a **Write a JAVA program to display default value of all primitive data type of JAVA**

Java, primitive data types have specific default values when they are declared as fields of a class. These defaults are important because they ensure that every field has a value, even if it's not explicitly initialized. Here's a detailed explanation of the default values for each primitive data type:

1. **byte**:

   - **Default Value**: `0`
   - **Description**: The `byte` data type is an 8-bit signed integer. Its default value is `0`, which is the smallest possible value for this type.

2. **short**:

   - **Default Value**: `0`
   - **Description**: The `short` data type is a 16-bit signed integer. Its default value is also `0`, similar to `byte`.

3. **int**:

   - **Default Value**: `0`
   - **Description**: The `int` data type is a 32-bit signed integer. The default value is `0`, which is a common default for integer types in Java.

4. **long**:

   - **Default Value**: `0L`
   - **Description**: The `long` data type is a 64-bit signed integer. Its default value is `0L`, where the `L` suffix indicates that the literal is of type `long`.

5. **float**:

   - **Default Value**: `0.0f`
   - **Description**: The `float` data type is a single-precision 32-bit IEEE 754 floating-point. Its default value is `0.0f`, where `f` indicates that the literal is a float.

6. **double**:

   - **Default Value**: `0.0`
   - **Description**: The `double` data type is a double-precision 64-bit IEEE 754 floating-point. Its default value is `0.0`, with no suffix needed as `0.0` is treated as a `double` by default.

7. **char**:

   - **Default Value**: `'\u0000'`
   - **Description**: The `char` data type represents a single 16-bit Unicode character. Its default value is `'\u0000'`, which is the null character and represents a Unicode code point of 0.

8. **boolean**:

   - **Default Value**: `false`
   - **Description**: The `boolean` data type represents a value that can be either `true` or `false`. Its default value is `false`, indicating that it is initially set to false if not explicitly initialized.

```
public class Demo {
  static boolean val1;
  static double val2;
  static float val3;
  static int val4;
  static long val5;
  static String val6;
```

```java
  public static void main(String[] args) {
    System.out.println("Default values.....");
    System.out.println("Val1 = " + val1);
    System.out.println("Val2 = " + val2);
    System.out.println("Val3 = " + val3);
    System.out.println("Val4 = " + val4);
    System.out.println("Val5 = " + val5);
    System.out.println("Val6 = " + val6);
  }
}
```

out put:
Default values.....
Val1 = false
Val2 = 0.0
Val3 = 0.0
Val4 = 0
Val5 = 0
Val6 = null

b   Write a java program that display the roots of a quadratic equation $ax^2+bx=0$. Calculate the discriminate D and basing on value of D, describe the nature of root.

```java
public class Main {

  public static void main(String[] args)
  {
 double a = 7.2, b = 5, c = 9;
    double firstroot, secondroot;
    double det = b * b - 4 * a * c;
    if (det > 0) {
      firstroot = (-b + Math.sqrt(det)) / (2 * a);
      secondroot = (-b - Math.sqrt(det)) / (2 * a);

      System.out.format(
        "First Root = %.2f and Second Root = %.2f",
        firstroot, secondroot);
    }
    else if (det == 0) {
      firstroot = secondroot = -b / (2 * a);

      System.out.format(
        "First Root = Second Root = %.2f;",
        firstroot);
    }
    else {

      double real = -b / (2 * a);

      double imaginary = Math.sqrt(-det) / (2 * a);

      System.out.printf("First Root = %.2f+%.2fi",
              real, imaginary);
      System.out.printf("\nSecond Root = %.2f-%.2fi",
              real, imaginary);
    }
  }
}
```

out put:
First Root = -0.35+1.06i
Second Root = -0.35-1.06i