Date:

18/07/2023

Java Assignment

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Datatype Range of Float and Double:

In Java, the data types **`float`** and **`double`** are used to represent floating-point numbers with single and double precision, respectively. Here are the ranges and sizes of these data types:

1) Float Datatype:

This data type is a single-precision 32-bit floating-point number. It is typically used when memory conservation is a concern, or when you need to perform floating-point calculations that do not require high precision.

- Range: Approximately ±1.4E-45 to ±3.4028235E38
- Size: 32 bits (4 bytes)

Example for float datatype:

```
package project;

public class floatrange {

	public static void main(String[] args) {
		float minValue = Float.MIN_VALUE;
	  float maxValue = Float.MAX_VALUE;

	  System.out.println("Minimum value of float: " + minValue);
	  System.out.println("Maximum value of float: " + maxValue);

	}

}
```

Output:

```
Minimum value of float: 1.4E-45
Maximum value of float: 3.4028235E38
```

2) Double Datatype:

This data type is a double-precision 64-bit floating-point number. It offers higher precision compared to `float` and is commonly used for most floating-point calculations in Java.

- Range: Approximately ±4.9E-324 to ±1.7976931348623157E308
- Size: 64 bits (8 bytes)

Example for double datatype:

```
package project;

public class doublerange {

	public static void main(String[] args) {
		double minValue = Double.MIN_VALUE;
		double maxValue = Double.MAX_VALUE;

		System.out.println("Minimum value of double: " + minValue);
		System.out.println("Maximum value of double: " + maxValue);
	}

}
```

Output:

```
Minimum value of double: 4.9E-324
Maximum value of double: 1.7976931348623157E308
```

Digits permitted after decimal point:

In Java, the number of digits permitted after the decimal point in a `float` or `double` data type depends on their precision and size.

1. **`float`**: The `float` data type is a single-precision 32-bit floating-point number. It can typically store up to 7 significant digits, and the rest are lost due to its limited precision. Keep in mind that this is an approximation, and the actual number of digits can vary depending on the specific values being represented.
2. **`double`**: The `double` data type is a double-precision 64-bit floating-point number. It provides higher precision compared to `float` and can store up to 15 significant digits. Similarly, some precision might be lost in extremely large or small numbers.

Example:

```
package project;

public class doublerange {

	public static void main(String[] args) {
		float floatValue = 3.14159265358979323846f;
	  double doubleValue = 3.14159265358979323846;

	  System.out.println("Float value: " + floatValue);
	  System.out.println("Double value: " + doubleValue);
	}

}
```

Output:

```
Float value: 3.1415927
Double value: 3.141592653589793
```