Afrah Mulla - Core Java Assignment 1

1. **Download and install oracle JDK on your machine and explore JDK home & JRE home directory.**
   Reference:https://docs.oracle.com/javase/8/docs/technotes/tools/windows/jdkfiles.html

   In JDK 21, after downloading and installing from Oracle, you'll find the JDK home directory containing essential folders like bin, lib, and jmods. Unlike older versions, there is no separate JRE directory—starting from Java 11, Oracle merged JRE functionality into the JDK. The 'bin/java' executable now handles runtime execution directly.

2. **Copy src.zip and rt.jar on desktop. Extract them and observe the directories as well as files & their extensions.**

   'src.zip' contains the human-readable .java source files for core Java classes. 'rt.jar' holds the compiled .class files used by the JVM to run applications.

   These two files are closely related: src.zip lets developers explore and understand the source code behind the compiled classes in rt.jar. IDEs like Eclipse or IntelliJ can link them together, enabling you to view and debug standard Java library code during development.

3. **Write a simple "Hello World!" application in any text editor and compile & run it from terminal.**

```java
public class HelloWorld {
    public static void main(String[] args) {
        System.out.println("Hello World!");
    }
}
```

   When I tried to compile and run it using 'javac HelloWorld.java' and 'java HelloWorld' from the terminal, I received an error saying 'javac' is not recognized as an internal or external command. This indicated that the Java PATH was not set in my system.

4. **Set path permanently in environment variable and test "Hello World!" application again.**
   Reference:https://docs.oracle.com/javase/8/docs/technotes/tools/windows/jdkfiles.html

```java
public class HelloWorld {
    public static void main(String[] args) {
        System.out.println("Hello World!");
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac HelloWorld.java
PS D:\CDAC\Java\Assignment1> java HelloWorld
Hello World!
```

5. **Use Java disassembler and its switches to observe bytecode.**
   Command: javap -c HelloWorld
   javap is used to look inside compiled Java program and see what the computer actually runs. This shows the bytecode, which is like a set of instructions for the Java Virtual Machine. It shows the step-by-step instructions for the main method. Other options like -verbose is used to see more details and -private to include private parts of the code.

6. **Write a program to perform below operations on Boolean type to convert:**
   a. **boolean value into String**
   b. **boolean value into Boolean instance.**
   c. **String value into boolean value**
   d. **String value into Boolean instance.**

   Reference: https://docs.oracle.com/javase/8/docs/api/java/lang/Boolean.html

```java
public class ConvertBooleanString {
    public static void main(String[] args) {
        boolean booleanVar = true;

        // a.
        String stringCon = Boolean.toString(booleanVar);
        System.out.println("Boolean to String: " + stringCon);

        // b.
        Boolean booleanIns = Boolean.valueOf(booleanVar);
        System.out.println("Boolean to Boolean Instance: " + booleanIns);

        String stringVar = "abc";

        // c.
        Boolean boolCon = Boolean.parseBoolean(stringVar);
        System.out.println("String to Boolean: " + boolCon);

        // d.
        Boolean boolIns = Boolean.valueOf(stringVar);
        System.out.println("String to Boolean Instance: " + boolIns);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac ConvertBooleanString.java
PS D:\CDAC\Java\Assignment1> java ConvertBooleanString
Boolean to String: true
Boolean to Boolean Instance: true
String to Boolean: false
String to Boolean Instance: false
```

7. **Write a program to perform below operations on byte type to get:**
   a. **The number of bits used to represent a byte value**
   b. **The number of bytes used to represent a byte value**
   c. **The minimum value a byte**
   d. **The maximum value a byte**

Reference:https://docs.oracle.com/javase/8/docs/api/java/lang/Byte.html

```
public class ByteDesc {
    public static void main(String[] args) {
        // a.
        byte bitSize = Byte.SIZE;
        System.out.println("Number of bits used to represent byte value: "
+ bitSize);

        // b.
        byte byteSize = Byte.BYTES;
        System.out.println("Number of bytes used to represent byte value:
" + byteSize);

        // c.
        byte minValue = Byte.MIN_VALUE;
        System.out.println("Minimum value of a byte: " + minValue);

        // d.
        byte maxValue = Byte.MAX_VALUE;
        System.out.println("Maximum value of a byte: " + maxValue);

    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac ByteDesc.java
PS D:\CDAC\Java\Assignment1> java ByteDesc
Number of bits used to represent byte value: 8
Number of bytes used to represent byte value: 1
Minimum value of a byte: -128
Maximum value of a byte: 127
```

8. **Write a program to convert:**
   a. **byte value into String**
   b. **byte value into Byte instance.**
   c. **String instance into Byte instance.**

```
public class ByteString {
    public static void main(String[] args) {
        byte byteVar = 12;

        // a.
        String byteToString = Byte.toString(byteVar);
        System.out.println("Byte to String: " + byteToString);

        // b.
        Byte byteIns = Byte.valueOf(byteVar);
        System.out.println("Byte to Byte Instance: " + byteIns);

        // c.
        String str = "20";
        Byte stringToByteIns = Byte.valueOf(str);
        System.out.println("String Instance to Byte Instance: " +
stringToByteIns);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac ByteString.java
PS D:\CDAC\Java\Assignment1> java CharDesc
Number of bits used to represent char value: 16
Number of bytes used to represent char value: 2
Minimum value of a character: 0
Maximum value of a character: 65535
```

9. **Write a program to convert state of Byte instance into byte, short, int. long, float and double.**

```
public class ByteCon {
    public static void main(String[] args) {
        Byte byteIns = 15;

        // Byte Instance to byte
        byte byteVar = Byte.valueOf(byteIns);
        System.out.println("Byte Instance to Byte: " + byteVar);

        // Short
        short byteInsToShort = byteIns.shortValue();
        System.out.println("Byte Instance to Short: " + byteInsToShort);
```

```
        // Int
        int byteInsToInt = byteIns.intValue();
        System.out.println("Byte Instance to Int: " + byteInsToInt);

        // Long
        long byteInsToLong = byteIns.longValue();
        System.out.println("Byte Instance to Long: " + byteInsToLong);

        // Float
        float byteInsToFloat = byteIns.floatValue();
        System.out.println("Byte Instance to Float: " + byteInsToFloat);

        // Double
        double byteInsToDouble = byteIns.doubleValue();
        System.out.println("Byte Instance to Double: " + byteInsToDouble);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac ByteCon.java
PS D:\CDAC\Java\Assignment1> java ByteCon
Byte Instance to Byte: 15
Byte Instance to Short: 15
Byte Instance to Int: 15
Byte Instance to Long: 15
Byte Instance to Float: 15.0
Byte Instance to Double: 15.0
```

10. **Write a program to perform below operations on char type to get:**
    a. **The number of bits used to represent a char value**
    b. **The number of bytes used to represent a char value**
    c. **The minimum value a char**
    d. **The maximum value a char**

Reference:https://docs.oracle.com/javase/8/docs/api/java/lang/Character.html

```
public class CharDesc {
    public static void main(String[] args) {
        // a.
        int bitSize = Character.SIZE;
        System.out.println("Number of bits used to represent char value: "
+ bitSize);

        // b.
        int byteSize = Character.BYTES;
        System.out.println("Number of bytes used to represent char value:
" + byteSize);
```

```
        // c.
        int minValue = Character.MIN_VALUE;
        System.out.println("Minimum value of a character: " + minValue);

        // d.
        int maxValue = Character.MAX_VALUE;
        System.out.println("Maximum value of a character: " + maxValue);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac CharDesc.java
PS D:\CDAC\Java\Assignment1> java CharDesc
Number of bits used to represent char value: 16
Number of bytes used to represent char value: 2
Minimum value of a character: 0
Maximum value of a character: 65535
```

11. **Accept character from command line and perform below operations. Here you can use charAt() method to extract character:**
    a. **Check whether entered character is letter or digit. If it is digit then print its values as well as code point.**
    b. **If it is character then check whether it is in lowercase? If it is in lowercase then convert it into upper case and print it well as its code point. If it is in uppercase then convert it into lower case and print it well as its code point.**

```
import java.util.Scanner;

public class CharCon {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter a character: ");
        char charVar = sc.next().charAt(0);

        if (Character.isDigit(charVar)) {
            System.out.println("It is a digit.\nValue: " +
Character.getNumericValue(charVar));
            System.out.println("Code Point: " + (int) charVar);
        } else if (Character.isLetter(charVar)) {
            System.out.println("It is a letter.");
            if (Character.isLowerCase(charVar)) {
                char upperVar = Character.toUpperCase(charVar);
                System.out.println("Character is lowercase.\nUppercase: "
+ upperVar);
                System.out.println("Code Point: " + (int) upperVar);
```

```
            } else if (Character.isUpperCase(charVar)) {
                char lowerVar = Character.toLowerCase(charVar);
                System.out.println("Character is uppercase.\nLowercase: "
+ lowerVar);
                System.out.println("Code Point: " + (int) lowerVar);
            }
        }
        sc.close();
    }
}
```

```
PS D:\CDAC\Java\Assignment1> java CharCon
Enter a character:
A
It is a letter.
Character is uppercase.
Lowercase: a
Code Point: 97
```

12. **Write a program to perform below operations on short type to get:**
    a. **The number of bits used to represent a short value**
    b. **The number of bytes used to represent a short value**
    c. **The minimum value a short**
    d. **The maximum value a short**

Reference: https://docs.oracle.com/javase/8/docs/api/java/lang/Short.html

```
public class ShortDesc {
    public static void main(String[] args) {
        // a.
        int bitSize = Short.SIZE;
        System.out.println("Number of bits used to represent short value:
" + bitSize);

        // b.
        int byteSize = Short.BYTES;
        System.out.println("Number of bytes used to represent short value:
" + byteSize);

        // c.
        int minValue = Short.MIN_VALUE;
        System.out.println("Minimum value of a short: " + minValue);

        // d.
        int maxValue = Short.MAX_VALUE;
```

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

```
PS D:\CDAC\Java\Assignment1> javac ShortDesc.java
PS D:\CDAC\Java\Assignment1> java ShortDesc
Number of bits used to represent short value: 16
Number of bytes used to represent short value: 2
Minimum value of a short: -32768
Maximum value of a short: 32767
```

13. **Write a program to convert:**
    a. **short value into String**
    b. **short value into Short instance.**
    c. **String instance into Short instance.**

```
public class ShortString {
    public static void main(String[] args) {
        short shortVar = 12;

        // a.
        String shortToString = Short.toString(shortVar);
        System.out.println("Short to String: " + shortToString);

        // b.
        Short shortIns = Short.valueOf(shortVar);
        System.out.println("Short to Short Instance: " + shortIns);

        // c.
        String str = "20";
        Short stringToShortIns = Short.valueOf(str);
        System.out.println("String Instance to Short Instance: " +
stringToShortIns);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac ShortString.java
PS D:\CDAC\Java\Assignment1> java ShortString
Short to String: 12
Short to Short Instance: 12
String Instance to Short Instance: 20
```

14. **Write a program to convert state of Short instance into byte, short, int, long, float and double.**

```
public class ShortCon {
    public static void main(String[] args) {
        Short shortIns = 15;

        // Byte
        byte byteVar = shortIns.byteValue();
        System.out.println("Short Instance to Byte: " + byteVar);

        // Short Instance to Short
        short shortInsToShort = shortIns.shortValue();
        System.out.println("Short Instance to Short: " + shortInsToShort);

        // Int
        int shortInsToInt = shortIns.intValue();
        System.out.println("Short Instance to Int: " + shortInsToInt);

        // Long
        long shortInsToLong = shortIns.longValue();
        System.out.println("Short Instance to Long: " + shortInsToLong);

        // Float
        float shortInsToFloat = shortIns.floatValue();
        System.out.println("Short Instance to Float: " + shortInsToFloat);

        // Double
        double shortInsToDouble = shortIns.doubleValue();
        System.out.println("Short Instance to Double: " +
shortInsToDouble);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac ShortCon.java
PS D:\CDAC\Java\Assignment1> java ShortCon
Short Instance to Byte: 15
Short Instance to Short: 15
Short Instance to Int: 15
Short Instance to Long: 15
Short Instance to Float: 15.0
Short Instance to Double: 15.0
```

15. **Write a program to perform below operations on int type to get:**
    a. **The number of bits used to represent a integer value**
    b. **The number of bytes used to represent a integer value**
    c. **The minimum value a integer**
    d. **The maximum value a integer**

Reference:https://docs.oracle.com/javase/8/docs/api/java/lang/Integer.html

```java
public class IntDesc {
    public static void main(String[] args) {
        // a.
        int bitSize = Integer.SIZE;
        System.out.println("Number of bits used to represent integer value: " + bitSize);

        // b.
        int byteSize = Integer.BYTES;
        System.out.println("Number of bytes used to represent integer value: " + byteSize);

        // c.
        int minValue = Integer.MIN_VALUE;
        System.out.println("Minimum value of a integer: " + minValue);

        // d.
        int maxValue = Integer.MAX_VALUE;
        System.out.println("Maximum value of a integer: " + maxValue);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac IntDesc.java
PS D:\CDAC\Java\Assignment1> java IntDesc
Number of bits used to represent integer value: 32
Number of bytes used to represent integer value: 4
Minimum value of a integer: -2147483648
Maximum value of a integer: 2147483647
```

16. **Write a program to convert:**
    a. **int value into String**
    b. **int value into Integer instance.**
    c. **String instance into Integer instance.**
    d. **int value into binary, octal and hexadecimal string.**

```java
public class IntString {
    public static void main(String[] args) {
        int intVar = 12650;

        // a.
        String intToString = Integer.toString(intVar);
        System.out.println("Int to String: " + intToString);
```

```
        // b.
        Integer shortIns = Integer.valueOf(intVar);
        System.out.println("Int to Int Instance: " + shortIns);

        // c.
        String str = "200";
        Integer stringToIntIns = Integer.valueOf(str);
        System.out.println("String Instance to Int Instance: " +
stringToIntIns);

        // d.
        String binString = Integer.toBinaryString(intVar);
        System.out.println("Int to Binary String: " + binString);
        String octalString = Integer.toOctalString(intVar);
        System.out.println("Int to Octal String: " + octalString);
        String hexString = Integer.toHexString(intVar);
        System.out.println("Int to Hexadecimal String: " + hexString);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac IntString.java
PS D:\CDAC\Java\Assignment1> java IntString
Int to String: 12650
Int to Int Instance: 12650
String Instance to Int Instance: 200
Int to Binary String: 11000101101010
Int to Octal String: 30552
Int to Hexadecimal String: 316a
```

17. **Write a program to convert state of Integer instance into byte, short, int, long, float and double.**

```
public class IntCon {
    public static void main(String[] args) {
        Integer intIns = 15260;

        // Byte
        byte byteVar = intIns.byteValue();
        System.out.println("Int Instance to Byte: " + byteVar);

        // Short
        short intInsToShort = intIns.shortValue();
        System.out.println("Int Instance to Short: " + intInsToShort);

        // Int Instance to Int
```

```
        int intInsToInt = intIns.intValue();
        System.out.println("Int Instance to Int: " + intInsToInt);

        // Long
        long intInsToLong = intIns.longValue();
        System.out.println("Int Instance to Long: " + intInsToLong);

        // Float
        float intInsToFloat = intIns.floatValue();
        System.out.println("Int Instance to Float: " + intInsToFloat);

        // Double
        double intInsToDouble = intIns.doubleValue();
        System.out.println("Int Instance to Double: " + intInsToDouble);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac IntCon.java
PS D:\CDAC\Java\Assignment1> java IntCon
Int Instance to Byte: -100
Int Instance to Short: 15260
Int Instance to Int: 15260
Int Instance to Long: 15260
Int Instance to Float: 15260.0
Int Instance to Double: 15260.0
```

18. **Write a program to find minimum and maximum number as well as to add two integer numbers using methods of Integer.**

```
import java.util.Scanner;

public class IntFunc {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter number 1: ");
        int a = sc.nextInt();
        System.out.println("Enter number 2: ");
        int b = sc.nextInt();
        System.out.println("Minimum of two integer: " + Integer.min(a,
b));
        System.out.println("Maximum of two integer: " + Integer.max(a,
b));
        System.out.println("Sum of two integer: " + Integer.sum(a, b));
        sc.close();
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac IntFunc.java
PS D:\CDAC\Java\Assignment1> java IntFunc
Enter number 1:
12
Enter number 2:
13
Minimum of two integer: 12
Maximum of two integer: 13
Sum of two integer: 25
```

19. **Write a program to perform below operations on long type to get:**
    a. **The number of bits used to represent a long value**
    b. **The number of bytes used to represent a long value**
    c. **The minimum value a long**
    d. **The maximum value a long**

Reference:https://docs.oracle.com/javase/8/docs/api/java/lang/Long.html

```
public class LongDesc {
    public static void main(String[] args) {
        // a.
        long bitSize = Long.SIZE;
        System.out.println("Number of bits used to represent long value: "
+ bitSize);

        // b.
        long byteSize = Long.BYTES;
        System.out.println("Number of bytes used to represent long value:
" + byteSize);

        // c.
        long minValue = Long.MIN_VALUE;
        System.out.println("Minimum value of a long: " + minValue);

        // d.
        long maxValue = Long.MAX_VALUE;
        System.out.println("Maximum value of a long: " + maxValue);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac LongDesc.java
PS D:\CDAC\Java\Assignment1> java LongDesc
Number of bits used to represent long value: 64
Number of bytes used to represent long value: 8
Minimum value of a long: -9223372036854775808
Maximum value of a long: 9223372036854775807
```

20. **Write a program to convert:**
    a. **long value into String**
    b. **long value into Long instance.**
    c. **String instance into Long instance.**
    d. **long value into binary, octal and hexadecimal string.**

```java
public class LongString {
    public static void main(String[] args) {
        long longVar = 1265078955;

        // a.
        String longToString = Long.toString(longVar);
        System.out.println("Long to String: " + longToString);

        // b.
        Long longIns = Long.valueOf(longVar);
        System.out.println("Long to Long Instance: " + longIns);

        // c.
        String str = "1230";
        Long stringToLongIns = Long.valueOf(str);
        System.out.println("String Instance to Long Instance: " +
stringToLongIns);

        // d.
        String binString = Long.toBinaryString(longVar);
        System.out.println("Long to Binary String: " + binString);
        String octalString = Long.toOctalString(longVar);
        System.out.println("Long to Octal String: " + octalString);
        String hexString = Long.toHexString(longVar);
        System.out.println("Long to Hexadecimal String: " + hexString);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac LongString.java
PS D:\CDAC\Java\Assignment1> java LongString
Long to String: 1265078955
Long to Long Instance: 1265078955
String Instance to Long Instance: 1230
Long to Binary String: 1001011011001111001001010101011
Long to Octal String: 11331711253
Long to Hexadecimal String: 4b6792ab
```

21. **Write a program to convert state of Long instance into byte, short, int, long, float and double.**

```java
public class LongCon {
    public static void main(String[] args) {
        Long longIns = 152604578l;

        // Byte
        byte byteVar = longIns.byteValue();
        System.out.println("Long Instance to Byte: " + byteVar);

        // Short
        short longInsToShort = longIns.shortValue();
        System.out.println("Long Instance to Short: " + longInsToShort);

        // Int
        int longInsToInt = longIns.intValue();
        System.out.println("Long Instance to Int: " + longInsToInt);

        // Long Instance to Long
        long longInsToLong = longIns.longValue();
        System.out.println("Long Instance to Long: " + longInsToLong);

        // Float
        float longInsToFloat = longIns.floatValue();
        System.out.println("Long Instance to Float: " + longInsToFloat);

        // Double
        double longInsToDouble = longIns.doubleValue();
        System.out.println("Long Instance to Double: " + longInsToDouble);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac LongCon.java
PS D:\CDAC\Java\Assignment1> java LongCon
Long Instance to Byte: -94
Long Instance to Short: -28766
Long Instance to Int: 152604578
Long Instance to Long: 152604578
Long Instance to Float: 1.5260458E8
Long Instance to Double: 1.52604578E8
```

22. **Write a program to find minimum and maximum number as well as to add two long numbers using methods of Long.**

```java
import java.util.Scanner;

public class LongFunc {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
```

```
        System.out.println("Enter number 1: ");
        long a = sc.nextLong();
        System.out.println("Enter number 2: ");
        long b = sc.nextLong();
        System.out.println("Minimum of two long: " + Long.min(a, b));
        System.out.println("Maximum of two long: " + Long.max(a, b));
        System.out.println("Sum of two long: " + Long.sum(a, b));
        sc.close();
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac LongFunc.java
PS D:\CDAC\Java\Assignment1> java LongFunc
Enter number 1:
12457803
Enter number 2:
3567845
Minimum of two long: 3567845
Maximum of two long: 12457803
Sum of two long: 16025648
```

23. **Write a program to perform below operations on float type to get:**
    a. **The number of bits used to represent a float value**
    b. **The number of bytes used to represent a float value**
    c. **The minimum value a float**
    d. **The maximum value a float**

Reference:https://docs.oracle.com/javase/8/docs/api/java/lang/Float.html

```
public class FloatDesc {
    public static void main(String[] args) {
        // a.
        float bitSize = Float.SIZE;
        System.out.println("Number of bits used to represent float value:
" + bitSize);

        // b.
        float byteSize = Float.BYTES;
        System.out.println("Number of bytes used to represent float value:
" + byteSize);

        // c.
        float minValue = Float.MIN_VALUE;
        System.out.println("Minimum value of a float: " + minValue);

        // d.
```

```
        float maxValue = Float.MAX_VALUE;
        System.out.println("Maximum value of a float: " + maxValue);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac FloatDesc.java
PS D:\CDAC\Java\Assignment1> java FloatDesc
Number of bits used to represent float value: 32.0
Number of bytes used to represent float value: 4.0
Minimum value of a float: 1.4E-45
Maximum value of a float: 3.4028235E38
```

24. **Write a program to convert:**
    a. **float value into String**
    b. **float value into Float instance.**
    c. **String instance into Float instance.**
    d. **float value into hexadecimal string.**

```
public class FloatString {
    public static void main(String[] args) {
        float floatVar = 1265078955;

        // a.
        String floatToString = Float.toString(floatVar);
        System.out.println("Float to String: " + floatToString);

        // b.
        Float floatIns = Float.valueOf(floatVar);
        System.out.println("Float to Float Instance: " + floatIns);

        // c.
        String str = "1230";
        Float stringToFloatIns = Float.valueOf(str);
        System.out.println("String Instance to Float Instance: " +
stringToFloatIns);

        // d.
        String hexString = Float.toHexString(floatVar);
        System.out.println("Float to Hexadecimal String: " + hexString);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac FloatString.java
PS D:\CDAC\Java\Assignment1> java FloatString
Float to String: 1.2650789E9
Float to Float Instance: 1.2650789E9
String Instance to Float Instance: 1230.0
Float to Hexadecimal String: 0x1.2d9e4ap30
```

25. **Write a program to convert state of Float instance into byte, short, int, long, float and double.**

```
public class FloatCon {
    public static void main(String[] args) {
        Float floatIns = 152604578f;

        // Byte
        byte byteVar = floatIns.byteValue();
        System.out.println("Float Instance to Byte: " + byteVar);

        // Short
        short floatInsToShort = floatIns.shortValue();
        System.out.println("Float Instance to Short: " + floatInsToShort);

        // Int
        int floatInsToInt = floatIns.intValue();
        System.out.println("Float Instance to Int: " + floatInsToInt);

        // Long
        long floatInsToLong = floatIns.longValue();
        System.out.println("Float Instance to Long: " + floatInsToLong);

        // Float Instance to Float
        float floatInsToFloat = floatIns.floatValue();
        System.out.println("Float Instance to Float: " + floatInsToFloat);

        // Double
        double floatInsToDouble = floatIns.doubleValue();
        System.out.println("Float Instance to Double: " +
floatInsToDouble);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac FloatCon.java
PS D:\CDAC\Java\Assignment1> java FloatCon
Float Instance to Byte: -96
Float Instance to Short: -28768
Float Instance to Int: 152604576
Float Instance to Long: 152604576
Float Instance to Float: 1.5260458E8
Float Instance to Double: 1.52604576E8
```

26. **Write a program to find minimum and maximum number as well as to add two float numbers using methods of Float.**

```
import java.util.Scanner;

public class FloatFunc {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter number 1: ");
        float a = sc.nextFloat();
        System.out.println("Enter number 2: ");
        float b = sc.nextFloat();
        System.out.println("Minimum of two float: " + Float.min(a, b));
        System.out.println("Maximum of two float: " + Float.max(a, b));
        System.out.println("Sum of two float: " + Float.sum(a, b));
        sc.close();
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac FloatFunc.java
PS D:\CDAC\Java\Assignment1> java FloatFunc
Enter number 1:
3597.4624
Enter number 2:
456932.45332
Minimum of two float: 3597.4624
Maximum of two float: 456932.47
Sum of two float: 460529.94
```

27. **Write a program to perform below operations on Double type to get:**

   a. **The number of bits used to represent a double value**

   b. **The number of bytes used to represent a double value**

   c. **The minimum value a double**

   d. **The maximum value a double**

Reference: https://docs.oracle.com/javase/8/docs/api/java/lang/Double.html

```
public class DoubleDesc {
    public static void main(String[] args) {
        // a.
        double bitSize = Double.SIZE;
        System.out.println("Number of bits used to represent double value:
" + bitSize);

        // b.
        double byteSize = Double.BYTES;
```

```
        System.out.println("Number of bytes used to represent double
value: " + byteSize);

        // c.
        double minValue = Double.MIN_VALUE;
        System.out.println("Minimum value of a double: " + minValue);

        // d.
        double maxValue = Double.MAX_VALUE;
        System.out.println("Maximum value of a double: " + maxValue);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac DoubleDesc.java
PS D:\CDAC\Java\Assignment1> java DoubleDesc
Number of bits used to represent double value: 64.0
Number of bytes used to represent double value: 8.0
Minimum value of a double: 4.9E-324
Maximum value of a double: 1.7976931348623157E308
```

28. **Write a program to convert:**
    a. **double value into String**
    b. **double value into Double instance.**
    c. **String instance into Double instance.**
    d. **double value into binary, octal and hexadecimal string (Note: Here you can use doubleToLongBits() method along with methods of Long class).**

```
public class DoubleString {
    public static void main(String[] args) {
        double doubleVar = 1265078.955;

        // a.
        String doubleToString = Double.toString(doubleVar);
        System.out.println("Double to String: " + doubleToString);

        // b.
        Double doubleIns = Double.valueOf(doubleVar);
        System.out.println("Double to Double Instance: " + doubleIns);

        // c.
        String str = "1230";
        Double stringToDoubleIns = Double.valueOf(str);
        System.out.println("String Instance to Double Instance: " +
stringToDoubleIns);

        // d.
```

```
        long bits = Double.doubleToLongBits(doubleVar);
        String binString = Long.toBinaryString(bits);
        System.out.println("Double to Binary String: " + binString);
        String octalString = Long.toOctalString(bits);
        System.out.println("Double to Octal String: " + octalString);
        String hexString = Long.toHexString(bits);
        System.out.println("Double to Hexadecimal String: " + hexString);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac DoubleString.java
PS D:\CDAC\Java\Assignment1> java DoubleString
Double to String: 1265078.955
Double to Double Instance: 1265078.955
String Instance to Double Instance: 1230.0
Double to Binary String: 1000001001100110100110110110110111101000111101011100001010010000
Double to Octal String: 404632333336436560510
Double to Hexadecimal String: 41334db6f47ae148
```

29. **Write a program to convert state of Double instance into byte, short, int, long, float and double.**

```
public class DoubleCon {
    public static void main(String[] args) {
        Double doubleIns = 152600.4578;

        // Byte
        byte byteVar = doubleIns.byteValue();
        System.out.println("Double Instance to Byte: " + byteVar);

        // Short
        short doubleInsToShort = doubleIns.shortValue();
        System.out.println("Double Instance to Short: " +
doubleInsToShort);

        // Int
        int doubleInsToInt = doubleIns.intValue();
        System.out.println("Double Instance to Int: " + doubleInsToInt);

        // Long
        long doubleInsToLong = doubleIns.longValue();
        System.out.println("Double Instance to Long: " + doubleInsToLong);

        // Float
        float doubleInsToFloat = doubleIns.floatValue();
        System.out.println("Double Instance to Float: " +
doubleInsToFloat);

        // Double Instance to Double
        double doubleInsToDouble = doubleIns.doubleValue();
```

```
        System.out.println("Double Instance to Double: " +
doubleInsToDouble);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac DoubleCon.java
PS D:\CDAC\Java\Assignment1> java DoubleCon
Double Instance to Byte: 24
Double Instance to Short: 21528
Double Instance to Int: 152600
Double Instance to Long: 152600
Double Instance to Float: 152600.45
Double Instance to Double: 152600.4578
```

30. **Write a program to find minimum and maximum number as well as to add two double numbers using methods of Double.**

```
import java.util.Scanner;

public class DoubleFunc {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter number 1: ");
        double a = sc.nextDouble();
        System.out.println("Enter number 2: ");
        double b = sc.nextDouble();
        System.out.println("Minimum of two double: " + Double.min(a, b));
        System.out.println("Maximum of two double: " + Double.max(a, b));
        System.out.println("Sum of two double: " + Double.sum(a, b));
        sc.close();
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac DoubleFunc.java
PS D:\CDAC\Java\Assignment1> java DoubleFunc
Enter number 1:
123377890.34228805
Enter number 2:
1456799.356788922
Minimum of two double: 1456799.356788922
Maximum of two double: 1.23377890342288O5E8
Sum of two double: 1.2483468969907697E8
```

31. **Read the documentation of NumberFormatException and try to generate it in Java code.**
Reference:https://docs.oracle.com/javase/8/docs/api/java/lang/NumberFormatException.html

```
public class NumException {
    public static void main(String[] args) {
        String str = "aliza123";
        int number = Integer.parseInt(str);
        System.out.println(number);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac NumException.java
PS D:\CDAC\Java\Assignment1> java NumException
Exception in thread "main" java.lang.NumberFormatException: For input string: "aliza123"
        at java.base/java.lang.NumberFormatException.forInputString(NumberFormatException.java:67)
        at java.base/java.lang.Integer.parseInt(Integer.java:662)
        at java.base/java.lang.Integer.parseInt(Integer.java:778)
        at NumException.main(NumException.java:4)
```

32. **Write a program to accept and print full name as an argument from command line.**

```
public class FullName {
    public static void main(String[] args) {
        System.out.println("Full Name: " + args[0]);
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac FullName.java
PS D:\CDAC\Java\Assignment1> java FullName "Afrah Mulla"
Full Name: Afrah Mulla
```

33. **Pass integer, float and double value from command line. Parse it appropriately and perform arithmetic operations (+,-,*,/) on it. Here you can you switch case.**
Reference:https://docs.oracle.com/javase/tutorial/java/nutsandbolts/switch.html

```
public class ArithmeticOp {
    public static void main(String[] args) {
        int intVal = Integer.parseInt(args[0]);
        float floatVal = Float.parseFloat(args[1]);
        double doubleVal = Double.parseDouble(args[2]);
        String operation = args[3].trim();

        switch (operation) {
            case "+":
                System.out.println("Addition: " + (intVal + floatVal +
doubleVal));
```

```
                break;
            case "-":
                System.out.println("Subtraction: " + (intVal - floatVal -
doubleVal));
                break;
            case "x":
                System.out.println("Multiplication: " + (intVal * floatVal
* doubleVal));
                break;
            case "/":
                if (floatVal != 0 && doubleVal != 0) {
                    System.out.println("Result (Division): " + ((intVal /
floatVal) / doubleVal));
                } else {
                    System.out.println("Error: Division by zero is not
allowed.");
                }
                break;
            default:
                System.out.println("Invalid operation. Use +, -, *, or
/.");
        }
    }
}
```

```
PS D:\CDAC\Java\Assignment1> javac ArithmeticOp.java
PS D:\CDAC\Java\Assignment1> java ArithmeticOp 125 63259.2550 6689.75 "+"
Addition: 70074.00390625
PS D:\CDAC\Java\Assignment1> java ArithmeticOp 125 63259.2550 6689.75 "-"
Subtraction: -69824.00390625
PS D:\CDAC\Java\Assignment1> java ArithmeticOp 125 63259.2550 6689.75 "x"
Multiplication: 5.2898572633375E10
PS D:\CDAC\Java\Assignment1> java ArithmeticOp 125 63259.2550 6689.75 "/"
Result (Division): 2.9537658185505173E-7
```

Afrah Mulla - Core Java Assignment 1

Write a class EmployeeManagement.
Declare variables for id, name, salary, holidays, address.
Declare methods for calculating the salary of that employee based on
number of days he has worked. Take 3 classes for types of employees.
1. Manager (Daily Salary 500 rs)
2. Peon (Daily Sal 100)
3. New Joinee (Daily Sal 200)

Now call all employee objects from main method class.
Create COnstructors of 3 types. Initialize ID of employees through
constructor only

Display who is getting highest salary for that month and what amount?
use this to refer to current objcet.

Use static keyword also.

```
class EmployeeManagement {
    int id;
    String name;
    int salary;
    int dailySalary;
    int holidays;
    String address;
    static int highestSalary = 0;
    static String highestEarner = "";

    EmployeeManagement() {

    }

    EmployeeManagement(int id, String name) {
        this.id = id;
        this.name = name;
    }

    EmployeeManagement(int id, String name, int holidays, String address,
int dailySalary) {
        this(id, name);
        this.holidays = holidays;
        this.address = address;
        this.dailySalary = dailySalary;
    }
```

```
    public void totalSalary() {
        int daysWorked = 30 - this.holidays;
        this.salary = this.dailySalary * daysWorked;

        if (this.salary > highestSalary) {
            highestSalary = this.salary;
            highestEarner = this.name;
        }
    }

    void displayDetails() {
        System.out.println("ID: " + this.id);
        System.out.println("Name: " + this.name);
        System.out.println("Address: " + this.address);
        System.out.println("Salary: Rs " + this.salary);
        System.out.println("--------------------------");
    }
}

public class CalculateSalary {
    public static void main(String[] args) {
        EmployeeManagement manager = new EmployeeManagement(101, "Afrah",
8, "Kurla", 500);
        EmployeeManagement peon = new EmployeeManagement(102, "Rahul", 2,
"Navi Mumbai", 100);
        EmployeeManagement newJoinee = new EmployeeManagement(103,
"Dante", 3, "Thane", 200);

        manager.totalSalary();
        peon.totalSalary();
        newJoinee.totalSalary();

        manager.displayDetails();
        peon.displayDetails();
        newJoinee.displayDetails();

        System.out.println("Highest Earner of the Month: " +
EmployeeManagement.highestEarner);
        System.out.println("Amount: Rs " +
EmployeeManagement.highestSalary);
    }
}
```

```
PS D:\CDAC\Java> javac CalculateSalary.java
PS D:\CDAC\Java> java CalculateSalary
ID: 101
Name: Afrah
Address: Kurla
Salary: Rs 11000
---------------------------
ID: 102
Name: Rahul
Address: Navi Mumbai
Salary: Rs 2800
---------------------------
ID: 103
Name: Dante
Address: Thane
Salary: Rs 5400
---------------------------
Highest Earner of the Month: Afrah
Amount: Rs 11000
```