ASSIGNMENT NO.2

Note: Consider the following before starting the assignment:

- A **static field** declared inside a class is called a **class-level variable**. To access this variable, use the class name and the dot operator (e.g., `Integer.MAX_VALUE`).
- A **static method** defined inside a class is called a **class-level method**. To access this method, use the class name and the dot operator (e.g., `Integer.parseInt()`).
- When accessing static members within the same class, you do not need to use the class name.

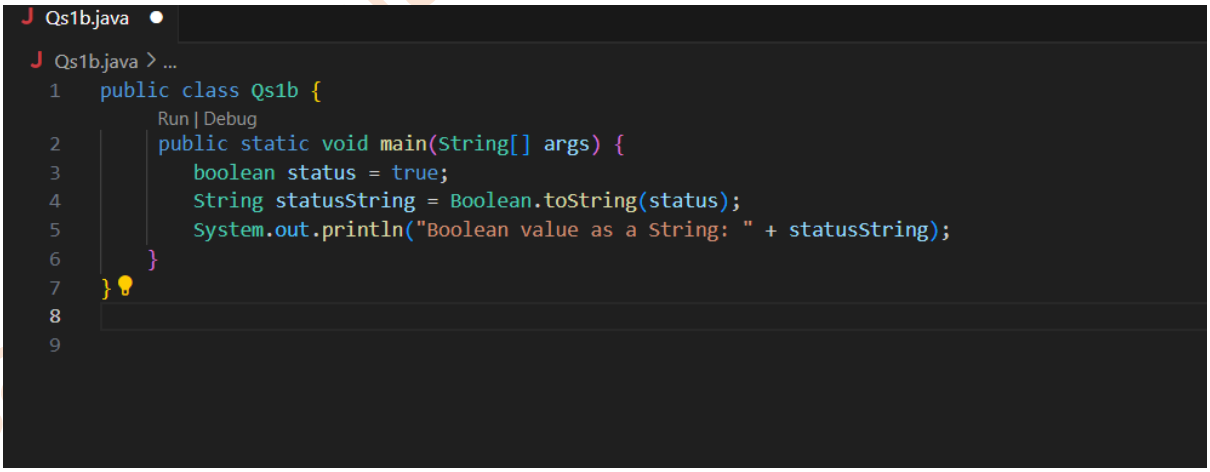
1. Working with `java.lang.Boolean`

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

b. 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)`).

Ans:

```
public class Qs1b {
public static void main(String[] args) {
boolean status = true;
String statusString = Boolean.toString(status);
System.out.println("Boolean value as a String: " + statusString);
 }
}
```



```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs1b.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs1b
Boolean value as a String: true
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

c. 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)`).

Ans:

```
public class Qs1c
{
   public static void main(String args[]){
 String strstatus = "true";
boolean status = Boolean.parseBoolean(strstatus);
 System.out.println("String value converted to boolean"  + strstatus);
}
}
```

Qs1b.java ● Qs1c.java 1 ×

Qs1c.java > ...

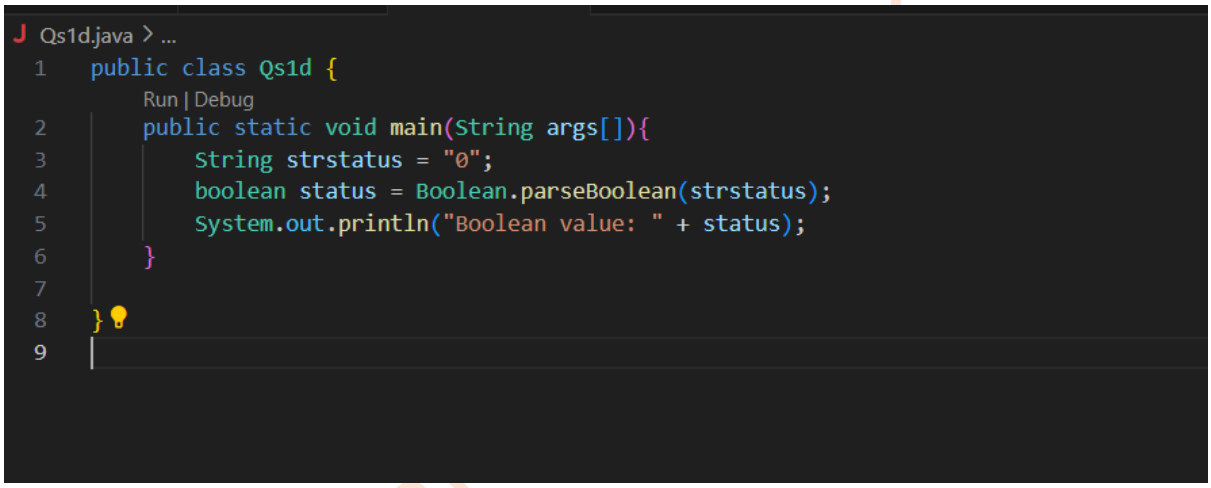
```
1  public class Qs1c{
       Run | Debug
2      public static void main(String args[]){
3          String strstatus = "true";
4          boolean status = Boolean.parseBoolean(strstatus);
5          System.out.println("String value converted to boolean"  + strstatus);
6
7      }
8  }
9
```

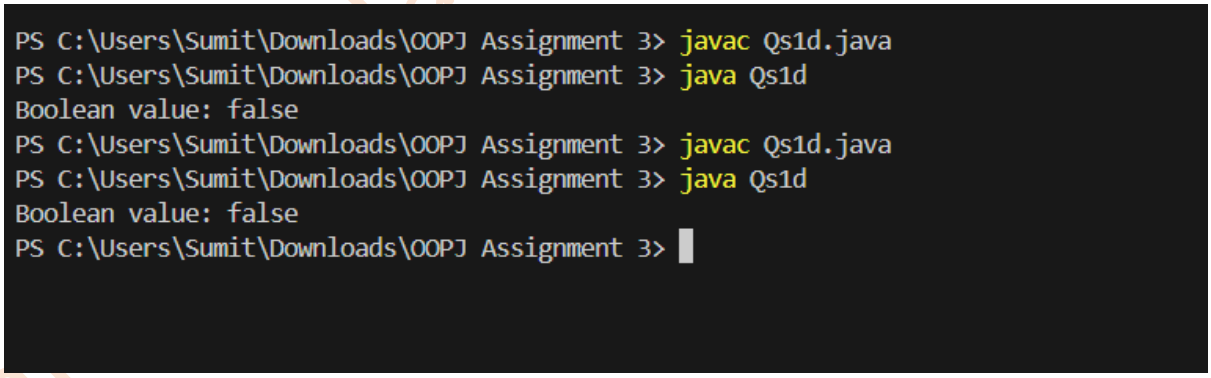
```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs1c.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs1c
String value converted to booleantrue
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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"`).

Ans:

```
public class Qs1d {
public static void main(String args[]){
String strstatus = "0";
 boolean status = Boolean.parseBoolean(strstatus);
 System.out.println("Boolean value: " + status);
  }
}
```



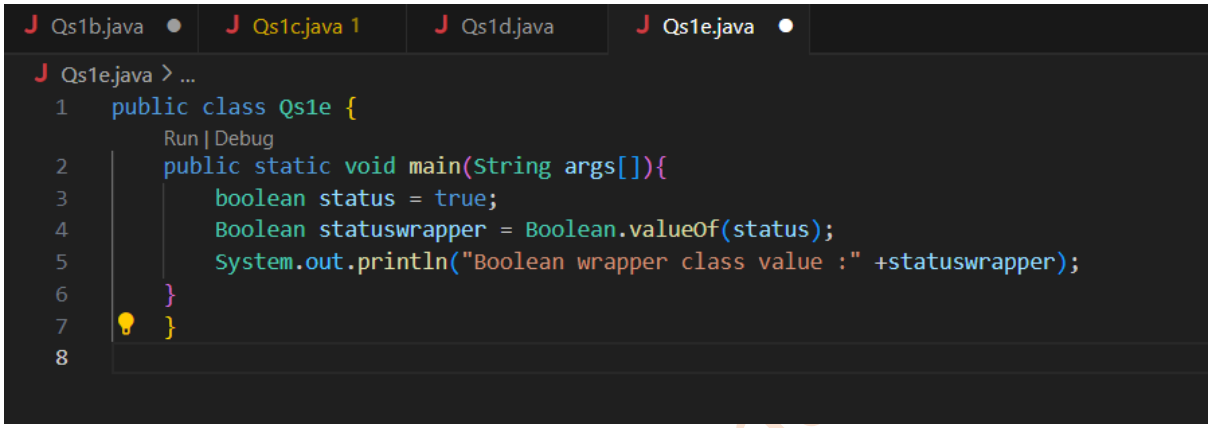


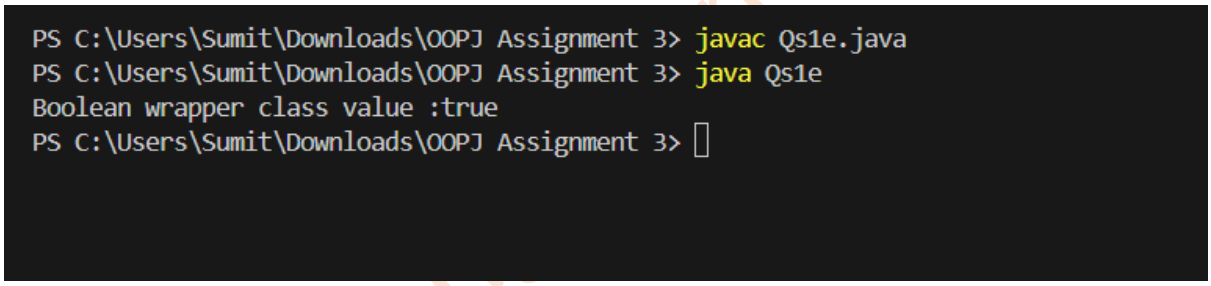
e. Declare a method-local variable `status` of type `boolean` with the value `true` and convert it to the corresponding wrapper class using `Boolean.valueOf()`. (Hint: Use `Boolean.valueOf(boolean)`).

Ans:

```
public class Qs1e {
public static void main(String args[]){
```

```
    boolean status = true;
Boolean statuswrapper = Boolean.valueOf(status);
 System.out.println("Boolean wrapper class value :" +statuswrapper);
  }
  }
```





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)`).

Ans:

```
public class Qs1f {
 public static void main(String args[]){
 String strstatus ="true";
 Boolean statuswrapper = Boolean.valueOf(strstatus);
 System.out.println("Boolean wrapper class value :" +statuswrapper);
  }
```

}

Qs1b.java ● Qs1c.java 1 Qs1d.java Qs1e.java ● Qs1f.java ×

Qs1f.java > ...

```java
public class Qs1f {
    Run | Debug
    public static void main(String args[]){
        String strstatus ="true";
        Boolean statuswrapper = Boolean.valueOf(strstatus);
        System.out.println("Boolean wrapper class value :" +statuswrapper);
    }

}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs1f.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs1f
Boolean wrapper class value :true
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

g. Experiment with converting a `boolean` value into other primitive types or vice versa and observe the results.

Ans:

1. <u>Boolean to String</u>

```
public class Qs1g {
  public static void main(String args[]){
  //boolean to String
  boolean boolvalue = true;
 String strvalue = Boolean.toString(boolvalue);
 System.out.println("String value :" +strvalue);
  }
}
```

Qs1g.java > ...

```java
public class Qs1g {
    Run | Debug
    public static void main(String args[]){
        //boolean to String
        boolean boolvalue = true;
        String strvalue = Boolean.toString(boolvalue);
        System.out.println("String value :" +strvalue);
    }

}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs1g.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs1g
String value :true
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

2. Int to Boolean

```
public class Qs1g {
   public static void main(String args[]){
int intValue = 1;
    boolean boolValue = (intValue != 0);
    System.out.println("Boolean value: " + boolValue);
   }
}
```

Qs1g.java > ...

```java
public class Qs1g {
    Run | Debug
    public static void main(String args[]){
        //boolean to String
       // boolean boolvalue = true;
        //String strvalue = Boolean.toString(boolvalue);
        //System.out.println("String value :" +strvalue);
        int intValue = 1;
     boolean boolValue = (intValue != 0);
     System.out.println("Boolean value: " + boolValue);

    }

}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs1g.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs1g
Boolean value: true
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

3. String to Boolean

```
public class Qs1g {
```

```
   public static void main(String args[]){
String strValue = "true";
boolean boolValue = Boolean.parseBoolean(strValue);
    System.out.println("Boolean value: " + boolValue);
 }
}
```

Qs1g.java > ...

```java
public class Qs1g {
    Run | Debug
    public static void main(String args[]){
        //boolean to String
       // boolean boolvalue = true;
        //String strvalue = Boolean.toString(boolvalue);
        //System.out.println("String value :" +strvalue);
      //  int intValue = 1;
      //boolean boolValue = (intValue != 0);
      //System.out.println("Boolean value: " + boolValue);
      String strValue = "true";
      boolean boolValue = Boolean.parseBoolean(strValue);
      System.out.println("Boolean value: " + boolValue);

    }

}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs1g.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs1g
Boolean value: true
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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`).

Ans:

```
public class Qs2b  {
 public static void main(String[] args) {
// Byte.BYTES is a constant holding the number of bytes used to represent a byte value
```

```
    int byteSize = Byte.BYTES;
 System.out.println("Number of bytes used to represent a byte value: " +byteSize);
  }
}
```

```
Qs2b.java > ...
1   public class Qs2b  {
        Run | Debug
2       public static void main(String[] args) {
3           // Byte.BYTES is a constant holding the number of bytes used to represent a byte value
4           int byteSize = Byte.BYTES;
5
6           System.out.println("Number of bytes used to represent a byte value: " + byteSize);
7       }
8   }
9
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs2b.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs2b.java
Number of bytes used to represent a byte value: 1
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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`).

Ans:

```
public class Qs2c {
public static void main(String args[]){
  byte minvalue = Byte.MIN_VALUE;
byte maxvalue = Byte.MAX_VALUE;
System.out.println("The minimum value of byte is: " +minvalue);
   System.out.println("The maximum value of Byte is: " +maxvalue);
  }
}
```

```
Qs2c.java > Qs2c > main(String[])
1   public class Qs2c {
        Run | Debug
2       public static void main(String args[]){
3           byte minvalue = Byte.MIN_VALUE;
4           byte maxvalue = Byte.MAX_VALUE;
5           System.out.println("The minimum value of byte is: " +minvalue);
6           System.out.println("The maximum value of Byte is: " +maxvalue);
7
8       }
9
10  }
11
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs2c.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs2c
The minimum value of byte is: -128
The maximum value of Byte is: 127
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs2d {
public static void main(String[] args) {
byte number = 42;
String numberAsString = Byte.toString(number);
System.out.println("The byte value as a String is: " + numberAsString);
}
}
```

Qs2d.java > ...

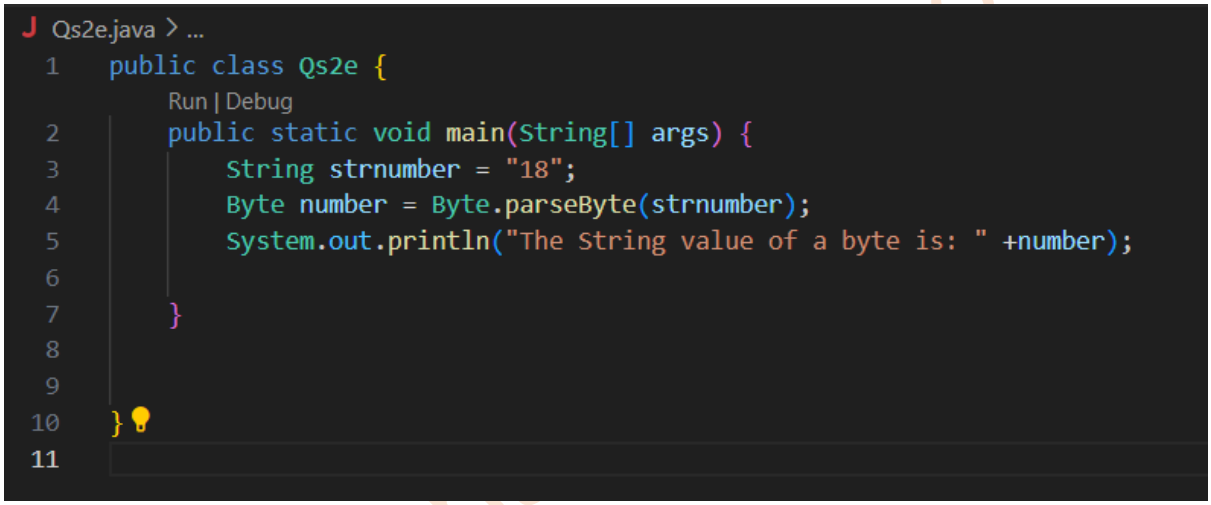
```
1   public class Qs2d {
        Run | Debug
2       public static void main(String[] args) {
3           byte number = 42;
4           String numberAsString = Byte.toString(number);
5           System.out.println("The byte value as a String is: " + numberAsString);
6       }
7   }
8
```

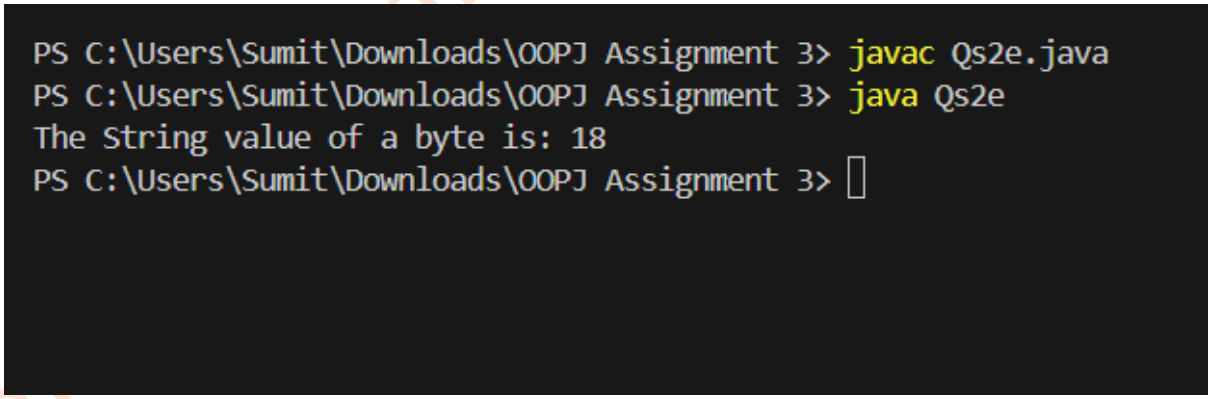
```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs2d.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs2d
The byte value as a String is: 42
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs2e {
public static void main(String[] args) {
String strnumber = "18";
 Byte number = Byte.parseByte(strnumber);
 System.out.println("The String value of a byte is: " +number);
  }
}
```





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`).

Ans:

```
public class Qs2f {
public static void main(String args[]){
  String strnumber = "Ab12Cd3";
  byte number = Byte.parseByte(strnumber);
System.out.println("The String value of a Byte is :" +number);
```

```
  }
}
```

```java
Qs2f.java > Qs2f
public class Qs2f {
    Run | Debug
    public static void main(String args[]){
        String strnumber = "Ab12Cd3";
        byte number = Byte.parseByte(strnumber);
        System.out.println("The String value of a Byte is :" +number);
    }

}

```

```
PROBLEMS 1  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

        at java.base/java.lang.Byte.parseByte(Byte.java:219)
        at Qs2f.main(Qs2f.java:4)
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs2f.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs2f.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs2f
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:668)
        at java.base/java.lang.Byte.parseByte(Byte.java:193)
        at java.base/java.lang.Byte.parseByte(Byte.java:219)
        at Qs2f.main(Qs2f.java:4)
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs2g {
 public static void main(String args[]){
byte number = 10;
 byte wrapper = Byte.valueOf(number);
System.out.println("Wrapper class of Byte value is:" +wrapper);
  }
}
```

```java
Qs2g.java > ...
public class Qs2g {
    Run | Debug
    public static void main(String args[]){
        byte number = 10;
        byte wrapper = Byte.valueOf(number);
        System.out.println("Wrapper class of Byte value is:" +wrapper);
    }

}

```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs2g.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs2g
Wrapper class of Byte value is:10
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs2h {
public static void main(String args[]){
String strnumber = "45";
 Byte Bytevalue = Byte.valueOf(strnumber);
 System.out.println("Byte value :" +Bytevalue);
 }
}
```

Qs2h.java > ...

```
1   public class Qs2h {
        Run | Debug
2       public static void main(String args[]){
3           String strnumber = "45";
4           Byte Bytevalue = Byte.valueOf(strnumber);
5           System.out.println("Byte value :" +Bytevalue);
6       }
7
8   }
9
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs2h.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs2h
Byte value :45
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

i. Experiment with converting a `byte` value into other primitive types or vice versa and observe the results.

Ans:

```
public class Qs2i {
 public static void main(String[] args) {
// Declare a byte value
 byte byteValue = 42;
  // Convert byte to other primitive types
  int intValue = byteValue;
 short shortValue = byteValue;
 long longValue = byteValue;
 float floatValue = byteValue;
 double doubleValue = byteValue;
char charValue = (char) byteValue;
  boolean booleanValue = (byteValue != 0);
  // Print the converted value
 System.out.println("Byte value: " + byteValue);
System.out.println("Converted to int: " + intValue);
  System.out.println("Converted to short: " + shortValue);
System.out.println("Converted to long: " + longValue);
System.out.println("Converted to float: " + floatValue);
 System.out.println("Converted to double: " + doubleValue);
System.out.println("Converted to char: " + charValue);
System.out.println("Converted to boolean: " + booleanValue);
// Convert other primitive types to byte
  byte fromInt = (byte) intValue;
  byte fromShort = (byte) shortValue;
 byte fromLong = (byte) longValue;
byte fromFloat = (byte) floatValue;
 byte fromDouble = (byte) doubleValue;
byte fromChar = (byte) charValue;
// Print the converted byte values
  System.out.println("Converted from int: " + fromInt);
System.out.println("Converted from short: " + fromShort);
System.out.println("Converted from long: " + fromLong);
  System.out.println("Converted from float: " + fromFloat);
  System.out.println("Converted from double: " + fromDouble);
  System.out.println("Converted from char: " + fromChar);
}
```

ASSIGNMENT NO.2

}

Qs2i.java > Qs2i > main(String[])

```java
public class Qs2i {
    Run | Debug
    public static void main(String[] args) {
        // Declare a byte value
        byte byteValue = 42;

        // Convert byte to other primitive types
        int intValue = byteValue;
        short shortValue = byteValue;
        long longValue = byteValue;
        float floatValue = byteValue;
        double doubleValue = byteValue;
        char charValue = (char) byteValue;
        boolean booleanValue = (byteValue != 0);

        // Print the converted values
        System.out.println("Byte value: " + byteValue);
        System.out.println("Converted to int: " + intValue);
        System.out.println("Converted to short: " + shortValue);
        System.out.println("Converted to long: " + longValue);
        System.out.println("Converted to float: " + floatValue);
        System.out.println("Converted to double: " + doubleValue);
        System.out.println("Converted to char: " + charValue);
        System.out.println("Converted to boolean: " + booleanValue);

        // Convert other primitive types to byte
        byte fromInt = (byte) intValue;
        byte fromShort = (byte) shortValue;
        byte fromLong = (byte) longValue;
        byte fromFloat = (byte) floatValue;
        byte fromDouble = (byte) doubleValue;
        byte fromChar = (byte) charValue;

        // Print the converted byte values
        System.out.println("Converted from int: " + fromInt);
        System.out.println("Converted from short: " + fromShort);
        System.out.println("Converted from long: " + fromLong);
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs2i.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs2i
Byte value: 42
Converted to int: 42
Converted to short: 42
Converted to long: 42
Converted to float: 42.0
Converted to double: 42.0
Converted to char: *
Converted to boolean: true
Converted from int: 42
Converted from short: 42
```

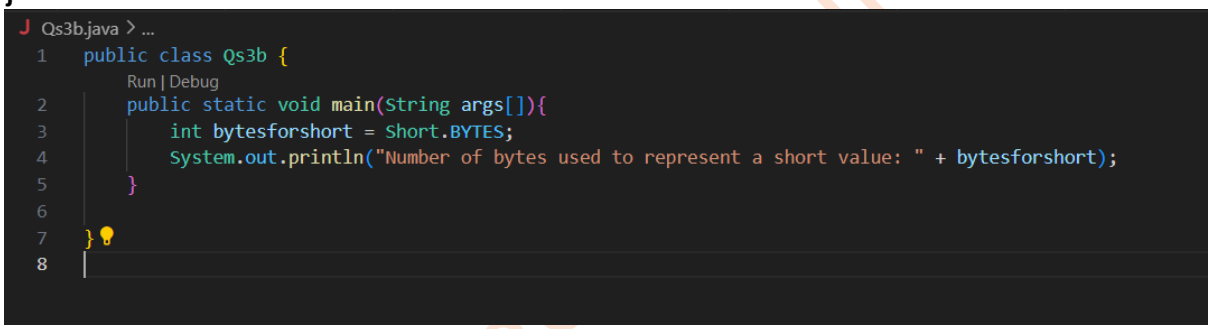
3. Working with `java.lang.Short`

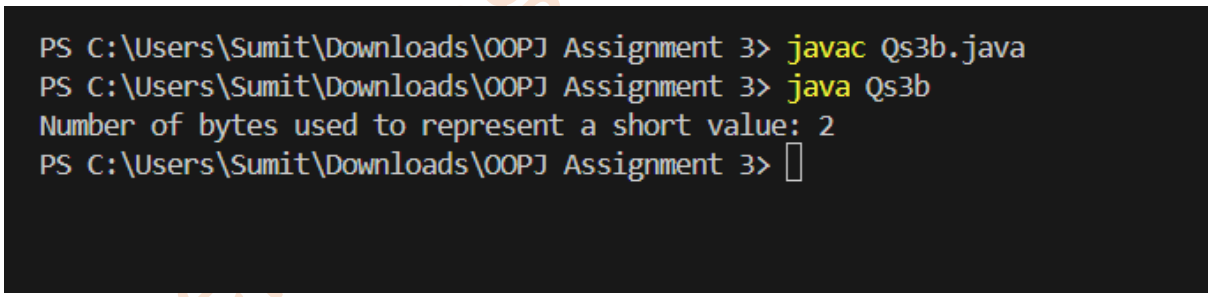
a. Explore the Java API documentation for `java.lang.Short` and observe its modifiers and super types.

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

Ans:

```
public class Qs3b {
public static void main(String args[]){
 int bytesforshort = Short.BYTES;
 System.out.println("Number of bytes used to represent a short value: " +
bytesforshort);
  }
}
```





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`).

Ans:

```
public class Qs3c {
  public static void main(String[] args) {
 short minValue = Short.MIN_VALUE;
 short maxValue = Short.MAX_VALUE;
 System.out.println("Minimum value of short: " + minValue);
  System.out.println("Maximum value of short: " + maxValue);
  }
}
```

```java
public class Qs3c {
    public static void main(String[] args) {

        short minValue = Short.MIN_VALUE;
        short maxValue = Short.MAX_VALUE;
        System.out.println("Minimum value of short: " + minValue);
        System.out.println("Maximum value of short: " + maxValue);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs3c.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs3c
Minimum value of short: -32768
Maximum value of short: 32767
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs3d {
  public static void main(String[] args) {
short number = 123;
String numberAsString = Short.toString(number);
 System.out.println("The short value as a String is: " + numberAsString);
  }
}
```

```java
public class Qs3d {
    public static void main(String[] args) {
        short number = 123;
        String numberAsString = Short.toString(number);
        System.out.println("The short value as a String is: " + numberAsString);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs3d.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs3d
The short value as a String is: 123
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs3e {
 public static void main(String[] args) {
 String strNumber = "12345";
 short number = Short.parseShort(strNumber);
System.out.println("The String value as a short is: " + number);
   }
}
```

Qs3e.java > ...

```
1   public class Qs3e {
        Run | Debug
2       public static void main(String[] args) {
3
4           String strNumber = "12345";
5           short number = Short.parseShort(strNumber);
6           System.out.println("The String value as a short is: " + number);
7       }
8   }
9
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs3e.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs3e
The String value as a short is: 12345
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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`).

Ans:

```
public class Qs3f {
 public static void main(String[] args) {
```

```
      String strNumber = "Ab12Cd3";
      try {
     short number = Short.parseShort(strNumber);
   System.out.println("Converted number: " + number);
  } catch (NumberFormatException e) {
System.out.println("NumberFormatException: " + e.getMessage());
  }
 }
}
```

Qs3f.java > ...

```java
public class Qs3f {
    Run | Debug
    public static void main(String[] args) {

        String strNumber = "Ab12Cd3";

        try {

            short number = Short.parseShort(strNumber);
            System.out.println("Converted number: " + number);
        } catch (NumberFormatException e) {

            System.out.println("NumberFormatException: " + e.getMessage());
        }
    }
}

```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs3f.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs3f
NumberFormatException: For input string: "Ab12Cd3"
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs3g {|
public static void main(String[] args) {
 short number = 123;
 Short shortObject = Short.valueOf(number);
 System.out.println("Short object: " + shortObject);
   }
```

}

```java
Qs3g.java > Qs3g
public class Qs3g {
    Run | Debug
    public static void main(String[] args) {
        short number = 123;
        Short shortObject = Short.valueOf(number);
        System.out.println("Short object: " + shortObject);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs3g.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs3g
Short object: 123
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs3h {
 public static void main(String[] args) {
 String strNumber = "123";
  Short shortObject = Short.valueOf(strNumber);
  System.out.println("Short object: " + shortObject);
 }
```

}

```java
public class Qs3h {
    Run | Debug
    public static void main(String[] args) {
        // Declare the method-local variable
        String strNumber = "123";

        // Convert the string to its corresponding wrapper class
        Short shortObject = Short.valueOf(strNumber);

        // Print the Short object
        System.out.println("Short object: " + shortObject);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs3h.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs3h
Short object: 123
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

i. Experiment with converting a `short` value into other primitive types or vice versa and observe the results.

Ans:

```
public class Qs3i{

    public static void main(String[] args) {
    short myShort = 100;
    int myInt = myShort;
    long myLong = myShort;
    float myFloat = myShort;
    double myDouble = myShort;
    System.out.println("short to int: " + myInt);
    System.out.println("short to long: " + myLong);
    System.out.println("short to float: " + myFloat);
    System.out.println("short to double: " + myDouble);
    myInt = 100;
    myShort = (short) myInt;
    System.out.println("int to short: " + myShort);
    myLong = 100L;
   myShort = (short) myLong;
   System.out.println("long to short: " + myShort);
```

```
        myFloat = 100.0f;
        myShort = (short) myFloat;
        System.out.println("float to short: " + myShort);
        myDouble = 100.0;
        myShort = (short) myDouble;
        System.out.println("double to short: " + myShort);
    }
    }
```

Qs3i.java > Qs3i > main(String[])

```java
public class Qs3i{
    Run | Debug
    public static void main(String[] args) {
        short myShort = 100;

        // Converting short to other primitive types
        int myInt = myShort; // Automatic widening conversion
        long myLong = myShort; // Automatic widening conversion
        float myFloat = myShort; // Automatic widening conversion
        double myDouble = myShort; // Automatic widening conversion

        System.out.println("short to int: " + myInt);
        System.out.println("short to long: " + myLong);
        System.out.println("short to float: " + myFloat);
        System.out.println("short to double: " + myDouble);

        // Converting other primitive types to short
        myInt = 100;
        myShort = (short) myInt; // Manual narrowing conversion
        System.out.println("int to short: " + myShort);

        myLong = 100L;
        myShort = (short) myLong; // Manual narrowing conversion
        System.out.println("long to short: " + myShort);

        myFloat = 100.0f;
        myShort = (short) myFloat; // Manual narrowing conversion
        System.out.println("float to short: " + myShort);

        myDouble = 100.0;
        myShort = (short) myDouble; // Manual narrowing conversion
        System.out.println("double to short: " + myShort);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs3i.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs3i
short to int: 100
short to long: 100
short to float: 100.0
short to double: 100.0
int to short: 100
long to short: 100
float to short: 100
double to short: 100
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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`).

Ans:

```
public class Qs4b{
 public static void main(String[] args) {
 int bytes = Integer.BYTES;
 System.out.println("Number of bytes used to represent an int: " + bytes);
}
}
```

Qs4b.java > ...

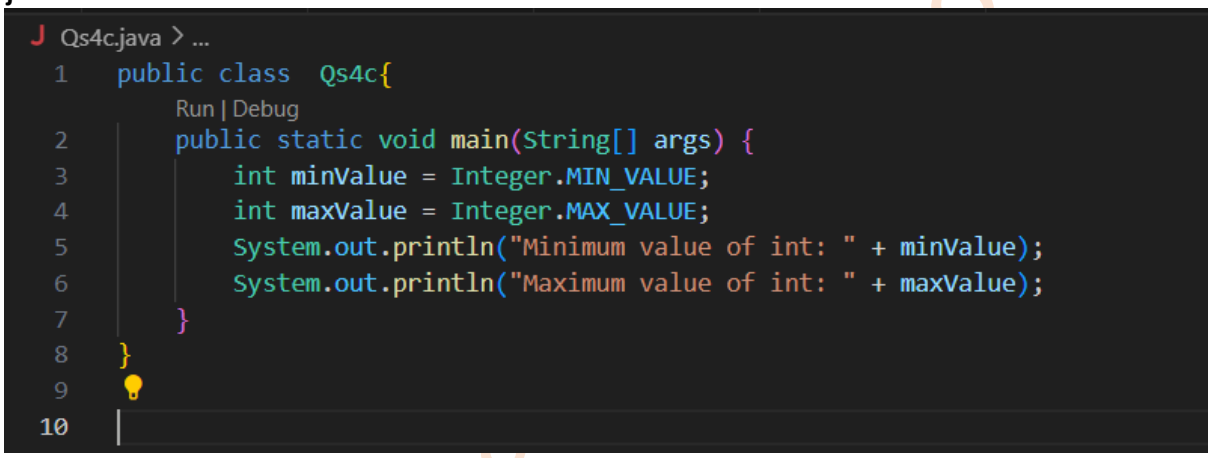
```
1   public class Qs4b{
        Run | Debug
2       public static void main(String[] args) {
3           int bytes = Integer.BYTES;
4           System.out.println("Number of bytes used to represent an int: " + bytes);
5       }
6   }
7
8
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs4b.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs4b
Number of bytes used to represent an int: 4
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

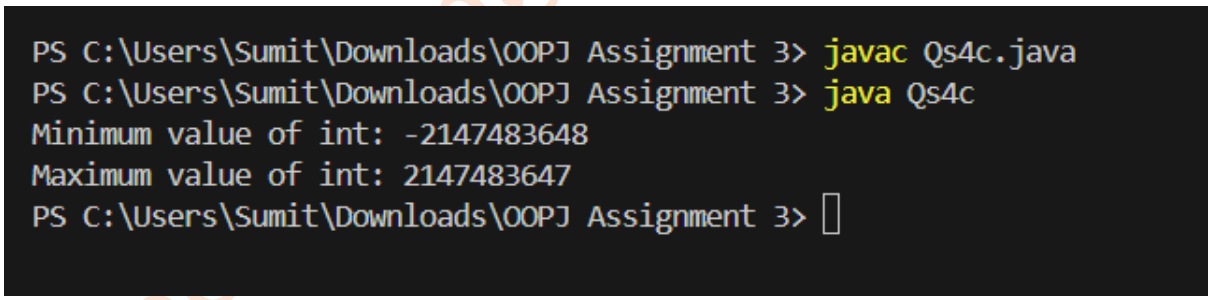
c. Write a program to find the minimum and maximum values of `int` using the `MIN_VALUE` and `MAX_VALUE` fields. (Hint: Use `Integer.MIN_VALUE` and `Integer.MAX_VALUE`).

Ans:

```
public class  Qs4c{
 public static void main(String[] args) {
  int minValue = Integer.MIN_VALUE;
  int maxValue = Integer.MAX_VALUE;
 System.out.println("Minimum value of int: " + minValue);
System.out.println("Maximum value of int: " + maxValue);
 }
}
```



```
Qs4c.java > ...
1   public class  Qs4c{
        Run | Debug
2       public static void main(String[] args) {
3           int minValue = Integer.MIN_VALUE;
4           int maxValue = Integer.MAX_VALUE;
5           System.out.println("Minimum value of int: " + minValue);
6           System.out.println("Maximum value of int: " + maxValue);
7       }
8   }
9
10
```



```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs4c.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs4c
Minimum value of int: -2147483648
Maximum value of int: 2147483647
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs4d {
public static void main(String[] args) {
int number = 12345;
 String numberAsString = Integer.toString(number);
System.out.println("The number as a String is: " + numberAsString);
 }
```

}

```java
public class Qs4d {
    public static void main(String[] args) {
        int number = 12345;
        String numberAsString = Integer.toString(number);
        System.out.println("The number as a String is: " + numberAsString);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs4d.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs4d
The number as a String is: 12345
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs4e {
public static void main(String[] args) {
 String strNumber = "12345";
 int number = Integer.parseInt(strNumber);
 System.out.println("The String as an int is: " + number);
 }
}
```

```java
public class Qs4e {
    public static void main(String[] args) {
        String strNumber = "12345";
        int number = Integer.parseInt(strNumber);
        System.out.println("The String as an int is: " + number);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs4e.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs4e
The String as an int is: 12345
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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`).

Ans:

```
public class Qs4f {
 public static void main(String[] args) {
 String strNumber = "Ab12Cd3";
 try {
 int number = Integer.parseInt(strNumber);
System.out.println("The String as an int is: " + number);
} catch (NumberFormatException e) {
System.out.println("NumberFormatException: " + e.getMessage());
 }
}
}
```

Qs4f.java > ...

```java
public class Qs4f {
    Run | Debug
    public static void main(String[] args) {
        String strNumber = "Ab12Cd3";
            try {
            int number = Integer.parseInt(strNumber);
            System.out.println("The String as an int is: " + number);
        } catch (NumberFormatException e) {
          System.out.println("NumberFormatException: " + e.getMessage());
        }
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs4f.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs4f
NumberFormatException: For input string: "Ab12Cd3"
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs4g {
public static void main(String[] args) {
 int number = 12345;
 Integer wrapperNumber = Integer.valueOf(number);
System.out.println("The int as an Integer object is: " + wrapperNumber);
 }
}
```

```java
Qs4g.java > ...
1   public class Qs4g {
        Run | Debug
2       public static void main(String[] args) {
3           int number = 12345;
4           Integer wrapperNumber = Integer.valueOf(number);
5       System.out.println("The int as an Integer object is: " + wrapperNumber);
6       }
7   }
8
9
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs4g.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs4g
The int as an Integer object is: 12345
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs4h {
 public static void main(String[] args) {
 String strNumber = "123";
 Integer intNumber = Integer.valueOf(strNumber);
  System.out.println("The integer value is: " + intNumber);
  }
```

}

Qs4h.java > ...

```java
public class Qs4h {
    Run | Debug
    public static void main(String[] args) {
        String strNumber = "123";
        Integer intNumber = Integer.valueOf(strNumber);
        System.out.println("The integer value is: " + intNumber);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs4h.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs4h
The integer value is: 123
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs4i {
public static void main(String[] args) {
 int num1 = 10;
  int num2 = 20;
  int sum = Integer.sum(num1, num2);
  System.out.println("The sum of " + num1 + " and " + num2 + " is: " + sum);
 }
}
```

Qs4i.java > ...

```java
public class Qs4i {
    Run | Debug
    public static void main(String[] args) {
        int num1 = 10;
        int num2 = 20;
        int sum = Integer.sum(num1, num2);
        System.out.println("The sum of " + num1 + " and " + num2 + " is: " + sum);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs4i.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs4i
The sum of 10 and 20 is: 30
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs4j {
 public static void main(String[] args) {
 int num1 = 10;
 int num2 = 20;
 int min = Integer.min(num1, num2);
int max = Integer.max(num1, num2);
System.out.println("Minimum value: " + min);
 System.out.println("Maximum value: " + max);
 }
}
```

Qs4j.java > ...

```
1   public class Qs4j {
        Run | Debug
2       public static void main(String[] args) {
3           int num1 = 10;
4           int num2 = 20;
5           int min = Integer.min(num1, num2);
6           int max = Integer.max(num1, num2);
7           System.out.println("Minimum value: " + min);
8           System.out.println("Maximum value: " + max);
9       }
10  }
11
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs4j.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs4j
Minimum value: 10
Maximum value: 20
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs4k {
public static void main(String[] args) {
int number = 7;
 // Convert to binary
String binaryString = Integer.toBinaryString(number);
 System.out.println("Binary: " + binaryString);
  // Convert to octal
 String octalString = Integer.toOctalString(number);
System.out.println("Octal: " + octalString);
// Convert to hexadecimal
String hexString = Integer.toHexString(number);
System.out.println("Hexadecimal: " + hexString);
 } }
```

Qs4k.java > ...

```java
public class Qs4k {
    Run | Debug
    public static void main(String[] args) {
        int number = 7;

        // Convert to binary
        String binaryString = Integer.toBinaryString(number);
        System.out.println("Binary: " + binaryString);

        // Convert to octal
        String octalString = Integer.toOctalString(number);
        System.out.println("Octal: " + octalString);

        // Convert to hexadecimal
        String hexString = Integer.toHexString(number);
        System.out.println("Hexadecimal: " + hexString);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs4k.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs4k
Binary: 111
Octal: 7
Hexadecimal: 7
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

I. Experiment with converting an `int` value into other primitive types or vice versa and observe the results.

Ans:

```
public class Qs4l {
public static void main(String[] args) {
int number = 42;
 // Convert int to other primitive types
byte byteValue = (byte) number;
 short shortValue = (short) number;
long longValue = number;
float floatValue = number;
double doubleValue = number;
 char charValue = (char) number;
boolean booleanValue = (number != 0);
// Print the converted values
 System.out.println("Original int value: " + number);
 System.out.println("Converted to byte: " + byteValue);
System.out.println("Converted to short: " + shortValue);
 System.out.println("Converted to long: " + longValue);
  System.out.println("Converted to float: " + floatValue);
  System.out.println("Converted to double: " + doubleValue);
  System.out.println("Converted to char: " + charValue);
System.out.println("Converted to boolean: " + booleanValue);
// Convert other primitive types back to int
  int fromByte = byteValue;
  int fromShort = shortValue;
 int fromLong = (int) longValue;
int fromFloat = (int) floatValue;
int fromDouble = (int) doubleValue;
  int fromChar = charValue;
// Print the values converted back to int
 System.out.println("Converted back from byte: " + fromByte);
System.out.println("Converted back from short: " + fromShort);
System.out.println("Converted back from long: " + fromLong);
System.out.println("Converted back from float: " + fromFloat);
System.out.println("Converted back from double: " + fromDouble);
```

```
        System.out.println("Converted back from char: " + fromChar);
    }
}
```

Qs4l.java > ...

```java
public class Qs4l {
    Run | Debug
    public static void main(String[] args) {
        int number = 42;

        // Convert int to other primitive types
        byte byteValue = (byte) number;
        short shortValue = (short) number;
        long longValue = number;
        float floatValue = number;
        double doubleValue = number;
        char charValue = (char) number;
        boolean booleanValue = (number != 0);

        // Print the converted values
        System.out.println("Original int value: " + number);
        System.out.println("Converted to byte: " + byteValue);
        System.out.println("Converted to short: " + shortValue);
        System.out.println("Converted to long: " + longValue);
        System.out.println("Converted to float: " + floatValue);
        System.out.println("Converted to double: " + doubleValue);
        System.out.println("Converted to char: " + charValue);
        System.out.println("Converted to boolean: " + booleanValue);

        // Convert other primitive types back to int
        int fromByte = byteValue;
        int fromShort = shortValue;
        int fromLong = (int) longValue;
        int fromFloat = (int) floatValue;
        int fromDouble = (int) doubleValue;
        int fromChar = charValue;

        // Print the values converted back to int
        System.out.println("Converted back from byte: " + fromByte);
        System.out.println("Converted back from short: " + fromShort);
        System.out.println("Converted back from long: " + fromLong);
        System.out.println("Converted back from float: " + fromFloat);
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs4l.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs4l
Original int value: 42
Converted to byte: 42
Converted to short: 42
Converted to long: 42
Converted to float: 42.0
Converted to double: 42.0
Converted to char: *
Converted to boolean: true
Converted back from byte: 42
Converted back from short: 42
```

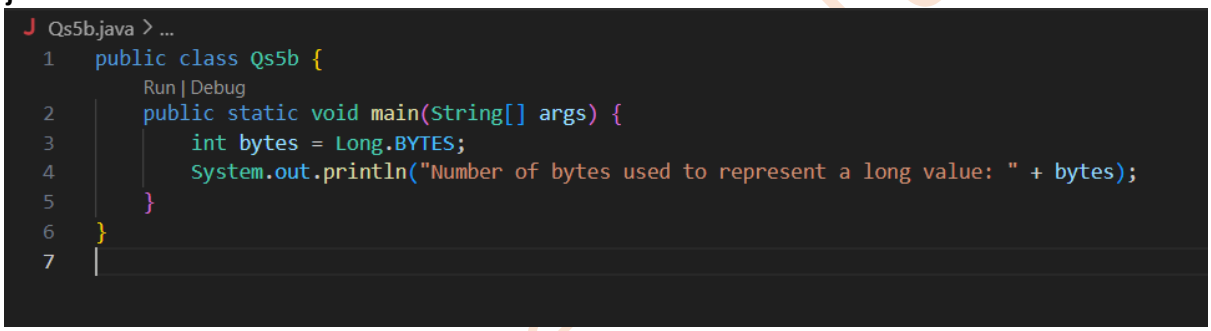
5. Working with `java.lang.Long`

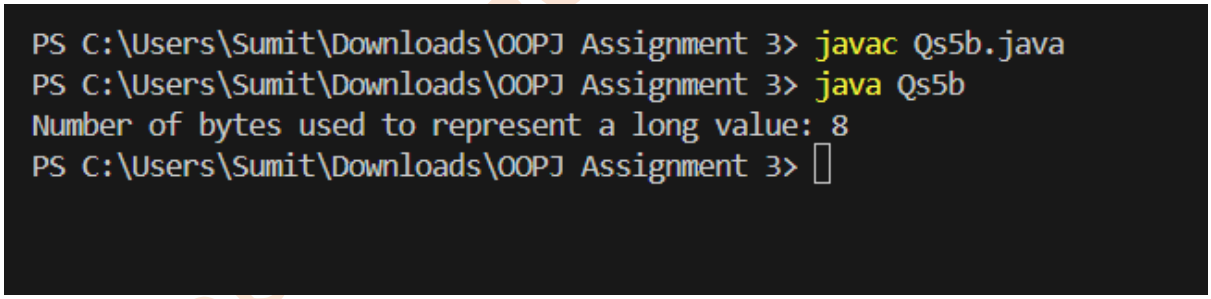
a. Explore the Java API documentation for `java.lang.Long` and observe its modifiers and super types.

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

Ans:

```
public class Qs5b {
 public static void main(String[] args) {
  int bytes = Long.BYTES;
System.out.println("Number of bytes used to represent a long value: " + bytes);
 }
}
```





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`).

Ans:

```
public class Qs5c {
 public static void main(String[] args) {
 // Get the minimum and maximum values of long
 long minValue = Long.MIN_VALUE;
  long maxValue = Long.MAX_VALUE;
// Print the minimum and maximum values
 System.out.println("Minimum value of long: " + minValue);
System.out.println("Maximum value of long: " + maxValue)
   }
}
```

```java
Qs5c.java > ...
public class Qs5c {
    Run | Debug
    public static void main(String[] args) {
        // Get the minimum and maximum values of long
        long minValue = Long.MIN_VALUE;
        long maxValue = Long.MAX_VALUE;

        // Print the minimum and maximum values
        System.out.println("Minimum value of long: " + minValue);
        System.out.println("Maximum value of long: " + maxValue);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs5c.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs5c
Minimum value of long: -9223372036854775808
Maximum value of long: 9223372036854775807
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs5d {
public static void main(String[] args) {
 long number = 123456789L;
 String numberString = Long.toString(number);
  System.out.println("The string representation of the number is: " +
numberString);
 }
}
```

```java
Qs5d.java > ...
public class Qs5d {
    Run | Debug
    public static void main(String[] args) {
     long number = 123456789L;
     String numberString = Long.toString(number);
        System.out.println("The string representation of the number is: " + numberString);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs5d.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs5d
The string representation of the number is: 123456789
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs5e {
 public static void main(String[] args) {
 String strNumber = "987654321";
  long number = Long.parseLong(strNumber);
System.out.println("The long value is: " + number);
 }
}
```

Qs5e.java

```
1  public class Qs5e {
       Run | Debug
2      public static void main(String[] args) {
3          String strNumber = "987654321";
4          long number = Long.parseLong(strNumber);
5          System.out.println("The long value is: " + number);
6      }
7  }
8
9
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs5e.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs5e
The long value is: 987654321
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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`).

Ans:

```
public class Qs5f {
  public static void main(String[] args)
```

```
 // Declare a method-local variable 'strNumber' of type String with the value "Ab12Cd3"
String strNumber = "Ab12Cd3";
  try {
 // Attempt to convert the String value to a long using Long.parseLong(String)
 long number = Long.parseLong(strNumber);
 System.out.println("The long value is: " + number);
 } catch (NumberFormatException e) {
// Handle the exception if the string cannot be parsed to a long
 System.out.println("NumberFormatException: " + e.getMessage());
}
}
}
```

Qs5f.java > Qs5f > main(String[])

```java
public class Qs5f {
    Run | Debug
    public static void main(String[] args) {
        // Declare a method-local variable 'strNumber' of type String with the value "Ab12Cd3"
        String strNumber = "Ab12Cd3";

        try {
            // Attempt to convert the String value to a long using Long.parseLong(String)
            long number = Long.parseLong(strNumber);
            System.out.println("The long value is: " + number);
        } catch (NumberFormatException e) {
            // Handle the exception if the string cannot be parsed to a long
            System.out.println("NumberFormatException: " + e.getMessage());
        }
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs5f.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs5f
NumberFormatException: For input string: "Ab12Cd3"
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs5g {
 public static void main(String[] args) {
long number = 123456789L;
Long wrapperNumber = Long.valueOf(number);
 System.out.println("The Long wrapper class value is: " + wrapperNumber)
 }
```

}

Qs5g.java > ...

```java
public class Qs5g {
    Run | Debug
    public static void main(String[] args) {
        long number = 123456789L;
        Long wrapperNumber = Long.valueOf(number);
        System.out.println("The Long wrapper class value is: " + wrapperNumber);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs5g.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs5g
The Long wrapper class value is: 123456789
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

public class Qs5h {
public static void main(String[] args) {
String strNumber = "123456789";
Long wrapperNumber = Long.valueOf(strNumber);
System.out.println("The Long wrapper class value is: " + wrapperNumber);
}
}

Qs5h.java > ...

```java
public class Qs5h {
    Run | Debug
    public static void main(String[] args) {
        String strNumber = "123456789";
        Long wrapperNumber = Long.valueOf(strNumber);
        System.out.println("The Long wrapper class value is: " + wrapperNumber);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs5h.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs5h
The Long wrapper class value is: 123456789
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs5i{
public static void main(String[] args) {
 long num1 = 1123L;
long num2 = 9845L;
 long sum = Long.sum(num1, num2);
System.out.println("The sum of " + num1 + " and " + num2 + " is: " + sum);
}
}
```

Qs5i.java > Qs5i

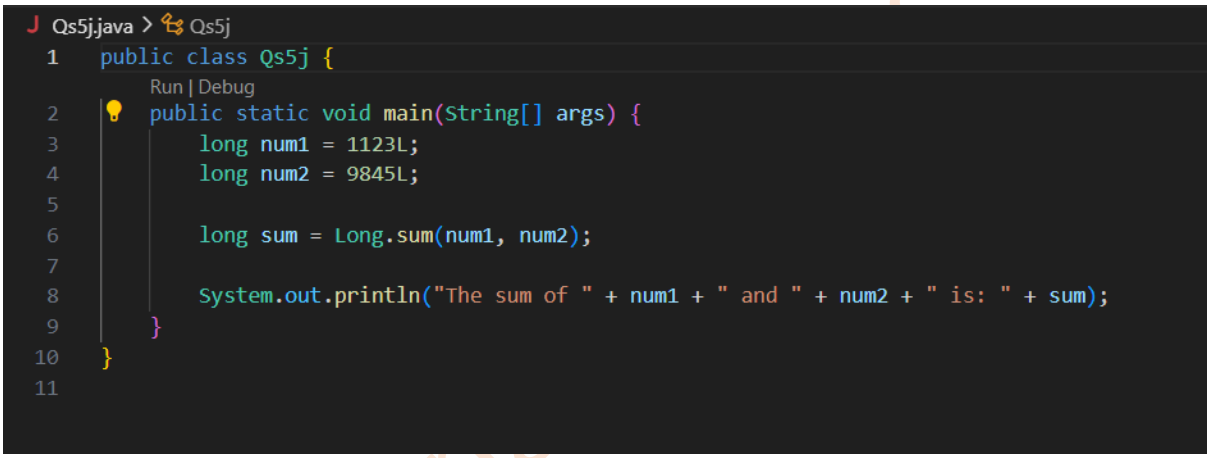
```java
public class Qs5i{
    Run | Debug
    public static void main(String[] args) {
        long num1 = 1123L;
        long num2 = 9845L;

        long sum = Long.sum(num1, num2);

        System.out.println("The sum of " + num1 + " and " + num2 + " is: " + sum);
    }
}
```

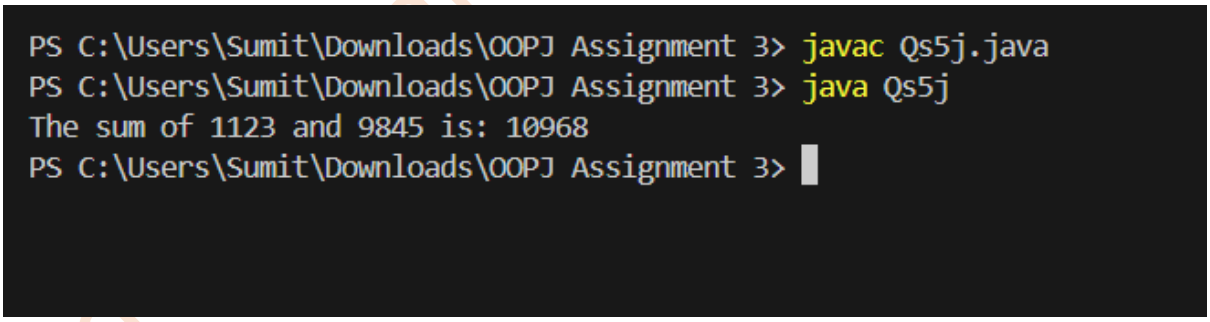
```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs5i.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs5i
The sum of 1123 and 9845 is: 10968
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

j. Declare two long variables with values `1122` and `5566`, and find the minimum and maximum values using the `Long` class. (Hint: Use `Long.min(long, long)` and `Long.max(long, long)`).

Ans:

```
public class Qs5j {
  public static void main(String[] args) {
  long num1 = 1123L;
 long num2 = 9845L;
long sum = Long.sum(num1, num2);
System.out.println("The sum of " + num1 + " and " + num2 + " is: " + sum);
 }
}
```





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)`).

Ans:

```
public class Qs5k{
 public static void main(String[] args) {
 long num = 7L;
String binaryString = Long.toBinaryString(num);
String octalString = Long.toOctalString(num);
 String hexString = Long.toHexString(num);
 System.out.println("Binary representation of " + num + " is: " + binaryString);
```

```
System.out.println("Octal representation of " + num + " is: " + octalString);
System.out.println("Hexadecimal representation of " + num + " is: " + hexString);
 }
}
```

```java
Qs5k.java > ...
public class Qs5k{
    Run | Debug
    public static void main(String[] args) {
        long num = 7L;

        String binaryString = Long.toBinaryString(num);
        String octalString = Long.toOctalString(num);
        String hexString = Long.toHexString(num);

        System.out.println("Binary representation of " + num + " is: " + binaryString);
        System.out.println("Octal representation of " + num + " is: " + octalString);
        System.out.println("Hexadecimal representation of " + num + " is: " + hexString);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs5k.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs5k
Binary representation of 7 is: 111
Octal representation of 7 is: 7
Hexadecimal representation of 7 is: 7
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

l. Experiment with converting a `long` value into other primitive types or vice versa and observe the results.

Ans:

```
public class Qs5l {
 public static void main(String[] args) {
long longValue = 123456789L;
int intValue = (int) longValue;
 short shortValue = (short) longValue;
 byte byteValue = (byte) longValue;
 float floatValue = longValue;
double doubleValue = longValue;
int anotherIntValue = 98765;
 long fromInt = (long) anotherIntValue;
```

```
 short anotherShortValue = 12345;
 long fromShort = (long) anotherShortValue;
byte anotherByteValue = 123;
 long fromByte = (long) anotherByteValue;
float anotherFloatValue = 12345.67F;
long fromFloat = (long) anotherFloatValue;
 double anotherDoubleValue = 12345.6789;
 long fromDouble = (long) anotherDoubleValue;
// Print the results
 System.out.println("Original long value: " + longValue);
System.out.println("Converted to int: " + intValue);
System.out.println("Converted to short: " + shortValue);
System.out.println("Converted to byte: " + byteValue);
System.out.println("Converted to float: " + floatValue);
System.out.println("Converted to double: " + doubleValue);
System.out.println("Original int value: " + anotherIntValue);
System.out.println("Converted from int to long: " + fromInt);
System.out.println("Original short value: " + anotherShortValue);
System.out.println("Converted from short to long: " + fromShort);
System.out.println("Original byte value: " + anotherByteValue);
System.out.println("Converted from byte to long: " + fromByte);
System.out.println("Original float value: " + anotherFloatValue);
System.out.println("Converted from float to long: " + fromFloat);
System.out.println("Original double value: " + anotherDoubleValue);
System.out.println("Converted from double to long: " + fromDouble);
  }
```

}

Qs5l.java > Qs5l > main(String[])

```java
public class Qs5l {
    Run | Debug
    public static void main(String[] args) {
        long longValue = 123456789L;


        int intValue = (int) longValue;
        short shortValue = (short) longValue;
        byte byteValue = (byte) longValue;
        float floatValue = longValue;
        double doubleValue = longValue;

        int anotherIntValue = 98765;
        long fromInt = (long) anotherIntValue;

        short anotherShortValue = 12345;
        long fromShort = (long) anotherShortValue;

        byte anotherByteValue = 123;
        long fromByte = (long) anotherByteValue;

        float anotherFloatValue = 12345.67F;
        long fromFloat = (long) anotherFloatValue;

        double anotherDoubleValue = 12345.6789;
        long fromDouble = (long) anotherDoubleValue;

        // Print the results
        System.out.println("Original long value: " + longValue);
        System.out.println("Converted to int: " + intValue);
        System.out.println("Converted to short: " + shortValue);
        System.out.println("Converted to byte: " + byteValue);
        System.out.println("Converted to float: " + floatValue);
        System.out.println("Converted to double: " + doubleValue);

        System.out.println("Original int value: " + anotherIntValue);
        System.out.println("Converted from int to long: " + fromInt);
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs5l.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs5l
Original long value: 123456789
Converted to int: 123456789
Converted to short: -13035
Converted to byte: 21
Converted to float: 1.23456792E8
Converted to double: 1.23456789E8
Original int value: 98765
Converted from int to long: 98765
Original short value: 12345
Converted from short to long: 12345
```

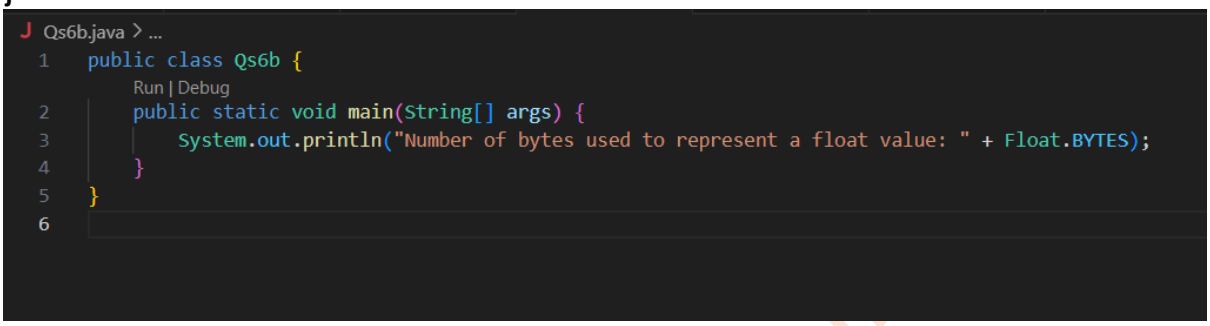
6. Working with `java.lang.Float`

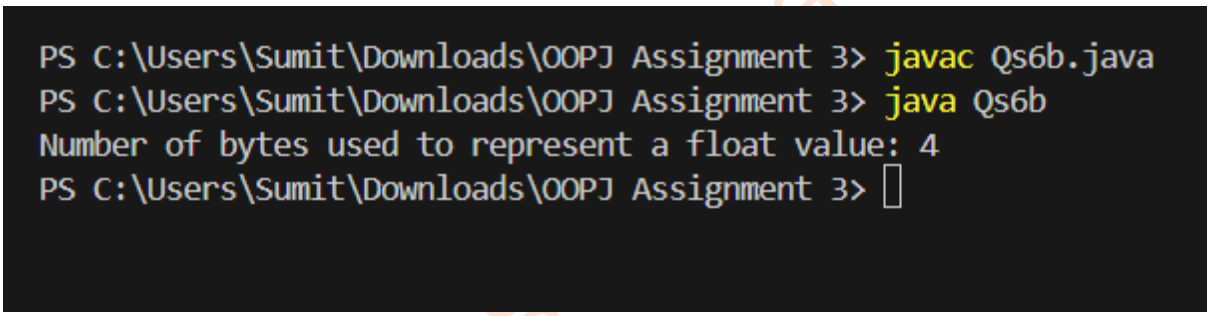
a. Explore the Java API documentation for `java.lang.Float` and observe its modifiers and super types.

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

Ans:

```
public class Qs6b {
 public static void main(String[] args) {
System.out.println("Number of bytes used to represent a float value: " +
Float.BYTES);
  }
}
```





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`).

Ans:

```
public class FloatMinMax {
public static void main(String[] args) {
 // Minimum value of a float
float minValue = Float.MIN_VALUE;
 // Maximum value of a float
 float maxValue = Float.MAX_VALUE;
 System.out.println("Minimum value of a float: " + minValue);
System.out.println("Maximum value of a float: " + maxValue);
}
}
```

Qs6c.java > ...

```java
public class Qs6c {
    Run | Debug
    public static void main(String[] args) {
        // Minimum value of a float
        float minValue = Float.MIN_VALUE;
        // Maximum value of a float
        float maxValue = Float.MAX_VALUE;

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

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs6c.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs6c
Minimum value of a float: 1.4E-45
Maximum value of a float: 3.4028235E38
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Main {
public static void main(String[] args) {
 // Declare a method-local variable of type float
float number = 3.14f;
// Convert the float to a String using Float.toString(float)
String numberAsString = Float.toString(number);
// Print the result
System.out.println("The float value as a String is: " + numberAsString);
}
}
```

```java
Qs6d.java > ...
1   public class Qs6d {
        Run | Debug
2       public static void main(String[] args) {
3       // Declare a method-local variable of type float
4       float number = 3.14f;
5       // Convert the float to a String using Float.toString(float)
6       String numberAsString = Float.toString(number);
7       // Print the result
8       System.out.println("The float value as a String is: " + numberAsString);
9       }
10      }
11
12
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs6d.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs6d
The float value as a String is: 3.14
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs6e {
public static void main(String[] args) {
// Declare a method-local variable strNumber of type String
String strNumber = "123.45";
// Convert the String to a float using Float.parseFloat(String)
float floatNumber = Float.parseFloat(strNumber);
 // Print the float value
System.out.println("The float value is: " + floatNumber);
}
```

}

Qs6e.java > ...

```java
public class Qs6e {
    Run | Debug
    public static void main(String[] args) {
        // Declare a method-local variable strNumber of type String
        String strNumber = "123.45";

        // Convert the String to a float using Float.parseFloat(String)
        float floatNumber = Float.parseFloat(strNumber);

        // Print the float value
        System.out.println("The float value is: " + floatNumber);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs6e.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs6e
The float value is: 123.45
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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`).

Ans:

```
public class Qs6f {
public static void main(String[] args) {
// Declare a method-local variable strNumber of type String
String strNumber = "Ab12Cd3";
try {
// Attempt to convert the String to a float using Float.parseFloat(String)
float floatNumber = Float.parseFloat(strNumber);
System.out.println("The float value is: " + floatNumber);
} catch (NumberFormatException e) {
// Handle the NumberFormatException
System.out.println("NumberFormatException occurred: " + e.getMessage());
 }
```

```
    }
}
```

Qs6f.java > ...

```java
public class Qs6f {
    Run | Debug
    public static void main(String[] args) {
        // Declare a method-local variable strNumber of type String
        String strNumber = "Ab12Cd3";

        try {
            // Attempt to convert the String to a float using Float.parseFloat(String)
            float floatNumber = Float.parseFloat(strNumber);
            System.out.println("The float value is: " + floatNumber);
        } catch (NumberFormatException e) {
            // Handle the NumberFormatException
            System.out.println("NumberFormatException occurred: " + e.getMessage());
        }
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs6f.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs6f
NumberFormatException occurred: For input string: "Ab12Cd3"
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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

Ans:

```
public class Main {
public static void main(String[] args) {
// Declare a method-local variable number of type float
float number = 123.45f;
// Convert the float to the corresponding wrapper class using Float.valueOf(float)
Float wrapperNumber = Float.valueOf(number);
// Print the wrapper class value
System.out.println("The Float wrapper class value is: " + wrapperNumber);
}
}
```

```java
public class Qs6g {
    Run | Debug
    public static void main(String[] args) {
        // Declare a method-local variable number of type float
        float number = 123.45f;

        // Convert the float to the corresponding wrapper class using Float.valueOf(float)
        Float wrapperNumber = Float.valueOf(number);

        // Print the wrapper class value
        System.out.println("The Float wrapper class value is: " + wrapperNumber);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs6g.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs6g
The Float wrapper class value is: 123.45
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs6h{
 public static void main(String[] args) {
// Declare a method-local variable strNumber of type String
String strNumber = "123.45";
// Convert the String to the corresponding wrapper class using
Float.valueOf(String)
Float wrapperNumber = Float.valueOf(strNumber);
// Print the wrapper class value
System.out.println("The Float wrapper class value is: " + wrapperNumber);
}
```

}

```java
public class Qs6h{
    Run | Debug
    public static void main(String[] args) {
        // Declare a method-local variable strNumber of type String
        String strNumber = "123.45";

        // Convert the String to the corresponding wrapper class using Float.valueOf(String)
        Float wrapperNumber = Float.valueOf(strNumber);

        // Print the wrapper class value
        System.out.println("The Float wrapper class value is: " + wrapperNumber);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs6h.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs6h
The Float wrapper class value is: 123.45
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs6i {
public static void main(String[] args) {
// Declare two float variables
float number1 = 112.3f;
float number2 = 984.5f;
// Add the two float values using Float.sum(float, float)
float sum = Float.sum(number1, number2);
// Print the sum
System.out.println("The sum of " + number1 + " and " + number2 + " is: " + sum);
}
```

}

Qs6i.java > ...

```java
public class Qs6i {
    Run | Debug
    public static void main(String[] args) {
        // Declare two float variables
        float number1 = 112.3f;
        float number2 = 984.5f;

        // Add the two float values using Float.sum(float, float)
        float sum = Float.sum(number1, number2);

        // Print the sum
        System.out.println("The sum of " + number1 + " and " + number2 + " is: " + sum);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs6i.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs6i
The sum of 112.3 and 984.5 is: 1096.8
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs6j {
public static void main(String[] args) {
float num1 = 112.2f;
float num2 = 556.6f;
float min = Float.min(num1, num2);
float max = Float.max(num1, num2);
System.out.println("Minimum value: " + min);
System.out.println("Maximum value: " + max);
}
```

}

Qs6j.java > ...

```java
public class Qs6j {
    Run | Debug
    public static void main(String[] args) {
        float num1 = 112.2f;
        float num2 = 556.6f;

        float min = Float.min(num1, num2);
        float max = Float.max(num1, num2);

        System.out.println("Minimum value: " + min);
        System.out.println("Maximum value: " + max);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs6j.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs6j
Minimum value: 112.2
Maximum value: 556.6
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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

Ans:

```
public class Main {
public static void main(String[] args) {
float num = -25.0f;
// Math.sqrt() returns NaN for negative values
double sqrtValue = Math.sqrt(num);
System.out.println("Square root of " + num + " is: " + sqrtValue);
}
}
```

ASSIGNMENT NO.2

```java
public class Qs6k {
    Run | Debug
    public static void main(String[] args) {
        float num = -25.0f;

        // Math.sqrt() returns NaN for negative values
        double sqrtValue = Math.sqrt(num);

        System.out.println("Square root of " + num + " is: " + sqrtValue);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs6k.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs6k
Square root of -25.0 is: NaN
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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

Ans:

```
public class Qs6l {
public static void main(String[] args) {
float num1 = 0.0f;
float num2 = 0.0f;
float result = num1 / num2;
System.out.println("Result of division: " + result);
}
```

}

```java
public class Qs6l {
    Run | Debug
    public static void main(String[] args) {
        float num1 = 0.0f;
        float num2 = 0.0f;

        float result = num1 / num2;

        System.out.println("Result of division: " + result);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs6l.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs6l
Result of division: NaN
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

m. Experiment with converting a `float` value into other primitive types or vice versa and observe the results.

Ans:

```
public class Qs6m {
public static void main(String[] args) {
float floatValue = 123.45f;
// Convert float to int
int intValue = (int) floatValue;
System.out.println("Float to int: " + intValue);
// Convert float to double
double doubleValue = floatValue;
System.out.println("Float to double: " + doubleValue);
// Convert float to long
long longValue = (long) floatValue;
System.out.println("Float to long: " + longValue);
// Convert int to float
int anotherIntValue = 100;
float anotherFloatValue = (float) anotherIntValue;
System.out.println("Int to float: " + anotherFloatValue);
// Convert double to float
```

double anotherDoubleValue = 456.78;
float yetAnotherFloatValue = (float) anotherDoubleValue;
System.out.println("Double to float: " + yetAnotherFloatValue);
}
}

Qs6m.java > ...

```java
public class Qs6m {
    Run | Debug
    public static void main(String[] args) {
        float floatValue = 123.45f;

        // Convert float to int
        int intValue = (int) floatValue;
        System.out.println("Float to int: " + intValue);

        // Convert float to double
        double doubleValue = floatValue;
        System.out.println("Float to double: " + doubleValue);

        // Convert float to long
        long longValue = (long) floatValue;
        System.out.println("Float to long: " + longValue);

        // Convert int to float
        int anotherIntValue = 100;
        float anotherFloatValue = (float) anotherIntValue;
        System.out.println("Int to float: " + anotherFloatValue);

        // Convert double to float
        double anotherDoubleValue = 456.78;
        float yetAnotherFloatValue = (float) anotherDoubleValue;
        System.out.println("Double to float: " + yetAnotherFloatValue);
    }
}

```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs6m.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs6m
Float to int: 123
Float to double: 123.44999694824219
Float to long: 123
Int to float: 100.0
Double to float: 456.78
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

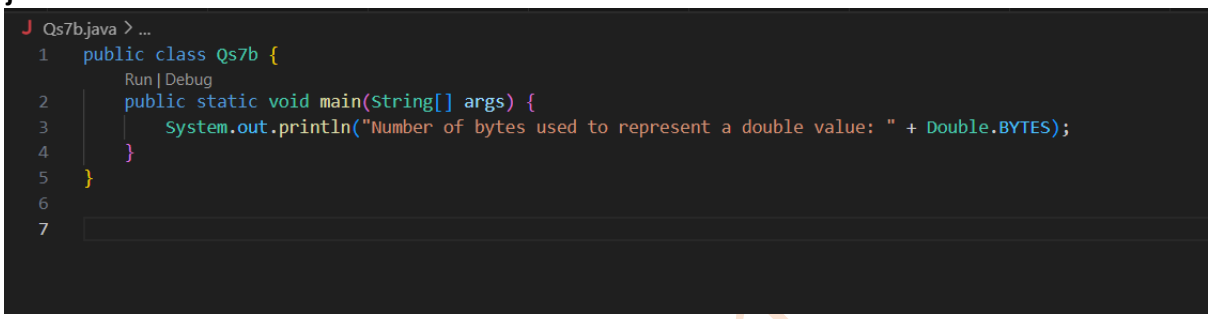
7. Working with `java.lang.Double`

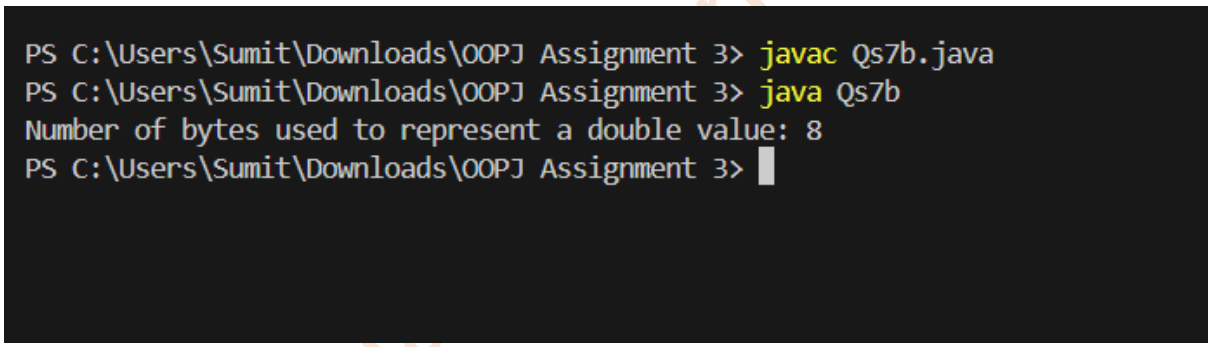
a. Explore the Java API documentation for `java.lang.Double` and observe its modifiers and super types.

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

Ans:

```
public class Qs7b {
public static void main(String[] args) {
System.out.println("Number of bytes used to represent a double value: " +
Double.BYTES);
}
}
```





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`).

Ans:

```
public class Qs7c {
public static void main(String[] args) {
System.out.println("Minimum value of double: " + Double.MIN_VALUE);
System.out.println("Maximum value of double: " + Double.MAX_VALUE);
 }
```

}

```java
public class Qs7c {
    Run | Debug
    public static void main(String[] args) {
        System.out.println("Minimum value of double: " + Double.MIN_VALUE);
        System.out.println("Maximum value of double: " + Double.MAX_VALUE);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs7c.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs7c
Minimum value of double: 4.9E-324
Maximum value of double: 1.7976931348623157E308
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs7d {
public static void main(String[] args) {
 // Declare a method-local variable of type double
double number = 123.456;
// Convert the double to a String using Double.toString(double)
String numberAsString = Double.toString(number);
// Print the String representation of the double
System.out.println("The double value as a String is: " + numberAsString);
}
}
```

```java
public class Qs7d {
    Run | Debug
    public static void main(String[] args) {
        // Declare a method-local variable of type double
        double number = 123.456;

        // Convert the double to a String using Double.toString(double)
        String numberAsString = Double.toString(number);

        // Print the String representation of the double
        System.out.println("The double value as a String is: " + numberAsString);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs7d.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs7d
The double value as a String is: 123.456
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs7e {
public static void main(String[] args) {
// Declare a method-local variable strNumber of type String
String strNumber = "123.45";
 // Convert the String to a double using Double.parseDouble
double number = Double.parseDouble(strNumber);
// Print the double value
System.out.println("The double value is: " + number);
}
```

}

Qs7e.java > ...

```java
public class Qs7e {
    Run | Debug
    public static void main(String[] args) {
        // Declare a method-local variable strNumber of type String
        String strNumber = "123.45";

        // Convert the String to a double using Double.parseDouble
        double number = Double.parseDouble(strNumber);

        // Print the double value
        System.out.println("The double value is: " + number);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs7e.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs7e
The double value is: 123.45
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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`).

Ans:

```
public class Qs7f {
public static void main(String[] args) {
// Declare a method-local variable strNumber of type String
String strNumber = "Ab12Cd3";
 try {
// Attempt to convert the String to a double using Double.parseDouble
double number = Double.parseDouble(strNumber);
System.out.println("The double value is: " + number);
 } catch (NumberFormatException e) {
 // Handle the exception
System.out.println("NumberFormatException: " + e.getMessage());
```

```
    }
}
}
```

Qs7f.java > ...

```java
public class Qs7f {
    Run | Debug
    public static void main(String[] args) {
        // Declare a method-local variable strNumber of type String
        String strNumber = "Ab12Cd3";

        try {
            // Attempt to convert the String to a double using Double.parseDouble
            double number = Double.parseDouble(strNumber);
            System.out.println("The double value is: " + number);
        } catch (NumberFormatException e) {
            // Handle the exception
            System.out.println("NumberFormatException: " + e.getMessage());
        }
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs7f.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs7f
NumberFormatException: For input string: "Ab12Cd3"
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs8f {
public static void main(String[] args) {
// Declare a method-local variable number of type double
 double number = 123.45;
// Convert the double to the corresponding wrapper class using
Double.valueOfDouble wrapperNumber = Double.valueOf(number);
 // Print the wrapper class value
System.out.println("The Double wrapper class value is: " + wrapperNumber);
}
}
```

```java
public class Qs8g {
    Run | Debug
    public static void main(String[] args) {
        // Declare a method-local variable number of type double
        double number = 123.45;

        // Convert the double to the corresponding wrapper class using Double.valueOf
        Double wrapperNumber = Double.valueOf(number);

        // Print the wrapper class value
        System.out.println("The Double wrapper class value is: " + wrapperNumber);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs8g.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs8g
The Double wrapper class value is: 123.45
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Main {
public static void main(String[] args) {
 // Declare a method-local variable strNumber of type String
String strNumber = "123.45";
 // Convert the String to the corresponding wrapper class using
Double.valueOfDouble wrapperNumber = Double.valueOf(strNumber);
 // Print the wrapper class value
 System.out.println("The Double wrapper class value is: " + wrapperNumber);
}
}
```

ASSIGNMENT NO.2

```java
public class Qs8h {
    Run | Debug
    public static void main(String[] args) {
        // Declare a method-local variable strNumber of type String
        String strNumber = "123.45";

        // Convert the String to the corresponding wrapper class using Double.valueOf
        Double wrapperNumber = Double.valueOf(strNumber);

        // Print the wrapper class value
        System.out.println("The Double wrapper class value is: " + wrapperNumber);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs8h.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs8h
The Double wrapper class value is: 123.45
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

```
public class Qs8i {
public static void main(String[] args) {
double num1 = 112.3;
double num2 = 984.5;
double result = Double.sum(num1, num2);
 System.out.println("The sum of " + num1 + " and " + num2 + " is: " + result);
  }
}
```

```java
public class Qs8i {
    Run | Debug
    public static void main(String[] args) {
        double num1 = 112.3;
        double num2 = 984.5;
        double result = Double.sum(num1, num2);
        System.out.println("The sum of " + num1 + " and " + num2 + " is: " + result);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs8i.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs8i
The sum of 112.3 and 984.5 is: 1096.8
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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)`).

Ans:

public class Qs8j {
public static void main(String[] args) {
double num1 = 112.3;
double num2 = 984.5;
double result = Double.sum(num1, num2);
System.out.println("The sum of " + num1 + " and " + num2 + " is: " + result);|
}
}

Qs8j.java > Qs8j

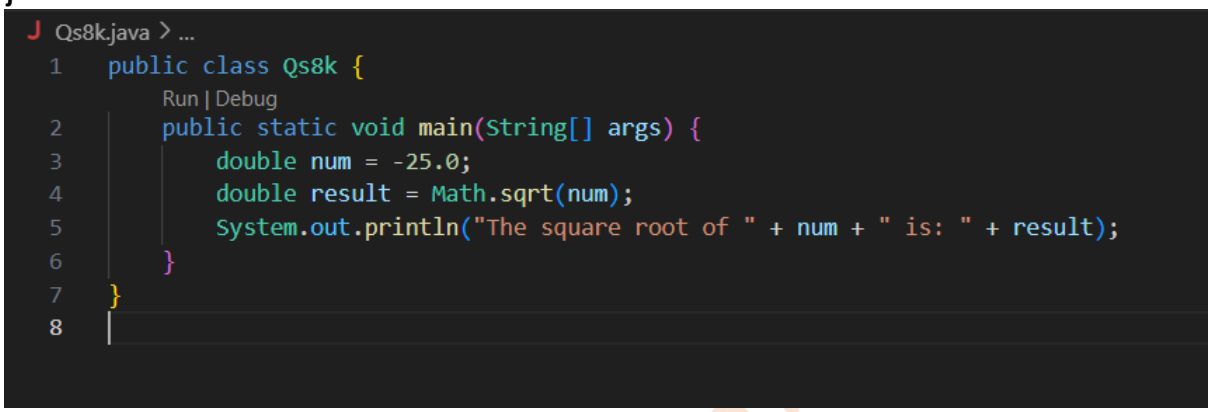
```java
public class Qs8j {
    Run | Debug
    public static void main(String[] args) {
        double num1 = 112.3;
        double num2 = 984.5;
        double result = Double.sum(num1, num2);
        System.out.println("The sum of " + num1 + " and " + num2 + " is: " + result);
    }
}
```

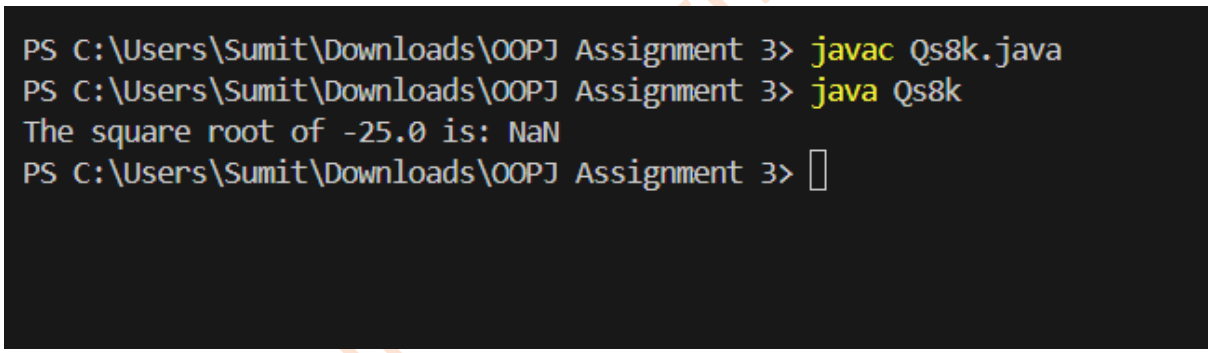
```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs8j.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs8j
The sum of 112.3 and 984.5 is: 1096.8
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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

Ans:

```
public class Qs8k {
public static void main(String[] args) {
 double num = -25.0;
double result = Math.sqrt(num);
System.out.println("The square root of " + num + " is: " + result);
 }
}
```





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

Ans:

```
public class Qs8l {
 public static void main(String[] args) {
double num1 = 0.0;
double num2 = 0.0;
double result = num1 / num2;
 System.out.println("The result of dividing " + num1 + " by " + num2 + " is: " +
result);
 }
}
```

```java
public class Qs8l {
    Run | Debug
    public static void main(String[] args) {
        double num1 = 0.0;
        double num2 = 0.0;
        double result = num1 / num2;
        System.out.println("The result of dividing " + num1 + " by " + num2 + " is: " + result);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs8l.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs8l
The result of dividing 0.0 by 0.0 is: NaN
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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

Ans:

```
public class Qs8m {
public static void main(String[] args) {
double doubleValue = 123.45;
 // Convert double to int
int intValue = (int) doubleValue;
 System.out.println("Double to int: " + intValue);
  // Convert double to float
float floatValue = (float) doubleValue;
 System.out.println("Double to float: " + floatValue);
// Convert double to long
long longValue = (long) doubleValue;
System.out.println("Double to long: " + longValue);
// Convert double to byte
byte byteValue = (byte) doubleValue;
System.out.println("Double to byte: " + byteValue);
 // Convert int to double
int anotherIntValue = 100;
double anotherDoubleValue = (double) anotherIntValue;
System.out.println("Int to double: " + anotherDoubleValue);
```

```
    // Convert float to double
    float anotherFloatValue = 50.5f;
 double anotherDoubleFromFloat = (double) anotherFloatValue;
System.out.println("Float to double: " + anotherDoubleFromFloat);
}
}
```

Qs8m.java > ...

```java
public class Qs8m {
    Run | Debug
    public static void main(String[] args) {
        double doubleValue = 123.45;

        // Convert double to int
        int intValue = (int) doubleValue;
        System.out.println("Double to int: " + intValue);

        // Convert double to float
        float floatValue = (float) doubleValue;
        System.out.println("Double to float: " + floatValue);

        // Convert double to long
        long longValue = (long) doubleValue;
        System.out.println("Double to long: " + longValue);

        // Convert double to byte
        byte byteValue = (byte) doubleValue;
        System.out.println("Double to byte: " + byteValue);

        // Convert int to double
        int anotherIntValue = 100;
        double anotherDoubleValue = (double) anotherIntValue;
        System.out.println("Int to double: " + anotherDoubleValue);

        // Convert float to double
        float anotherFloatValue = 50.5f;
        double anotherDoubleFromFloat = (double) anotherFloatValue;
        System.out.println("Float to double: " + anotherDoubleFromFloat);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs8m.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs8m
Double to int: 123
Double to float: 123.45
Double to long: 123
Double to byte: 123
Int to double: 100.0
Float to double: 50.5
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```

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()`).

Ans:

```
public class Qs8 {
public static void main(String[] args) {
// Initialize variables of each primitive type
 byte byteValue = 10;
 short shortValue = 20;
 int intValue = 30;
 long longValue = 40L;
 float floatValue = 50.5f;
 double doubleValue = 60.6;
 char charValue = 'A';
 boolean booleanValue = true;
  // Convert using toString method of wrapper class
String byteStr1 = Byte.toString(byteValue);
 String shortStr1 = Short.toString(shortValue);
 String intStr1 = Integer.toString(intValue);
 String longStr1 = Long.toString(longValue);
 String floatStr1 = Float.toString(floatValue);
 String doubleStr1 = Double.toString(doubleValue);
 String charStr1 = Character.toString(charValue);
 String booleanStr1 = Boolean.toString(booleanValue);
// Convert using valueOf method of String class
String byteStr2 = String.valueOf(byteValue);
String shortStr2 = String.valueOf(shortValue);
String intStr2 = String.valueOf(intValue);
String longStr2 = String.valueOf(longValue);
String floatStr2 = String.valueOf(floatValue);
String doubleStr2 = String.valueOf(doubleValue);
String charStr2 = String.valueOf(charValue);
String booleanStr2 = String.valueOf(booleanValue);
// Print results
 System.out.println("Using toString method:");
 System.out.println("Byte: " + byteStr1);
System.out.println("Short: " + shortStr1);
System.out.println("Int: " + intStr1);
 System.out.println("Long: " + longStr1);
 System.out.println("Float: " + floatStr1);
 System.out.println("Double: " + doubleStr1);
```

```
        System.out.println("Char: " + charStr1);
        System.out.println("Boolean: " + booleanStr1);


        System.out.println("\nUsing valueOf method:");
        System.out.println("Byte: " + byteStr2);
        System.out.println("Short: " + shortStr2);
        System.out.println("Int: " + intStr2);
        System.out.println("Long: " + longStr2);
        System.out.println("Float: " + floatStr2);
        System.out.println("Double: " + doubleStr2);
        System.out.println("Char: " + charStr2);
        System.out.println("Boolean: " + booleanStr2);
    }
}
```

Qs8.java > Qs8 > main(String[])

```java
public class Qs8 {
    Run | Debug
    public static void main(String[] args) {
        // Initialize variables of each primitive type
        byte byteValue = 10;
        short shortValue = 20;
        int intValue = 30;
        long longValue = 40L;
        float floatValue = 50.5f;
        double doubleValue = 60.6;
        char charValue = 'A';
        boolean booleanValue = true;

        // Convert using toString method of wrapper class
        String byteStr1 = Byte.toString(byteValue);
        String shortStr1 = Short.toString(shortValue);
        String intStr1 = Integer.toString(intValue);
        String longStr1 = Long.toString(longValue);
        String floatStr1 = Float.toString(floatValue);
        String doubleStr1 = Double.toString(doubleValue);
        String charStr1 = Character.toString(charValue);
        String booleanStr1 = Boolean.toString(booleanValue);

        // Convert using valueOf method of String class
        String byteStr2 = String.valueOf(byteValue);
        String shortStr2 = String.valueOf(shortValue);
        String intStr2 = String.valueOf(intValue);
        String longStr2 = String.valueOf(longValue);
        String floatStr2 = String.valueOf(floatValue);
        String doubleStr2 = String.valueOf(doubleValue);
        String charStr2 = String.valueOf(charValue);
        String booleanStr2 = String.valueOf(booleanValue);

        // Print results
        System.out.println(x:"Using toString method:");
        System.out.println("Byte: " + byteStr1);
        System.out.println("Short: " + shortStr1);
```

```
        System.out.println(x:"Using toString method:");
        System.out.println("Byte: " + byteStr1);
        System.out.println("Short: " + shortStr1);
        System.out.println("Int: " + intStr1);
        System.out.println("Long: " + longStr1);
        System.out.println("Float: " + floatStr1);
        System.out.println("Double: " + doubleStr1);
        System.out.println("Char: " + charStr1);
        System.out.println("Boolean: " + booleanStr1);

        System.out.println(x:"\nUsing valueOf method:");
        System.out.println("Byte: " + byteStr2);
        System.out.println("Short: " + shortStr2);
        System.out.println("Int: " + intStr2);
        System.out.println("Long: " + longStr2);
        System.out.println("Float: " + floatStr2);
        System.out.println("Double: " + doubleStr2);
        System.out.println("Char: " + charStr2);
        System.out.println("Boolean: " + booleanStr2);
    }
}
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs8.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs8
Using toString method:
Byte: 10
Short: 20
Int: 30
Long: 40
Float: 50.5
Double: 60.6
Char: A
Boolean: true
```

9. Default Values of Primitive Types

Declare variables of each primitive type as fields of a class and check their default values. (Note: Default values depend on whether the variables are instance variables or static variables).

Ans:

```
public class Qs9 {
// Instance variables
byte instanceByte;
short instanceShort;
```

```
 int instanceInt;
 long instanceLong;
 float instanceFloat;
 double instanceDouble;
 char instanceChar;
 boolean instanceBoolean;
// Static variables
 static byte staticByte;
static short staticShort;
static int staticInt;
static long staticLong;
static float staticFloat;
static double staticDouble;
static char staticChar;
static boolean staticBoolean;
public static void main(String[] args) {
Qs9 obj = new Qs9();
// Display instance variable default values
System.out.println("Instance Variables:");
System.out.println("byte: " + obj.instanceByte);
System.out.println("short: " + obj.instanceShort);
System.out.println("int: " + obj.instanceInt);
System.out.println("long: " + obj.instanceLong);
System.out.println("float: " + obj.instanceFloat);
System.out.println("double: " + obj.instanceDouble);
System.out.println("char: [" + obj.instanceChar + "]");
System.out.println("boolean: " + obj.instanceBoolean);
 // Display static variable default values
System.out.println("\nStatic Variables:");
System.out.println("byte: " + staticByte);
System.out.println("short: " + staticShort);
System.out.println("int: " + staticInt);
System.out.println("float: " + staticFloat);
System.out.println("double: " + staticDouble);
System.out.println("char: [" + staticChar + "]");
System.out.println("boolean: " + staticBoolean);
}
```

}

Qs9.java > ...

```java
public class Qs9 {
    // Instance variables
    byte instanceByte;
    short instanceShort;
    int instanceInt;
    long instanceLong;
    float instanceFloat;
    double instanceDouble;
    char instanceChar;
    boolean instanceBoolean;

    // Static variables
    static byte staticByte;
    static short staticShort;
    static int staticInt;
    static long staticLong;
    static float staticFloat;
    static double staticDouble;
    static char staticChar;
    static boolean staticBoolean;

    Run | Debug
    public static void main(String[] args) {
        Qs9 obj = new Qs9();

        // Display instance variable default values
        System.out.println(x:"Instance Variables:");
        System.out.println("byte: " + obj.instanceByte);
        System.out.println("short: " + obj.instanceShort);
        System.out.println("int: " + obj.instanceInt);
        System.out.println("long: " + obj.instanceLong);
        System.out.println("float: " + obj.instanceFloat);
        System.out.println("double: " + obj.instanceDouble);
        System.out.println("char: [" + obj.instanceChar + "]");
        System.out.println("boolean: " + obj.instanceBoolean);

        // Display static variable default values
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs9.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs9
Instance Variables:
byte: 0
short: 0
int: 0
long: 0
float: 0.0
double: 0.0
char: []
boolean: false
```

10. Arithmetic Operations with Command Line Input

Write a program that accepts two integers and an arithmetic operator (`+`, `-`, `*`, `/`) from the command line. Perform the specified arithmetic operation based on the operator provided. (Hint: Use `switch-case` for operations).

Ans:

```
public class Qs10 {
public static void main(String[] args) {
 if (args.length != 3) {
System.out.println("Usage: java ArithmeticOperations <num1> <operator>
<num2>");
return;
}
try {
int num1 = Integer.parseInt(args[0]);
String operator = args[1];
int num2 = Integer.parseInt(args[2]);
int result = 0;
boolean validOperation = true;
 switch (operator) {
case "+":
result = num1 + num2;
break;
case "-":
result = num1 - num2;
break;
case "*":
result = num1 * num2;
break;
case "/":
if (num2 != 0) {
result = num1 / num2;
} else {
 System.out.println("Error: Division by zero is not allowed.");
validOperation = false;
}
break;
default:
System.out.println("Error: Invalid operator. Use +, -, *, or /.");
validOperation = false;
}
if (validOperation) {
System.out.println("Result: " + result);
}
} catch (NumberFormatException e) {
```

```
            System.out.println("Error: Please enter valid integers.");
        }
    }
}
```

Qs10.java > ...

```java
public class Qs10 {
    Run | Debug
    public static void main(String[] args) {
        if (args.length != 3) {
            System.out.println(x:"Usage: java ArithmeticOperations <num1> <operator> <num2>");
            return;
        }

        try {
            int num1 = Integer.parseInt(args[0]);
            String operator = args[1];
            int num2 = Integer.parseInt(args[2]);

            int result = 0;
            boolean validOperation = true;

            switch (operator) {
                case "+":
                    result = num1 + num2;
                    break;
                case "-":
                    result = num1 - num2;
                    break;
                case "*":
                    result = num1 * num2;
                    break;
                case "/":
                    if (num2 != 0) {
                        result = num1 / num2;
                    } else {
                        System.out.println(x:"Error: Division by zero is not allowed.");
                        validOperation = false;
                    }
                    break;
                default:
                    System.out.println(x:"Error: Invalid operator. Use +, -, *, or /.");
                    validOperation = false;
```

```
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> javac Qs10.java
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3> java Qs10
Usage: java ArithmeticOperations <num1> <operator> <num2>
PS C:\Users\Sumit\Downloads\OOPJ Assignment 3>
```