

Quiz #3, on Thursday, October 18, will consist of questions taken or inspired from Parts I and II of this homework, from the lab, and from parts of homework #4 (details to follow). Use this homework to study for Exam #1.

Part I — Questions

1. What does the keyword `return` do?
2. Write a statement that creates a new object from the `Rectangle` class.
3. Consider the following UML diagram:

Circle
- radius : float
+ setRadius(radiusParam : float) : void
+ getRadius(): float
+ getArea(): float

What is the name of the class, what are the methods and attributes of the class?

4. Write a getter for an attribute of type `string` named `myName`.
5. Write a setter for an attribute of type `int` named `myAge`.
6. Is it possible to have more than one constructor defined for a class? If yes, how can C# know which one is called?
7. What is the name of a constructor method? What is the return type of a constructor?
8. Write a constructor for a `Soda` class with one `string` attribute called `name`.
9. What is called the “default” constructor? Do we always have the possibility of using it?
10. Consider the following partial class definition:

```
1      public class Book
2      {
3          private string title;
4          private string author;
5          private string publisher;
6          private int copiesSold;
7      }
```

1. Write a statement that would create a `Book` object.
2. Write a “getter” and a “setter” for the `title` attribute.
3. Write a constructor for the `Book` class taking at least one argument (you’re free to decide which one(s)).

11. Why would one want to define a constructor for a class?
12. Write a get method for a total instance variable of type `int`.
13. Assuming `name` is a `string` instance variable, there is problem with the following setter. Fix it.

```
public int SetName1(string var){  
    name = var;  
}
```

14. Draw the UML diagram of a class named “Student” with a single attribute, “name”, of type `string`, and two methods, `SetName` and `GetName`.
15. Briefly describe what a format specifier is. Write a statement that uses one.

Part II – Problems

There is only one problem this time, and it is harder than what you’ll be asked to do during the exam. Being able to solve it is an excellent sign that you are ready.

In the meantime, focus on lab 10 and 11, that are challenging, and make sure you understand all the concepts we studied so far.

Problem 1

You are going to design a class named `Triangle`. A triangle has three angles, but knowing the value of only two angles is sufficient to determine the value of the third, since they always add up to 180° . Hence, it is sufficient to have only two `double` attributes, `angle1` and `angle2`. We want to define several methods:

- a no-arg constructor that sets the value of `angle1` to 60.0 and the value of `angle2` to 60.0,
- another constructor, that takes two arguments, and assigns to `angle1` the value of the first argument, and assigns to `angle2` the value of the second argument,
- getters for `angle1` and `angle2`,
- a method that computes and returns the value of the third angle, that we name `ComputeAngle3`,
- a method that rotate the triangle: the value of the first angle should become the value of the second angle, and the value of the second angle should become the value of the third angle.

1. Write the UML diagram for the `Triangle` class.
2. Write the full, compilable implementation of the `Triangle` class.

