CSCI 1101
Computer Science II
Assignment No. 2
Date Given: February 12, 2013
Due: Sunday, February 24, 2013, 11.59 p.m.
Submission: On Moodle

This programming assignment is on class collaboration and the design of an object-oriented program with multiple classes. Design one class at a time, test it for errors, and then write a demo program that utilizes all the classes. Submit your java files (source codes) and sample outputs.

Parking Ticket Simulator
You are to design a set of classes that work together to simulate a police officer issuing a parking ticket. You should design the following classes. You are given the broad description of each class. You should design the appropriate variables and methods that go into each class.

- The **ParkedCar** class: This class should simulate a parked car. The car has a *make*, *model*, *color*, *license number*.

- The **ParkingMeter** class: This class should simulate a parking meter. The class has three parameters:
    - a reference to the *car* (`ParkedCar` object) that is currently parked at the meter. If no car is parked, this parameter should be set to `null` (in this case, make sure to return "Car: none" in your `toString` method).
    - *the number of minutes of parking time that has been purchased.*
    - if the parking meter is expired, *the number of minutes by which the purchased time has exceeded.* (Normally parking meters just indicate whether the parking meter has expired, but for this example, assume that the parking meter is sophisticated enough to indicate the exceeded time).

You are suggested to include methods for parking a car at the meter, increasing purchased time and a method to set the elapsed time (it decreases the purchased time and increments the exceeded time if no purchased time left).

- The **ParkingTicket** class: This class should simulate a parking ticket. The class should report:
    - the *make*, *model*, *color* and *license number* of the illegally parked car.
    - the *amount of fine*, which is $25 for the first hour or part of an hour that the car is illegally parked, plus $10 for every additional hour or part of an hour that the car is illegally parked.
    - the *name* and *badge number* of the police officer issuing the ticket (DO NOT store `PoliceOfficer` object).

- The **PoliceOfficer** class: This class should simulate a police officer inspecting parked cars. The class has
    - the officer's *name* and *badge number*
    - `isExpired` method that examines the `ParkingMeter` object and determines whether the car's time has expired.
    - a method that examines the given parking meter and returns a parking ticket (generates a `ParkingTicket` object) if the car's time has expired. If time is not expired or no car is parked at the meter, return `null` value.

You may include instance variables and methods in each class as you may find appropriate.
Write a program that demonstrates how these classes collaborate.