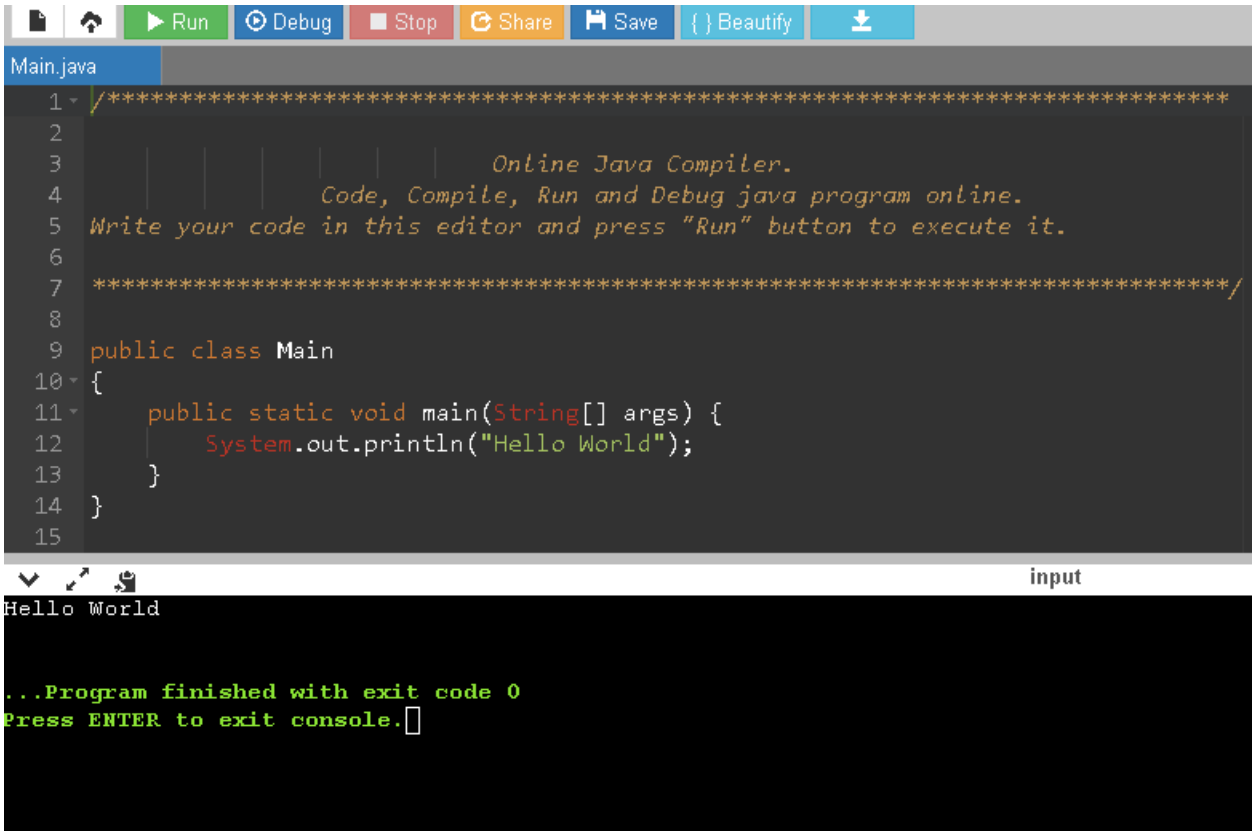
## 01. Write a Java program to print “Hello World”.

**CODE:**

**OUTPUT:**




**02. Write a Java program that prints all the real and imaginary solutions to the quadratic equations ax2 + bx + c = 0.Read in a, b, c and use the quadratic formula.**

**CODE:**

helloWorld.java | quadraticEquations.java

quadraticEquations.java

```java
import java.util.*;

// QUADRATIC EQUATIONS PROGRAM

public class quadraticEquations{
    public static void main(String args[]){
        Scanner scan = new Scanner(System.in); //creating scanner object
        System.out.println("Enter coefficient of x^2: ");
        double a = scan.nextFloat(); //x^2 coefficient
        System.out.println("Enter coefficient of x: ");
        double b = scan.nextFloat(); // x coefficient
        System.out.println("Enter value of constant: ");
        double c = scan.nextFloat(); // constant value

        // calculating determinant
        double det = b*b - 4*a*c , root1, root2;

        // check if determinant > 0
        if(det > 0.0){
            // roots are real and distinct
            root1 = (-b - Math.sqrt(det)) / (2*a);
            root2 = (-b + Math.sqrt(det)) / (2*a);

            // roots output
            System.out.format("Root1: %.2f\tRoot2: %.2f",root1,root2);
        }

        // check if determinant = 0
        else if(det == 0.0){
            // roots are real and equal
            root1 = root2 = -b / (2*a);
```

```
32
33          // roots output
34          System.out.format("Root1: %.2f\tRoot2: %.2f",root1,root2);
35      }
36
37      // check if determinant < 0
38      if(det < 0.0){
39          // roots are complex and distinct
40          double realPart = -b / (2*a);
41          double imgPart = Math.sqrt(-det) / (2*a);
42
43          // roots output
44          System.out.format("Root1: %.2f + %.2fi\tRoot2: %.2f - %.2fi",realPart, imgPart,realPart, imgP
45
46      }
47
48
49
```

**OUTPUT:**


**03. Write a Java program to implement calculator operations.**

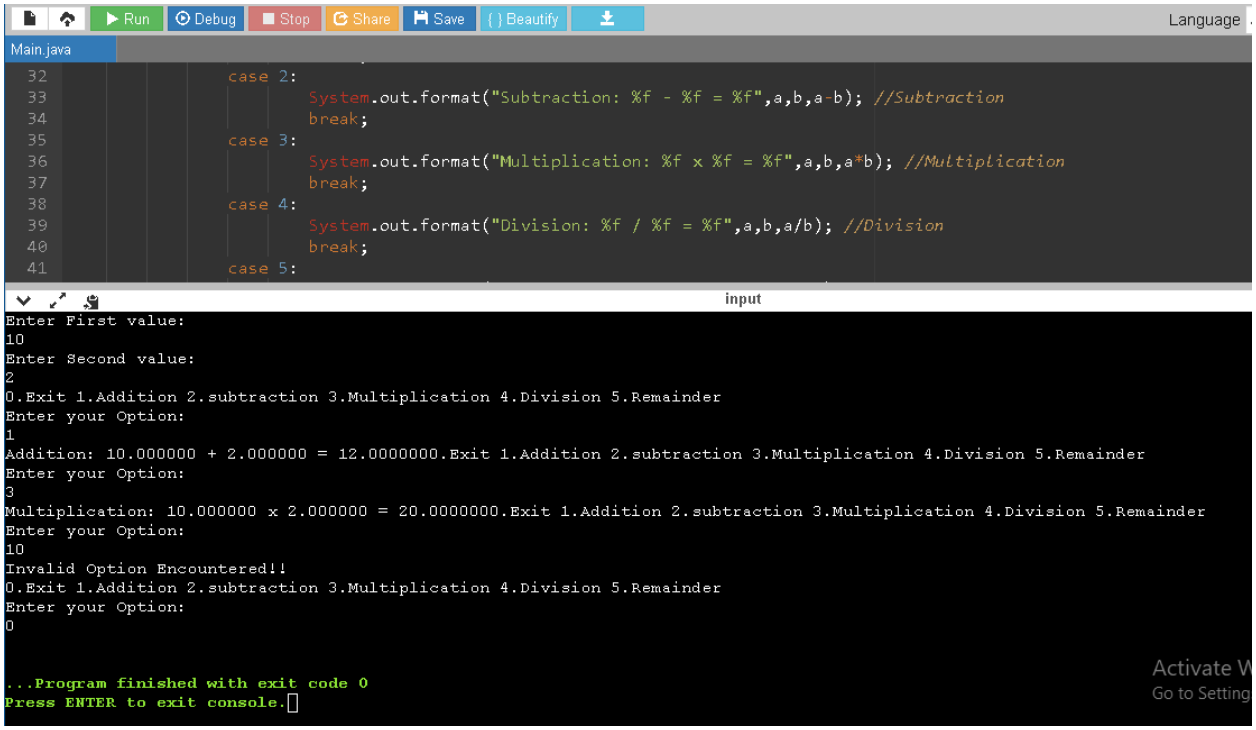
**CODE:**

calculatorOperations.java

```java
import java.util.*;

// CALCULATOR OPERATIONS PROGRAM

public class calculatorOperations{
    public static void main(String args[]){
        Scanner scan = new Scanner(System.in); //creating scanner object
        System.out.println("Enter First value: ");
        double a = scan.nextFloat(); // first value
        System.out.println("Enter Second value: ");
        double b = scan.nextFloat(); // second value
        boolean flag = true;
        while(flag){
            System.out.println("0.Exit 1.Addition 2.subtraction 3.Multiplication 4.Division 5.Remainder");
            System.out.println("Enter your Option: ");
            int opt = scan.nextInt(); // input option

            switch(opt){
                case 0:
                        flag = false;// to end while loop
                        break;
                case 1:
                        System.out.format("Addition: %f + %f = %f",a,b,a+b);//Addition
                        break;
                case 2:
                        System.out.format("Subtraction: %f - %f = %f",a,b,a-b); //Subtraction
                        break;
                case 3:
                        System.out.format("Multiplication: %f x %f = %f",a,b,a*b); //Multiplication
                        break;
                case 4:
                        System.out.format("Division: %f / %f = %f",a,b,a/b); //Division
                        break;
                case 5:
                        System.out.format("Remainder: %f % %f = %f",a,b,a%b); //Remainder
                        break;
                default:
                        System.out.println("Invalid Option Encountered!!"); //Default
                        break;
            }
        }
    }
}
```



**OUTPUT:**




## 04. Write a Java program to find prime factors of a given number.

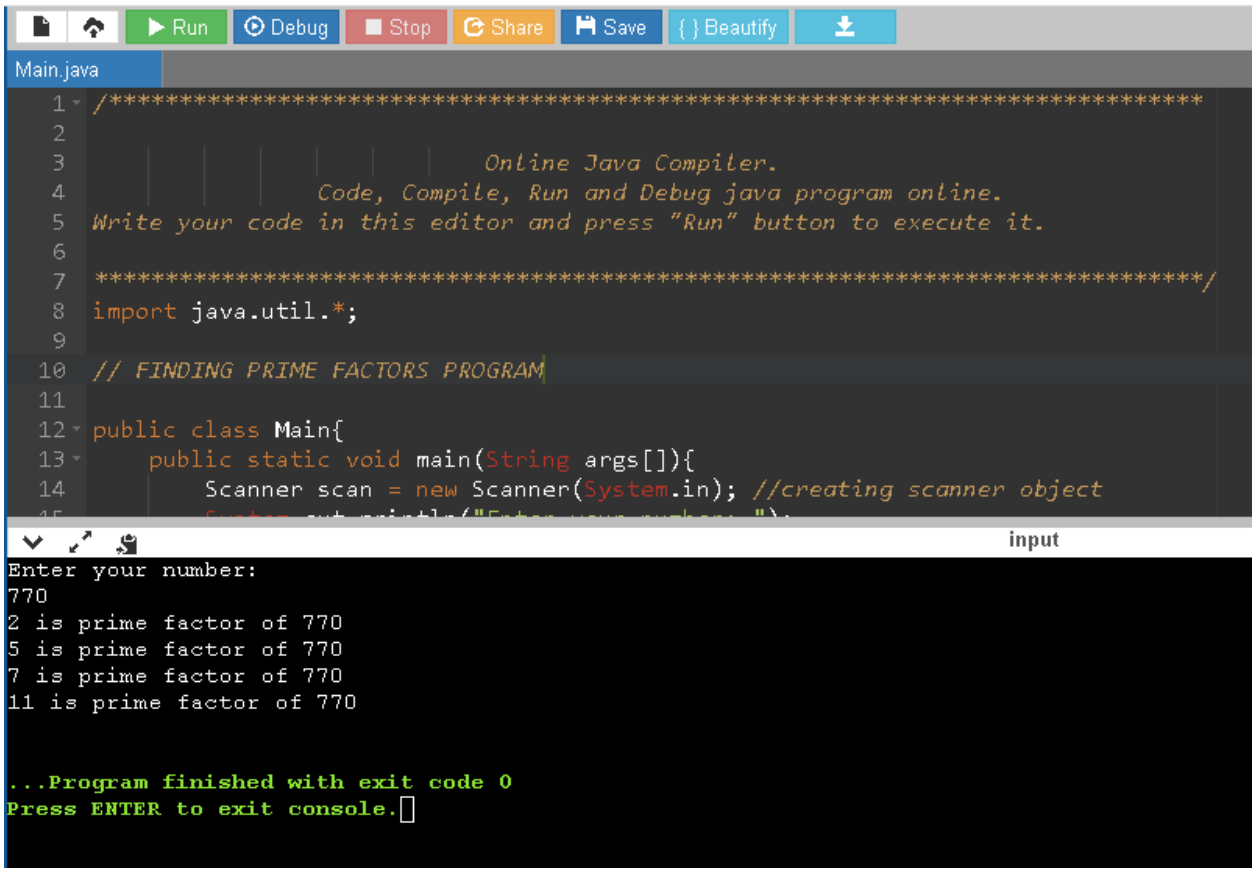
## CODE:

primeFactors.java

```java
import java.util.*;

// FINDING PRIME FACTORS PROGRAM

public class primeFactors{
    public static void main(String args[]){
        Scanner scan = new Scanner(System.in); //creating scanner object
        System.out.println("Enter your number: ");
        int num = scan.nextInt(); // input number

        int isPrime;// flag to check if number is a prime

        // loop from 2 to the num (not from 1 because, 1 is not prime nor composite)
        for(int i=2; i<=num; i++){
            if(num%i == 0){
                int factor = i; // i is a factor
                // check if factor is prime
                isPrime = 1;

                for(int j=2; j<(factor/2); j++){ //optimised  code
                    if(factor%j == 0){ //if other than 1 and itself is a factor then it is not a prime
                        isPrime = 0;
                        //break;
                    }
                }
                if(isPrime == 1){ // check if num is prime
                        System.out.format("%d is prime factor of %d\n",factor,num);

                }
            }
        }
    }
}
```



**OUTPUT:**



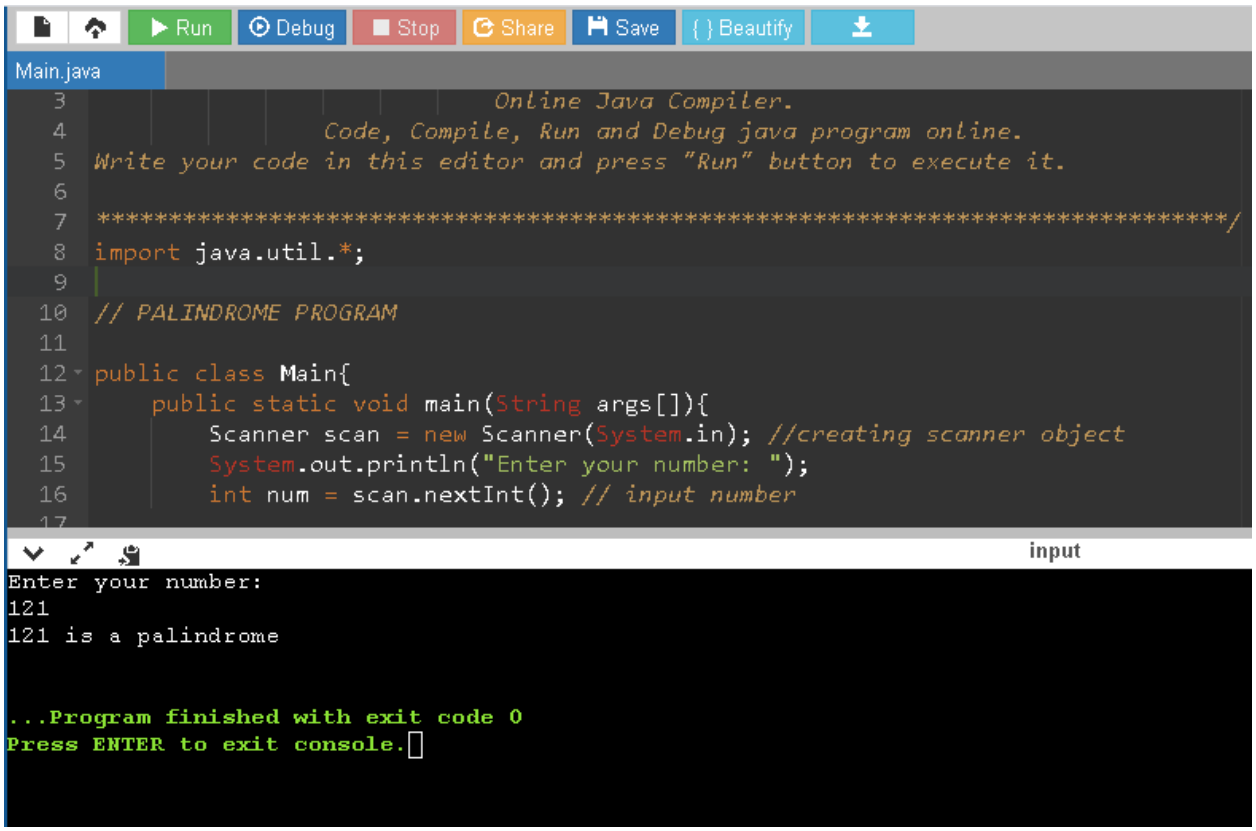

**05. Write a Java program to find whether given number is palindrome or not.**

**CODE:**

palindrome.java

```java
import java.util.*;

// PALINDROME PROGRAM

public class palindrome{
    public static void main(String args[]){
        Scanner scan = new Scanner(System.in); //creating scanner object
        System.out.println("Enter your number: ");
        int num = scan.nextInt(); // input number

        int temp = num; //saving num in temporary variable
        int rem; // to save last digits
        int rev=0; // to save reversing numbers

        //Reversing input number
        while(temp!=0){
            rem = temp%10; // taking out last digits
            rev = (rev*10) + rem; // placing in rev variable
            temp = temp/10; // removing last digit from given number
        }

        // checking if reverse number is equal to given number
        if(num == rev)
            System.out.format("%d is a palindrome\n", num);
        else // if reverse is not equal to given number
            System.out.format("%d is not a palindrome\n", num);
    }
}
```

**OUTPUT:**




**06. Write an application that declares 5 integers, determines and prints the largest and smallest in the group.**

**CODE:**

largestAndSmallest.java

```java
import java.util.*;

// LARGEST AND SMALLEST PROGRAM

public class largestAndSmallest{
    public static void main(String args[]){
        Scanner scan = new Scanner(System.in); //creating scanner object

        System.out.println("Enter number of values: ");
        int n = scan.nextInt(); // number of values
        int a[] = new int[n]; // declaring array with size n
        int smallest = 9999; //smallest number
        int largest = -1; // largest number

        for(int i=0; i<n; i++){
            System.out.format("Enter value of a[%d]: ",i);
            a[i] = scan.nextInt();

            // finding smallest
            if(a[i] < smallest)
                smallest = a[i];

            // finding largest
            if(a[i] > largest)
                largest = a[i];
        }
        System.out.format("Smallest value: %d\n", smallest);
        System.out.format("Largest value: %d\n", largest);
    }
}
```

**OUTPUT:**


Run
Debug
Stop
Share
Save
{ } Beautify
Main.java
/*****************************************************************************
Online Java Compiler.
Code, Compile, Run and Debug java program online.
Write your code in this editor and press "Run" button to execute it.
*****************************************************************************/
import java.util.*;
// LARGEST AND SMALLEST PROGRAM
public class Main{
public static void main(String args[]){
Scanner scan = new Scanner(System.in); //creating scanner object
input
Enter number of values:
5
Enter value of a[0]: 10
Enter value of a[1]: 1
Enter value of a[2]: 5
Enter value of a[3]: 22
Enter value of a[4]: 8
Smallest value: 1
Largest value: 22
...Program finished with exit code 0
Press ENTER to exit console.