

Counting Characters in a String

h e l l o w o r l d

Initial state (no characters processed yet)

Current counts: {}

Need to know: Dictionary, for loop

```
def count_characters(string):
    counts = {}
    for char in string:
        if char in counts:
            counts[char] = counts[char] + 1
        else:
            counts[char] = 1
    return counts

# Example usage:
input_string = "hello world"
result = count_characters(input_string)

print("Character counts:")
for char, count in result.items():
    print(f"{char}: {count}")
```

If you need to keep a counter of characters, a common mistake is to say that the space complexity required for the counter is $O(n)$. The space required for a counter of a string of latin characters is $O(1)$ not $O(n)$. This is because the upper bound is the range of characters, which is usually a fixed

constant of 26. The input set is just lowercase Latin characters.

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