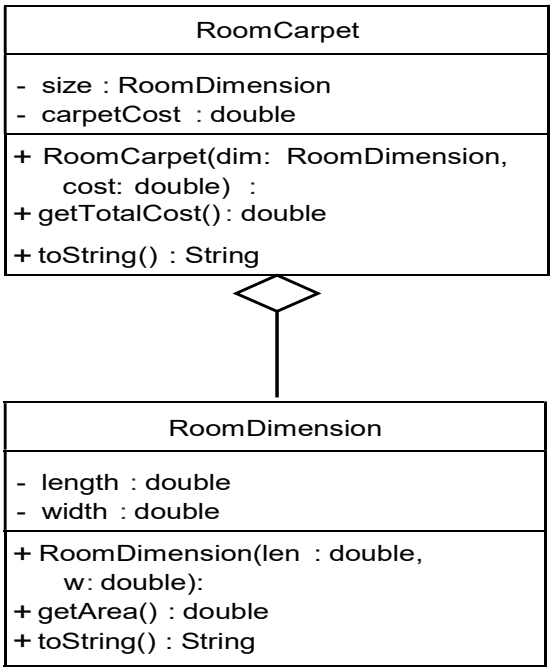
CS2365-Spring 2022
Homework #3

Question1: (5pts)
The Westfield Carpet Company has asked you to write an application that calculates the price of carpeting for rectangular rooms. To calculate the price, you multiply the area of the floor (width times length) by the price per square foot of carpet. For example, the area of floor that is 12 feet long and 10 feet wide is 120 square feet. To cover that floor with carpet that costs $8 per square foot would cost $960. (12 x 10 x 8 = 960.) The toString methd displays the length and width of Room Dimension object.

First, you should create a class named RoomDimension that has two fields: one for the length of the room and one for the width. The RoomDimension class should have a method that returns the area of the room. (The area of the room is the room's length multiplied by the room's width.)

Next you should create a RoomCarpet class that has a RoomDimension object as a field. It should also have a field for the cost of the carpet per square foot. The RoomCarpet class should have a method that returns the total cost of the carpet. The toString methd displays the size and carpet cost of Room Carpet object.

The following is a UML diagram that shows possible class designs and the relationships among the classes. Once you have written these classes, use them in an application that asks the user to enter the dimensions of a room and the price per square foot of the desired carpeting. The application should display the total cost of the carpet.



Question 2: (5 pts)
Write a Geometry class with the following methods:

• A static method that accepts the radius of a circle and returns the area of the circle. Use the following formula:

Area = π*r*2

Use Math.PI for π and the radius of the circle for *r*.

• A static method that accepts the length and width of a rectangle and returns the area of the rectangle. Use the following formula:

Area = *Length* x *Width*

• A static method that accepts the length of a triangle's base and the triangle's height. The method should return the area of the triangle. Use the following formula:

Area = *Base* x *Height* x 0.5

The methods should display an error message if negative values are used for the circle's radius, the rectangle's length or width, or the triangle's base or height.

Next, write a program to test the class, which displays the following menu and responds to the user's selection:

```
Geometry Calculator
1. Calculate the Area of a Circle
2. Calculate the Area of a Rectangle
3. Calculate the Area of a Triangle
4. Quit
Enter your choice (1-4):
```

Display an error message if the user enters a number outside the range of 1 through 4 when selecting an item from the menu.