Assignment 1

1. Transform and Clean Data

You are given a list of product names that contain extra spaces and inconsistent capitalization:

```
products = ["  LAPTOP ", "phone  ", "  Tablet", "CAMERA  "]
```

Using `map()` and `lambda`, clean the data by:

- Removing extra spaces
- Converting to title case (e.g. `"laptop"` → `"Laptop"`)

Expected Output:

```
['Laptop', 'Phone', 'Tablet', 'Camera']
```

Hint:
Use `str.strip()` and `str.title()` inside a lambda.

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2. Convert Temperatures (Celsius → Fahrenheit)

Given a list of temperatures in Celsius, convert them to Fahrenheit using:

$$F=9/5C+32$$

```
celsius = [0, 10, 20, 30, 40]
```

Expected Output:

```
[32.0, 50.0, 68.0, 86.0, 104.0]
```

Hint:
Use `map(lambda c: (9/5)*c + 32, celsius)`

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3. Apply Multiple Transformations

You have a list of integers.
You need to:

1. Square each number.
2. Then add 10 to each result.

All using **one `map()` and one `lambda`**.

```
nums = [1, 2, 3, 4, 5]
```

Expected Output:

```
[11, 14, 19, 26, 35]
```

Hint:
Combine both operations in one lambda.

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4. Extract First and Last Characters

Given a list of words, create a new list of tuples `(first_char, last_char)` for each word.

```
words = ["python", "lambda", "programming", "map", "function"]
```

Expected Output:

```
[('p', 'n'), ('l', 'a'), ('p', 'g'), ('m', 'p'), ('f', 'n')]
```

Hint:
Use string indexing in the lambda: `lambda w: (w[0], w[-1])`

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5. Nested Map Transformation (Challenge 🌟)

You have a 2D list representing student marks:

```
marks = [[45, 80, 70], [90, 60, 100], [88, 76, 92]]
```

Using nested `map()` and `lambda`,

- Increase each mark by 5%,
- Round it to the nearest integer.

Expected Output:

```
[[47, 84, 74], [95, 63, 105], [92, 80, 97]]
```

Hint:
Use:

```
map(lambda row: list(map(lambda x: round(x * 1.05), row)), marks)
```

6. Create a program that normalizes a list of numbers between 0 and 1 using `map()` and `lambda`.

7. Given a list of sentences, extract the length of each word in every sentence using nested `map()`.