Problem 1: Functional Programming warmup

In class we talked about two higher order functions called map and reduce (it is up to you to decide which one is appropriate for the problem). The functions you pass into map and reduce should be anonymous functions. You might have to think about each one for a few minutes, but the solutions are a single line each. You may pseudocode these, but they should be easily convertible to a working python program. You may assume for each of these that you have a variable list as your input.

Part 1: Length of each string in list

Write code for the string_length function, which takes in a list of strings and returns a list of their lengths.

Example

string_length(["cat", "a", "square"]) → [3,1,6]

Part 2: Max string length in list

Write code for the max_string_length function, which takes in a list of strings and returns the length of the longest string in the list.

Example

max_string_length(["cat", "a", "orange","square"]) → 6

Problem 2: Online Algorithms and Complexity

We also went through online algorithms and complexity during lecture. Answer the following questions in a sentence or two.

1. In comparing an online algorithm to its offline counterpart, we see that the biggest difference in their costs occurs when the former has a cost of 300 units and the latter has a cost of 100 units. What is the competitive ratio in this case?

2. What are the definitions of tractable and intractable problems?