FULL SAIL UNIVERSITY

Data Structures and Algorithms

Lab 2: std::vector

Overview

The **std::vector** class is a templated sequence container class that stores data contiguously (through the internal use of a dynamic array). This enables them to be used in place of arrays, and provide additional flexibility, without having to completely refactor the code.

This lab focuses on using several of the key methods provided by the class. While the last lab focused on writing your own version of the class, it is just as important to be able to use the built-in versions provided by the language.

Things to Review

- Calling class methods
- Binary file I/O

New Topics

- File headers (metadata)
- Iterators

Data Members

mValues	The main vector that will be used within every single method
mPalindromes	This vector will only be used in the **MovePalindromes** method

Methods

IsPalindromeNumber

- Checks to see if the value passed in is a palindrome or not
- This value can be any number of digits (1-N)
- *A palindrome is any sequence that reads the same forwards and backwards*

Fill (from file)

- Fill the **values** vector with the contents of the **binary** file
- This file contains a four-byte header section that represents the number of values to be read and stored in the vector

Fill (from array)

- Fill the **values** vector with the contents of the passed-in array

Clear

- Removes all elements from the **values** vector
- Decreases the capacity of the vector to 0
- *There are two methods within the vector class to handle this*

Sort

- Sorts the **values** vector, based on the value of the parameter
- Use the **std::sort** method to handle the sort

[] (Array Subscript) operator

- Returns an individual element from the **values** vector
- *No need for error-checking, as **std::vector***

Contains

- Determines if a value is present in the **values** vector

MovePalindromes

- The **values** vector is populated with a number of values. Iterate through this vector and move all of these values into the **palindromes** vector.
- This will require adding them to **palindromes** and erasing them from **values**
- **Pseudo-code**
    - **Iterate** through the **values** vector
        - If the value is a palindrome *(remember you have a method to check this)*
            - Add it to the **palindromes** vector
            - Remove it from the **values** vector