

Assignment 6

Section 1. For the following problem you are required to write code. Be sure you follow the instructions in your submission document. Be sure that you no longer use if statements to terminate code when checking for user validation.

1. Number Analysis Program

Write a program that asks the user for a file name. Assume the file contains a series of numbers, each written on a separate line (you may use the Numbers.txt file that we have been working with on past assignments). The program should read the contents of the file into an array and then display the following data:

- The lowest number in the array
- The highest number in the array
- The total of the numbers in the array
- The average of the numbers in the array

Note: you are not given the size of the array. Therefore, you must read the file and count the numbers first and then use that number for the size of the array.

In addition to your main function, your program should have five functions:

1. Function that reads the numbers from a file and stores them into an array
2. Function that finds the lowest value in the array and returns that value. There will be a “size” parameter which is the number of elements in the array.
3. Function that finds the highest value in the array and returns that value. There will be a “size” parameter which is the number of elements in the array.
4. Function that calculates and returns the sum of the values stored in the array.
5. Function that calculates and returns the average of the values stored in the array.

2. ABET Preparation

In preparation for our ABET accreditation, the faculty are required to provide evaluators with redacted samples of student work. Everything that is covered in a class must be provided to include the minimum grade, maximum grade and the average grade. Instead of doing this for everything that is covered in a class we are going to only focus on overall class grades. Write a program that does the following:

1. Asks the user for the number of students in the class (this will be the size of your array).
2. For each student the user should enter their overall class score (range 0 – 100 inclusive).
3. Write a function that will validate the user entry.
4. Write a function that will find the minimum value in the array.
5. Write a function that will find the maximum value in the array.
6. Write a function that will find the average value in the array.
7. Write a function that will find the mode value in the array.
8. Write a function that will display all of this information to the user in a nice format.

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3. Tic-Tac-Toe Game

Write a program that allows two players to play a game of tic-tac-toe. Use a two-dimensional char array with three rows and three columns as the game board. Each element of the array should be initialized with an asterisk (*). The program should run a loop that

- Displays the contents of the board array
- Allows player 1 to select a location on the board for an X. The program should ask the user to enter the row and column number.

In addition to your main function, your program should have five functions:

1. Function that displays the content of the game board.
2. Function that allows a player (X or O) to take a turn.
3. Function that will determine if the game is over. The function should return true in the case when either player has already won, or there is a tie.
4. A function that will accept the game board and a player symbol (X or O) as arguments, and will return true if the player has won.
5. A function that will return true if the player (X or O) can still win the game.
6. A function that will display the winner of the game.

Note: There are versions of this program that can be found Online. If you choose to use a solution from Online be sure that you cite your source and the solution is based on the problem statement given here.

Also, be sure you understand the code, this is a key program that will help you with your final exam.

Section 2. For the following problems write out your answers or provide the required diagram. No code should be created or submitted for these problems.

4. Find the Error (Note: A solution is found Online and it has the WRONG answers.)

- a) `int size;`
`double values[size];`
- b) `int collection[-20];`
- c) `int table[10];`
`for (int x = 0; x < 20; x++)`
`{`
`cout << "Enter the next value: ";`
`cin >> table[x];`
`}`
- d) `int hours[3] = 8, 12, 16;`
- e) `int numbers[8] = {1, 2, , 4, , 5};`
- f) `float ratings[];`
- g) `char greeting[] = {'H', 'e', 'l', 'l', 'o'};`
`cout << greeting;`
- h) `int array1[4], array2[4] = {3, 6, 9, 12};`
`array1 = array2;`
- i) `void showValues(int nums)`
`{`
`for (int count = 0; count < 8; count++)`
`cout << nums[count];`
`}`