OOPJ - Assignment 2

1. Working with java.lang.Boolean

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)).

```
public class Q1b{

    public static void main(String[] args){

        String result;

        boolean status = true;

        result=Boolean.toString(status);

        System.out.println(result);

    }

}
```

```
● PS C:\Users\HP\Downloads> cd "c:\Users\HP\Downloads\" ; if ($?) { javac Q1b.java } ; if ($?) { java Q1b }
  true
○ PS C:\Users\HP\Downloads>
```

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)).

```
public class Q1c{

    public static void main(String[] args){

        String strStatus = "true";

        Boolean result=Boolean.parseBoolean(strStatus);

        System.out.println(result);

    }

}
```

```
● PS D:\Programs\Java> cd "c:\Users\HP\Downloads\" ; if ($?) { javac Q1c.java } ; if ($?) { java Q1c }
  true
○ PS C:\Users\HP\Downloads>
```

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").
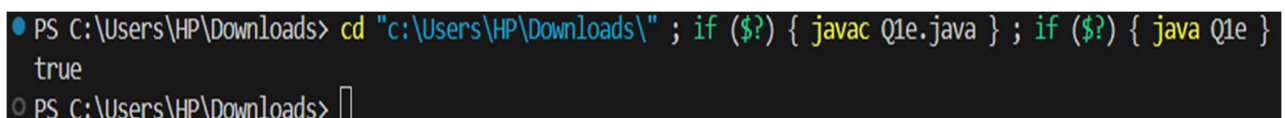
```
public class Q1d{

    public static void main(String[] args){

        String strStatus = "0";

        Boolean result=Boolean.parseBoolean(strStatus);

        System.out.println(result);

    }

}
```

```
PS C:\Users\HP\Downloads> cd "c:\Users\HP\Downloads\" ; if ($?) { javac Q1d.java } ; if ($?) { java Q1d }
 false
PS C:\Users\HP\Downloads>
```

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)).

```
public class Q1e{

    public static void main(String[] args){

        boolean Status = true;

        System.out.println(Boolean.valueOf(Status));

    }

}
```

```
PS C:\Users\HP\Downloads> cd "c:\Users\HP\Downloads\" ; if ($?) { javac Q1e.java } ; if ($?) { java Q1e }
 true
PS C:\Users\HP\Downloads>
```

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)).

```
public class Q1f{

    public static void main(String[] args){

        String strStatus = "true";

        boolean result= Boolean.valueOf(strStatus);
```

```
        System.out.println(result);

    }

}
```


```
● PS C:\Users\HP\Downloads> cd "c:\Users\HP\Downloads\" ; if ($?) { javac Q1f.java } ; if ($?) { java Q1f }
  true
○ PS C:\Users\HP\Downloads> []
```

2. Working with java.lang.Byte

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

public class Q2b{

    public static void main(String[] args) {

        System.out.println(Byte.BYTES);

    }

}


```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q2b.java } ; if ($?) { java Q2b }
  1
○ PS D:\Programs\Java> █
```

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).

public class Q2c {

    public static void main(String[] args) {

        System.out.println(Byte.MIN_VALUE);

        System.out.println(Byte.MAX_VALUE);

    }

}


```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q2c.java } ; if ($?) { java Q2c }
  -128
  127
○ PS D:\Programs\Java> []
```

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)).

public class Q2d{

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

        byte number = 42;

        String numberAsString = Byte.toString(number);

        System.out.println("Byte value as String: " + numberAsString);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q2d.java } ; if ($?) { java Q2d }
  Byte value as String: 42
○ PS D:\Programs\Java> ▯
```

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)).

```java
public class Q2e{

    public static void main(String[] args) {

        String strNumber = "50";

        byte number = Byte.parseByte(strNumber);

        System.out.println(number);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q2e.java } ; if ($?) { java Q2e }
  50
○ PS D:\Programs\Java> ▯
```

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).

```java
public class Q2f{

    public static void main(String[] args) {

        String strNumber = "Ab12Cd3";

        byte num = Byte.parseByte(strNumber);

        System.out.println("Byte value: " + num);

        System.out.println("Error: Cannot convert \"" + strNumber + "\" to a byte.");

    }

}
```

```
⊗ PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q2f.java } ; if ($?) { java Q2f }
  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:588)
          at java.base/java.lang.Byte.parseByte(Byte.java:195)
          at java.base/java.lang.Byte.parseByte(Byte.java:221)
          at Q2f.main(Q2f.java:6)
○ PS D:\Programs\Java> ▯
```

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)).

public class Q2g{

    public static void main(String[] args) {

        byte number = 10;

        Byte byteWrapper = Byte.valueOf(number);

        System.out.println("Byte value: " + number);

        System.out.println("Wrapper class Byte value: " + byteWrapper);

    }

}

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q2g.java } ; if ($?) { java Q2g }
  Byte value: 10
  Wrapper class Byte value: 10
○ PS D:\Programs\Java> ▯
```

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)).

public class Q2h{

    public static void main(String[] args) {

        String strNumber = "10";

        Byte byteWrapper = Byte.valueOf(strNumber);

        System.out.println("String value: " + strNumber);

        System.out.println("Wrapper class Byte value: " + byteWrapper);

    }

}

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q2h.java } ; if ($?) { java Q2h }
  String value: 10
  Wrapper class Byte value: 10
○ PS D:\Programs\Java> []
```

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

public class Q2i{

   public static void main(String[] args) {

      byte number = 42;

      int intValue = number;

      double doubleValue = number;

      short shortValue = number;

      System.out.println("Byte value: " + number);

      System.out.println("Converted to int: " + intValue);

      System.out.println("Converted to double: " + doubleValue);

      System.out.println("Converted to short: " + shortValue);

      int largeInt = 200;

      byte convertedByte = (byte) largeInt;

      System.out.println("Large int: " + largeInt + " converted to byte: " + convertedByte);

   }

}

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q2i.java } ; if ($?) { java Q2i }
  Byte value: 42
  Converted to int: 42
  Converted to double: 42.0
  Converted to short: 42
  Large int: 200 converted to byte: -56
○ PS D:\Programs\Java> []
```

3. Working with java.lang.Short

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

public class Q3b {

   public static void main(String[] args) {

      System.out.println("Bytes used to represent a short: " + Short.BYTES);

```
    }
}
```

```
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac assignment2.java } ; if ($?) { java assignment2 }
Bytes used to represent a short: 2
PS D:\Programs\Java>
```

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).

```
public class Q3c {

    public static void main(String[] args) {

        System.out.println("Minimum value of short: " + Short.MIN_VALUE);

        System.out.println("Maximum value of short: " + Short.MAX_VALUE);

    }

}
```

```
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac assignment2.java } ; if ($?) { java assignment2 }
Minimum value of short: -32768
Maximum value of short: 32767
PS D:\Programs\Java>
```

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)).

```
public class Q3d {

    public static void main(String[] args) {

        short number = 123;

        String strNumber = Short.toString(number);

        System.out.println("Short value as String: " + strNumber);

    }

}
```
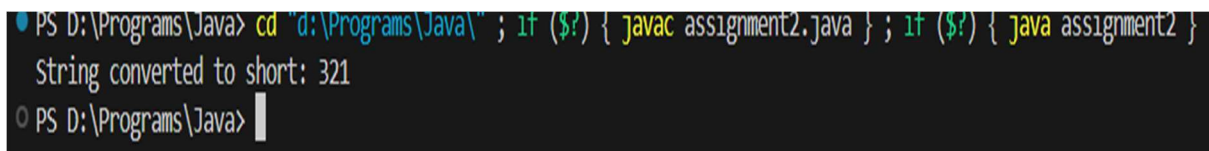
```
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac assignment2.java } ; if ($?) { java assignment2 }
Short value as String: 123
PS D:\Programs\Java>
```

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)).

```java
public class Q3e {

    public static void main(String[] args) {

        String strNumber = "321";

        short number = Short.parseShort(strNumber);

        System.out.println("String converted to short: " + number);

    }

}
```



```
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac assignment2.java } ; if ($?) { java assignment2 }
String converted to short: 321
PS D:\Programs\Java>
```
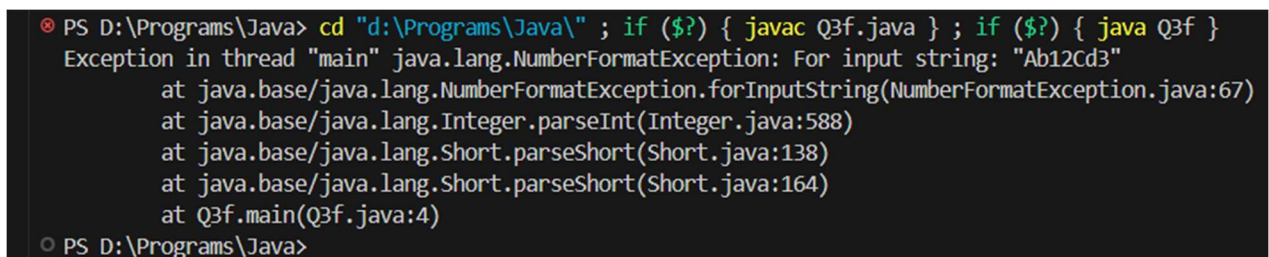
f. Declare a method-local variable strNumber of type String with the value "Ab12Cd3" and attempt to convert it to a short value. (Hint: parseShort method will throw a NumberFormatException).

```java
public class Q3f {

  public static void main(String[] args) {

        String strNumber = "Ab12Cd3";

        short number = Short.parseShort(strNumber);  // This will throw a NumberFormatException

        System.out.println("String converted to short: " + number);  // This line will not be executed

    }

}
```



```
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q3f.java } ; if ($?) { java Q3f }
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:588)
        at java.base/java.lang.Short.parseShort(Short.java:138)
        at java.base/java.lang.Short.parseShort(Short.java:164)
        at Q3f.main(Q3f.java:4)
PS D:\Programs\Java>
```

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)).

```java
public class Q3g {

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

```
    short number = 456;

    Short wrapperNumber = Short.valueOf(number);

    System.out.println("Short wrapper value: " + wrapperNumber);

  }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q3g.java } ; if ($?) { java Q3g }
  Short wrapper value: 456
○ PS D:\Programs\Java>
```

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)).

```
public class Q3h {

  public static void main(String[] args) {

    String strNumber = "789";

    Short wrapperNumber = Short.valueOf(strNumber);

    System.out.println("String converted to Short wrapper: " + wrapperNumber);

  }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q3h.java } ; if ($?) { java Q3h }
  String converted to Short wrapper: 789
○ PS D:\Programs\Java>
```

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

```
public class Q3i {

  public static void main(String[] args) {

    short number = 300;

    int intNumber = (int) number;

    System.out.println("Short to int: " + intNumber);

    long longNumber = (long) number;

    System.out.println("Short to long: " + longNumber);

    double doubleNumber = (double) number;
```

```java
        System.out.println("Short to double: " + doubleNumber);


        int largeInt = 1000;

        short shortFromInt = (short) largeInt;

        System.out.println("Int to short with loss of data: " + shortFromInt);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q3i.java } ; if ($?) { java Q3i }
  Short to int: 300
  Short to long: 300
  Short to double: 300.0
  Int to short with loss of data: 1000
○ PS D:\Programs\Java>
```

4. Working with java.lang.Integer

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

```java
public class Q4b {

    public static void main(String[] args) {

        System.out.println("Bytes used to represent an int: " + Integer.BYTES);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q4b.java } ; if ($?) { java Q4b }
  Bytes used to represent an int: 4
○ PS D:\Programs\Java>
```

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).

```java
public class Q4c {

    public static void main(String[] args) {

        System.out.println("Minimum value of int: " + Integer.MIN_VALUE);

        System.out.println("Maximum value of int: " + Integer.MAX_VALUE);

    }
```

```
}
```

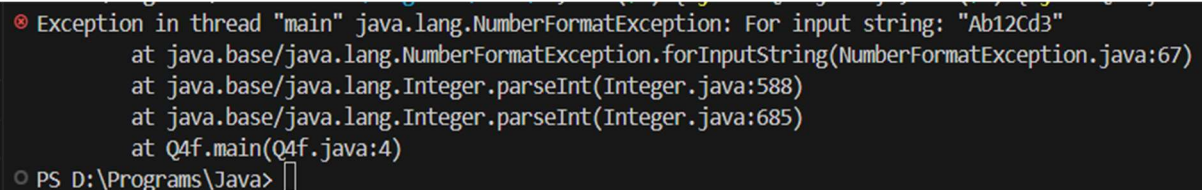**d. Declare a method-local variable number of type int with some value and convert it to a String using the toString method. (Hint: Use Integer.toString(int)).**

```
public class Q4d {

    public static void main(String[] args) {

        int number = 123;

        String strNumber = Integer.toString(number);

        System.out.println("Int value as String: " + strNumber);

    }

}
```

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)).

```
public class Q4e {

    public static void main(String[] args) {

        String strNumber = "321";

        int number = Integer.parseInt(strNumber);

        System.out.println("String converted to int: " + number);

    }

}
```

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).
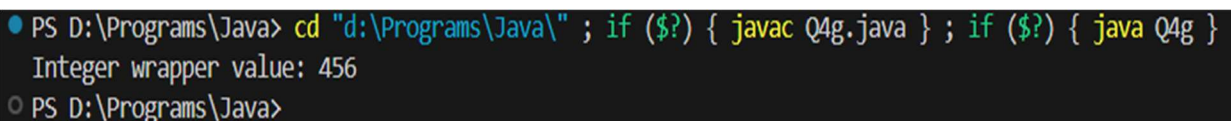
public class Q4f {

public static void main(String[] args) {

    String strNumber = "Ab12Cd3";

    int number = Integer.parseInt(strNumber); // This will throw a NumberFormatException

    System.out.println("String converted to int: " + number); // This line will not be executed

  }

}

```
⊗ 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:588)
        at java.base/java.lang.Integer.parseInt(Integer.java:685)
        at Q4f.main(Q4f.java:4)
○ PS D:\Programs\Java> []
```

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)).

public class Q4g {

  public static void main(String[] args) {

    int number = 456;

    Integer wrapperNumber = Integer.valueOf(number);

    System.out.println("Integer wrapper value: " + wrapperNumber);

  }

}

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q4g.java } ; if ($?) { java Q4g }
  Integer wrapper value: 456
○ PS D:\Programs\Java>
```

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)).

public class Q4h {

  public static void main(String[] args) {

```java
        String strNumber = "789";

        Integer wrapperNumber = Integer.valueOf(strNumber);

        System.out.println("String converted to Integer wrapper: " + wrapperNumber);

    }

}
```

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)).

```java
public class Q4i {

    public static void main(String[] args) {

        int a = 10;

        int b = 20;

        int sum = Integer.sum(a, b);

        System.out.println("Sum of a and b: " + sum);

    }

}
```

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)).

```java
public class Q4j {

    public static void main(String[] args) {

        int a = 10;

        int b = 20;

        int min = Integer.min(a, b);

        int max = Integer.max(a, b);

        System.out.println("Minimum of a and b: " + min);
```
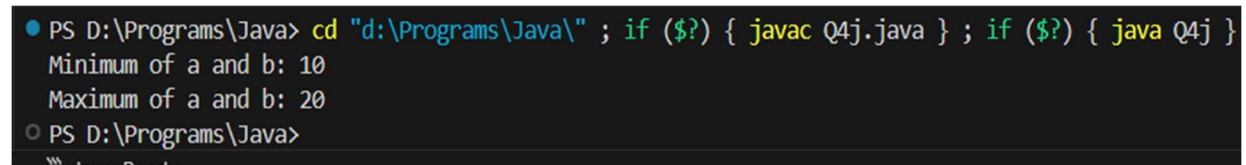
```
        System.out.println("Maximum of a and b: " + max);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q4j.java } ; if ($?) { java Q4j }
  Minimum of a and b: 10
  Maximum of a and b: 20
○ PS D:\Programs\Java>
```
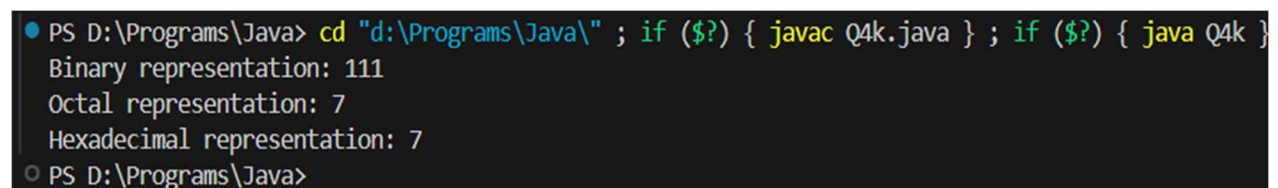
k. Declare an integer variable with the value 7. Convert it to binary, octal, and hexadecimal strings using methods from the Integer class. (Hint: Use Integer.toBinaryString(int), Integer.toOctalString(int), and Integer.toHexString(int)).

```
public class Q4k {

    public static void main(String[] args) {

        int number = 7;

        String binaryString = Integer.toBinaryString(number);

        String octalString = Integer.toOctalString(number);

        String hexString = Integer.toHexString(number);

        System.out.println("Binary representation: " + binaryString);

        System.out.println("Octal representation: " + octalString);

        System.out.println("Hexadecimal representation: " + hexString);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q4k.java } ; if ($?) { java Q4k }
  Binary representation: 111
  Octal representation: 7
  Hexadecimal representation: 7
○ PS D:\Programs\Java>
```

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

```
public class Q4l {

    public static void main(String[] args) {

        int number = 300;

        long longNumber = (long) number;
```

```java
        System.out.println("Int to long: " + longNumber);

        double doubleNumber = (double) number;

        System.out.println("Int to double: " + doubleNumber);

        float floatNumber = (float) number;

        System.out.println("Int to float: " + floatNumber);

        long largeLong = 10000000000L;

        int intFromLong = (int) largeLong;

        System.out.println("Long to int (with possible data loss): " + intFromLong);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q4l.java } ; if ($?) { java Q4l }
  Int to long: 300
  Int to double: 300.0
  Int to float: 300.0
  Long to int (with possible data loss): 1410065408
○ PS D:\Programs\Java>
```

5. Working with java.lang.Long

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

```java
public class Q5b {

    public static void main(String[] args) {

        System.out.println("Bytes used to represent a long: " + Long.BYTES);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q5b.java } ; if ($?) { java Q5b }
  Bytes used to represent a long: 8
○ PS D:\Programs\Java>
```

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).

```java
public class Q5c {

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

```java
        System.out.println("Minimum value of long: " + Long.MIN_VALUE);

        System.out.println("Maximum value of long: " + Long.MAX_VALUE);

    }

}
```

```
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q5c.java } ; if ($?) { java Q5c }
 Minimum value of long: -9223372036854775808
 Maximum value of long: 9223372036854775807
PS D:\Programs\Java>
```

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)).

```java
public class Q5d {

    public static void main(String[] args) {

        long number = 123456789L;

        String strNumber = Long.toString(number);

        System.out.println("Long value as String: " + strNumber);

    }

}
```

```
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q5d.java } ; if ($?) { java Q5d }
 Long value as String: 123456789
PS D:\Programs\Java>
```

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)).

```java
public class Q5e {

    public static void main(String[] args) {

        String strNumber = "987654321";

        long number = Long.parseLong(strNumber);

        System.out.println("String converted to long: " + number);

    }

}
```

```
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q5e.java } ; if ($?) { java Q5e }
 String converted to long: 987654321
PS D:\Programs\Java>
```

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).

public class Q5f {

       public static void main(String[] args) {

       String strNumber ="Ab12Cd3";

       Long number = Long.parseLong(strNumber);

       System.out.println("String converted to long: " + number);

  }

}

```
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q5f.java } ; if ($?) { java Q5f }
Exception in thread "main" java.lang.NumberFormatException: For input string: "Ab12Cd3"
        at java.base/java.lang.NumberFormatException.forInputString(NumberFormatException.java:67)
        at java.base/java.lang.Long.parseLong(Long.java:618)
        at java.base/java.lang.Long.parseLong(Long.java:722)
        at Q5f.main(Q5f.java:4)
PS D:\Programs\Java>
```

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)).

public class Q5g {

  public static void main(String[] args) {

    long number=456789012L;

    Long wrapperNumber = Long.valueOf(number);

    System.out.println("Long wrapper value: " + wrapperNumber);

  }

}

```
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q5g.java } ; if ($?) { java Q5g }
Long wrapper value: 456789012
PS D:\Programs\Java>
```

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)).

public class Q5h {

  public static void main(String[] args) {

```java
        String strNumber ="789654321";

        Long wrapperNumber = Long.valueOf(strNumber);

        System.out.println("String converted to Long wrapper: " + wrapperNumber);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q5h.java } ; if ($?) { java Q5h }
  String converted to Long wrapper: 789654321
○ PS D:\Programs\Java>
```

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)).

```java
public class Q5i {

    public static void main(String[] args) {

        long a = 1123L;

        long b = 9845L;

        long sum = Long.sum(a, b);

        System.out.println("Sum of a and b: " + sum);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q5i.java } ; if ($?) { java Q5i }
  Sum of a and b: 10968
○ PS D:\Programs\Java>
```

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)).

```java
public class Q5j{

    public static void main(String[] args) {

        long a = 1122L;

        long b = 5566L;

        long min = Long.min(a, b);

        long max = Long.max(a, b);

        System.out.println("Minimum of a and b: " + min);
```

```
        System.out.println("Maximum of a and b: " + max);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q5j.java } ; if ($?) { java Q5j }
  Minimum of a and b: 1122
  Maximum of a and b: 5566
○ PS D:\Programs\Java>
```

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)).

```
public class Q5k {

    public static void main(String[] args) {

        long number = 7L;

        String binaryString = Long.toBinaryString(number);

        String octalString = Long.toOctalString(number);

        String hexString = Long.toHexString(number);

        System.out.println("Binary representation: " + binaryString);

        System.out.println("Octal representation: " + octalString);

        System.out.println("Hexadecimal representation: " + hexString);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q5k.java } ; if ($?) { java Q5k }
  Binary representation: 111
  Octal representation: 7
  Hexadecimal representation: 7
○ PS D:\Programs\Java>
```

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

```
public class Q5l {

    public static void main(String[] args) {

        long number = 5000000000L;

        int intNumber = (int) number;

        System.out.println("Long to int with data loss: " + intNumber);
```

```java
        float floatNumber = (float) number;

        System.out.println("Long to float: " + floatNumber);

        double doubleNumber = (double) number;

        System.out.println("Long to double: " + doubleNumber);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q5l.java } ; if ($?) { java Q5l }
  Long to int with data loss: 705032704
  Long to float: 5.0E9
  Long to double: 5.0E9
○ PS D:\Programs\Java>
```

Q6 Working with java.lang.Float

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

```java
public class Q6b {

    public static void main(String[] args) {

        System.out.println("Bytes used to represent a float: " + Float.BYTES);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q6b.java } ; if ($?) { java Q6b }
  Bytes used to represent a float: 4
○ PS D:\Programs\Java>
```

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).

```java
public class Q6c {

    public static void main(String[] args) {

        System.out.println("Minimum value of float: " + Float.MIN_VALUE);

        System.out.println("Maximum value of float: " + Float.MAX_VALUE);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q6c.java } ; if ($?) { java Q6c }
  Minimum value of float: 1.4E-45
  Maximum value of float: 3.4028235E38
○ PS D:\Programs\Java>
```

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)).

public class Q6d {

    public static void main(String[] args) {

        float number = 123.45f;

        String strNumber = Float.toString(number);

        System.out.println("Float value as String: " + strNumber);

    }

}

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q6d.java } ; if ($?) { java Q6d }
  Float value as String: 123.45
○ PS D:\Programs\Java>
```

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)).

public class Q6e {

    public static void main(String[] args) {

        String strNumber = "987.65";

        float number = Float.parseFloat(strNumber);

        System.out.println("String converted to float: " + number);

    }

}

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q6e.java } ; if ($?) { java Q6e }
  String converted to float: 987.65
○ PS D:\Programs\Java>
```

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).

public class Q6f {

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

        String strNumber = "Ab12Cd3";

        float number = Float.parseFloat(strNumber);

        System.out.println("String converted to float: " + number);

    }

}
```

```
 Exception in thread "main" java.lang.NumberFormatException: For input string: "Ab12Cd3"
         at java.base/jdk.internal.math.FloatingDecimal.readJavaFormatString(FloatingDecimal.java:2054)
         at java.base/jdk.internal.math.FloatingDecimal.parseFloat(FloatingDecimal.java:122)
         at java.base/java.lang.Float.parseFloat(Float.java:564)
         at Q6f.main(Q6f.java:4)
○ PS D:\Programs\Java>
```

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)).

```
public class Q6g {

    public static void main(String[] args) {

        float number = 456.78f;

        Float wrapperNumber = Float.valueOf(number);

        System.out.println("Float wrapper value: " + wrapperNumber);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q6g.java } ; if ($?) { java Q6g }
  Float wrapper value: 456.78
○ PS D:\Programs\Java>
```

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)).

```
public class Q6h {

    public static void main(String[] args) {

        String strNumber = "789.65";

        Float wrapperNumber = Float.valueOf(strNumber);

        System.out.println("String converted to Float wrapper: " + wrapperNumber);
```

```
    }
}
```

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)).

public class Q6i {

    public static void main(String[] args) {

        float a = 112.3f;

        float b = 984.5f;

        float sum = Float.sum(a, b);

        System.out.println("Sum of a and b: " + sum);

    }

}

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)).

public class Q6j {

    public static void main(String[] args) {

        float a = 112.2f;

        float b = 556.6f;

        float min = Float.min(a, b);

        float max = Float.max(a, b);

        System.out.println("Minimum of a and b: " + min);

        System.out.println("Maximum of a and b: " + max);

    }

}

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

public class Q6k {

   public static void main(String[] args) {

      float number = -25.0f;

      double sqrtValue = Math.sqrt(number);

      System.out.println("Square root of " + number + " is: " + sqrtValue);

   }

}

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

public class Q6l {

   public static void main(String[] args) {

      float zero1 = 0.0f;

      float zero2 = 0.0f;

      float result = zero1 / zero2;

      System.out.println("Result of 0.0f / 0.0f: " + result);

   }

}

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

```java
public class Q6m {

    public static void main(String[] args) {

        float number = 123.45f;

        int intNumber = (int) number;

        System.out.println("Float to int with data loss: " + intNumber);

        double doubleNumber = (double) number;

        System.out.println("Float to double: " + doubleNumber);

        long longNumber = (long) number;

        System.out.println("Float to long with data loss: " + longNumber);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac assignment2.java } ; if ($?) { java assignment2 }
  Float to int with data loss: 123
  Float to double: 123.44999694824219
  Float to long with data loss: 123
○ PS D:\Programs\Java>
```

Q7 Working with java.lang.Double

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

```java
public class Q7b {

    public static void main(String[] args) {

        System.out.println("Bytes used to represent a double: " + Double.BYTES);

    }

}
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac assignment2.java } ; if ($?) { java assignment2 }
  Bytes used to represent a double: 8
○ PS D:\Programs\Java>
```

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).

```java
public class Q7c {

    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 D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac assignment2.java } ; if ($?) { java assignment2 }
Minimum value of double: 4.9E-324
Maximum value of double: 1.7976931348623157E308
PS D:\Programs\Java>
```

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)).

```java
public class Q7d {

    public static void main(String[] args) {

        double number = 123.456;

        String numberStr = Double.toString(number);

        System.out.println("Double to String: " + numberStr);

    }

}
```

```
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac assignment2.java } ; if ($?) { java assignment2 }
Double to String: 123.456
PS D:\Programs\Java>
```

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)).

```java
public class Q7e {

    public static void main(String[] args) {

        String strNumber = "123.456";

        double number = Double.parseDouble(strNumber);

        System.out.println("String to double: " + number);

    }
```

```
}
```

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).

public class Q7f {

   public static void main(String[] args) {

      String strNumber = "Ab12Cd3";

      double number = Double.parseDouble(strNumber);

      System.out.println("String to double: " + number);

   }

}

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)).

public class Q7g {

   public static void main(String[] args) {

      double number = 123.456;

      Double wrapper = Double.valueOf(number);

      System.out.println("Wrapper class Double: " + wrapper);

   }

}

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)).

public class Q7h {

   public static void main(String[] args) {

      String strNumber = "123.456";

      Double wrapper = Double.valueOf(strNumber);

      System.out.println("Wrapper class Double from String: " + wrapper);

   }

}

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac assignment2.java } ; if ($?) { java assignment2 }
  Wrapper class Double from String: 123.456
○ PS D:\Programs\Java> |
```

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)).

public class Q7i {

   public static void main(String[] args) {

      double num1 = 112.3;

      double num2 = 984.5;

      double sum = Double.sum(num1, num2);

      System.out.println("Sum of doubles: " + sum);

   }

}

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac assignment2.java } ; if ($?) { java assignment2 }
  Sum of doubles: 1096.8
○ PS D:\Programs\Java> |
```

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)).

public class Q7j {

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

        double num1 = 112.2;

        double num2 = 556.6;

        double min = Double.min(num1, num2);

        double max = Double.max(num1, num2);

        System.out.println("Minimum value: " + min);

        System.out.println("Maximum value: " + max);

    }

}
```

```
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac assignment2.java } ; if ($?) { java assignment2 }
Minimum value: 112.2
Maximum value: 556.6
PS D:\Programs\Java>
```

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

```java
public class Q7k {

    public static void main(String[] args) {

        double number = -25.0;

        double sqrt = Math.sqrt(number);

        System.out.println("Square root of " + number + ": " + sqrt);

    }

}
```

```
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac assignment2.java } ; if ($?) { java assignment2 }
Square root of -25.0: NaN
PS D:\Programs\Java>
```

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

```java
public class Q7l {

    public static void main(String[] args) {

        double num1 = 0.0;

        double num2 = 0.0;
```

```
        double result = num1 / num2;

        System.out.println("0.0 / 0.0: " + result);

    }

}
```


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

```
public class Q7m {

    public static void main(String[] args) {

        double number = 123.456;

        int intValue = (int) number;

        long longValue = (long) number;

        float floatValue = (float) number;

        System.out.println("Double to int: " + intValue);

        System.out.println("Double to long: " + longValue);

        System.out.println("Double to float: " + floatValue);

    }

}
```
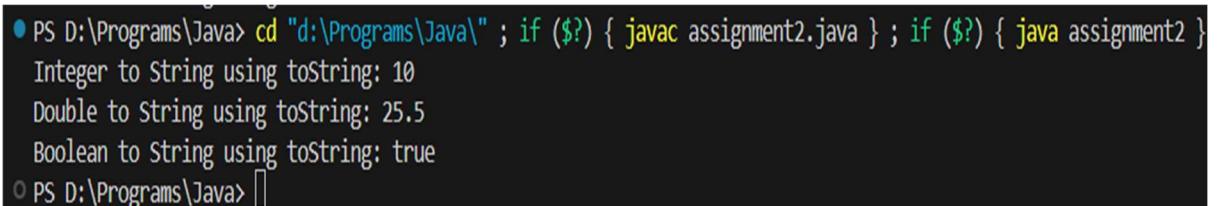

8. Conversion between Primitive Types and Strings

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()).

```java
public class Q8a {

    public static void main(String[] args) {

        int intValue = 10;

        double doubleValue = 25.5;

        boolean booleanValue = true;

        String intStr = Integer.toString(intValue);

        String doubleStr = Double.toString(doubleValue);

        String booleanStr = Boolean.toString(booleanValue);

        System.out.println("Integer to String using toString: " + intStr);

        System.out.println("Double to String using toString: " + doubleStr);

        System.out.println("Boolean to String using toString: " + booleanStr);

    }

}
```

```
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac assignment2.java } ; if ($?) { java assignment2 }
Integer to String using toString: 10
Double to String using toString: 25.5
Boolean to String using toString: true
PS D:\Programs\Java>
```

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

```java
public class Q8b {

    public static void main(String[] args) {

        int intValue = 10;

        double doubleValue = 25.5;

        boolean booleanValue = true;

        String intStr = String.valueOf(intValue);

        String doubleStr = String.valueOf(doubleValue);

        String booleanStr = String.valueOf(booleanValue);

        System.out.println("Integer to String using valueOf: " + intStr);

        System.out.println("Double to String using valueOf: " + doubleStr);
```

```
            System.out.println("Boolean to String using valueOf: " + booleanStr);

        }

    }
```

```
● PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac assignment2.java } ; if ($?) { java assignment2 }
  Integer to String using valueOf: 10
  Double to String using valueOf: 25.5
  Boolean to String using valueOf: 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).

public class Q9 {

    int intValue;

    float floatValue;

    double doubleValue;

    long longValue;

    boolean boolValue;

    char charValue;

    byte byteValue;

    short shortValue;

    static int staticIntValue;

    static float staticFloatValue;

    static double staticDoubleValue;

    static long staticLongValue;

    static boolean staticBoolValue;

    static char staticCharValue;

    static byte staticByteValue;

    static short staticShortValue;

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

    Q9 obj = new Q9();
    System.out.println("Instance Variable Defaults:");
    System.out.println("int: " + obj.intValue);
    System.out.println("float: " + obj.floatValue);
    System.out.println("double: " + obj.doubleValue);
    System.out.println("long: " + obj.longValue);
    System.out.println("boolean: " + obj.boolValue);
    System.out.println("char: '" + obj.charValue + "'");
    System.out.println("byte: " + obj.byteValue);
    System.out.println("short: " + obj.shortValue);

    System.out.println("\nStatic Variable Defaults:");
    System.out.println("static int: " + staticIntValue);
    System.out.println("static float: " + staticFloatValue);
    System.out.println("static double: " + staticDoubleValue);
    System.out.println("static long: " + staticLongValue);
    System.out.println("static boolean: " + staticBoolValue);
    System.out.println("static char: '" + staticCharValue + "'");
    System.out.println("static byte: " + staticByteValue);
    System.out.println("static short: " + staticShortValue);
}
}
```

```
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac assignment2.java } ; if ($?) { java assignment2 }
Instance Variable Defaults:
int: 0
float: 0.0
double: 0.0
long: 0
boolean: false
char: ''
byte: 0
short: 0

Static Variable Defaults:
static int: 0
static float: 0.0
static double: 0.0
static long: 0
static boolean: false
static char: ''
static byte: 0
static short: 0
PS D:\Programs\Java>
```

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).

import java.util.Scanner;

public class Q10 {

   public static void main(String[] args) {

      Scanner sc = new Scanner(System.in);

      System.out.print("Enter the first integer: ");

      int num1 = sc.nextInt();

      System.out.print("Enter the second integer: ");

      int num2 = sc.nextInt();

      System.out.print("Enter an operator (+, -, *, /): ");

      char operator = sc.next().charAt(0);

      int result;

      switch (operator) {

         case '+':

            result = num1 + num2;

```java
            System.out.println("Result: " + num1 + " + " + num2 + " = " + result);
            break;
        case '-':
            result = num1 - num2;
            System.out.println("Result: " + num1 + " - " + num2 + " = " + result);
            break;
        case '*':
            result = num1 * num2;
            System.out.println("Result: " + num1 + " * " + num2 + " = " + result);
            break;
        case '/':
            if (num2 != 0) {
                result = num1 / num2;
                System.out.println("Result: " + num1 + " / " + num2 + " = " + result);
            } else {
                System.out.println("Error: Division by zero is not allowed.");
            }
            break;
        default:
            System.out.println("Error: Invalid operator. Please enter +, -, *, or /.");
    }
  }
}
```

```
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q10.java } ; if ($?) { java Q10 }
Enter the first integer: 6
Enter the second integer: 21
Enter an operator (+, -, *, /): +
Result: 6 + 21 = 27
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q10.java } ; if ($?) { java Q10 }
Enter the first integer: 5
Enter the second integer: 6
Enter an operator (+, -, *, /): *
Result: 5 * 6 = 30
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q10.java } ; if ($?) { java Q10 }
Enter the first integer: 3
Enter the second integer: 98
Enter an operator (+, -, *, /): -
Result: 3 - 98 = -95
PS D:\Programs\Java> cd "d:\Programs\Java\" ; if ($?) { javac Q10.java } ; if ($?) { java Q10 }
Enter the first integer: 16
Enter the second integer: 4
Enter an operator (+, -, *, /): /
Result: 16 / 4 = 4
PS D:\Programs\Java>
```