CSE 1310: Introduction to Computers and Programming

Student Name: _____ **Student ID#:** _____ **Date:** _____

Exam 2

"*By taking this exam I agree to abide the UT Arlington Honor Code and guidelines listed in the syllabus provided by the instructor. In the event that the UT Arlington Honor Code and/or course guidance listed within the course syllabus are violated, I understand that this exam will be relinquished immediately and a grade of zero (0) will be administered. Any request to retake the exam will be denied. Furthermore, I understand that disciplinary action in accordance with University policy for academic dishonesty, will be taken and may result in suspension or expulsion from the University.*"

Part I (40 Points)

1. **Write a program using an ArrayList that asks the user to enter integers. Add the input to the ArrayList and manipulate the content using the rules below.** ***(20 Points)***

   A. Delete numbers that are divisible by 4.
   B. Numbers that are less than 5 should be duplicated and placed next to each other.
   C. Subtract 2 from numbers that are odd.
   D. Increase numbers that are even and greater than 6 by 1.
   E. Print the updated ArrayList.
   F. Print the sum of the ArrayList.
   G. Print the average of the ArrayList.

Note:

1. *An ArrayList MUST be used.*
2. *Methods are not required.*
3. *The original ArrayList does not have to be preserved.*
4. *Assume unlimited entries from the user. (DO NOT ASK FOR NUMBER OF ITEMS TO INPUT!)*

2. **Write a program that creates the structure below using a 2D Array and uses the rules below to manipulate the structure.** ***(20 Points)***

Original 2D Array

X O X X O
O X O
X O O X
O O
X

   A. Print the structure.
   B. Print the size of the structure.
   C. Change every "X" in an even column position to an "O".
   D. Change every "O" in an odd column position to a "X".
   E. Print the updated structure.
   F. Print the number of X's and O's in the updated structure.
   G. Sort the structure based on the row size from smallest to largest. (The array should have the row with fewest elements first and most elements last.)
   H. Print the sorted structure.

Note:

1. *An Array MUST be used.*
2. *Methods are not required.*
3. *The original Array does not have to be preserved.*

Part II (60 Points)

3. Write a program that takes four sets of words and stores each set in an Array. Using the Arrays perform the actions below using a method for each action. *(30 Points)*

A. Append the Arrays in the following order: 4th, 1st, 3rd, and 2nd.
B. Sort the combined Array in ascending alphabetical (A-Z) order. DO NOT use the .sort() method.
C. Reverse the content in the Array.
D. Reverse the letters in each word in the Array.
E. Print the updated Array.

Note:

1. *Arrays MUST be used.*
2. *Methods MUST be used for each function (A-D). (Printing can be done from main or in separate method.)*
3. *The original Array does not have to be preserved.*
4. *Assume unlimited entries from the user. (DO NOT ASK FOR NUMBER OF ITEMS TO INPUT!)*

4. Write a program that creates a dictionary. Using a 2D ArrayList allow the user to perform the options below. Print a menu that lists each option which represents a method that performs the associated action(s). (Include an option for the user to exit the program.) *(30 Points)*

A. Add words and definitions to dictionary.
B. Remove words and definitions from dictionary.
C. Edit words and/or definitions in dictionary.
D. Search for words in the dictionary and print the word and definition.
E. Print all words and definitions from dictionary.

Note:

1. *An ArrayList MUST be used.*
2. *Methods MUST be used.*
3. *The original ArrayList does not have to be preserved.*
4. *Assume unlimited entries from the user. (DO NOT ASK FOR NUMBER OF ITEMS TO INPUT!)*