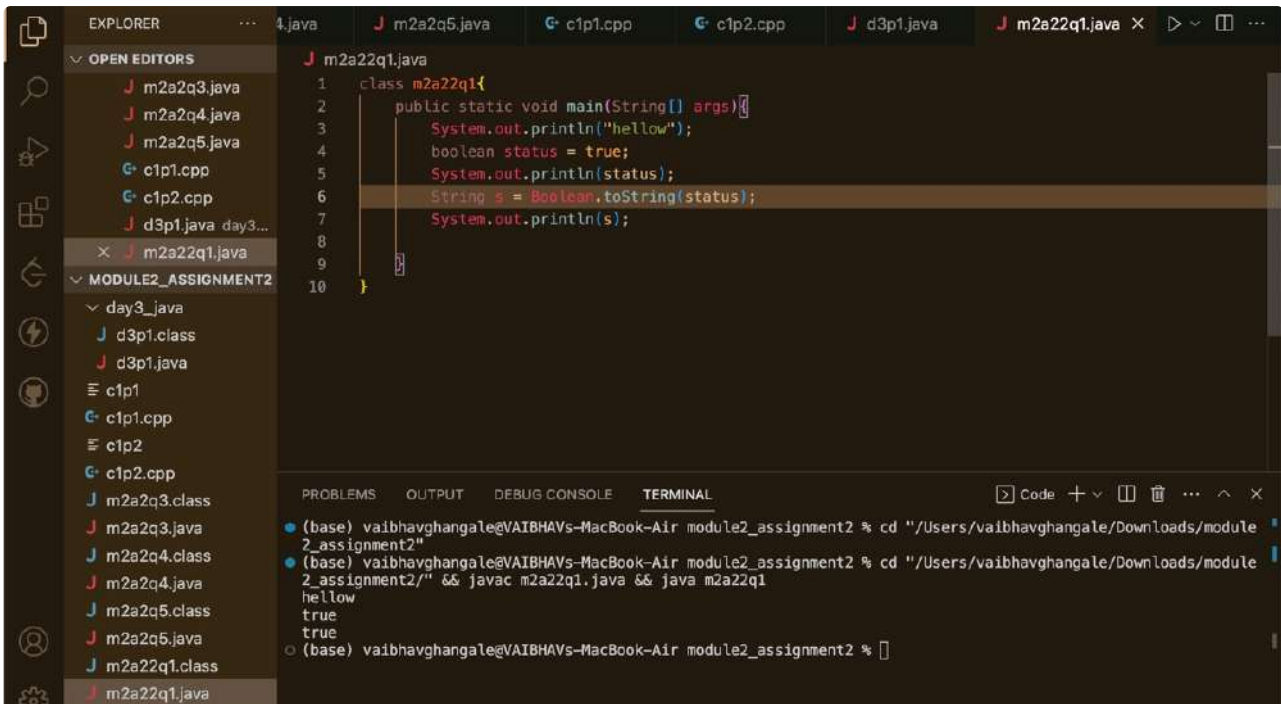


module 2 assignment 2.2 sandeep sir's assig2

1. Working with java.lang.Boolean

- Explore the Java API documentation for java.lang.Boolean and observe its modifiers and super types.
- Declare a method-local variable status of type boolean with the value true and convert it to a String using the toString method. (Hint: Use Boolean.toString(Boolean)).



The screenshot shows an IDE with the following code in `m2a22q1.java`:

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3         System.out.println("hello");
4         boolean status = true;
5         System.out.println(status);
6         String s = Boolean.toString(status);
7         System.out.println(s);
8     }
9 }
10
```

The terminal output shows the execution results:

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
hello
true
true
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

- Declare a method-local variable strStatus of type String with the value "true" and convert it to a boolean using the parseBoolean method. (Hint: Use Boolean.parseBoolean(String)).

The screenshot shows an IDE with the following components:

- EXPLORER:** Lists files in the `MODULE2_ASSIGNMENT2` project, including `day3_*.java`, `d3p1.class`, `d3p1.java`, `c1p1`, `c1p1.cpp`, `c1p2`, `c1p2.cpp`, `m2a2q3.class`, `m2a2q3.java`, `m2a2q4.class`, `m2a2q4.java`, `m2a2q5.class`, `m2a2q5.java`, `m2a22q1.class`, and `m2a22q1.java`.
- EDITOR:** Displays the code for `m2a22q1.java`:


```

1 class m2a22q1{
2     public static void main(String[] args){
3         String strStatus= "true";
4         System.out.println(strStatus);
5         boolean s = Boolean.parseBoolean(strStatus);
6         System.out.println(s);
7     }
8 }
9 
```
- TERMINAL:** Shows the execution of the program:


```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2" && javac m2a22q1.java && java m2a22q1
true
true
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % 
```

d. Declare a method-local variable `strStatus` of type `String` with the value "1" or "0" and attempt to convert it to a boolean. (Hint: `parseBoolean` method will not work as expected with "1" or "0").

The screenshot shows the same IDE setup as before, but with the following changes:

- EDITOR:** The code in `m2a22q1.java` now sets `strStatus` to "1":


```

1 class m2a22q1{
2     public static void main(String[] args){
3         String strStatus= "1";
4         System.out.println(strStatus);
5         boolean s = Boolean.parseBoolean(strStatus);
6         System.out.println(s);
7     }
8 }
9 
```
- TERMINAL:** Shows the execution results:


```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2" && javac m2a22q1.java && java m2a22q1
1
false
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % 
```

for both 1 and 0, false is o/p

e. Declare a method-local variable `status` of type `boolean` with the value `true` and convert it to the corresponding wrapper class using `Boolean.valueOf()`. (Hint: Use `Boolean.valueOf(boolean)`).

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3         boolean Status = true;
4         System.out.println(Status);
5         boolean s = Boolean.valueOf(Status);
6         System.out.println(s);
7     }
8 }
9 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2" && javac m2a22q1.java && java m2a22q1

true

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

f. Declare a method-local variable `strStatus` of type `String` with the value `"true"` and convert it to the corresponding wrapper class using `Boolean.valueOf()`. (Hint: Use `Boolean.valueOf(String)`).

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3         String Status = "true";
4         System.out.println(Status);
5         boolean s = Boolean.valueOf(Status);
6         System.out.println(s);
7     }
8 }
9 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2" && javac m2a22q1.java && java m2a22q1

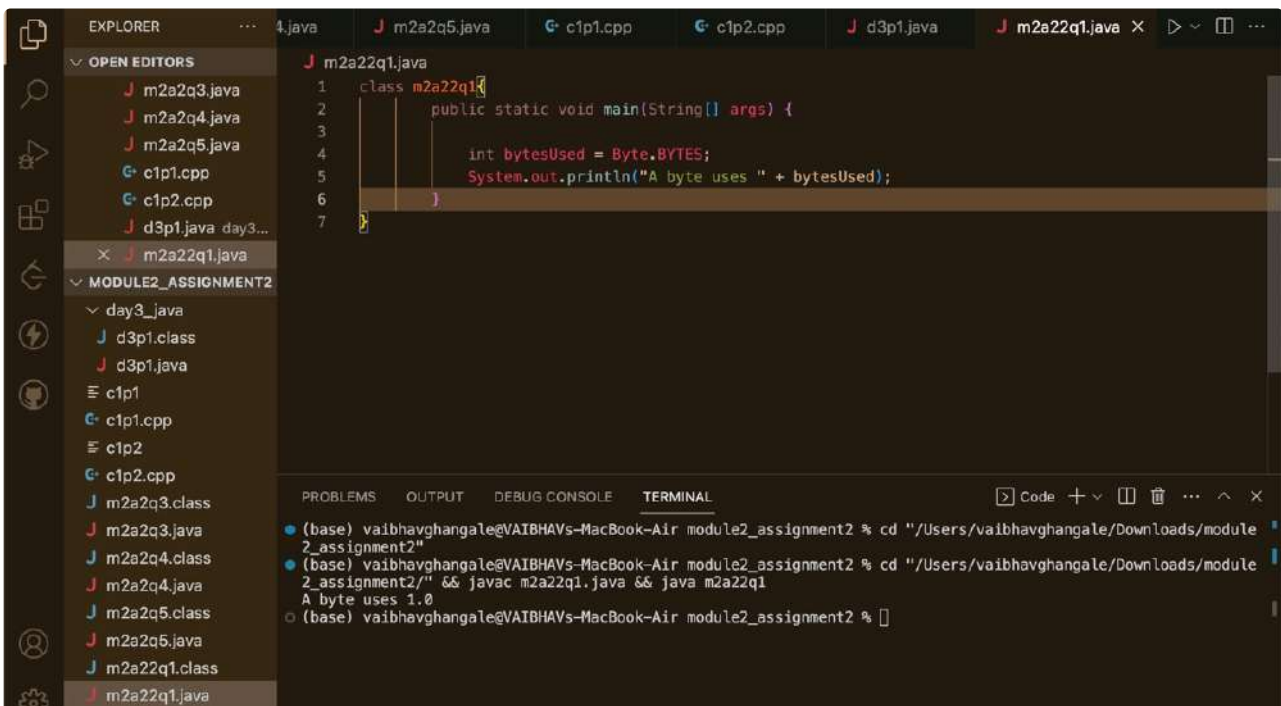
true

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

2. Working with `java.lang.Byte`

a. Explore the Java API documentation for `java.lang.Byte` and observe its modifiers and super types.

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

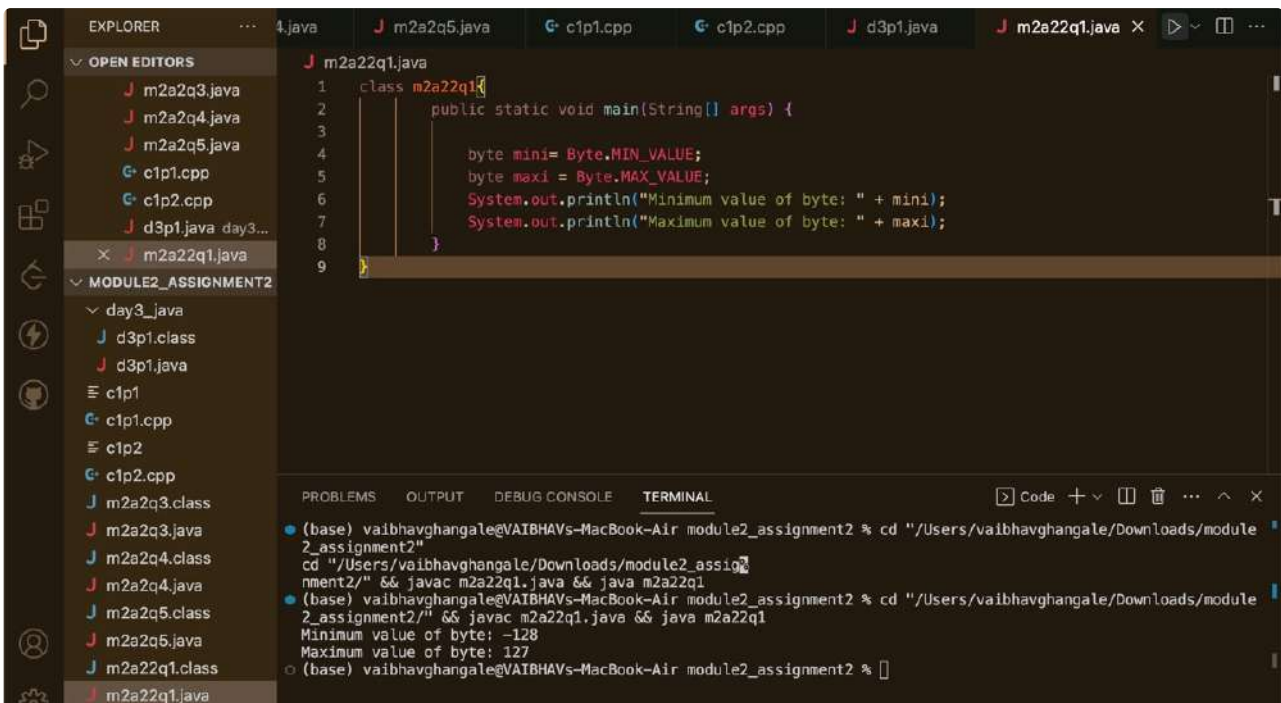


The screenshot shows an IDE with a file explorer on the left and a code editor on the right. The file explorer shows a project named 'MODULE2_ASSIGNMENT2' with a subdirectory 'day3_java' containing several Java files. The code editor shows a file named 'm2a22q1.java' with the following code:

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         int bytesUsed = Byte.BYTES;
5         System.out.println("A byte uses " + bytesUsed);
6     }
7 }
```

The terminal output shows the command to compile and run the program, and the output is 'A byte uses 1.0'.

c. Write a program to find the minimum and maximum values of byte using the MIN_VALUE and MAX_VALUE fields. (Hint: Use Byte.MIN_VALUE and Byte.MAX_VALUE).



The screenshot shows an IDE with a file explorer on the left and a code editor on the right. The file explorer shows a project named 'MODULE2_ASSIGNMENT2' with a subdirectory 'day3_java' containing several Java files. The code editor shows a file named 'm2a22q1.java' with the following code:

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         byte mini = Byte.MIN_VALUE;
5         byte maxi = Byte.MAX_VALUE;
6         System.out.println("Minimum value of byte: " + mini);
7         System.out.println("Maximum value of byte: " + maxi);
8     }
9 }
```

The terminal output shows the command to compile and run the program, and the output is 'Minimum value of byte: -128' and 'Maximum value of byte: 127'.

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

The screenshot shows an IDE with the Explorer panel on the left and the Editor panel on the right. The Explorer panel shows a project named 'MODULE2_ASSIGNMENT2' with a subdirectory 'day3_java' containing several Java files. The Editor panel shows the file 'm2a22q1.java' with the following code:

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         byte mini= 1;
5         String s=Byte.toString(mini);
6         System.out.println( "string is : " +s);
7     }
8 }
9
```

The Terminal panel at the bottom shows the following output:

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
string is : 1
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

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

The screenshot shows the same IDE as before, but the code in 'm2a22q1.java' has been updated to:

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         String s ="123";
5         byte b = Byte.parseByte(s);
6         System.out.println( "string to byte : " +b);
7     }
8 }
9
```

The Terminal panel at the bottom shows the following output:

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
string to byte : 123
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

f. Declare a method-local variable strNumber of type String with the value "Ab12Cd3" and attempt to convert it to a byte value. (Hint: parseByte method will throw a NumberFormatException).

```

class m2a22q1 {
    public static void main(String[] args) {
        String s = "Ab12Cd3";
        byte b = Byte.parseByte(s);
        System.out.println("string to byte : " + b);
    }
}

```

```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
Exception in thread "main" java.lang.NumberFormatException: For input string: "Ab12Cd3"
    at java.base/java.lang.NumberFormatException.forInputString(NumberFormatException.java:67)
    at java.base/java.lang.Integer.parseInt(Integer.java:662)
    at java.base/java.lang.Byte.parseByte(Byte.java:195)
    at java.base/java.lang.Byte.parseByte(Byte.java:221)
    at m2a22q1.main(m2a22q1.java:5)

```

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

```

class m2a22q1 {
    public static void main(String[] args) {
        byte a = 1;
        int b = Byte.valueOf(a);
        System.out.println("after converting to wrapper class : " + a);
    }
}

```

```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
after converting to wrapper class : 1
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % 

```

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

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4
5         String strNumber = "123";
6         int b=Byte.valueOf(strNumber);
7         System.out.println("after converting to wrapper class : "+strNumber);
8         abc strNumber
9     }
10 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1

after converting to wrapper class : 123

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

3. Working with java.lang.Short

- Explore the Java API documentation for java.lang.Short and observe its modifiers and super types.
- Write a program to test how many bytes are used to represent a short value using the BYTES field. (Hint: Use Short.BYTES).

```

1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         int bytesUsed = Short.BYTES;
5         System.out.println("A short uses " + bytesUsed + " bytes");
6     }
7 }

```

```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
A short uses 2 bytes
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

```

c. Write a program to find the minimum and maximum values of short using the MIN_VALUE and MAX_VALUE fields. (Hint: Use Short.MIN_VALUE and Short.MAX_VALUE).

```

1 class m2a22q1 {
2     public static void main(String[] args) {
3         //Short.MIN_VALUE and Short.MAX_VALUE
4         int mini = Short.MIN_VALUE;
5         int maxi = Short.MAX_VALUE;
6         System.out.println("mini " + mini + " maxi " + maxi);
7     }
8 }

```

```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
mini -32768 maxi 32767
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

```

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


```

1 class m2a22q1 {
2     public static void main(String[] args) {
3         //Short.MIN_VALUE and Short.MAX_VALUE
4         short number = 12;
5         String s = Short.toString(number);
6         System.out.println("short to string: "+s);
7     }
8 }

```

```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
short to string: 12
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

```

e. Declare a method-local variable `strNumber` of type `String` with some value and convert it to a short value using the `parseShort` method. (Hint: Use `Short.parseShort(String)`).

```

1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         String strNumber = "123";
5         short number = Short.parseShort(strNumber);
6
7         System.out.println("string to short : "+number);
8     }
9 }

```

```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
string to short : 123
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

```

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

```
class m2a22q1 {
    public static void main(String[] args) {
        String strNumber = "1Ab12Cd32";
        short number = Short.parseShort(strNumber);
        System.out.println("string to short : "+number);
    }
}
```

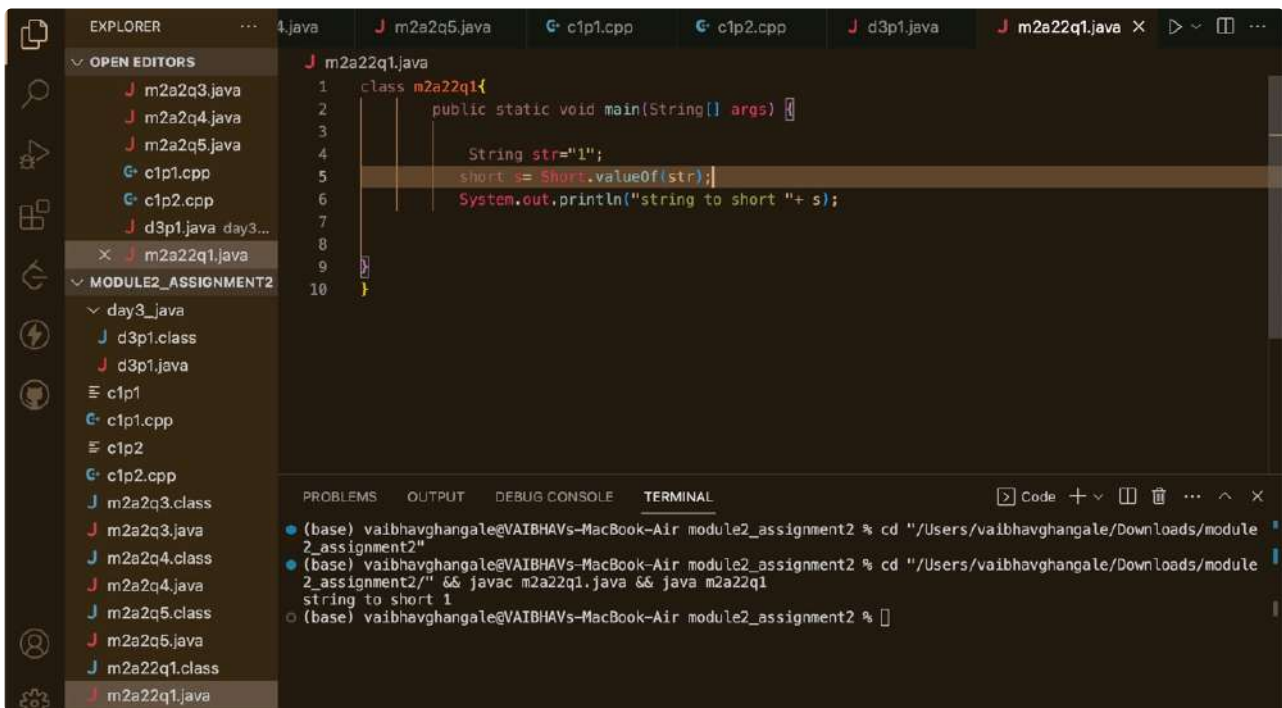
Exception in thread "main" java.lang.NumberFormatException: For input string: "1Ab12Cd32"

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

```
class m2a22q1 {
    public static void main(String[] args) {
        short number = 100;
        Short numberWrapper = Short.valueOf(number);
        System.out.println("Short wrapper value: " + numberWrapper);
    }
}
```

Short wrapper value: 100

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



```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         String str="1";
5         short s= Short.valueOf(str);
6         System.out.println("string to short "+ s);
7
8     }
9
10 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module 2_assignment2" && javac m2a22q1.java && java m2a22q1

string to short 1

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

4. Working with `java.lang.Integer`

a. Explore the Java API documentation for `java.lang.Integer` and observe its modifiers and super types.

b. Write a program to test how many bytes are used to represent an `int` value using the `BYTES` field. (Hint: Use `Integer.BYTES`).

The screenshot shows an IDE with the following components:

- EXPLORER:** A list of files including `m2a2q3.java`, `m2a2q4.java`, `m2a2q5.java`, `c1p1.cpp`, `c1p2.cpp`, `d3p1.java`, and `m2a22q1.java`. The `MODULE2_ASSIGNMENT2` folder is expanded, showing `day3_java` and its sub-files.
- EDITOR:** The file `m2a22q1.java` is open, showing the following code:


```

1 class m2a22q1{
2     public static void main(String[] args) {
3
4
5         int i= Integer.BYTES;
6         System.out.println("bytes are used to represent an int value "+ i);
7     }
8 }
      
```
- TERMINAL:** The terminal shows the execution of the program:


```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
bytes are used to represent an int value 4
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
      
```

c. Write a program to find the minimum and maximum values of int using the MIN_VALUE and MAX_VALUE fields. (Hint: Use Integer.MIN_VALUE and Integer.MAX_VALUE).

The screenshot shows an IDE with the following components:

- EXPLORER:** The same file list as the previous screenshot, with `m2a22q1.java` selected.
- EDITOR:** The file `m2a22q1.java` is open, showing the following code:


```

1 class m2a22q1{
2     public static void main(String[] args) {
3
4         //Integer.MIN_VALUE and Integer.MAX_VALUE
5         int i= Integer.MAX_VALUE;
6         int j=Integer.MIN_VALUE;
7         System.out.println("max "+ i+" min "+j);
8     }
9 }
      
```
- TERMINAL:** The terminal shows the execution of the program:


```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
max 2147483647 min -2147483648
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
      
```

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


```

1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         //Integer.MIN_VALUE and Integer.MAX_VALUE
5         int i= Integer.MAX_VALUE;
6         int j=Integer.MIN_VALUE;
7         String s=Integer.toString(i);
8         System.out.println("integer to string "+i);
9     }
10 }

```

```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
integer to string 2147483647
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % 

```

e. Declare a method-local variable strNumber of type String with some value and convert it to an int value using the parseInt method. (Hint: Use Integer.parseInt(String)).

```

1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         //Integer.MIN_VALUE and Integer.MAX_VALUE
5         int i= Integer.MAX_VALUE;
6         int j=Integer.MIN_VALUE;
7         String s=Integer.toString(i);
8         int n= Integer.parseInt(s);
9         System.out.println("string to integer "+ s );
10    }
11 }

```

```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
string to integer 2147483647
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % 

```

f. Declare a method-local variable strNumber of type String with the value "Ab12Cd3" and attempt to convert it to an int value. (Hint: parseInt method will throw a NumberFormatException).

```

1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         //Integer.MIN_VALUE and Integer.MAX_VALUE
5
6         String s="Ab12Cd3";
7         int i= Integer.parseInt(s);
8
9         System.out.println("string to integer with error "+ s );
10    }
11 }

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
Exception in thread "main" java.lang.NumberFormatException: For input string: "Ab12Cd3"
    at java.base/java.lang.NumberFormatException.forInputString(NumberFormatException.java:67)
    at java.base/java.lang.Integer.parseInt(Integer.java:662)
    at java.base/java.lang.Integer.parseInt(Integer.java:778)
    at m2a22q1.main(m2a22q1.java:7)
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

```

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

```

1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         //Integer.MIN_VALUE and Integer.MAX_VALUE
5         int i= Integer.MAX_VALUE;
6         int j=Integer.MIN_VALUE;
7         String s=Integer.toString(i);
8         System.out.println("integer to string "+i);
9
10    }

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
integer to string 2147483647
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

```

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

The screenshot shows an IDE with the Explorer panel on the left, the Editor panel in the center, and the Terminal panel at the bottom. The Explorer panel shows a project named 'MODULE2_ASSIGNMENT2' with a subdirectory 'day3_java' containing files 'd3p1.class' and 'd3p1.java'. The Editor panel shows the file 'm2a22q1.java' with the following code:

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         //Integer.MIN_VALUE and Integer.MAX_VALUE
5
6         String s="123";
7         int i= Integer.valueOf(s);
8
9         System.out.println("string to integer | "+ i);
10    }
11 }
```

The Terminal panel shows the following commands and output:

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
string to integer | 123
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

i. Declare two integer variables with values 10 and 20, and add them using a method from the Integer class. (Hint: Use Integer.sum(int, int)).

The screenshot shows the same IDE as before, but with the file 'm2a22q1.java' updated to the following code:

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         //Integer.MIN_VALUE and Integer.MAX_VALUE
5
6         int i=10;
7         int j=20;
8         int sum= Integer.sum(i,j);
9
10        System.out.println("sum is "+ sum);
11    }
12 }
```

The Terminal panel shows the following commands and output:

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
sum is 30
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

j. Declare two integer variables with values 10 and 20, and find the minimum and maximum values using the Integer class. (Hint: Use Integer.min(int, int) and Integer.max(int, int)).

The screenshot shows an IDE with the following components:

- EXPLORER:** Lists files in the `MODULE2_ASSIGNMENT2` folder, including `day3_*.java`, `d3p1.class`, `d3p1.java`, `c1p1`, `c1p1.cpp`, `c1p2`, `c1p2.cpp`, `m2a2q3.class`, `m2a2q3.java`, `m2a2q4.class`, `m2a2q4.java`, `m2a2q5.class`, `m2a2q5.java`, `m2a22q1.class`, and `m2a22q1.java`.
- EDITOR:** Displays the code for `m2a22q1.java`:


```

1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         // Integer.min(int, int) and Integer.max(int, int)).
5         int i=10;
6         int j=20;
7         int s= Integer.min(i,j);
8         int v= Integer.max(i,j);
9         System.out.println("max "+ v+" min "+s);
10    }
11 }
```
- TERMINAL:** Shows the execution of the program:


```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module
2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module
2_assignment2/" && javac m2a22q1.java && java m2a22q1
max 20 min 10
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % _
```

k. Declare an integer variable with the value 7. Convert it to binary, octal, and hexadecimal strings using methods from the Integer class. (Hint: Use `Integer.toBinaryString(int)`, `Integer.toOctalString(int)`, and `Integer.toHexString(int)`).

The screenshot shows an IDE with the following components:

- EXPLORER:** Similar to the previous screenshot, but with `m2a22q1.class` added to the file list.
- EDITOR:** Displays the code for `m2a22q1.java`:


```

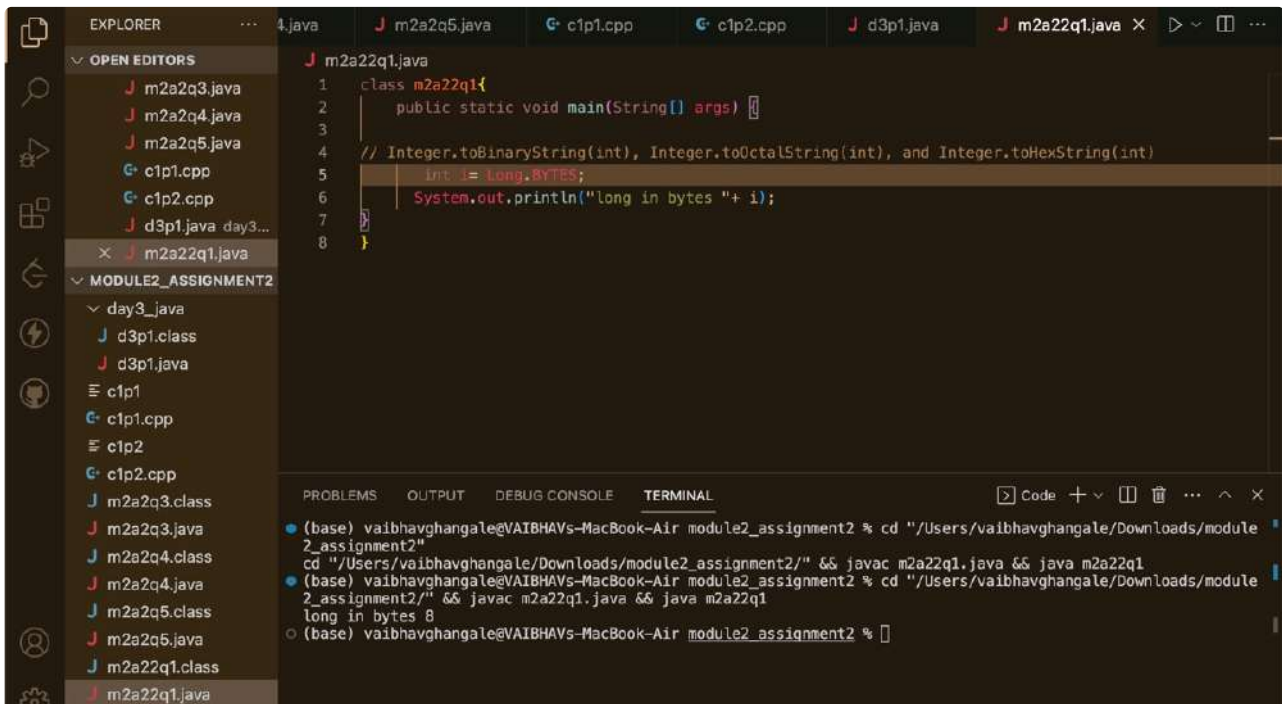
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         // Integer.toBinaryString(int), Integer.toOctalString(int), and Integer.toHexString(int)
5         int i=7;
6         String s= Integer.toBinaryString(i);
7         String v= Integer.toOctalString(i);
8         String j= Integer.toHexString(i);
9         System.out.println("binary "+ s +" octal "+ v +" hexa "+ j);
10    }
11 }
```
- TERMINAL:** Shows the execution of the program:


```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module
2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module
2_assignment2/" && javac m2a22q1.java && java m2a22q1
binary 111 octal 7 hexa 7
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % _
```

5. Working with java.lang.Long

- a. Explore the Java API documentation for `java.lang.Long` and observe its modifiers and super types.
- b. Write a program to test how many bytes are used to represent a long value using the `BYTES` field. (Hint: Use `Long.BYTES`).



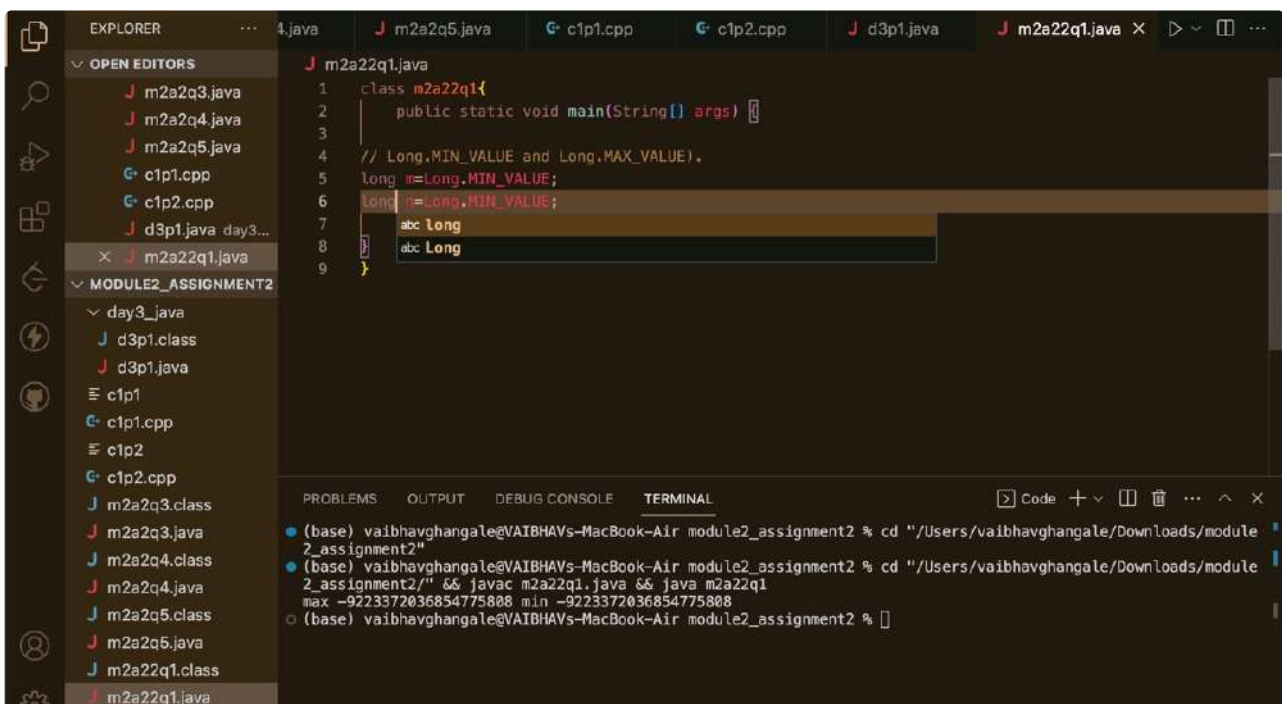
The screenshot shows an IDE with the following components:

- EXPLORER:** A list of files including `m2a2q3.java`, `m2a2q4.java`, `m2a2q5.java`, `c1p1.cpp`, `c1p2.cpp`, `d3p1.java`, and `m2a22q1.java`. The `m2a22q1.java` file is selected.
- EDITOR:** The code for `m2a22q1.java` is displayed:

```
1 class m2a22q1{
2     public static void main(String[] args) {
3
4         // Integer.toBinaryString(int), Integer.toOctalString(int), and Integer.toHexString(int)
5         int i = Long.BYTES;
6         System.out.println("long in bytes "+ i);
7     }
8 }
```
- TERMINAL:** The output of the program is shown:

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module
2_assignment2/"
cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module
2_assignment2/" && javac m2a22q1.java && java m2a22q1
long in bytes 8
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

- c. Write a program to find the minimum and maximum values of long using the `MIN_VALUE` and `MAX_VALUE` fields. (Hint: Use `Long.MIN_VALUE` and `Long.MAX_VALUE`).



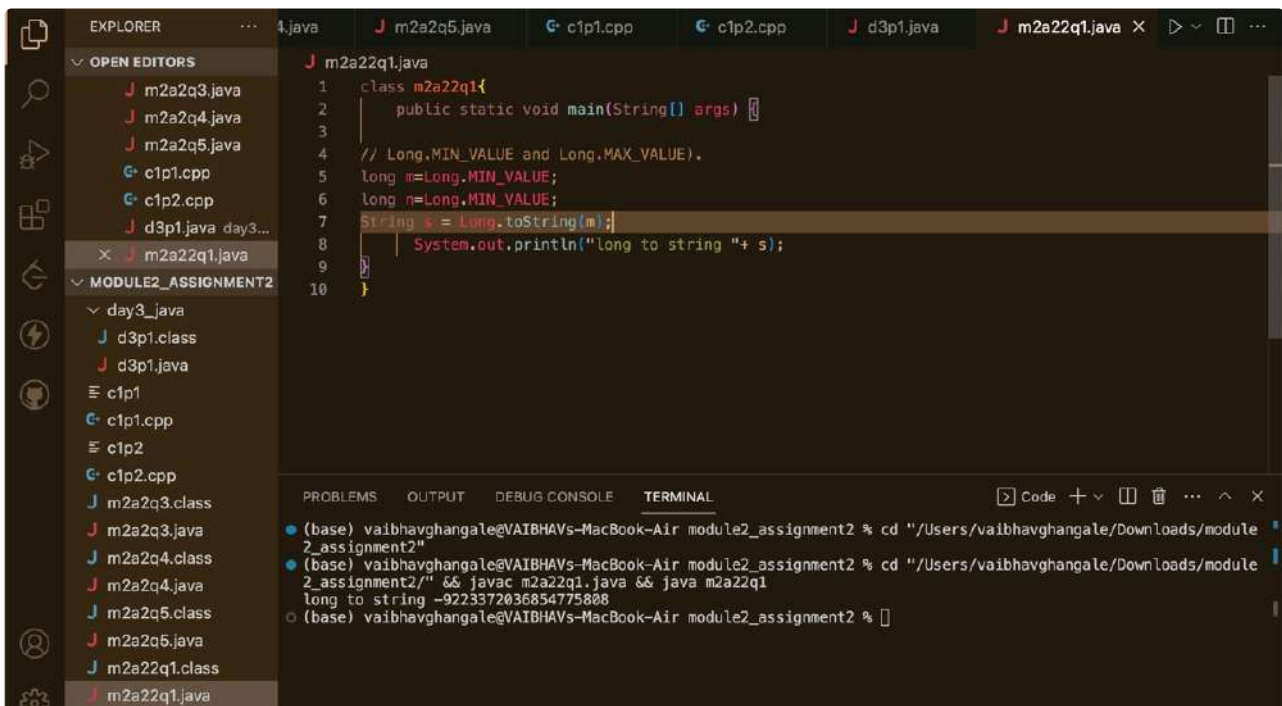
The screenshot shows an IDE with the following components:

- EXPLORER:** A list of files including `m2a2q3.java`, `m2a2q4.java`, `m2a2q5.java`, `c1p1.cpp`, `c1p2.cpp`, `d3p1.java`, and `m2a22q1.java`. The `m2a22q1.java` file is selected.
- EDITOR:** The code for `m2a22q1.java` is displayed:

```
1 class m2a22q1{
2     public static void main(String[] args) {
3
4         // Long.MIN_VALUE and Long.MAX_VALUE.
5         long m = Long.MIN_VALUE;
6         long n = Long.MIN_VALUE;
7         abc long
8         abc Long
9     }
}
```
- TERMINAL:** The output of the program is shown:

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module
2_assignment2/"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module
2_assignment2/" && javac m2a22q1.java && java m2a22q1
max -9223372036854775808 min -9223372036854775808
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

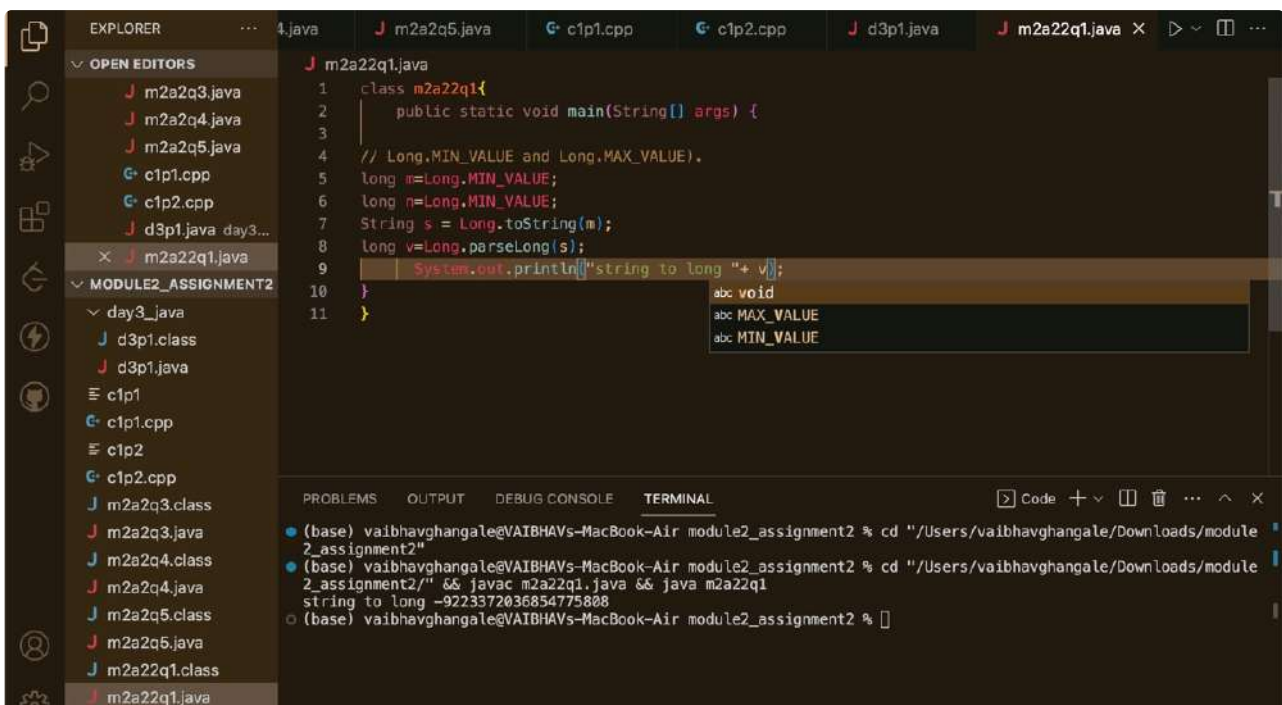
d. Declare a method-local variable number of type long with some value and convert it to a String using the toString method. (Hint: Use Long.toString(long)).



```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         // Long.MIN_VALUE and Long.MAX_VALUE.
5         long m = Long.MIN_VALUE;
6         long n = Long.MIN_VALUE;
7         String s = Long.toString(m);
8         System.out.println("long to string " + s);
9     }
10 }
```

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
long to string -9223372036854775808
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

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



```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         // Long.MIN_VALUE and Long.MAX_VALUE.
5         long m = Long.MIN_VALUE;
6         long n = Long.MIN_VALUE;
7         String s = Long.toString(m);
8         long v = Long.parseLong(s);
9         System.out.println("string to long " + v);
10     }
11 }
```

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
string to long -9223372036854775808
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

f. Declare a method-local variable strNumber of type String with the value "Ab12Cd3" and attempt to convert it to a long value. (Hint: parseLong method will throw a NumberFormatException).

```

1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         // Long.MIN_VALUE and Long.MAX_VALUE.
5
6         String s = "Ab12Cd3";
7         long v = Long.parseLong(s);
8         System.out.println("string to long " + v);
9     }
10 }

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```

(base) vaibhavghangale@VAIBHAVS-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVS-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
Exception in thread "main" java.lang.NumberFormatException: For input string: "Ab12Cd3"
    at java.base/java.lang.NumberFormatException.forInputString(NumberFormatException.java:67)
    at java.base/java.lang.Long.parseLong(Long.java:709)
    at java.base/java.lang.Long.parseLong(Long.java:832)
    at m2a22q1.main(m2a22q1.java:7)
(base) vaibhavghangale@VAIBHAVS-MacBook-Air module2_assignment2 %

```

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

```

1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         // Long.MIN_VALUE and Long.MAX_VALUE.
5
6         String s = "123";
7         long v = Long.parseLong(s);
8         Long w = Long.valueOf(v);
9         System.out.println("long to wrapper " + w);
10    }
11 }

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```

(base) vaibhavghangale@VAIBHAVS-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVS-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
long to wrapper 123
(base) vaibhavghangale@VAIBHAVS-MacBook-Air module2_assignment2 %

```

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


```

1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         // Long.MIN_VALUE and Long.MAX_VALUE.
5
6         String s = "123";
7         long v = Long.valueOf(s);
8
9         System.out.println("string to wrapper " + v);
10    }
11 }

```

```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
string to wrapper 123
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

```

i. Declare two long variables with values 1123 and 9845, and add them using a method from the Long class. (Hint: Use Long.sum(long, long)).

```

1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         // Long.MIN_VALUE and Long.MAX_VALUE.
5
6         long i = 1122;
7         long j = 5566;
8
9         long v = Long.sum(i, j);
10
11        System.out.println("long sum " + v);
12    }
13 }

```

```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
long sum 6688
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

```

k. Declare a long variable with the value 7. Convert it to binary, octal, and hexadecimal strings using methods from the Long class. (Hint: Use Long.toBinaryString(long), Long.toOctalString(long), and Long.toHexString(long)).

The screenshot shows an IDE with the Explorer panel on the left displaying a project structure. The main editor shows the file `m2a22q1.java` with the following code:

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         // Long.toBinaryString(long), Long.toOctalString(long), and Long.toHexString(long)
5         long l=7;
6         String j=Long.toBinaryString(l);
7         String n= Long.toOctalString(l);
8         String z= Long.toHexString(l);
9
10
11
12         System.out.println(" binary "+ j+" octal "+n+" hexa "+m);
13     }
14 }
```

The bottom panel shows the TERMINAL with the following output:

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
binary 111 octal 7 hexa 7
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

6. Working with java.lang.Float

- Explore the Java API documentation for `java.lang.Float` and observe its modifiers and super types.
- Write a program to test how many bytes are used to represent a float value using the `BYTES` field. (Hint: Use `Float.BYTES`).

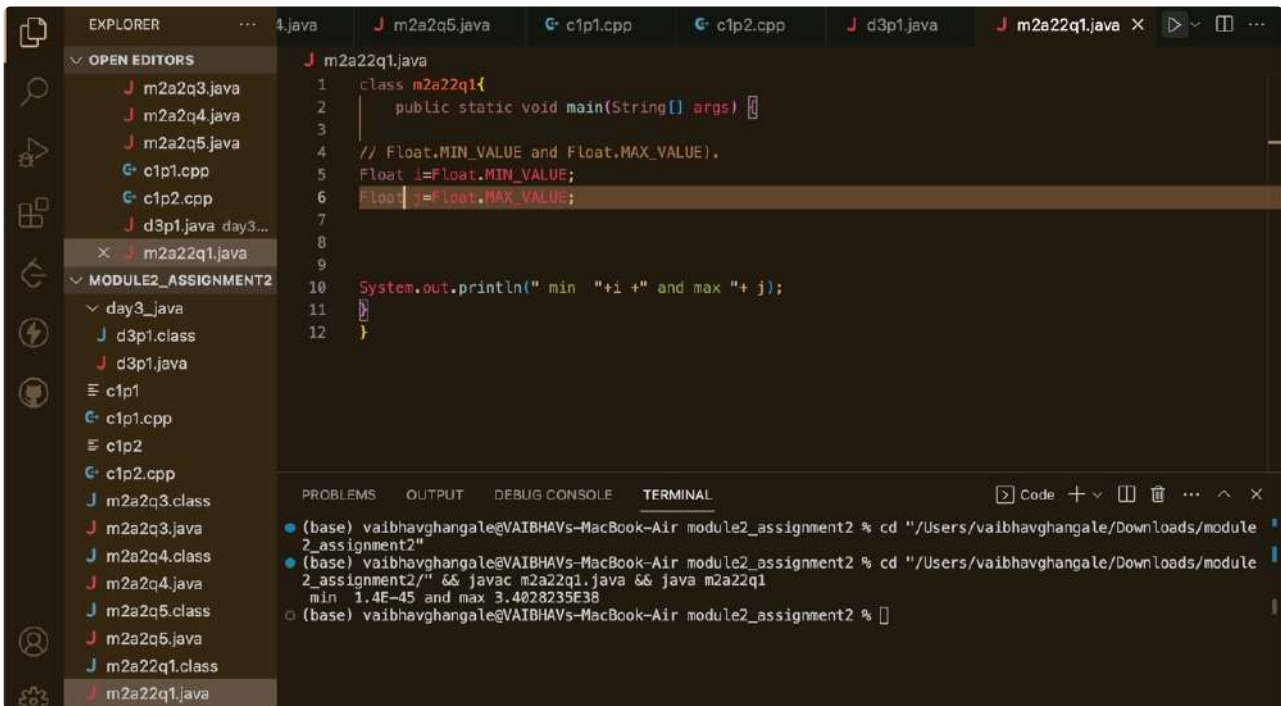
The screenshot shows the same IDE with the file `m2a22q1.java` updated to the following code:

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         // Long.toBinaryString(long), Long.toOctalString(long), and Long.toHexString(long)
5         int i=Float.BYTES;
6
7
8
9         System.out.println(" byte of float "+i);
10    }
11 }
```

The bottom panel shows the TERMINAL with the following output:

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
byte of float 4
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

c. Write a program to find the minimum and maximum values of float using the MIN_VALUE and MAX_VALUE fields. (Hint: Use Float.MIN_VALUE and Float.MAX_VALUE).

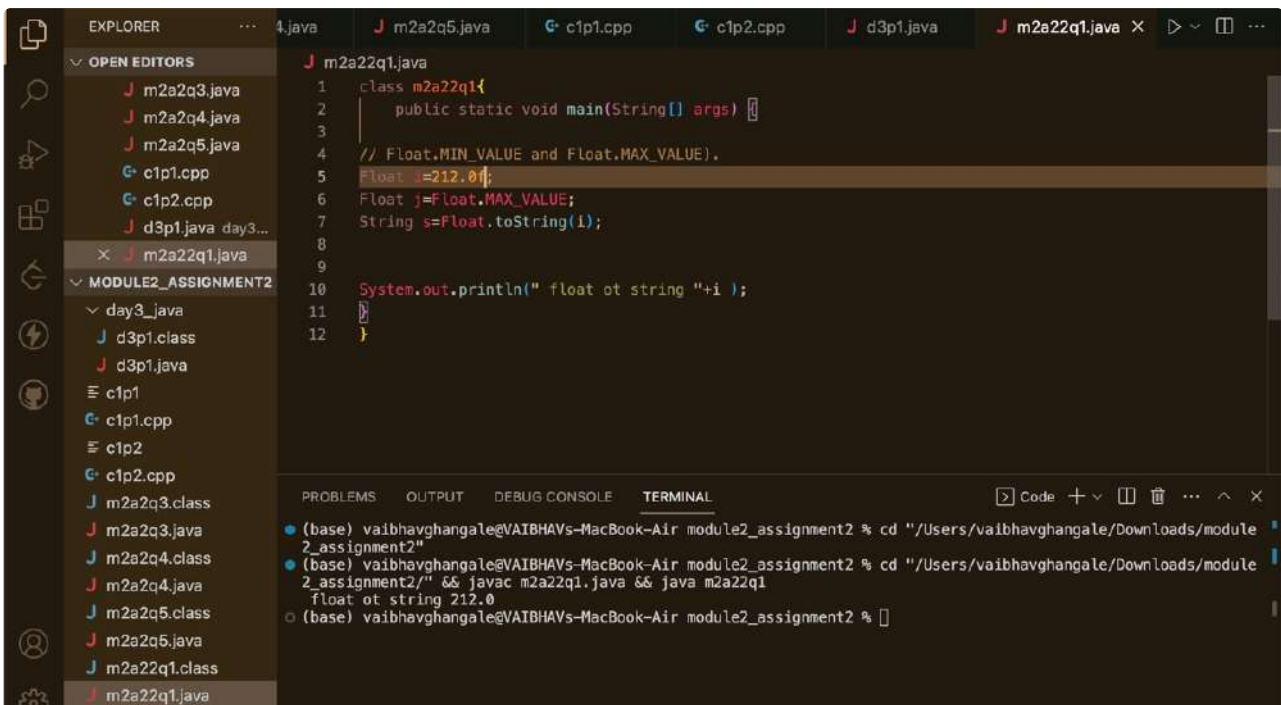


```
1 class m2a22q1{
2     public static void main(String[] args) {
3
4         // Float.MIN_VALUE and Float.MAX_VALUE).
5         Float i=Float.MIN_VALUE;
6         Float j=Float.MAX_VALUE;
7
8
9
10        System.out.println(" min "+i+" and max "+ j);
11    }
12 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

- (base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module 2_assignment2" && javac m2a22q1.java && java m2a22q1
- min 1.4E-45 and max 3.4028235E38
- (base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

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



```
1 class m2a22q1{
2     public static void main(String[] args) {
3
4         // Float.MIN_VALUE and Float.MAX_VALUE).
5         float i=212.0f;
6         Float j=Float.MAX_VALUE;
7         String s=Float.toString(i);
8
9
10        System.out.println(" float ot string "+i );
11    }
12 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

- (base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module 2_assignment2" && javac m2a22q1.java && java m2a22q1
- float ot string 212.0
- (base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

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

The screenshot shows an IDE with the following components:

- EXPLORER:** A list of files including `m2a2q3.java`, `m2a2q4.java`, `m2a2q5.java`, `c1p1.cpp`, `c1p2.cpp`, `d3p1.java`, and `m2a22q1.java`. The `MODULE2_ASSIGNMENT2` folder is expanded, showing `day3_java` and `d3p1.class`.
- EDITOR:** The file `m2a22q1.java` is open, showing the following code:


```

1 class m2a22q1{
2     public static void main(String[] args) {
3
4         // Float.MIN_VALUE and Float.MAX_VALUE).
5         Float i=212.0f;
6
7         String s=Float.toString(i);
8
9         Float f=Float.parseFloat(s);
10        System.out.println(" string to float "+f );
11    }
12 }
```
- TERMINAL:** The terminal shows the execution of the program:


```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
string to float 212.0
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

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

The screenshot shows the same IDE as before, but with the following changes:

- EDITOR:** The file `m2a22q1.java` is open, and the code is modified to:


```

1 class m2a22q1{
2     public static void main(String[] args) {
3
4         // Float.MIN_VALUE and Float.MAX_VALUE).
5         Float i=212.0f;
6
7         String s="Ab12Cd3";
8
9         Float f=Float.parseFloat(s);
10        System.out.println(" string to float "+f );
11    }
12 }
```
- TERMINAL:** The terminal shows the execution of the program, which results in a `NumberFormatException`:


```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
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.parseFloat(FloatingDecimal.java:122)
    at java.base/java.lang.Float.parseFloat(Float.java:556)
    at m2a22q1.main(m2a22q1.java:9)
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

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


```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         // Float.MIN_VALUE and Float.MAX_VALUE).
5         String strNumber = "12.34";
6
7         // Convert the String to the corresponding wrapper class (Float)
8         Float floatWrapper = Float.valueOf(strNumber);
9
10        // Print the wrapper object
11        System.out.println("Float wrapper value: " + floatWrapper);
12    }
13 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
Float wrapper value: 12.34
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

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

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         float a=112.3f;
5         float b=984.5f;
6         float s = Float.sum(a,b);
7         System.out.println("sum " + s);
8     }
9 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
sum 1096.8
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

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


```

1 class m2a22q1 {
2     public static void main(String[] args) {
3         //Float.min(float, float) and Float.max(float, float)
4         float a=112.3f;
5         float b=984.5f;
6         float s = Float.min(a, b);
7         float v= Float.max(a, b);
8         System.out.println("min " + s+ " max "+v);
9     }
10 }

```

```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module
2_assignment2/" && javac m2a22q1.java && java m2a22q1
min 112.3 max 984.5
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % 

```

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

```

1 class m2a22q1 {
2     public static void main(String[] args) {
3         //Float.min(float, float) and Float.max(float, float)
4         float a=-25.0f;
5         double v= Math.sqrt(a);
6         System.out.println("sqrt "+v);
7     }
8 }

```

```

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module
2_assignment2/" && javac m2a22q1.java && java m2a22q1
sqrt 5.0
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % 

```

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

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         // Declare two float variables with the value 0.0f
5         float num1 = 0.0f;
6         float num2 = 0.0f;
7
8         // Divide the two variables
9         float result = num1 / num2;
10
11        // Print the result
12        System.out.println("Result of dividing 0.0f by 0.0f: " + result);
13    }
14 }
15
16
17 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2" && javac m2a22q1.java && java m2a22q1
Result of dividing 0.0f by 0.0f: NaN
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

7. Working with java.lang.Double

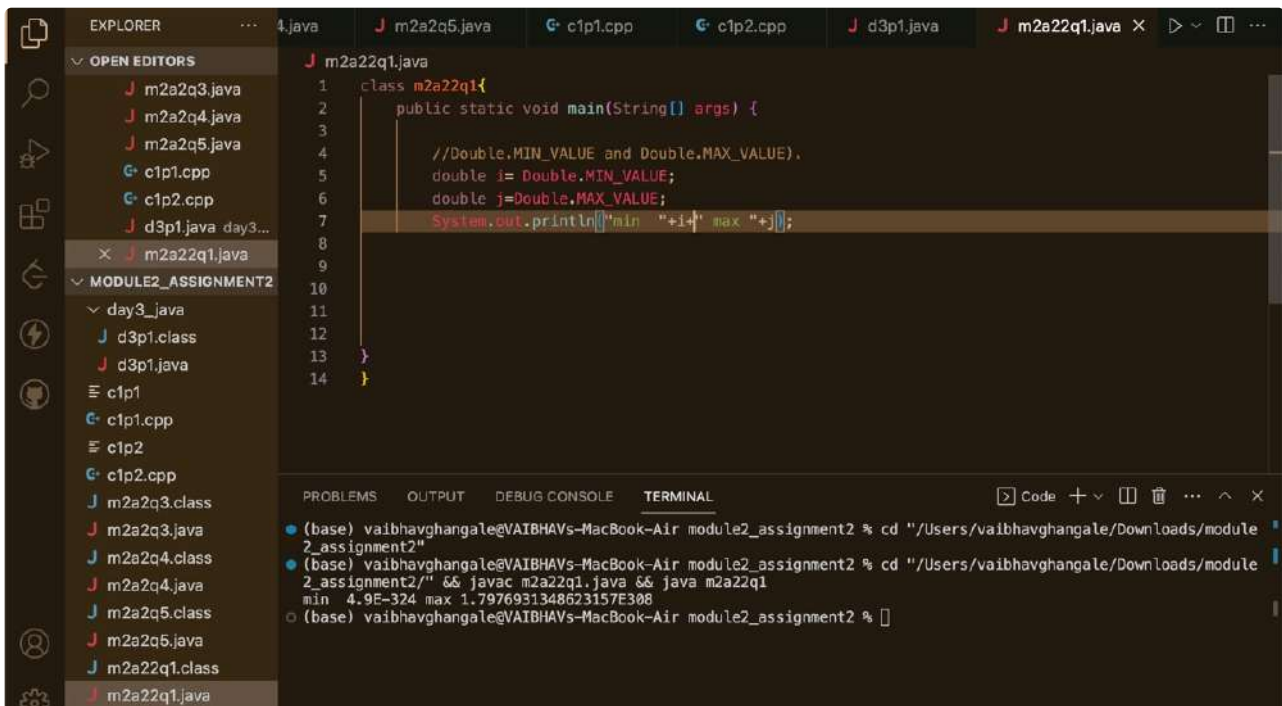
- Explore the Java API documentation for java.lang.Double and observe its modifiers and super types.
- Write a program to test how many bytes are used to represent a double value using the BYTES field.
(Hint: Use Double.BYTES).

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         double i = Double.BYTES;
5         System.out.println("double byte "+i);
6
7
8
9
10    }
11 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2" && javac m2a22q1.java && java m2a22q1
double byte 8.0
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

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).

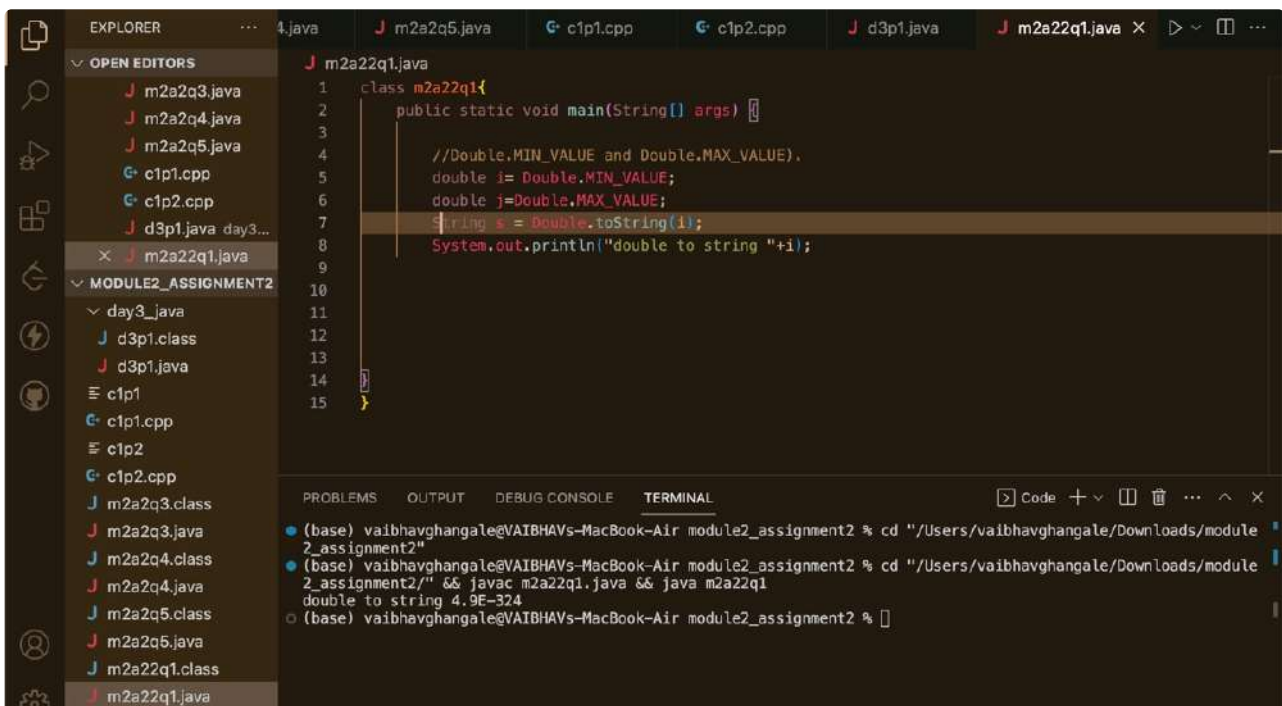


```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         //Double.MIN_VALUE and Double.MAX_VALUE.
5         double i= Double.MIN_VALUE;
6         double j=Double.MAX_VALUE;
7         System.out.println("min "+i+" max "+j);
8     }
9
10 }
11
12
13
14 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2" && javac m2a22q1.java && java m2a22q1
min 4.9E-324 max 1.7976931348623157E308
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

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)).

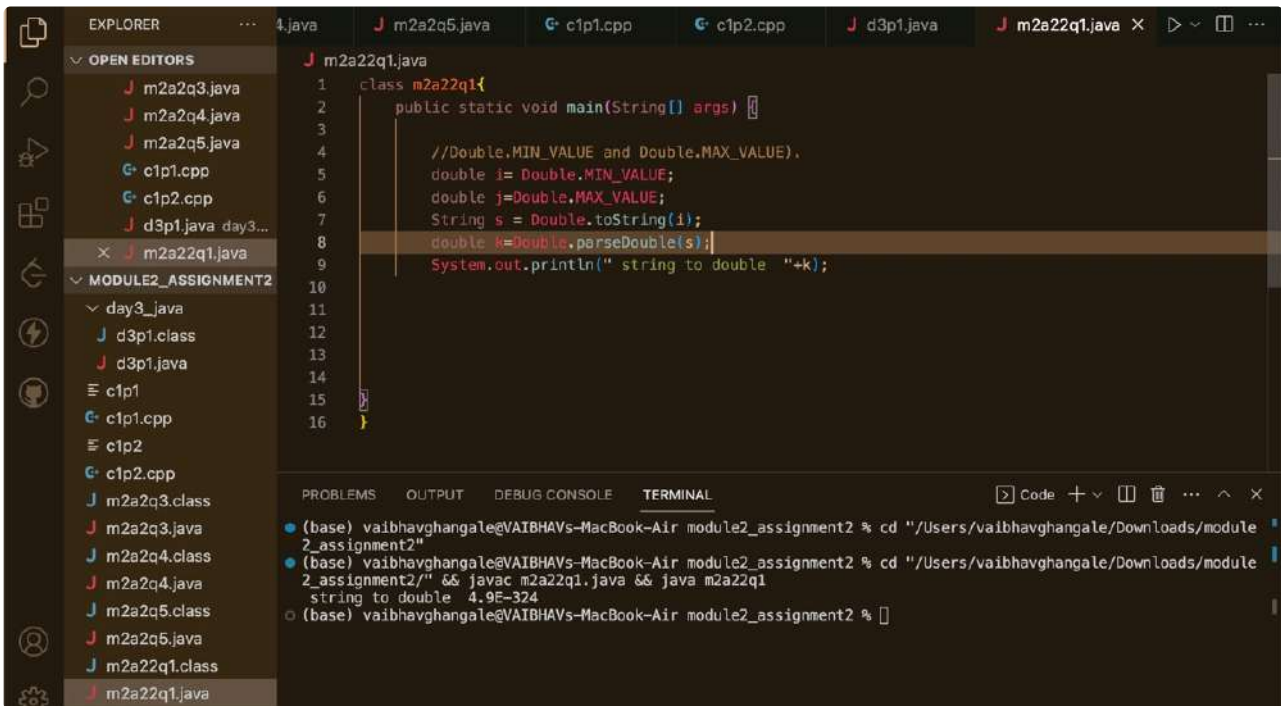


```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         //Double.MIN_VALUE and Double.MAX_VALUE.
5         double i= Double.MIN_VALUE;
6         double j=Double.MAX_VALUE;
7         String s = Double.toString(i);
8         System.out.println("double to string "+i);
9     }
10 }
11
12
13
14
15 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2" && javac m2a22q1.java && java m2a22q1
double to string 4.9E-324
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

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)`).



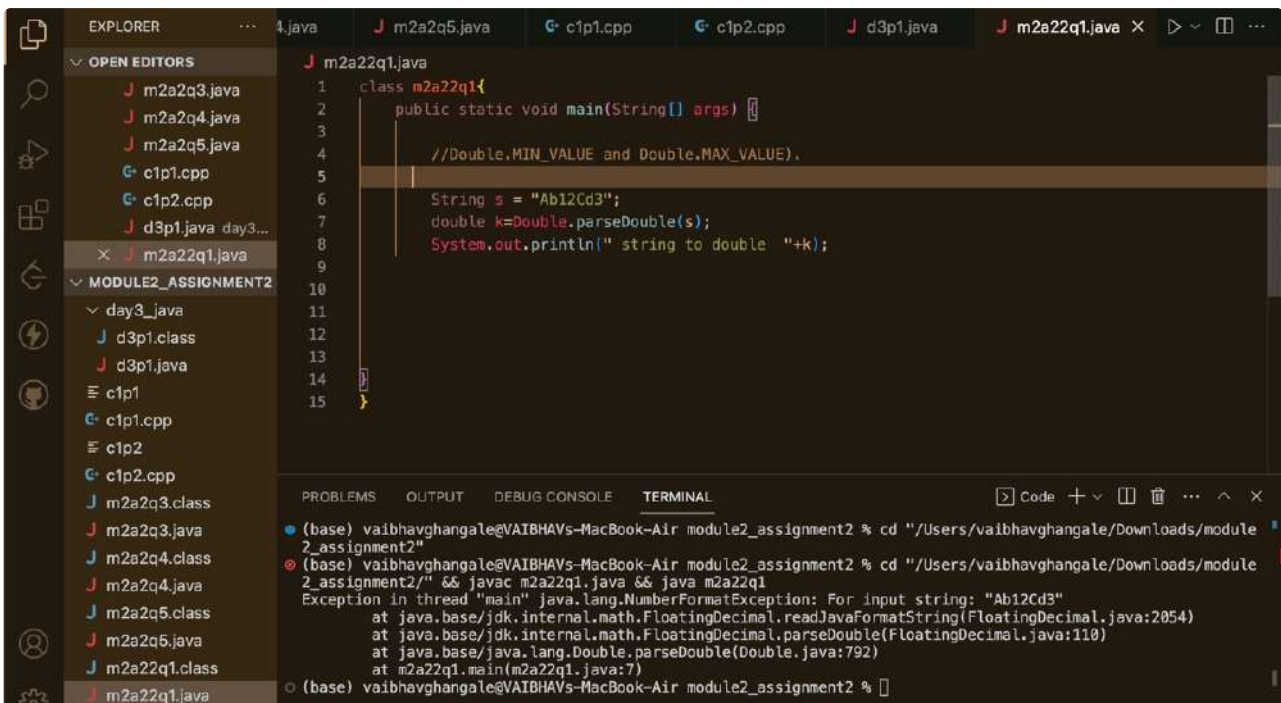
The screenshot shows an IDE with the Explorer panel on the left displaying a project structure for 'MODULE2_ASSIGNMENT2'. The main editor shows the file `m2a22q1.java` with the following code:

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         //Double.MIN_VALUE and Double.MAX_VALUE).
5         double i= Double.MIN_VALUE;
6         double j=Double.MAX_VALUE;
7         String s = Double.toString(i);
8         double k=Double.parseDouble(s);
9         System.out.println(" string to double "+k);
10    }
11 }
12
13
14
15
16 }
```

The bottom panel shows the TERMINAL with the following output:

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module 2_assignment2/" && javac m2a22q1.java && java m2a22q1
string to double 4.9E-324
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

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`).



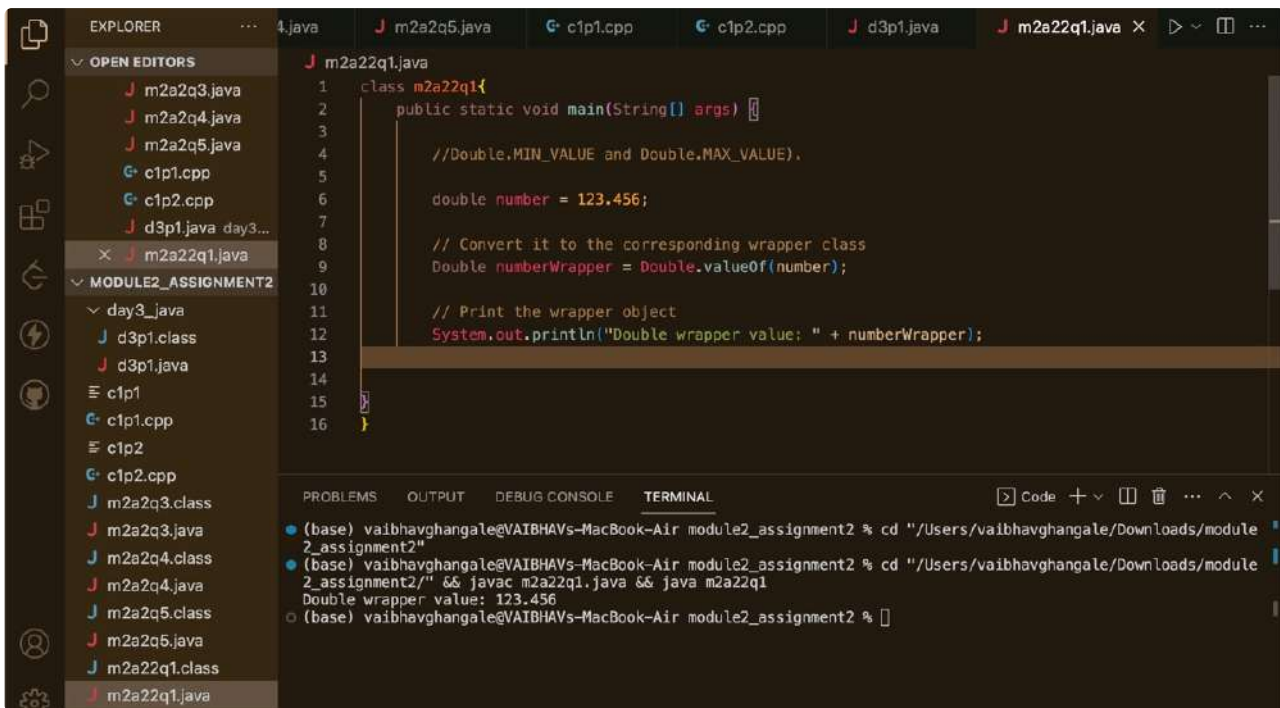
The screenshot shows the same IDE with the file `m2a22q1.java` modified to use the string "Ab12Cd3":

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         //Double.MIN_VALUE and Double.MAX_VALUE).
5
6         String s = "Ab12Cd3";
7         double k=Double.parseDouble(s);
8         System.out.println(" string to double "+k);
9
10    }
11 }
12
13
14
15 }
```

The bottom panel shows the TERMINAL with the following output:

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module 2_assignment2/" && javac m2a22q1.java && java m2a22q1
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:792)
    at m2a22q1.main(m2a22q1.java:7)
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

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)`).



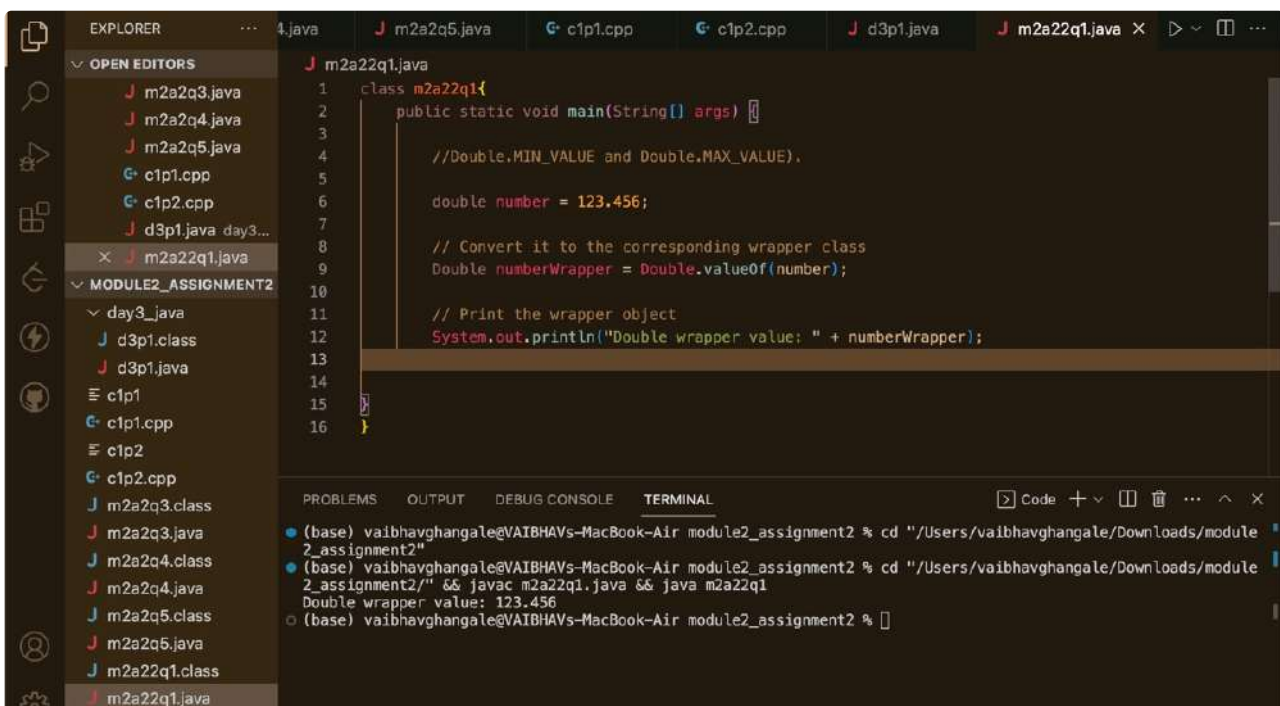
```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         //Double.MIN_VALUE and Double.MAX_VALUE).
5
6         double number = 123.456;
7
8         // Convert it to the corresponding wrapper class
9         Double numberWrapper = Double.valueOf(number);
10
11        // Print the wrapper object
12        System.out.println("Double wrapper value: " + numberWrapper);
13    }
14 }
15
16 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Code + - [] [] ... ^ x

- (base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
- (base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
- Double wrapper value: 123.456
- (base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

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 class m2a22q1 {
2     public static void main(String[] args) {
3
4         //Double.MIN_VALUE and Double.MAX_VALUE).
5
6         double number = 123.456;
7
8         // Convert it to the corresponding wrapper class
9         Double numberWrapper = Double.valueOf(number);
10
11        // Print the wrapper object
12        System.out.println("Double wrapper value: " + numberWrapper);
13    }
14 }
15
16 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Code + - [] [] ... ^ x

- (base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
- (base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
- Double wrapper value: 123.456
- (base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %

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)).

The screenshot shows an IDE with the Explorer panel on the left, the Editor panel in the center, and the Terminal panel at the bottom. The Explorer panel shows a project named 'MODULE2_ASSIGNMENT2' with a subfolder 'day3_java' containing files 'd3p1.class' and 'd3p1.java'. The Editor panel shows the file 'm2a22q1.java' with the following code:

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3
4         Double a=112.3;
5         Double b=984.5;
6         Double sum =Double.sum(a, b);
7
8         System.out.println("sum is " + sum);
9     }
10 }
11
12 }
```

The Terminal panel shows the following output:

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
sum is 1096.8
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

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)).

The screenshot shows an IDE with the Explorer panel on the left, the Editor panel in the center, and the Terminal panel at the bottom. The Explorer panel shows a project named 'MODULE2_ASSIGNMENT2' with a subfolder 'day3_java' containing files 'd3p1.class' and 'd3p1.java'. The Editor panel shows the file 'm2a22q1.java' with the following code:

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3         //Double.min(double, double) and Double.max(double, double)
4         Double a=112.3;
5         Double b=984.5;
6         Double sum =Double.min(a, b);
7         Double sum2 =Double.max(a, b);
8         System.out.println("min " + sum+" max "+sum2);
9     }
10 }
11
12 }
```

The Terminal panel shows the following output:

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
min 112.3 max 984.5
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

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

The screenshot shows an IDE with the Explorer panel on the left, the Editor panel in the center, and the Terminal panel at the bottom. The Explorer panel shows a project structure with files like m2a2q3.java, m2a2q4.java, m2a2q5.java, c1p1.cpp, c1p2.cpp, d3p1.java, and m2a22q1.java. The Editor panel shows the code for m2a22q1.java, which is a Java class with a main method. The code calculates the square root of 25.0 using Math.sqrt() and prints the result. The Terminal panel shows the output of the program, which is "Square root of 25.0 is: 5.0".

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3         //Double.min(double, double) and Double.max(double, double)
4         double number = 25.0;
5
6         // Find the square root of the value
7         double sqrtResult = Math.sqrt(number);
8
9         // Print the result
10        System.out.println("Square root of " + number + " is: " + sqrtResult);
11    }
12 }
```

Terminal output:

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
Square root of 25.0 is: 5.0
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

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

The screenshot shows the same IDE as before, but with a different Java program in the Editor panel. The program declares two double variables, num1 and num2, both initialized to 0.0. It then divides num1 by num2 and prints the result. The Terminal panel shows the output, which is "Result of dividing 0.0 by 0.0: NaN".

```
1 class m2a22q1 {
2     public static void main(String[] args) {
3         //Double.min(double, double) and Double.max(double, double)
4         double num1 = 0.0;
5         double num2 = 0.0;
6
7         // Divide the two variables
8         double result = num1 / num2;
9
10        // Print the result
11        System.out.println("Result of dividing 0.0 by 0.0: " + result);
12    }
13 }
```

Terminal output:

```
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2"
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 % cd "/Users/vaibhavghangale/Downloads/module2_assignment2/" && javac m2a22q1.java && java m2a22q1
Result of dividing 0.0 by 0.0: NaN
(base) vaibhavghangale@VAIBHAVs-MacBook-Air module2_assignment2 %
```

8. Conversion between Primitive Types and Strings

Initialize a variable of each primitive type with a user-defined value and convert it into String:

First, use the toString method of the corresponding wrapper class. (e.g., Integer.toString()).

Then, use the `valueOf` method of the `String` class. (e.g., `String.valueOf()`).

```
class m2a22q1 {
    public static void main(String[] args) {
        int intVar = 42;
        float floatVar = 3.14f;
        double doubleVar = 123.456;
        boolean boolVar = true;
        char charVar = 'A';
        byte byteVar = 10;
        short shortVar = 500;
        long longVar = 100000L;

        String intStr1 = Integer.toString(intVar);
        String floatStr1 = Float.toString(floatVar);
        String doubleStr1 = Double.toString(doubleVar);
        String boolStr1 = Boolean.toString(boolVar);
        String charStr1 = Character.toString(charVar);
        String byteStr1 = Byte.toString(byteVar);
        String shortStr1 = Short.toString(shortVar);
        String longStr1 = Long.toString(longVar);

        String intStr2 = String.valueOf(intVar);
        String floatStr2 = String.valueOf(floatVar);
        String doubleStr2 = String.valueOf(doubleVar);
        String boolStr2 = String.valueOf(boolVar);
        String charStr2 = String.valueOf(charVar);
        String byteStr2 = String.valueOf(byteVar);
        String shortStr2 = String.valueOf(shortVar);
        String longStr2 = String.valueOf(longVar);

        System.out.println("Using toString():");
        System.out.println("int: " + intStr1);
        System.out.println("float: " + floatStr1);
        System.out.println("double: " + doubleStr1);
        System.out.println("boolean: " + boolStr1);
        System.out.println("char: " + charStr1);
        System.out.println("byte: " + byteStr1);
        System.out.println("short: " + shortStr1);
        System.out.println("long: " + longStr1);

        System.out.println("\nUsing valueOf():");
        System.out.println("int: " + intStr2);
        System.out.println("float: " + floatStr2);
        System.out.println("double: " + doubleStr2);
        System.out.println("boolean: " + boolStr2);
        System.out.println("char: " + charStr2);
        System.out.println("byte: " + byteStr2);
        System.out.println("short: " + shortStr2);
        System.out.println("long: " + longStr2);
    }
}
```