CS-207: Programming II
Spring 2016
Northeastern Illinois University
Homework #3: Due 02/04/16 at 9:00 a.m.
Working with Classes

Problem #1

- In the `Duck` class provided below, each of the defined constructors has a number in parentheses to its right (this is not part of the program!).
- Match the constructor invocation (the call that uses `"new"`) in the `DuckTest` class (page 2) with the number next to the correct constructor definition from the `Duck` class.
- Note that the constructor definitions can be used more than once.
- Put your answers (appropriately labeled) in a .txt file named Homework3.
- Put the .txt file in a folder named Homework3 to be submitted to D2L.

(a) `d1` is created with which constructor? _____

(b) `d2` is created with which constructor? _____

(c) `d3` is created with which constructor? _____

(d) `d4` is created with which constructor? _____

(e) `d5` is created with which constructor? _____

(f) `d6` is created with which constructor? _____

(g) `d7` is created with which constructor? _____

```
public class DuckTest
{
    public static void main(String[] args)
    {
        int q = 8, h = 10;
        double m = 5.38, n = 7.96;
        String a = "Donald";
        char[] s = { 'f1', 'f2', 'f3' };
        boolean f = true;

        Duck d1 = new Duck(f);
        Duck d2 = new Duck(a, s);
        Duck d3 = new Duck(m);
        Duck d4 = new Duck();
        Duck d5 = new Duck(q, n);
        Duck d6 = new Duck(n);
        Duck d7 = new Duck(h, m);
    }
}
```

```
public class Duck
{
    private int pounds;
    private double floatability;
    private String name;
    private char[] feathers;
    private boolean canFly;

    public Duck()                                                    (1)
    {
        System.out.println("Duck 1");
    }

    public Duck(boolean fly)                                         (2)
    {
        this.canFly = fly;
        System.out.println("Duck 2");
    }

    public Duck(String n, char[] numfeathers)                        (3)
    {
        this.name = n;
        this.feathers = numFeathers;
        System.out.println("Duck 3");
    }

    public Duck(int weight, double density)                          (4)
    {
        this.pounds = weight;
        this.floatability = density;
        System.out.println("Duck 4");
    }

    public Duck(double density)                                      (5)
    {
        this.floatability = density;
        System.out.println("Duck 5");
    }
}
```

Problem #2:

1. Create a class called `Time`. The class contains:

   - Three private integer data fields (instance variables) named `hour`, `min` and `sec`.
   - A no-arg constructor that explicitly sets the the instance variables to values of 0.
   - A constructor that takes 3 integer parameters and sets the instance variables accordingly.
   - A public method named `getTotalSeconds()` that does not take any parameters. It should return an integer value representing the sum of the `hour`, `min` and `sec` instance variables in seconds.
   - A public method named `getTotalMinutes()` that does not take any parameters. It should return an integer value representing the sum of the `hour` and `min` instance variables in minutes.

- As a reminder, there are 60 minutes in an hour and 60 seconds in a minute.

2. Compile the `Time.java` class.

3. Download and compile the `TestTime.java` class - do **not** make any changes to this class. If you have created the `Time` class correctly, then the `TestTime` class will run without errors, producing the output below.

4. Put the `Time.java` file in the Homework3 to be submitted to D2L.

```
This object uses the default Time constructor:
The total number of seconds is: 0
The total number of minutes is: 0

This object uses the other Time constructor:
The total number of seconds is: 12475
The total number of minutes is: 207
```

A note on cheating/plagiarism:
A plagiarism detector is used on all submitted code (across all sections) for homework assignments. If the plagiarism detector determines that 25% or more of your code for a particular assignment is plagiarized, you will receive a zero (i.e. an F) for that homework assignment, regardless of whether you cheated from someone or vice-versa. If you plagiarize half or more of the total homework assignments, you will receive a zero for the entire homework percentage.

Submitting your assignment to D2L

1. Make sure your name and assignment number are in the .java file(s) (as comments) and text file.

2. Place all your files in a folder and compress (i.e. .zip) the folder. Submit the .zip file to the Homework #3 folder on D2L. You should submit only one file - the .zip file. Do **NOT** upload multiple files.

3. Turn your homework in to D2L by the specified deadline (no late homework will be accepted - see syllabus for policies)