

Emphasis on: **Using Recursion and Templates to Detect Palindromes**

In this assignment you will be asked to write a recursive function that tests whether an array of characters is a palindrome. You will then rewrite the function as a function template so that you can determine if an array of any type (e.g. arrays of int, float, bool) are palindromes.

A palindrome in the context of english words is a word that reads the same forward and backward. For instance, the following are palindromes:

dad level did madamimadam

A couple of hints to get you started. An array with 0 or 1 characters will be defined to be a palindrom (e.g. stopping condition). If the first and last characters of the array are equal, then it is a palindrome provided the string in between the ends is also a palindrome.

Part A:

Write a recursive function that accepts an array of characters (and possibly other parameters) and determines if the character array is a palindrome as defined above. The function should return a bool result that is true if it is a palindrome and false otherwise.

Part B:

Modify your function from part A to turn it into a function template. Thereby allow your palindrome testing function to test not only if an array of characters is a palindrome, but also arrays of ints, floats, etc.

Part C:

Write a test driver program that will read in character strings from a file. The input file will have 1 word per line. You should read in each line as a character array then test if it is a palindrome. If the line is a palindrome write it back out to standard output.

Requirements

- 1) You must create and use a function that solves the palindrome testing using true recursion
- 2) The palindrome function must be made into a template that can test for palindromes in any type of array.
- 3) Your test driver program should read in all lines in the input file and only output those lines that are palindromes.