Assignment 7: Inheritance

Using the **start project**, implement **two (2) classes**, the **Circle** class and the **Cylinder** class as described below. The **Main.cpp** file already contains testing cases.

Class Circle: Write the **interface** in the **Circle.h** file, and write the **implementation** in the **Circle.cpp** file.

- **Member variables:**
  - A double named **radius** that stores the value of the radius of the circle.
  - A double named **pi** that stores the value of pi.
- **Default constructor:**
  - Initializes the radius to 0.0 and pi to 3.142.
- **Overloaded constructor:**
  - **Parameters:** a double that stores a new value for the radius, and a double that stores a new value for pi.
  - Initializes all member variables to the values passed by the parameters.
- Function **getRadius**
  - Returns the value of the radius.
- Function **getPi**
  - Returns the value of pi.
- Function **setRadius**
  - **Parameter:** A double that stores a new value for the radius.
  - Re-sets the value of radius to the value passed by the parameter.
- Function **setPi**
  - **Parameter:** A double that stores a new value for pi.
  - Resets the value of pi with the value passed by the parameter.
- Function **calculateArea**:
  - Returns the area of the circle as a double.
  - Area formula: **π * radius * radius**
- Function **printDimensions**:
  - Outputs the dimensions of the circle in the following format:

    Radius: #
    Pi: #

    Where "#" will be replaced by the actual value.
  - **No** need to format the decimals; the testing cases will take care of that.
- **Destructor**
  - Left empty.

Class Cylinder: Write the **interface** in the **Cylinder.h** file, which **inherits** from the class **Circle**, and write the **implementation** in the **Cylinder.cpp** file.

- **Member variable:**
  - As usual, these are **private**.
  - A double named **height** that stores the value of the height of the cylinder.
- **Default constructor:**
  - Initializes the height of the cylinder to 0.0.
- **Overloaded constructor:**

- **Parameters:** a double that stores a new value for the radius, a double that stores a new value for pi, and a double that stores a new value for the height.
- Initializes its member variable to the variable passed by the parameter and calls the parent's overloaded constructor to pass the values of the parent's member variables. You need to use the **syntax** shown on the slides.

- Function **getHeight**
  - Returns the value of the height.
- Function **setHeight**
  - **Parameter:** A double that stores a new value for the height.
  - Re-sets the value of height to the value passed by the parameter.
- Function **calculateVolume**:
  - Returns the volume of the cylinder as a double.
  - Volume formula: **(π * radius * radius) * height**
- Function **printDimensions**:
  - Redefines the parent's function **printDimensions**.
  - To output the **radius** and **pi**, call the parent's function **printDimensions**.
  - Outputs the dimensions of the circle in the following format:

    Radius: #
    Pi: #
    Height: #

    Where "#" will be replaced by the actual values.
  - No need to format the decimals; the testing cases will take care of that.
- **Destructor**
  - Left empty.

Expected Output

```
Radius: 2.45
Pi: 3.14
Area: 18.85

Radius: 3.00
Pi: 7.21
Area: 64.89

First Cylinder
Radius: 3.00
Pi: 3.14
Height: 3.00
Volume: 84.83

Second Cylinder
Radius: 1.70
Pi: 3.14
Height: 2.40
Volume: 21.79
```