

Advanced Function Problem Set

1. **Function to Calculate Average Excluding Extremes:** Write a Python function that calculates the average of a list of numbers, excluding the maximum and minimum values.

Sample Input:

```
average_excluding_extremes([5, 10, 15, 20, 25])
```

Expected Output:

```
15.0
```

2. **Function for Element-wise Operations on Lists:** Write a Python function that performs element-wise operations (add, subtract, multiply, divide) on two lists of equal length.

Sample Input:

```
element_wise_operation([1, 2, 3], [4, 5, 6], "add")
```

Expected Output:

```
[5, 7, 9]
```

3. **Function to Find the Longest Word:** Write a Python function that takes a list of words and returns the longest word along with its length.

Sample Input:

```
longest_word(["apple", "banana", "cherry"])
```

Expected Output:

```
("banana", 6)
```

4. **Function to Detect Anagrams:** Write a Python function to check whether two words are anagrams of each other.

Sample Input:

```
is_anagram("listen", "silent")
```

Expected Output:

```
True
```

5. **Function to Count Specific Character Occurrences:** Write a Python function that counts the occurrences of a specific character in a string.

Sample Input:

```
count_character_occurrences("programming", "g")
```

Expected Output:

2

6. **Function to Merge Two Lists and Remove Duplicates:** Write a Python function that merges two lists and removes duplicates from the combined list.

Sample Input:

```
merge_and_deduplicate([1, 2, 3], [3, 4, 5])
```

Expected Output:

[1, 2, 3, 4, 5]

7. **Function to Rotate a List:** Write a Python function that rotates a list to the right by a specified number of positions.

Sample Input:

```
rotate_list([1, 2, 3, 4, 5], 2)
```

Expected Output:

[4, 5, 1, 2, 3]

8. **Function to Count Words in a Sentence:** Write a Python function to count the number of words in a given sentence.

Sample Input:

```
count_words("This is a test sentence.")
```

Expected Output:

5

9. **Function to Find Common Elements in Two Lists:** Write a Python function that returns a list of elements that are common in two input lists.

Sample Input:

```
find_common_elements([1, 2, 3], [2, 3, 4])
```

Expected Output:

[2, 3]

10. **Function to Validate Email Format:** Write a Python function to validate whether a given email address has a correct format (name@domain.extension).

Sample Input:

```
validate_email("test@example.com")
```

Expected Output:

True

11. **Function to Generate a Number Series:** Write a Python function that generates a list of numbers from a start value to an end value (exclusive) with a specified step size.

Sample Input:

```
generate_series(1, 10, 2)
```

Expected Output:

[1, 3, 5, 7, 9]

12. **Function to Count Divisors of a Number:** Write a Python function that returns the number of divisors of a given integer.

Sample Input:

```
count_divisors(12)
```

Expected Output:

6 # (1, 2, 3, 4, 6, 12)