COP 3275C Assignment 6 -

Assignment purpose: This assignment will help you practice using arrays, reading from a file, performing operations on static and dynamic arrays, implementing basic search techniques.

1. **Reading from a File**:
   Create a program that reads a list of integers from a file and stores them in an array. You will need to use `ifstream` to read from the file.
   - The input file should have at least 100 integers
   - The required name of the input file is `numbers.txt`

2. **Static Array**:
   Use a static array (size 100) to store the 100 integers read from the file.

3. **Dynamic Array**:
   After reading the integers, ask the user for a number between 1 and 100 to dynamically allocate memory to store values using a dynamic array. You must use `new` and `delete[]` to manage the dynamic array. Copy the values from the static array to the dynamic array.

4. **Passing arrays to a function (3 Programmer defined functions):**
   - Be sure to use function prototypes above main and function definitions below main
   - **Function 1: Print array elements in a column:**
     Implement a function that takes an array and its size as parameters. Print all the elements in the array in a column.
   - **Function 2: Looping Through the Array and make calculations**:
     Implement a function that calculates and returns the sum and the average of all the elements in the array.

     To return both the sum and the average you may decide to use one of the following:

     - 2 additional reference parameters (one for the sum and one for the average)
     - 1 additional reference parameter (for sum or average) and a double return type (sum or average)

   - **Function 3: Searching the Array**:
     Implement a function that searches for a specific value in the array and prints the index(es) where it was found. If the value is not found print a message that the value is not in the array.

5. **Main Function**:
   In your `main` function:
   - Read integers from a file into a static array.
   - Dynamically allocate an array (get the size (ONE to 100) of the dynamic array from the user (use a do/while lop to make sure the user enters a valid size for the dynamic array) copy values from the static array to the dynamic array.
   - Print the elements of the dynamic array in a column (call the function)
   - Call the function to calculate and return the sum and average of the array elements.(Pass the dynamic array, the size of the array, HINT: you will need to use at least one other reference parameter)
   - Print both the sum and the average from the main function.

- Ask the user for a number to search for, pass that number to the function search function along with the dynamic array and the size of the array to find the index or indexes, if the number is repeated in the dynamic array.
- Delete the dynamic array

Additional instructions:

- Be sure to comment your code
- Be sure to use function prototypes above main with function definitions below main
- Be sure to include comments on the function prototypes as well as the function definitions and throughout the code to make it easier to read and understand.
- Be sure to use descriptive variable names
- Be sure to use descriptive function names
- Submit ONE source code file: lastname_A6.cpp
- You do not need to submit "numbers.txt" be sue the input file name is "numbers.txt" in the code.
- Include a program header COMMENT with the following information:
  - Name, date, course, and a brief description of the assignment
- Test your code in an IDE before submitting
- The file names must match the assignment
- The code must be submitted on time in order to receive credit (11:59 PM on the due date)
  - NOTE: there is a grace period until 8:00 AM the following day
- The assignment allows multiple submissions you may make revisions and resubmit until the final due date

- Late submissions (after 8 AM or sent by email) will not be accepted or graded

Modifying data and submitting it as your own is a fraudulent practice—specifically, plagiarism—and is no different than copying paragraphs of information from a book or journal article and calling it your own (make sure that you work independently and submit only your own work)

This programming assignment is individual work, sharing code is considered cheating,

The use of AI to assist in this assignment is prohibited.