

## Q7] Working with java.lang.Double

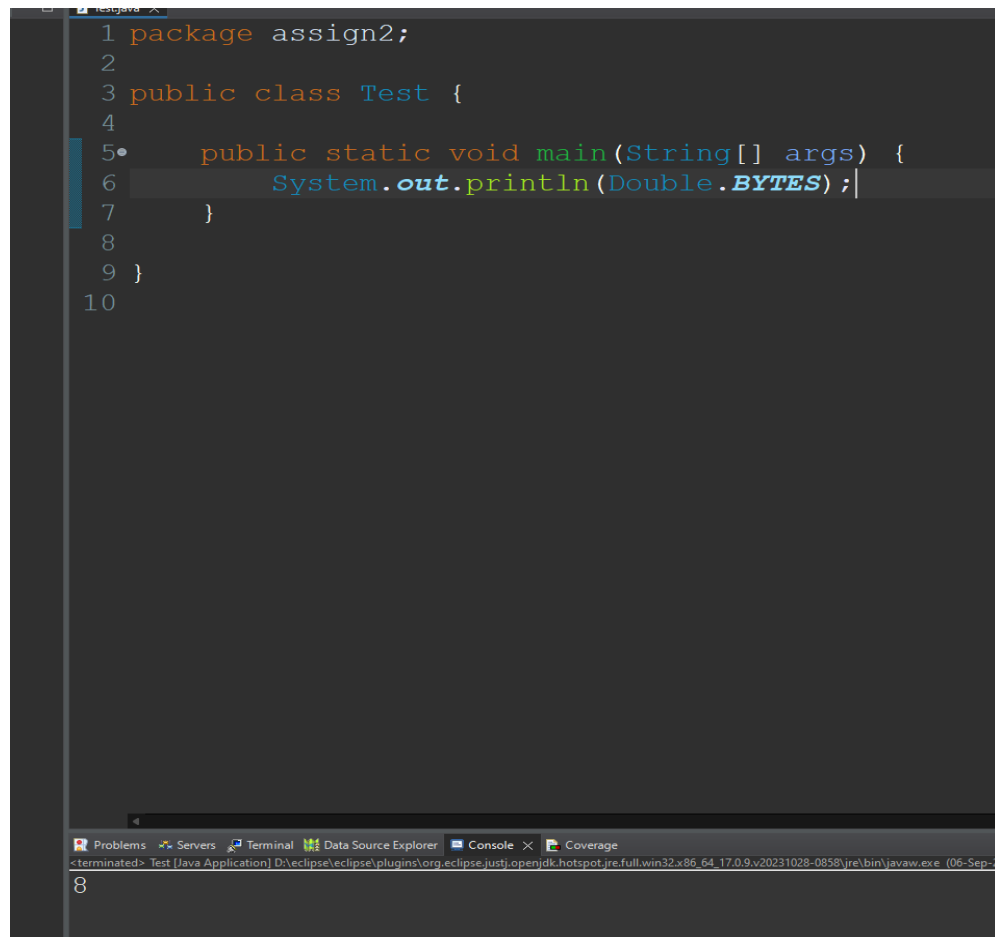
- a) Explore the Java API documentation for java.lang.Double and observe its modifiers and super types.

⇒ static double → MAX\_VALUE

static double → MIN\_VALUE

- b) Write a program to test how many bytes are used to represent a double value using the BYTES field. (Hint: Use Double.BYTES).

⇒

A screenshot of the Eclipse IDE interface. The main editor window shows a Java file named 'Test.java' with the following code:

```
1 package assign2;  
2  
3 public class Test {  
4  
5     public static void main(String[] args) {  
6         System.out.println(Double.BYTES);  
7     }  
8  
9 }  
10
```

The code is color-coded: package is orange, class is blue, static is orange, void is orange, main is green, String is blue, args is blue, System.out is blue, println is green, Double is blue, and BYTES is red. The bottom of the IDE shows a console window with the output '8' and a status bar indicating the file is terminated.

- c) Write a program to find the minimum and maximum values of double using the MIN\_VALUE and MAX\_VALUE

fields. (Hint: Use Double.MIN\_VALUE and Double.MAX\_VALUE).

A screenshot of the Eclipse IDE. The main editor window shows a Java file named 'Test.java' with the following code:

```
1 package assign2;
2
3 public class Test {
4
5     public static void main(String[] args) {
6         System.out.println("Min value: " + Double.MIN_VALUE);
7         System.out.println("Max value: " + Double.MAX_VALUE);
8     }
9
10 }
11
```

The bottom of the IDE shows a console window with the output of the program:

```
<terminated> Test [Java Application] D:\eclipse\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_17.0.9.v20231028-0858\jre\bin\javaw.exe (06-Sep-2024, 1:12:41 pm - 1:12:42 pm) [pid: 18116]
Min value: 4.9E-324
Max value: 1.7976931348623157E308
```

d) Declare a method-local variable number of type double with some value and convert it to a String using the toString method. (Hint: Use Double.toString(double)).



```
1 package assign2;
2
3 public class Test {
4
5     public static void main(String[] args) {
6         double number = 123.456;
7         String numberString = Double.toString(number);
8         System.out.println(numberString);
9     }
10
11 }
12
```

123.456

e) Declare a method-local variable strNumber of type String with some value and convert it to a double value using the parseDouble method. (Hint: Use Double.parseDouble(String)).



```
Test.java x
1 package assign2;
2
3 public class Test {
4
5     public static void main(String[] args) {
6         String strNumber = "123.456";
7         double number = Double.parseDouble(strNumber);
8         System.out.println(number);
9     }
10
11 }
12
```

Problems Servers Terminal Data Source Explorer Console Coverage

<terminated> Test [Java Application] D:\eclipse\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86\_64\_17.0.9.v20231028-0858\jre\bin\javaw.exe (06-Sep-2024, 1:16:07 pm - 1:16:08 pm)

123.456

f) Declare a method-local variable `strNumber` of type `String` with the value “Ab12Cd3” and attempt to convert it to a double value. (Hint: `parseDouble` method will throw a `NumberFormatException`).



```
1 package assign2;
2
3 public class Test {
4
5     public static void main(String[] args) {
6         String strNumber = "Ab12Cd3";
7         double number = Double.parseDouble(strNumber);
8         System.out.println(number);
9     }
10
11 }
12
```

Exception in thread "main" java.lang.NumberFormatException: For input string: "Ab12Cd3"  
at java.base/jdk.internal.math.FloatingDecimal.readJavaFormatString(FloatingDecimal.java:2054)  
at java.base/jdk.internal.math.FloatingDecimal.parseDouble(FloatingDecimal.java:110)  
at java.base/java.lang.Double.parseDouble(Double.java:651)  
at assign2.Test.main(Test.java:7)

g) Declare a method-local variable `number` of type `double` with some value and convert it to the corresponding wrapper class using `Double.valueOf()`. (Hint: Use `Double.valueOf(double)`).



```
Test.java
1 package assign2;
2
3 public class Test {
4
5     public static void main(String[] args) {
6         double number = 123.456;
7         Double wrapperNumber = Double.valueOf(number);
8         System.out.println(wrapperNumber);
9
10    }
11
12 }
13
```

Problems Servers Terminal Data Source Explorer Console Coverage

<terminated> Test [Java Application] D:\eclipse\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86\_64\_17.0.9.v20231028-0858\jre\bin\javaw.exe (06-Sep-2024, 1:21:30 pm - 1:21:31 pm) [pid: 3216]

123.456

h) Declare a method-local variable strNumber of type String with some double value and convert it to the corresponding wrapper class using Double.valueOf(). (Hint: Use Double.valueOf(String)).



```
1 package assign2;
2
3 public class Test {
4
5     public static void main(String[] args) {
6         String strNumber = "123.456";
7         Double wrapperNumber = Double.valueOf(strNumber);
8         System.out.println(wrapperNumber);
9
10    }
11
12 }
13
```

123.456

- i) Declare two double variables with values 112.3 and 984.5, and add them using a method from the Double class. (Hint: Use Double.sum(double, double)).



```
1 package assign2;
2
3 public class Test {
4
5     public static void main(String[] args) {
6         double num1 = 112.3;
7         double num2 = 984.5;
8         double sum = Double.sum(num1, num2);
9         System.out.println("Sum: " + sum);
10    }
11 }
12
13 }
14
```

1096.8

j) Declare two double variables with values 112.2 and 556.6, and find the minimum and maximum values using the Double class. (Hint: Use Double.min(double,double) and Double.max(double, double)).





```
Test.java x
1 package assign2;
2
3 public class Test {
4
5     public static void main(String[] args) {
6         double num1 = 112.2;
7         double num2 = 556.6;
8         double min = Double.min(num1, num2);
9         double max = Double.max(num1, num2);
10        System.out.println("Min: " + min);
11        System.out.println("Max: " + max);
12
13    }
14
15 }
16
```

Problems Servers Terminal Data Source Explorer Console Coverage  
<terminated> Test [Java Application] D:\eclipse\eclipse\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86\_64\_17.0.9.v20231028-0858\jre\bin\javaw.exe (06-Sep-2023)

Min: 112.2  
Max: 556.6

k) Declare a double variable with the value -25.0. Find the square root of this value.(Hint: Use Math.sqrt() method).



```
Test.java x
1 package assign2;
2
3 public class Test {
4
5     public static void main(String[] args) {
6         double value = -25.0;
7         double squareRoot = Math.sqrt(value);
8         System.out.println("Square root: " + squareRoot);
9
10    }
11
12 }
13
```

Square root: NaN

- 1) Declare two double variables with the same value, 0.0, and divide them. (Hint: Observe the result and any special floating-point behavior).



```
Test.java x
1 package assign2;
2
3 public class Test {
4
5     public static void main(String[] args) {
6         double num1 = 0.0;
7         double num2 = 0.0;
8         double result = num1 / num2;
9         System.out.println("Result of division: " + result);
10
11     }
12
13 }
14
```

Result of division: NaN

- m) Experiment with converting a double value into other primitive types or vice versa and observe the results.



```
1 package assign2;
2
3 public class Test {
4
5     public static void main(String[] args) {
6         double doubleValue = 123.456;
7         int intValue = (int) doubleValue;
8         System.out.println("Double value: " + doubleValue);
9         System.out.println("Converted to int: " + intValue);
10    }
11 }
12
13 }
14
```

Double value: 123.456  
Converted to int: 123