Java Assignment 1

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1.Calculate the area of a rectangle given its length and width.

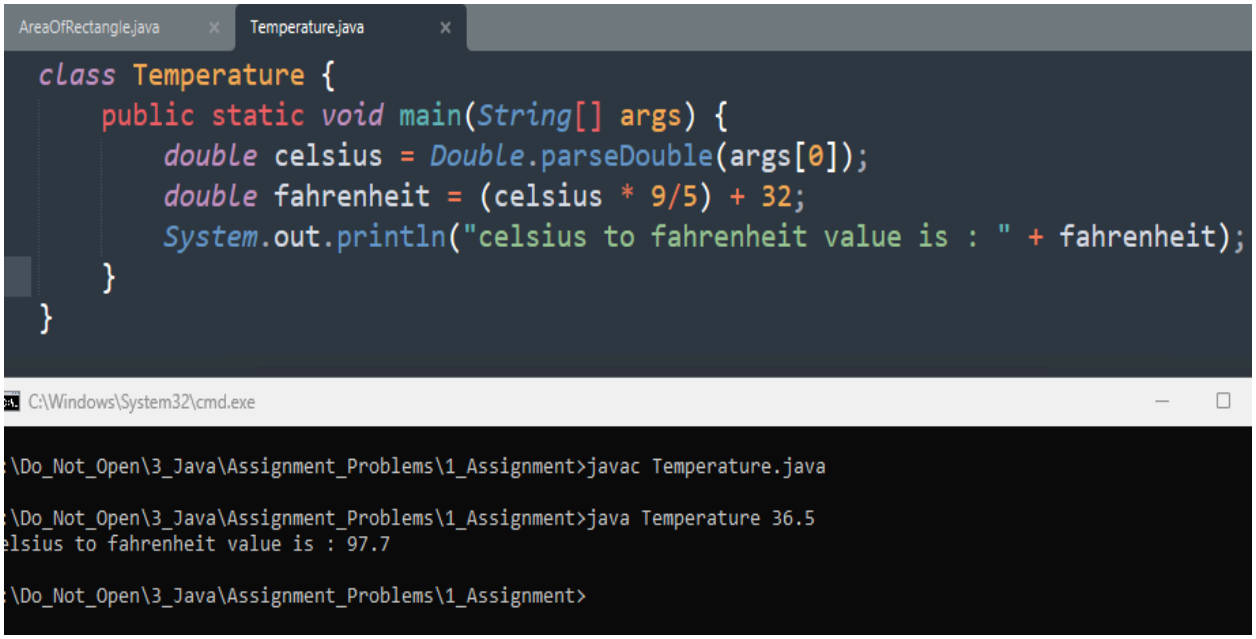
AreaOfRectangle.java

```java
class AreaOfRectangle {
    public static void main(String[] args) {
        double len = Double.parseDouble(args[0]);
        double wid = Double.parseDouble(args[1]);

        System.out.println("Area of Rectangle: " + len * wid);
    }
}
```

C:\Windows\System32\cmd.exe

```
D:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>java AreaOfRectangle 2 5
Area of Rectangle: 10.0

D:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>
```

2.Convert a temperature from Celsius to Fahrenheit using the formula: F = (C * 9/5) + 32.



3.Calculate the area of a circle given its radius using the formula: A = π * r^2.

- Using `static final` for class-level constants:
- **Naming convention:**
  Java convention for constants is to use `ALL_CAPS` with underscores separating words (e.g., `MAX_ATTEMPTS`, `PI`).

1. If there is a `public` class in the Java file:
    - The Java compiler requires that the filename exactly matches the name of the `public` class within that file (including case sensitivity).
    - If the filename and the `public` class name do not match, the compiler will issue a compilation error.
    - For example, if you have a `public class MyClass` in a file named `AnotherFile.java`, compilation will fail.
2. If there is NO `public` class in the Java file (i.e., all classes are package-private or default access):
    - The filename does not strictly need to match the name of any class within the file.
    - **Summary:**
        - **Public class:** Filename must match the public class name.
        - **No public class:** Filename can differ from class names, but it's not recommended for good coding practices.

Circle.java

```java
class Area_of_circle {
    public static double PI = 3.14159; // class-level constant
    public static void main(String[] args) {
        double radius = Double.parseDouble(args[0]);
        double ac = PI * (radius*radius);
        System.out.println("Area_of_circle: " + ac);
    }
}
```

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```
 error

):\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>javac Circle.java

):\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>java Area_of_circle 7
Area_of_circle: 153.93791

):\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>
```

4.Compute the hypotenuse of a right triangle using the Pythagorean theorem: c = sqrt(a^2 + b^2).

```java
import java.lang.Math;

class Hypotenuse {
    public static void main(String[] args) {
        double a = Double.parseDouble(args[0]);
        double b = Double.parseDouble(args[1]);
        double c = Math.sqrt(a * a + b * b);

        System.out.println("Hypotenuse of a" + a + "and b " + b + "is :" + c);
    }
}
```

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```
error

\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>javac Hypotenuse.java

\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>java Hypotenuse 3 4
ypotenuse of a3.0and b 4.0is :5.0

\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>
```

5.Calculate the simple interest on an investment using the formula: A = P * T * R / 100;

SimpleInterest.java

```java
class SimpleInterest {
    public static void main(String[] args) {
        double p = Double.parseDouble(args[0]);
        double t = Double.parseDouble(args[1]);
        double r = Double.parseDouble(args[2]);
        double si = (p * t * r)/100;

        System.out.println("SimpleInterest: " + si);
    }
}
```

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```
:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>javac SimpleInterest.java

:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>java SimpleInterest 1000 5 2
impleInterest: 100.0

:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>
```

6.Calculate the compound interest on an investment using the formula: A = P * (1 + r/100n)^(n*t).

CompoundInterest.java

```java
class CompoundInterest {
    public static void main(String[] args) {
        double p = Double.parseDouble(args[0]);
        double r = Double.parseDouble(args[1]);
        double t = Double.parseDouble(args[2]);
        double n = Double.parseDouble(args[3]);

        double ci = p * Math.pow((1 + (r / 100 * n)), n * t);

        System.out.println("CompoundInterest: " + ci);
    }
}
```

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```
ompoundInterest: 121000.0

:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>javac CompoundInterest.java

:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>java CompoundInterest 1000 10 2 1
ompoundInterest: 1210.0000000000002

:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>
```

7.Determine the volume of a sphere given its radius using the formula: V = (4/3) * π * r^3.

SphereVolume.java | Circle.java

```java
class SphereVolume {
    public static final double PI = 3.14159;
    public static void main(String[] args) {
        double radius = Double.parseDouble(args[0]);

        double volume = 4.0/3 * PI * Math.pow(radius, 3);

        System.out.println("Vloume of Sphere: " + volume);
    }
}
```

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```
1 error

D:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>javac SphereVolume.java

D:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>java SphereVolume 10
Vloume of Sphere: 4188.786666666666

D:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>
```

8.Convert a distance from kilometers to miles using the formula: miles = kilometers * 0.621371.

Miles.java

```java
class Miles {
    public static void main(String[] args) {
        double km = Double.parseDouble(args[0]);
        double miles = km * 0.621371;

        System.out.println(miles);
    }
}
```

C:\Windows\System32\cmd.exe

```
Vloume of Sphere: 4188.786666666666

D:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>javac Miles.java

D:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>java Miles 10
6.21371

D:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>
```

9.Calculate the sum of the first n natural numbers using the formula: sum = (n * (n + 1)) / 2.

SumOfNumbers.java

```java
class SumOfNumbers {
    public static void main(String[] args) {
        double n = Double.parseDouble(args[0]);

        double s = (n * (n + 1))/2;

        System.out.println("Sum of numbers: " + s);
    }
}
```

C:\Windows\System32\cmd.exe

```
6.21371

D:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>javac SumOfNumbers.java

D:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>java SumOfNumbers 10
Sum of numbers: 55.0

D:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>
```

10.Compute the area of a triangle given the lengths of its three sides using Heron's formula.

The formula is as follows:
s = (a + b + c) / 2
A = sqrt(s * (s - a) * (s - b) * (s - c))
where:
a, b, and c are the lengths of the triangle's sides.
s is the semi perimeter (half of the perimeter) of the triangle.
A is the area of triangle

Heron.java

```java
class Heron {
    public static void main(String[] args) {
        double a = Double.parseDouble(args[0]);
        double b = Double.parseDouble(args[1]);
        double c = Double.parseDouble(args[2]);

        double s = (a * b * c)/2;

        double area = Math.sqrt(s * (s-a) * (s-b) * (s-c));

        System.out.println("Area of Triangle: " + area);
    }
}
```

```
C:\Windows\System32\cmd.exe
Sum of numbers: 55.0

D:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>javac Heron.java

D:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>java Heron 10 20 30
Area of Triangle: 8910099.999438839

D:\Do_Not_Open\3_Java\Assignment_Problems\1_Assignment>
```