

**NAME- RAGHAVENDRA KOWTAL**

**[EMAIL-raghavendrakowtal@gmail.com](mailto:raghavendrakowtal@gmail.com)**

**BATCH- A2 (2 – 4pm)**

**ASSIGNMENT TOPIC- RANGE OF THE DATA THAT  
CAN BE STORED IN DOUBLE**

# RANGE OF THE DATA THAT CAN BE STORED IN DOUBLE

In Java, the double data type is a 64-bit floating-point type that adheres to the IEEE 754 standard. It has a range of values that can be stored, including both positive and negative numbers.

The minimum positive value that can be stored in a double is approximately  $4.9 \times 10^{-324}$ , while the maximum positive value is approximately  $1.8 \times 10^{308}$ . These values provide a large range of representable numbers.

The double type uses 52 bits to represent the significand (also known as the mantissa) of the floating-point number. This allows for a precision of about 15 decimal digits.

It's important to keep in mind that while the range and precision of double provide a broad spectrum for storing numerical data, it is still subject to the limitations of floating-point arithmetic. Some operations may result in rounding errors or loss of precision, particularly when dealing with very large or very small numbers or when performing extensive calculations.

## EXAMPLE:

```
public class DoubleExample {  
  
    public static void main(String[] args) {  
  
        double minVal = 4.9e-324;  
  
        double maxVal = 1.8e+308;  
  
        double largeNumber = 1.234567890123456789;  
  
        double smallNumber = 0.000000000123456789;  
  
        System.out.println("Minimum double value: " + minVal);  
  
        System.out.println("Maximum double value: " + maxVal);  
  
        System.out.println("Large number: " + largeNumber);  
  
        System.out.println("Small number: " + smallNumber);  
  
    }  
}
```

```
}
```

### **OUTPUT:**

Minimum double value: 4.9E-324

Maximum double value: 1.8E308

Large number: 1.2345678901234568

Small number: 1.23456789E-10

## **HOW MANY DECIMAL POINTS CAN BE STORED IN FLOAT AND DOUBLE?**

The float data type is a 32-bit floating-point type, and the double data type is a 64-bit floating-point type. The number of decimal points that can be stored in each data type depends on their respective precisions.

The float type typically provides about 7 decimal digits of precision. This means that it can store numbers with approximately 7 significant decimal places. However, it's important to note that due to the nature of floating-point representation, not all decimal numbers with 7 digits of precision can be accurately represented. Some numbers may introduce rounding errors.

On the other hand, the double type generally provides about 15 decimal digits of precision. It can store numbers with approximately 15 significant decimal places. Like float, double is also subject to potential rounding errors.

The number of decimal points that can be stored is not an absolute limit. It depends on the specific values being represented and the operations performed on them. Certain calculations or manipulations may introduce additional rounding errors, affecting the precision of the decimal points.