Object Oriented Programming

Homework 02   **Marks 10**

Instructions

Work on this homework individually. Absolutely NO collaboration is allowed. Any traces of plagiarism would result in ZERO marks in this homework and possible disciplinary action. Task should be coded in **C++**. You are strictly ***NOT ALLOWED*** to include any additional data-members/functions/constructors in your class. Write the ***main*** function first and keep testing the functionality of each function once created.

Due Date

Paste the solution *(source code .cpp file)* labeled with your complete roll number *(capital letters e.g., BITF21M000)* in BSIT – HW 02 and BSCS – HW 02 folders for BSITF21 and BSCSF21 sections respectively till 05:00PM Friday, February 17, 2023. These folders are available at \\printsrv\Teacher Data\Umair Babar\Students.

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 the mind the importance of **Cuboids** you must implement a class **Cuboids** with following functionalities.

1. The class should have 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** for all the data members *(width, height, and depth)* of the class.

3. Provide the implementation of **accessors** for all the data members *(width, height, and depth)* of the class.

4. Provide the implementation of following **constructors** and a **destructor**

    1. A **constructor** that accepts **cuboids' height**, **width** and **depth** as arguments and assigns them to the appropriate member variables.

    2. 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.

    3. A **default constructor** that initializes all the data members of the class with **default values**.

    4. A **copy constructor** to initialize a cuboids' object with already existing object.

    5. A **destructor** that does nothing except displaying a simple message "Destructor executed…" on the screen.

5. Provide the implementation of following member functions

    1. **setCuboids** method accepts **cuboids' height**, **width** and **depth** as arguments and assigns them to the appropriate member variables.

    2. **getCuboids** method to **initialize the data** of a cuboids **taken** from the user.

    3. **putCuboids** method to display the **information** of a particular cuboids.

    4. **getSurfaceArea** method provide the facility to calculate the **surface area** of a cuboids that is

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

    5. **getVolume** method provide the facility to calculate the **volume** of a cuboids that is *height * width * depth*

    6. **getSpaceDiagonal** method provide the facility to calculate the **space diagonal** of a cuboids that is

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

    7. **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 **few objects** of it in **main** function.

Failure to a abide by the submission instructions will cause a penalty of two marks.
No submission will be accepted after the due date and time.

BEST OF LUCK