**CSI-155 Object Oriented Programming**

Final Exam

Wednesday, December 7, 2016

Create a new windows form application. Use your name as the project name.

Add a class Student. Given the code below.

Zip your project and upload it to canvas

public class Student

{

public string First { get; set; }

public string Last { get; set; }

public List<int> Scores { get; set; }

public int ID { get; set; }

}

In Form1, Declare a List of students, then in a method populate the list.  
Use the code given below

List<Student> students;

//method to populate a list of students **Make sure this method gets called when the //application starts**

private void PopulateStudents()

{

students = new List<Student>

{

new Student {First="Svetlana", Last="Omelchenko", ID=111, Scores= new List<int> {97, 92, 81, 60}},

new Student {First="Claire", Last="O’Donnell", ID=112, Scores= new List<int> {75, 84, 91, 39}},

new Student {First="Sven", Last="Mortensen", ID=113, Scores= new List<int> {88, 94, 65, 91}},

new Student {First="Cesar", Last="Garcia", ID=114, Scores= new List<int> {97, 89, 85, 82}},

new Student {First="Debra", Last="Garcia", ID=115, Scores= new List<int> {35, 72, 91, 70}},

new Student {First="Fadi", Last="Fakhouri", ID=116, Scores= new List<int> {99, 86, 90, 94}},

new Student {First="Hanying", Last="Feng", ID=117, Scores= new List<int> {93, 92, 80, 87}},

new Student {First="Hugo", Last="Garcia", ID=118, Scores= new List<int> {92, 90, 83, 78}},

new Student {First="Lance", Last="Tucker", ID=119, Scores= new List<int> {68, 79, 88, 92}},

new Student {First="Terry", Last="Adams", ID=120, Scores= new List<int> {99, 82, 81, 79}},

new Student {First="Eugene", Last="Zabokritski", ID=121, Scores= new List<int> {96, 85, 91, 60}},

new Student {First="Michael", Last="Tucker", ID=122, Scores= new List<int> {94, 92, 91, 91} }

};

}

1. To the student class **Add the method GetAverageGrade()** that returns the average of all the grades in the Scores list.
2. In Form1 **add a method Display** that takes a List of students and display the list in a listview. Display lastname, firstname, id, and average grade.
3. **Use the Icomparable<Student>** interface to allow you to sort the students list. Use the average grade as criteria for comparing 2 students. Add a button that calls the sort method to sort by average grade and display the list in a listview
4. **Use another sort method that takes an Icomparer<Student> interface**, make this interface compare students by last name. Use a button that calls this Sort method to sort the students list by lastname and display the list in the listview
5. **Create a Dictionary studentsDictionary** that stores student objects and use the student id as a key.
6. **Add a method ‘PopulateDictionary()**’ that takes the content of the students list and copy them to the studentsDictionary (Adds every student in the list to the dictionary). Make sure this method gets called when the application starts
7. **Add a Display method that takes a dictionary** and display all the students in the dictionary.
8. Add gui to enter a student id, then use the appropriate method of the Dictionary to **get or search the student object with the given id**. Display the student info in a messagebox, or display not found if no student exists with the given id.
9. Provide gui to **remove a student by id from the studentsDictionary**. Display if the removal was successful or not. Display the dictionary if the removal was successful.
10. **Create a Queue of integers**. Initialize it with 30 random positive and negative integer values.

**Define a method ‘RemoveNegatives()** that takes a Queue of int and remove the negative values from the queue while maintaining the rest of the integers in the queue in their original order.

1. **Create a Stack of integers.** Initialize it with 30 random positive and negative integer valuees. Then **define a method RemovePositivesFromStack()** that removes all the positive integers from the stack while maintaing the rest of the negative integers in the stack in their original order.