**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 HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Boolean.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Boolean.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Boolean.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Boolean.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Boolean.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Boolean.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Boolean.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Boolean.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Boolean.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Boolean.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Boolean.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Boolean.html" HYPERLINK 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**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) ).

==>

**class Q1b {**

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

**boolean status =true ;**

**System.out.println(status);**

**String str =Boolean.toString(status);**

**System.out.println(str);**

**}**

**}**

**output==>**

**true**

**true**

**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";**

**System.out.println(strStatus);**

**boolean boolvalue= Boolean.parseBoolean(strStatus);**

**System.out.println(boolvalue);**

**}**

**}**

**output ==>**

**true**

**true**

**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 value =Boolean.parseBoolean(strStatus);**

**System.out.println(value);**

**}**

**}**

**output =false**

**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;**

**boolean statusWrapper =Boolean.valueOf(status);**

**System.out.println(statusWrapper);**

**}**

**}**

**output true**

**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 strStatusWrapper =Boolean.valueOf(strStatus);**

**System.out.println(strStatusWrapper);**

**}**

**}**

**output ==>true**

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

**public class Q1g {**

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

**int num =12;**

**float numChange =(float) num;**

**System.out.println(numChange);**

**int num2 =12252555;**

**double num2Change =(double) num2;**

**System.out.println(num2Change);**

**double num3 =12252555.68d;**

**int num3Change =(int) num3;**

**System.out.println(num3Change);**

**}**

**}**

**output==>**

**12.0**

**1.2252555E7**

**122525552. Working with java.lang.Byte**

**2. Working with java.lang.Byte**

**a.** Explore the [Java API documentation for HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Byte.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Byte.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Byte.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Byte.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Byte.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Byte.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Byte.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Byte.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Byte.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Byte.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Byte.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Byte.html" HYPERLINK 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**b.** Write a program to test how many bytes are used to represent a byte value using the BYTES field. (Hint: Use Byte.BYTES).

==>

**class Q2b {**

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

**int bytesweused =Byte.BYTES;**

**System.out.println(bytesweused);**

**}**

**}**

**output ==>**

**1**

**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) {**

**byte minValue = Byte.MIN\_VALUE;**

**byte maxValue = Byte.MAX\_VALUE;**

**System.out.println(minValue);**

**System.out.println(maxValue);**

**}**

**}**

**OUTPUT ==>**

**-128**

**127**

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

==>

**public class Q2d {**

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

**byte number = 11;**

**String str =Byte.toString(number);**

**System.out.println(str);**

**}**

**}**

**output 11**

**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)).

**==>**

**public class Q2e {**

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

**String strNumber ="123";**

**byte changeValue =Byte.parseByte(strNumber);**

**System.out.println(changeValue);**

**}**

**}**

**output 123**

**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).

==>**public class Q2f {**

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

**String strNumber ="Ab12Cd3";**

**byte changeByte= Byte.parseByte(strNumber);**

**System.out.println(changeByte);**

**}**

**}**

**output ==>**

**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:665)**

**at java.base/java.lang.Byte.parseByte(Byte.java:193)**

**at java.base/java.lang.Byte.parseByte(Byte.java:219)**

**at Q2f.main(Q2f.java:5)**

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

==>

**public class Q2g {**

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

**byte number =12;**

**byte wrappperNum=Byte.valueOf(number);**

**System.out.println(wrappperNum);**

**}**

**}**

**outpu=> 12**

**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 ="123";**

**byte changestr =Byte.valueOf(strNumber);**

**System.out.println(changestr);**

**}**

**}**

**output ==> 123**

**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) {**

**int number =134;**

**byte changenum =(byte) number;**

**System.out.println(changenum);**

**short number2=455;**

**byte changeByte =(byte) number2;**

**System.out.println(changeByte);**

**}**

**}**

**outpu**

**-122**

**-57**

**3. Working with java.lang.Short**

**a.** Explore the [Java API documentation for HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Short.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Short.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Short.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Short.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Short.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Short.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Short.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Short.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Short.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Short.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Short.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Short.html" HYPERLINK 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**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) {**

**short byteUsed = Short.BYTES;**

**System.out.println(byteUsed);**

**}**

**}**

**output =>2**

**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) {**

**short minvalue =Short.MIN\_VALUE;**

**short maxvalue =Short.MAX\_VALUE;**

**System.out.println("min value"+minvalue);**

**System.out.println(" max value "+maxvalue);**

**}**

**}**

**output**

**min value-32768**

**max value 32767**

**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 = 325;**

**String valuechange = Short.toString(number);**

**System.out.println(valuechange);**

**}**

**}**

**output**

**325**

**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))

**==>.**

**public class Q3e {**

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

**String strNumber= "11";**

**short changevalue =Short.parseShort(strNumber);**

**System.out.println(changevalue);**

**}**

**}**

**output ==> 11**

**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).

==>

**public class Q3f {**

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

**String strNumber = "Ab12Cd3";**

**short changevaltoshort=Short.parseShort(strNumber);**

**System.out.println(changevaltoshort);**

**}**

**}**

**output==>**

**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:665)**

**at java.base/java.lang.Short.parseShort(Short.java:137)**

**at java.base/java.lang.Short.parseShort(Short.java:163)**

**at Q3f.main(Q3f.java:4)**

**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)).

==>

**public class Q3g {**

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

**short strNumber =123;**

**short shortwrapper =Short.valueOf(strNumber);**

**System.out.println(shortwrapper);**

**}**

**}**

**==> 123**

**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 ="123";**

**short changewrapper=Short.valueOf(strNumber);**

**System.out.println(changewrapper);**

**}**

**}**

**output ==>123**

**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 num1=745;**

**int changeshort=num1;**

**System.out.println(changeshort);**

**}**

**}**

**==>745**

**4. Working with java.lang.Integer**

**a.** Explore the [Java API documentation for HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Integer.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Integer.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Integer.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Integer.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Integer.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Integer.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Integer.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Integer.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Integer.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Integer.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Integer.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Integer.html" HYPERLINK 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**b.** Write a program to test how many bytes are used to represent an int value using the BYTES field. (Hint: Use Integer.BYTES).

**answer =>**

**public class Q4a {**

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

**int byteused =Integer.BYTES;**

**System.out.println(byteused);**

**}**

**}**

**output ==>4**

**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).

**public class Q4c {**

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

**int minvalue = Integer.MIN\_VALUE;**

**int maxvalue = Integer.MAX\_VALUE;**

**System.out.println("min value" + minvalue);**

**System.out.println("max value" + maxvalue);**

**}**

**}**

**output =>**

**min value-2147483648**

**max value2147483647**

**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 str=Integer.toString(number);**

**System.out.println(str);**

**}**

**}**

**output =>**

**123**

**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)).

answer ==>

**public class Q4e {**

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

**String strNumber = "1234";**

**int change =Integer.parseInt(strNumber);**

**System.out.println(change);**

**}**

**}**

**output ==>1234**

**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 changevalue =Integer.parseInt(strNumber);**

**System.out.println(changevalue);**

**}**

**}**

**output ==>**

**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:665)**

**at java.base/java.lang.Integer.parseInt(Integer.java:781)**

**at Q4f.main(Q4f.java:4)**

**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 =1223;**

**int intwrapper =Integer.valueOf(number);**

**System.out.println(intwrapper);**

**}**

**}**

**==>1223**

**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) {**

**String strNumber = "1234";**

**int checkwrappwr = Integer.valueOf(strNumber);**

**System.out.println(checkwrappwr);**

**}**

**}**

**output ==>1234**

**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)).

**answer==>**

**public class Q4i {**

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

**int num1=10;**

**int num2=20;**

**int result=Integer.sum(num1,num2);**

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

**}**

**}**

**==>30**

**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)).

answer =>

**public class Q4j {**

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

**int a=10;**

**int b =20;**

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

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

**}**

**}**

**output=>**

**20**

**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 a = 7;**

**String binarystring = Integer.toBinaryString(a);**

**String hexadecimalstr = Integer.toHexString(a);**

**String octailstr = Integer.toOctalString(a);**

**System.out.println(binarystring);**

**System.out.println(hexadecimalstr);**

**System.out.println(octailstr);**

**}**

**}**

**==>**

**111**

**7**

**7**

**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 = 100;**

**byte byteValue = (byte) number;**

**short shortValue = (short) number;**

**long longValue = number;**

**float floatValue = number;**

**double doubleValue = number;**

**char charValue = (char) number;**

**boolean boolValue = (number != 0);**

**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: " + boolValue);**

**int fromByte = byteValue;**

**int fromShort = shortValue;**

**int fromLong = (int) longValue;**

**int fromFloat = (int) floatValue;**

**int fromDouble = (int) doubleValue;**

**int fromChar = charValue;**

**System.out.println("\nConverted back to int:");**

**System.out.println("From byte: " + fromByte);**

**System.out.println("From short: " + fromShort);**

**System.out.println("From long: " + fromLong);**

**System.out.println("From float: " + fromFloat);**

**System.out.println("From double: " + fromDouble);**

**System.out.println("From char: " + fromChar);**

**}**

**}**

**output ==>**

**Original int value: 100**

**Converted to byte: 100**

**Converted to short: 100**

**Converted to long: 100**

**Converted to float: 100.0**

**Converted to double: 100.0**

**Converted to char: d**

**Converted to boolean: true**

**Converted back to int:**

**From byte: 100**

**From short: 100**

**From long: 100**

**From float: 100**

**From double: 100**

**From char: 100**

**5. Working with java.lang.Long**

**a.** Explore the [Java API documentation for HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Long.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Long.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Long.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Long.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Long.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Long.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Long.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Long.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Long.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Long.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Long.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Long.html" HYPERLINK 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**b.** Write a program to test how many bytes are used to represent a long value using the BYTES field. (Hint: Use Long.BYTES).

==>

**public class Q5b {**

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

**long byteUsed = Long.BYTES;**

**System.out.println(byteUsed);**

**}**

**}**

**==>8**

**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).

==>

**public class Q5c {**

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

**long minvalue=Long.MIN\_VALUE;**

**long maxvalue=Long.MAX\_VALUE;**

**System.out.println("max value" +maxvalue);**

**System.out.println("min value"+minvalue);**

**}**

**}**

**==>**

**max value9223372036854775807**

**min value-9223372036854775808**

**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)).

**==>**

**public class Q5d {**

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

**long number =12345;**

**String str =Long.toString(number);**

**System.out.println(str);**

**}**

**}**

**==>12345**

**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)).

==>

**public class Q5e {**

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

**String strNumber ="1234576";**

**Long strchange =Long.parseLong(strNumber);**

**System.out.println(strchange);**

**}**

**}**

**==> 1234576**

**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 change = Long.parseLong(strNumber);**

**System.out.println(change);**

**}**

**}**

**==>**

**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:708)**

**at java.base/java.lang.Long.parseLong(Long.java:831)**

**at Q5f.main(Q5f.java:4)**

**PS C:\Users\gaura\OneDrive\Desktop\C-DAC 2024\core java sandeep sir\Assignments\Assignment 4>**

**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 =123456;**

**long wrapper =Long.valueOf(number);**

**System.out.println(wrapper);**

**}**

**}**

**==> 123456**

**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) {**

**String setNumber ="489464416";**

**Long change =Long.valueOf(setNumber);**

**System.out.println(change);**

**}**

**}**

**==>489464416**

**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)).

==>

**public class Q5i {**

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

**long value1 = 11233;**

**long value12 = 9845;**

**long result = Long.sum(value12, value1);**

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

**}**

**}**

**==>21078**

**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)).

=>>

**public class Q5j {**

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

**long value1 = 1122 ;**

**long value12 = 5566;**

**long max = Long.max(value1, value12);**

**long min = Long.min(value1, value12);**

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

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

**}**

**}**

**==> value is min : 1122**

**value is max : 5566**

**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 value =7;**

**String binary =Long.toBinaryString(value);**

**String octal =Long.toOctalString(value);**

**String hexadecimal =Long.toHexString(value);**

**System.out.println("value is binary :" + binary);**

**System.out.println("value is octal :" + octal);**

**System.out.println("value is hexadecimal:" + hexadecimal);**

**}**

**}**

**==>**

**value is binary :111**

**value is octal :7**

**value is hexadecimal:7**

**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 longValue = 100000L;**

**int intValue = (int) longValue;**

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

**short shortValue = (short) longValue;**

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

**byte byteValue = (byte) longValue;**

**System.out.println("Long to byte: " + byteValue);**

**float floatValue = longValue;**

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

**double doubleValue = longValue;**

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

**int intToLong = 200;**

**long convertedLongFromInt = intToLong;**

**System.out.println("Int to long: " + convertedLongFromInt);**

**short shortToLong = 300;**

**long convertedLongFromShort = shortToLong;**

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

**byte byteToLong = 100;**

**long convertedLongFromByte = byteToLong;**

**System.out.println("Byte to long: " + convertedLongFromByte);**

**}**

**}**

**===> output**

**Long to int: 100000**

**Long to short: -31072**

**Long to byte: -96**

**Long to float: 100000.0**

**Long to double: 100000.0**

**Int to long: 200**

**Short to long: 300**

**6. Working with java.lang.Float**

**a.** Explore the [Java API documentation for HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Float.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Float.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Float.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Float.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Float.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Float.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Float.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Float.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Float.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Float.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Float.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Float.html" HYPERLINK 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**b.** Write a program to test how many bytes are used to represent a float value using the BYTES field. (Hint: Use 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).

**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)).

**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)).

**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).

**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)).

**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)).

**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)).

**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)).

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

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

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

**==>**

**public class Q6 {**

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

**// b. Write a program to test how many bytes are used to represent a float value using the BYTES field.**

**int floatBytes = Float.BYTES;**

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

**// c. Write a program to find the minimum and maximum values of float using the MIN\_VALUE and MAX\_VALUE fields.**

**float minFloatValue = Float.MIN\_VALUE;**

**float maxFloatValue = Float.MAX\_VALUE;**

**System.out.println("Minimum value for float: " + minFloatValue);**

**System.out.println("Maximum value for float: " + maxFloatValue);**

**// d. Declare a method-local variable number of type float with some value and convert it to a String using the toString method.**

**float floatNumber = 123.45f;**

**String floatAsString = Float.toString(floatNumber);**

**System.out.println("Float as String: " + floatAsString);**

**// e. Declare a method-local variable strNumber of type String with some value and convert it to a float value using the parseFloat method.**

**String strNumber = "456.78";**

**float parsedFloat = Float.parseFloat(strNumber);**

**System.out.println("Parsed float: " + parsedFloat);**

**// f. Declare a method-local variable strNumber of type String with the value "Ab12Cd3" and attempt to convert it to a float value.**

**try {**

**String invalidStrNumber = "Ab12Cd3";**

**float invalidFloat = Float.parseFloat(invalidStrNumber);**

**System.out.println("This won't print: " + invalidFloat);**

**} catch (NumberFormatException e) {**

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

**}**

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

**float floatValue = 789.01f;**

**Float floatWrapper = Float.valueOf(floatValue);**

**System.out.println("Float wrapper: " + floatWrapper);**

**// 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().**

**String floatStrNumber = "987.65";**

**Float strToWrapper = Float.valueOf(floatStrNumber);**

**System.out.println("String to Float wrapper: " + strToWrapper);**

**// i. Declare two float variables with values 112.3 and 984.5, and add them using a method from the Float class.**

**float float1 = 112.3f;**

**float float2 = 984.5f;**

**float sumResult = Float.sum(float1, float2);**

**System.out.println("Sum of floats: " + sumResult);**

**// j. Declare two float variables with values 112.2 and 556.6, and find the minimum and maximum values using the Float class.**

**float float3 = 112.2f;**

**float float4 = 556.6f;**

**float minFloat = Float.min(float3, float4);**

**float maxFloat = Float.max(float3, float4);**

**System.out.println("Minimum float: " + minFloat + ", Maximum float: " + maxFloat);**

**// k. Declare a float variable with the value -25.0f. Find the square root of this value.**

**float negativeFloat = -25.0f;**

**double sqrtResult = Math.sqrt(negativeFloat); // Note: Math.sqrt() returns double**

**System.out.println("Square root of " + negativeFloat + ": " + sqrtResult);**

**// l. Declare two float variables with the same value, 0.0f, and divide them.**

**float zero1 = 0.0f;**

**float zero2 = 0.0f;**

**float zeroDivisionResult = zero1 / zero2;**

**System.out.println("Result of dividing 0.0f by 0.0f: " + zeroDivisionResult);**

**}**

**}**

**==>**

**Bytes used to represent a float: 4**

**Minimum value for float: 1.4E-45**

**Maximum value for float: 3.4028235E38**

**Float as String: 123.45**

**Parsed float: 456.78**

**Caught NumberFormatException: For input string: "Ab12Cd3"**

**Float wrapper: 789.01**

**String to Float wrapper: 987.65**

**Sum of floats: 1096.8**

**Minimum float: 112.2, Maximum float: 556.6**

**Square root of -25.0: NaN**

**Result of dividing 0.0f by 0.0f: NaN**

**7. Working with java.lang.Double**

**a.** Explore the [Java API documentation for HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Double.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Double.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Double.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Double.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Double.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Double.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Double.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Double.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Double.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Double.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Double.html" HYPERLINK "https://docs.oracle.com/javase/8/docs/api/java/lang/Double.html" HYPERLINK 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**b.** Write a program to test how many bytes are used to represent a double value using the BYTES field. (Hint: Use 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).

**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)).

**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)).

**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).

**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)).

**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)).

**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)).

**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)).

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

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

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

**==>**

**public class Q7 {**

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

**// b**

**double bytescheck = Double.BYTES;**

**System.out.println("byte for double is :" + bytescheck);**

**// c**

**double minValue = Double.MIN\_VALUE;**

**double maxValue = Double.MAX\_VALUE;**

**System.out.println("min value for double is: " + minValue + "" + " max value for double is " + maxValue);**

**// d**

**double number = 234.3456;**

**String str = Double.toString(number);**

**System.out.println(str);**

**// e**

**String strNumber = "123.45";**

**double strnum = Double.parseDouble(strNumber);**

**System.out.println(strnum);**

**// f**

**// String strNumString1 ="Ab12Cd3";**

**// Double strchange =Double.parseDouble(strNumString1);**

**// System.out.println(strchange);**

**// g**

**double number1 = 456.856;**

**Double numwrapper = Double.valueOf(number1);**

**System.out.println(numwrapper);**

**// h**

**String strnumber = "125.45";**

**Double strwrapper = Double.valueOf(strnumber);**

**System.out.println(strwrapper);**

**// i**

**double value1 = 112.3;**

**double value2 = 984.5;**

**double result =Double.sum(value1 ,value2);**

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

**//j**

**double value3= 112.2;**

**double value4= 556.6;**

**double min=Double.min(value4, value3);**

**double max=Double.max(value4, value3);**

**System.out.println("min value is : "+min+" max value is : "+max);**

**//k**

**double variable =-25.0;**

**double result1 =Math.sqrt(variable);**

**System.out.println(result1);**

**//l**

**double x=0.0;**

**double y=0.0;**

**double result3 =x/y;**

**System.out.println(result3);**

**}**

**}**

**==> output**

**byte for double is :8.0**

**min value for double is: 4.9E-324 max value for double is 1.7976931348623157E308**

**234.3456**

**123.45**

**456.856**

**125.45**

**1096.8**

**min value is : 112.2 max value is : 556.6**

**NaN**

**NaN**

**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()).

**==>**

**public class Q8 {**

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

**// Initialize variables of each primitive type with user-defined values**

**int a = 42;**

**double b = 3.14;**

**float c = 9.81f;**

**long d = 123456789L;**

**boolean e = true;**

**char f = 'A';**

**byte g = 127;**

**short h = 32000;**

**String aStr = Integer.toString(a);**

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

**String bStr = Double.toString(b);**

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

**String cStr = Float.toString(c);**

**System.out.println("Float to String using toString(): " + cStr);**

**String dStr = Long.toString(d);**

**System.out.println("Long to String using toString(): " + dStr);**

**String eStr = Boolean.toString(e);**

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

**String fStr = Character.toString(f);**

**System.out.println("Char to String using toString(): " + fStr);**

**String gStr = Byte.toString(g);**

**System.out.println("Byte to String using toString(): " + gStr);**

**String hStr = Short.toString(h);**

**System.out.println("Short to String using toString(): " + hStr);**

**String aStr2 = String.valueOf(a);**

**System.out.println("Integer to String using valueOf(): " + aStr2);**

**String bStr2 = String.valueOf(b);**

**System.out.println("Double to String using valueOf(): " + bStr2);**

**String cStr2 = String.valueOf(c);**

**System.out.println("Float to String using valueOf(): " + cStr2);**

**String dStr2 = String.valueOf(d);**

**System.out.println("Long to String using valueOf(): " + dStr2);**

**String eStr2 = String.valueOf(e);**

**System.out.println("Boolean to String using valueOf(): " + eStr2);**

**String fStr2 = String.valueOf(f);**

**System.out.println("Char to String using valueOf(): " + fStr2);**

**String gStr2 = String.valueOf(g);**

**System.out.println("Byte to String using valueOf(): " + gStr2);**

**String hStr2 = String.valueOf(h);**

**System.out.println("Short to String using valueOf(): " + hStr2);**

**}**

**}**

**==>ouitput**

**Integer to String using toString(): 42**

**Double to String using toString(): 3.14**

**Float to String using toString(): 9.81**

**Long to String using toString(): 123456789**

**Boolean to String using toString(): true**

**Char to String using toString(): A**

**Byte to String using toString(): 127**

**Short to String using toString(): 32000**

**Integer to String using valueOf(): 42**

**Double to String using valueOf(): 3.14**

**Float to String using valueOf(): 9.81**

**Long to String using valueOf(): 123456789**

**Boolean to String using valueOf(): true**

**Char to String using valueOf(): A**

**Byte to String using valueOf(): 127**

**Short to String using valueOf(): 32000**

**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 {**

**// Instance variables (non-static)**

**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) {**

**// Create an object of the class to access instance variables**

**Q9 obj = new Q9();**

**// Print default values of instance variables**

**System.out.println("Default values of 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);**

**// Print default values of static variables**

**System.out.println("\nDefault values of static variables:");**

**System.out.println("byte: " + staticByte);**

**System.out.println("short: " + staticShort);**

**System.out.println("int: " + staticInt);**

**System.out.println("long: " + staticLong);**

**System.out.println("float: " + staticFloat);**

**System.out.println("double: " + staticDouble);**

**System.out.println("char: '" + staticChar + "'");**

**System.out.println("boolean: " + staticBoolean);**

**}**

**}**

**==>Default values of instance variables:**

**byte: 0**

**short: 0**

**int: 0**

**long: 0**

**float: 0.0**

**double: 0.0**

**char: ''**

**boolean: false**

**Default values of static 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).