08 - Programming Exercises
Cuboids ADT

Program the following task in your C++ compiler. Keep compiling and executing even after writing a single line of code.

ADT: Cuboids

Cuboids are three-dimensional shapes having different measurements in each dimension say **height**, **width,** and **depth**. Cuboids shapes are often used for boxes, cupboards, rooms, buildings, etc. So, keeping in mind the importance of Cuboids you must implement a class Cuboids with the following functionalities.

1. The class should have the following three private data members to which value should only be assigned to them when it is greater than 0 and lesser than 35.00, 1 otherwise no matter to which dimension.
   1) A float named **height** that holds the cuboids' height.
   2) A float named **width** that holds the cuboids' width.
   3) A float named **depth** that holds the cuboids' depth.
2. Provide the implementation of mutators (setters) for all the data members (**width**, **height**, and **depth**) of the class.
3. Provide the implementation of accessors (getters) for all the data members (**width**, **height**, and **depth**) of the class.
4. Provide the implementation of following constructors and a destructor.
   - A constructor that accepts cuboids' **height**, **width** and **depth** as arguments and assigns them to the appropriate member variables.
   - A constructor that accepts cuboids' **height** and **width** as arguments and assigns them to the appropriate member variables. The **depth** field should be assigned the default value.
   - A default constructor that initializes all the data members of the class with default values.
   - A copy constructor initializes a cuboids' object with an already existing object.
   - A destructor that does nothing except displaying a simple message "Destructor executed…" on the screen.
5. Provide the implementation of the following member functions.
   - **setCuboids** method accepts cuboids' **height**, **width** and **depth** as arguments and assigns them to the appropriate member variables.
   - **getCuboids** method to initialize the data of a cuboids taken from the user through the console.
   - **putCuboids** method to display the information of a particular cuboids on the console.
   - **getSurfaceArea** method provide the facility to calculate the surface area of a cuboids that is.

     $$2(height * width) + 2(height * depth) + 2(width * depth)$$

   - **getVolume** method provide the facility to calculate the volume of a cuboids that is $height * width * depth$
   - **getSpaceDiagonal** method provide the facility to calculate the **space diagonal** of a cuboids that is.

     $$\sqrt{height^2 + width^2 + depth^2}$$

   - **putCuboidsInfo** method should display all the dimensions, surface area, volume, and space diagonal of a cuboids.
6. Test the functionality of Cuboids class by creating a few objects of it in the **main** function.