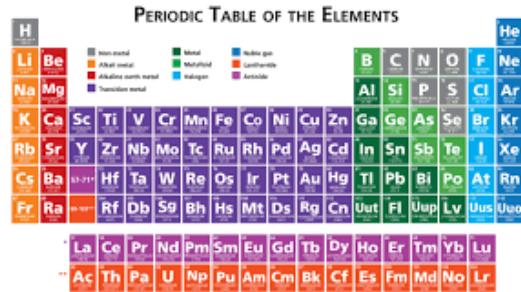


CST 180 C++ Programming

Structures Program Assignment (30 pts)



Purpose

To create a C++ program that uses record structures, arrays, and file processing.

Specifications

Write a C++ program that will aid a chemistry student with the periodic table of elements.

The text file named [periodic.txt](#) includes the basic information for each chemical element including the code (1 or 2 characters), the name, the chemical number, and the chemical weight. Design a record structure to store information for one element. Your program should then input information in the entire file to an array of "element" record structures.

Your program should be driven by a simple menu. Allow the user to search the periodic table using either the element code or the atomic number of the element. When you match the given user request, provide all of the information on the element including the name, code, atomic number, and atomic weight.

Include functions as detailed below. Consider the main tasks that are being performed and the data "flowing" between actions. Be sure to include error checking to return an error message to the user if either the atomic number or element code is not found in the data set. Finally, a variety of string operations are required for this program.

LoadArray	<p>Primary responsibility: Loads periodic table array with records.</p> <p>HOW: Pass the address of your structures array to the function. Use a loop to read in the data records from the data file for each atom.</p>
DisplayMenu	<p>Primary responsibility: Displays the program menu.</p> <p>HOW: Display a menu that allows the user to search the periodic table using either the element code or the atomic number. Return the menu selection to the calling function.</p>
CodeSearch	<p>Primary responsibility: Searches the structure array by element symbol(code).</p> <p>How: Pass the address of your structures array and the symbol for the desired element. Set up a loop to process the array, searching for the symbol. If found, return the array index where the element was found. If not found, return -1.</p>

NumberSearch	Primary responsibility: Searches the structure array by atomic number (element number). HOW: Pass the address of your structures array and the atomic number for the desired element. Set up a loop to process the array, searching for the atomic number. If found, return the array index where the element was found. If not found, return -1.
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In addition to the above functions, you should display the result of the search (e.g. whether the element was found or not) and the associated information.

Design Requirement

Use planning documentation tools as needed to design your program. For turn-in, write pseudocode or a flowchart detailing the algorithm.

Final Deliverables

Deliver a single document with the following:

- Cover page with assignment name, student name, and list of attachments
- Hierarchy chart that shows function calls
- Pseudocode or flowchart for program.
- Printed copy of source code
- Output screenshot(s)

Upload the document **AND** the .cpp source code file for grading into the appropriate dropbox.