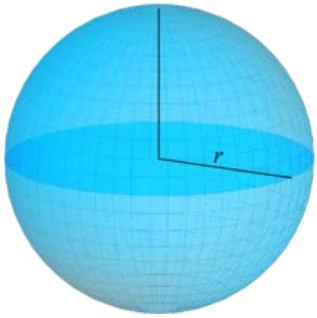
Problem Set 4 Exercise #02: Sphere



Reference: Lecture 10 Unit 1 notes

Learning objective: Object-oriented programming

Estimated completion time: 20 minutes

Problem statement:

Write a program **PS4_Ex02_Sphere.java** to define a **`Sphere`** class that contains the following attribute:

- **`private double radius; // radius of a Sphere object`**

There is no need to add any other attribute.

You are to write a constructor **`Sphere(double rad)`** to create a sphere of given radius.

The **`Sphere`** class should also provide the following member methods:

- **`double getRadius()`** to return radius of "this" (the calling) Sphere object.
- **`double computeDiameter()`** to return diameter of "this" sphere.
- **`double computeCircumference()`** to return circumference of "this" sphere.
- **`double computeSurfaceArea()`** to return surface area of "this" sphere.
- **`double computeVolume()`** to return volume of "this" sphere.

You are to use the π (pi) constant defined in the **java.lang.Math** class in some of the above methods as necessary.

A client program **PS4_Ex02_TestSphere.java** is provided and should **not** be modified. You must write your **`Sphere`** class properly such that running **`TestSphere`** produces the same output as the sample runs shown below.

Sample run #1:

```
Enter radius: 32.1
Radius = 32.1000
Diameter = 64.2000
Circumference = 201.6902
Surface area = 12948.5139
Volume = 138549.0992
```

Sample run #2:

```
Enter radius: 88
Radius = 88.0000
Diameter = 176.0000
Circumference = 552.9203
Surface area = 97313.9740
Volume = 2854543.2384
```