Functions in Python

Problem Set - Part I

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1 Problem 1: Even numbers

Write a Python function `filter_even_numbers` that takes a list of numbers and returns a new list containing only the even numbers.

- Example Input: [1, 2, 3, 4]
- Example Output: [2, 4]

- Solution

```
1  def filter_even_numbers(numbers):
2    even_numbers = [] # create an empty list for the even numbers
3    for num in numbers:
4      if num % 2 == 0: # if the number is divisable by 2 then it is even
5        even_numbers.append (num) # if so, add it to the list of even
   ↪  numbers
6    return even_numbers
7
8  filter_even_numbers([1, 2, 3, 4])
```

```
[2, 4]
```

- Solution #2

```python
1  def filter_even_numbers_v2(numbers):
2      return [num for num in numbers if num % 2 == 0]
3
4  filter_even_numbers_v2([1, 2, 3, 4])
```

```
[2, 4]
```

2 Problem 2: Fizz Buzz

Write a Python function `fizzbuzz` that takes a number and returns `"Fizz"` if the number is divisible by 3, `"Buzz"` if the number is divisible by 5, and `"FizzBuzz"` if the number is divisible by both 3 and 5. Otherwise, returns the number.

- Solution

```python
1  def fizzbuzz(number):
2      if number % 3 == 0 and number % 5 == 0:
3          return "FizzBuzz"
4      elif number % 3 == 0:
5          return "Fizz"
6      elif number % 5 == 0:
7          return "Buzz"
8      else:
9          return number
```

```python
1  fizzbuzz(15)
```

```
'FizzBuzz'
```

```python
1  fizzbuzz(5)
```

```
'Buzz'
```

```
1  fizzbuzz(3)
```

'Fizz'

```
1  fizzbuzz(1)
```

1

3 Problem 3: Second largest

Write a Python function `find_second_largest` that takes a list of positive numbers and returns the second largest number in the list *without* sorting the list.

- Example Input: [2, 5, 7, 1, 8, 3, 9]
- Example Output: 8

- Solution

```
1   def find_second_largest(numbers):
2     largest = -1
3     second_largest = -1
4     for num in numbers:
5       if num > largest:
6         second_largest = largest
7         largest = num
8       elif num > second_largest:
9         second_largest = num
10     return second_largest
11
12  find_second_largest([2, 5, 7, 1, 8, 3, 9])
```

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4 Problem 4: Most common letter

Write a Python function `find_most_common_letter` that takes a string and returns the most common letter in the string.

- Example Input: `"Hello, World!"`
- Example Output: `'L'`