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def find_longest_word(input_string):
    words = input_string.split()
    longest_word = max(words, key=len)
    return longest_word

def count_characters(input_string, character):
    return input_string.count(character)

def is_palindrome(input_string):
    input_string = input_string.lower().replace(" ", "")
    return input_string == input_string[::-1]

def find_substring_index(input_string, substring):
    return input_string.find(substring)

def count_word_occurrences(input_string):
    words = input_string.split()
    word_count = {}
    for word in words:
        word = word.strip(".,!?'\"()[]{}")
        if word in word_count:
            word_count[word] += 1
        else:
            word_count[word] = 1
    return word_count

input_string = input("Enter a string: ")

# Find the longest word
longest_word = find_longest_word(input_string)
print(f"The longest word in the string is: {longest_word}")

# Character frequency
character = input("Enter a character to count its frequency: ")
char_count = count_characters(input_string, character)
print(f"The character '{character}' appears {char_count} times in the string")

# Check for palindrome
if is_palindrome(input_string):
    print("The string is a palindrome.")
else:
    print("The string is not a palindrome.")

# Find substring index
substring = input("Enter a substring to find its index: ")
substring_index = find_substring_index(input_string, substring)
if substring_index ≠ -1:
    print(f"The first appearance of '{substring}' starts at index
{substring_index}")
else:
    print(f"'{substring}' is not found in the string.")

# Count word occurrences
word_occurrences = count_word_occurrences(input_string)
print("Word occurrences:")
for word, count in word_occurrences.items():
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    print(f"'{word}': {count} times")


"""*******OUTPUT*********

*** Remote Interpreter Reinitialized ***
Enter a string: welcome to sidhhant college
The longest word in the string is: sidhhant
Enter a character to count its frequency: sidhhant
The character 'sidhhant' appears 1 times in the string
The string is not a palindrome.
Enter a substring to find its index: college
The first appearance of 'college' starts at index 20
Word occurrences:
'welcome': 1 times
'to': 1 times
'sidhhant': 1 times
'college': 1 times
>>>
"""
```