In [5]:
```python
# Initialize a tuple
my_tuple = ('apple', 'banana', 'cherry', 'date', 'apple')

# 1. count(x)
# Returns the number of occurrences of 'apple' in the tuple
count_apple = my_tuple.count('apple')
print("Count of 'apple':", count_apple)  # Output: 2

# 2. index(x[, start[, end]])
# Returns the index of the first occurrence of 'cherry'
index_cherry = my_tuple.index('cherry')
print("Index of 'cherry':", index_cherry)  # Output: 2

# Demonstrating the optional start and end parameters
# Finding 'banana' starting from index 1
index_banana_from_1 = my_tuple.index('banana', 1)
print("Index of 'banana' from index 1:", index_banana_from_1)  # Output: 1

# Finding 'apple' between index 2 and 4 (exclusive)
index_apple_in_range = my_tuple.index('apple', 2, 4)
print("Index of 'apple' between index 2 and 4:", index_apple_in_range)  # Output: 4

# Examples with immutable tuples
# Creating a tuple with numbers
numbers = (1, 2, 3, 4, 5)

# Count of a number not present
count_not_present = numbers.count(6)
print("Count of 6:", count_not_present)  # Output: 0

# Index of a number present
index_of_4 = numbers.index(4)
print("Index of 4:", index_of_4)  # Output: 3

# Handling cases where the element is not found
try:
    index_not_present = numbers.index(6)
except ValueError as e:
    print("Error:", e)  # Output: Error: tuple.index(x): x not in tuple
```

```
After append: ['apple', 'banana', 'cherry', 'date', 'elderberry', 'fig']
After extend: ['apple', 'banana', 'cherry', 'date', 'elderberry', 'fig', 'grape', 'honey
dew']
After insert: ['apple', 'banana', 'blueberry', 'cherry', 'date', 'elderberry', 'fig', 'g
rape', 'honeydew']
After remove: ['apple', 'banana', 'blueberry', 'cherry', 'elderberry', 'fig', 'grape',
'honeydew']
After pop: ['apple', 'banana', 'blueberry', 'cherry', 'elderberry', 'grape', 'honeydew']
Popped item: fig
Index of 'grape': 5
Count of 'blueberry': 1
After sort: ['apple', 'banana', 'blueberry', 'cherry', 'elderberry', 'grape', 'honeyde
w']
After reverse: ['honeydew', 'grape', 'elderberry', 'cherry', 'blueberry', 'banana', 'app
le']
After clear: []
Original list: ['apple', 'banana', 'cherry']
Copied list: ['apple', 'banana', 'cherry']
Sorted numbers: [9, 6, 5, 3, 1]
Reversed numbers: [1, 3, 5, 6, 9]
Count of 3: 1
```

In [ ]: