

Please read 4.1–4.5, 4.8–4.9, 7.6 of the textbook and then answer the following, trying not to look at your notes or at the textbook. Quiz #3, on 21st February, will consist of questions taken or inspired from the Part I of this homework and from the lab. Part II will help you in getting ready for the first exam.

Part I — Questions

1. Write an explicit conversion, from a **double** variable `myDoubleVar` to a **int** variable called `myIntVar`. You don't need to re-declare those variables. Assuming `myDoubleVar`'s value is 5.89, what value would be stored in `myIntVar`?

2. What does the keyword **return** do?

3. Write a statement that performs an implicit conversion between two different numeric datatypes.

4. Is there an error in the following code? Explain the error, or give the value of `b` after the second statement is executed.

```
1 float a = 3.7f;  
2 int b = (int)a;
```

5. Write a statement that creates a new object from the `Rectangle` class.

6. If one of the operator's operand is of type **float**, and the other is of type **int**, what will be the type of the result of the operation?

7. What is the return type of the operation `12.4 * 3`?

8. Assuming that `myLastName` and `myFirstName` are two **string** variables that have been initialized, write a statement that *concatenate* them, with a space and a comma in-between, and assign the resulting **string** to a variable named `fullName`. For instance, if the value of `myLastName` is "`Holbertonand`", and the value of `myFirstName` is "`Betty`", then the value of `fullName` after your operation should be "`Holbertonand, Betty`".

9. 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?

10. Write a getter for an attribute of type **string** named `myName`.

11. Write a setter for an attribute of type **int** named `myAge`.

12. Is it possible to have more than one constructor defined for a class? If yes, how can C# know which one is called by an object?

13. What is the name of a constructor method? What is the return type of a constructor?
14. Write a constructor for a Soda class with one `string` attribute called `name`.
15. What is called the “default” constructor? Do we always have the possibility of using it?
16. Briefly describe what a format specifier is.
17. 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)).

Part II — Programming Exercises

This time, the two exercises **do not** require a computer, and are here to craft on your problem-solving skills, and to prepare you for the exam. Make sure you feel ready before starting them, try to do them with limited time and without notes, and check your answer using VS.

Problem 1

Write down, on a piece of paper, a program that

1. declares a `string` variable named `userName`,
2. prints “Please, type in your user name:”,
3. reads a `string` value from the keyboard and assigns the value to the `userName` variable,
4. declares a `int` variable named `number`,
5. prints “Please, enter your number:”,
6. reads a `int` value from the keyboard and assigns the value to the `number` variable,
7. declares a `string` variable named `id` and initializes it with the string referenced by the `userName` variable, followed by the number entered by the user,
8. prints “Your id is” and the content of the `id` variable.

Problem 2

Write down, on a piece of paper, a fully compilable program that initializes an `int` variable named `persons` with the value 5, an `int` variable named `bottles` with the value 3, and a `double` variable named `litterPerBottle` with the value 1.5. What should be the type of a variable `litterPerPerson` to be able to be assigned the number of litters every person is going to get, if we split equitably? Write the correct initialization of that variable, and print its value.

Place a delimited comment with a your name and the time at which you wrote the program at the top of the program.

Problem 3

This problem 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.

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.

