Atul Parida
1006184
50.003 Elements of Software Construction
Cohort Exercise 9

Test Cases for the `findmax` Function

The `findmax` function takes an array `list` as input and returns the maximum value from that array. Below are the test cases, each with a concise description and expected behaviour:

Correctness and Failures (Question 1):

1. Test: Fails

- Description: The function should correctly compute the maximum value. This test case is designed to fail.
- Input: `[1, 2, 3, 4, 5]`
- Expected Output: `3`

2. Test: Throws Error

- Description: The function should throw an error when provided with an undefined argument.
- Input: `undefined`
- Expected Output: Error should be thrown (not caught by the test).

3. Test: Passes

- Description: The function should correctly compute the maximum value.
- Input: `[5, 4, 3, 2, 1]`
- Expected Output: `5`

Equivalence Test Cases (Question 2):

4. Test: Empty Array

- Description: The function should handle an empty array and return an appropriate value.
- Input: `[]`
- Expected Output: `undefined` or some other appropriate value.

5. Test: Array with Null Values

- Description: The function should ignore null values and consider the remaining numeric values.
- Input: `[null, null, null]`
- Expected Output: `0`

6. Test: Array with NaN Values

- Description: The function should consider `NaN` values as potential candidates for the maximum value, but any comparison with `NaN` will result in `NaN`.
- Input: `[NaN, NaN, NaN]`
- Expected Output: `NaN`

7. Test: Array with a Single Ordinal Value

- Description: The function should return the single value in the array.
- Input: `[42]`
- Expected Output: `42`

8. Test: Max Value at Index 0

- Description: The function should correctly identify the maximum value when it occurs at the first index (index 0).
- Input: `[10, 2, 4, 7]`
- Expected Output: `10`

9. Test: Max Value at Index N-1

- Description: The function should correctly identify the maximum value when it occurs at the last index (index N-1).
- Input: `[3, 1, 6, 9]`
- Expected Output: `9`

10. Test: Max Value Not at Index 0 or Index N-1

- Description: The function should correctly identify the maximum value when it is not at index 0 or index N-1.
- Input: `[5, 2, 8, 3]`
- Expected Output: `8`

11. Test: Array with Non-Numeric Values

- Description: The function should handle non-numeric values and return `NaN`.
- Input: `['apple', 'banana', 'orange']`
- Expected Output: `NaN`

12. Test: Array with Positive and Negative Values

- Description: The function should correctly identify the maximum value in an array with positive and negative numbers.
- Input: `[-5, 10, -3, 7, 0]`
- Expected Output: `10`

13. Test: Array with Duplicated Maximum Values

- Description: The function should correctly identify the maximum value even if it occurs multiple times in the array.
- Input: `[5, 2, 8, 8, 3]`
- Expected Output: `8`

14. Test: Array with Mixed Data Types

- Description: When mixed data types are present, the function should compare values based on their converted numeric values.
- Input: `[1, '2', 3, '4', 5]`
- Expected Output: `5`

15. Test: Array with a Large Number of Elements

- Description: The function should handle large arrays efficiently and return the correct maximum value.
- Input: An array with 100,000 elements (0 to 99,999)
- Expected Output: `99999`