PROG 8010 Assignment Week 8

You are only required to complete the programming problem that has been assigned to your group. However, you are encouraged to work through as many programming problems as possible.

Each group is to submit one solution to eConestoga. Someone from your group will be selected at random to present their solution to the class. Your mark on the assignment will depend on a combination of the quality, functionality, and adhesion to coding standards of your code. If you are absent without excuse, your mark for the presentation portion of the assignment (20%) is zero.

Group 1/7 Problem – Jagged Array of Exam Scores

Dr. Hunter teaches three sections of her Intro to Computer Science class. She has 12 students in section 1, 8 students in section 2, and 10 students in section 3. In the supplementary materials, you will find the following files:

- Section1.txt – this file contains the final exam scores for each student in section 1.
- Section2.txt – this file contains the final exam scores for each student in section 2.
- Section3.txt – this file contains the final exam scores for each student in section 3.

Create an application that reads these three files and stores their contents in a jagged array. The array's first row should hold the exam scores for the students in section 1, and so on.

The application should display each section's exam scores in a separate ListBox control and then use the jagged array to determine the following:

- The average exam score for each individual section
- The average exam score for all students in all sections
- The highest exam score among all three sections and the section number in which that score was found
- The lowest exam score among all three sections and the section number in which that score was found

Group 2/8 Problem – Driver's License Exam

The local driver's license office has asked you to create an application that grades the written portion of the driver's license exam. The exam has 20 multiple-choice questions. Here are the correct answers:

1.B 2.D 3.A 4.A 5.C 6.A 7.B 8.A 9.C 10.D
11.B 12.C 13.D 14.A 15.D 16.C 17.C 18.B 19.D 20.A

Your program should store these correct answers in an array. The program should read the student's answers for each of the 20 questions from a text file and store the answers in another array. After the student's answers have been read from the file, the program should display a message indicating whether the student passed or failed the exam. A student must correctly answer 15 questions to pass. It should then display the total number of correctly answered questions, the total number of incorrectly answered questions, and a list showing the question numbers of the incorrectly answered questions.

Group 3/9 Problem – World Series Champions

In the supplementary materials, you will find the following files:

- Teams.txt – this file contains a list of several Major League baseball teams in alphabetical order. Each team listed in the file has won the World Series at least once.
- WorldSeriesWinners.txt – this file contains a chronological list of the World Series' winning teams from 1903 to 2012. (The first line in the file is the name of the team that won in 1903, and the last line is the name of the team that won in 2012. Note that the World Series was not played in 1904 or 1994).

Create an application that displays the contents of the Teams.txt file in a ListBox control. When the user selects a team in the ListBox, the application should display the number of times that team has won the World Series in the time period from 1903 through 2012.

Group 4/10 Problem – Name Search

In the supplementary materials, you will find the following files:

- GirlNames.txt – This file contains a list of the 200 most popular names given to girls born in the United States from 2000 to 2009.
- BoyNames.txt – This file contains a list of the 200 most popular names given to boys born in the United States from 2000 to 2009.

Create an application that reads the contents of the two files into two separate arrays or Lists. The user should be able to enter a boy's name, a girl's name, or both, and the application should display messages indicating whether the names were among the most popular.

Group 5/11 Problem – Population Data

In the supplementary materials, you will find a file named USPopulation.txt. The file contains the midyear population of the United States, in thousands, during the years 1950 through 1990. The first line in the file contains the population for 1950, the second line contains the population for 1951, and so on.

Create an application that reads the file's contents into an array or List. The application should display the following data:

- The average annual change in population during the time period
- The year with the greatest increase in population during the time period
- The year with the least increase in population during the time period

Group 6/12 Problem – Tic-Tac-Toe Simulator

Create an application that simulates a game of tic-tac-toe. You could use a 3x3 grid of Label controls to show the X's and O's.
The application should use a two-dimensional int array to simulate the game board in memory. When the user clicks the 'New Game' button, the application should step through the array, storing a random number in the range of 0 to 1 in each element. Let the number zero represent the letter O, and the number 1 represent the letter X. The form should then be updated to display the game board. The application should display a message indicating whether player X won, player O won, or if the game was a tie.