School of Software Engineering

Object-Oriented Programming OOP (2016)
Exercise 5

Please submit the source files, program results after running the .exe file and related documents. The submitted package/files should be named by "yourname_studentid_exerciseno". Submit the package/files to your own folder on server (\\10.60.41.1). It should be the C++ folder.

Due day: 12:00 noon, Wednesday, Apr.20, 2016

Problem 1

Analyze a car by using object-oriented design principles. In other words, pick one of the car's systems, such as the braking system, and analyze it in terms of the divide-and-conquer, encapsulation, information-hiding, and interface principles.

Problem 2

A **Caesar cipher** is a secret code in which each letter of the alphabet is shifted by N letters to the right, with the letters at the end of the alphabet wrapping around to the beginning. For example, if N is 1, when we shift each letter to the right, the word _daze_ would be written as _ebaf_. Note that the _z_ has wrapped around to the beginning of the alphabet. Describe an algorithm that can be used to create a Caesar encoded message with a shift of 5.

Suppose you received the message, "_sxccohv duh ixq_", which you know to be a Caesar cipher. Figure out what it says and then describe an algorithm that will always find what the message said regardless of the size of the shift that was used.

Problem 3

Create a partial definition of a **Student** class. Create instance variables for the first name, last name, and an integer student identification number. Write the headers for three methods. One method uses three parameters to set values for the three instance variables. One method returns the student identification number. The last method returns a String containing the student's first name and last name. Write the main function to test the class.