Assignment 1 – Palindrome

Submission

Submit your code files and the Answer to Question 1 below to Blackboard under Assignment 1 by the due date specified in Blackboard. Plan to demonstrate your working program to the instructor in class after the due date.

Details

A Palindrome is a word or phrase that reads the same forward or backward.

For example

- Pop and eye are palindromes
- Rececar is a palindrome
- Able was I ere I saw elba is a palindrome
- Marshall is not a palindrome

There are numerous was to determine if a phrase is a palindrome. Use **For loops** to reverse a phrase and compare it to the original. Use a **Stack**. Push the characters of the phrase on the stack – one at a time. Form a new phrase by popping the characters one at a time. Then compare the new phrase to the original.

Sample function: public Boolean isPalindrome (String phrase)

A recursive solution is also possible. If the first and last characters in the phrase are *different*, the phrase *is not* a palindrome. We see this a base case and we **return** *false*. If the phrase has one character, another base case, we **return** *true*. If the first and last characters in the phrase are the *same*, it is *possible* that the phrase is a palindrome. We apply recursion and determine if the string in positions (first+1) through (last -1) is a palindrome.

Example – racecar

- Call isPalindrome(racecar)
- First and last characters are the same: racecar
- Return true && isPalindrome(aceca)
- First and last characters are the same: aceca
- Return true && true && isPalindrome(cec)
- First and last characters are the same: cec
- Return true && true && true && isPalindrome(e)
- Return true && true && true && true

Question 1. Show how this algorithm works on the following strings using pseudo code:

- rester
- able was i ere i saw elba

Requirements

Using the programming language of your choosing Your Palindrome program should use a recursive function call isPalindrome that returns a Boolean and accepts a string as a parameter. This program should be called from the command line / console and prompt the user to enter a string to check or Q to quit.

See the following example output screen:

```
Enter a string to check for palindrome.  Q to quit:  racecar
racecar is a palindrome.
Enter a string to check for palindrome.  Q to quit:  able was i ere i saw elba
able was i ere i saw elba is a palindrome.
Enter a string to check for palindrome.  Q to quit:  Racecar
Racecar is not a palindrome.
Enter a string to check for palindrome.  Q to quit:  Marshall
Marshall is not a palindrome.
Enter a string to check for palindrome.  Q to quit:
```