

Day 18: Queues and Stacks



Welcome to Day 18! Today we're learning about Stacks and Queues. Check out the [Tutorial](#) tab for learning materials and an instructional video!

A *palindrome* is a word, phrase, number, or other sequence of characters which reads the same backwards and forwards. Can you determine if a given string, *s*, is a palindrome?

To solve this challenge, we must first take each character in *s*, *enqueue* it in a *queue*, and also *push* that same character onto a *stack*. Once that's done, we must *dequeue* the first character from the *queue* and *pop* the top character off the *stack*, then compare the two characters to see if they are the same; as long as the characters match, we continue dequeuing, popping, and comparing each character until our containers are empty (a non-match means *s* isn't a palindrome).

Write the following declarations and implementations:

1. Two instance variables: one for your *stack*, and one for your *queue*.
2. A *void pushCharacter(char ch)* method that pushes a character onto a stack.
3. A *void enqueueCharacter(char ch)* method that enqueues a character in the *queue* instance variable.
4. A *char popCharacter()* method that pops and returns the character at the top of the *stack* instance variable.
5. A *char dequeueCharacter()* method that dequeues and returns the first character in the *queue* instance variable.

Input Format

You *do not* need to read anything from stdin. The locked stub code in your editor reads a single line containing string *s*. It then calls the methods specified above to pass each character to your instance variables.

Constraints

- *s* is composed of lowercase English letters.

Output Format

You are *not* responsible for printing any output to stdout.

If your code is correctly written and *s* is a palindrome, the locked stub code will print

The word, *s*, is a palindrome.; otherwise, it will print **The word, *s*, is not a palindrome.**

Sample Input

```
racecar
```

Sample Output

```
The word, racecar, is a palindrome.
```