Gas Stations

Try to solve the Gas Stations problem.

We'll cover the following

Statement

There are n gas stations along a circular route, where the amount of gas at the i^{th} station is `gas[i]`.

We have a car with an unlimited gas tank, and it costs `cost[i]` of gas to travel from the i^{th} station to the next $(i+1)^{th}$ station. We begin the journey with an empty tank at one of the gas stations.

Find the index of the gas station in the integer array `gas` such that if we start from that index we may return to the same index by traversing through all the elements, collecting `gas[i]` and consuming `cost[i]`.

- If it is not possible, return -1.
- If there exists such index, it is guaranteed to be unique.

Constraints:

- `gas.length` $==$ `cost.length`
- $1 \leq$ `gas.length`, `cost.length` $\leq 10^3$
- $0 \leq$ `gas[i]`, `cost[i]` $\leq 10^3$

Examples

Sample example 1

Input

gas	1	2	3	4	5

cost	3	4	5	1	2

Output

```
Starting Index = 3
```

Start at station index 3 and fill up with 4 units of gas.

Travel to station index 4. Current gas = 0 + (4 - 1) = 3
Travel to station index 0. Current gas = 3 + (5 - 2) = 6
Travel to station index 1. Current gas = 6 + (1 - 3) = 4
Travel to station index 2. Current gas = 4 + (2 - 4) = 2

Travel to station index 3. Current gas = 2 + (3 - 5) = 0

We came back to index 3. This is where we started our journey.
Therefore, return 3 as the starting index.

1 of 3

Understand the problem

Let's take a moment to make sure you've correctly understood the problem. The quiz below helps you check if you're solving the correct problem:

Gas Stations

1 What will the output be if the following gas and cost arrays are provided as input?

gas = [3, 1, 1]

cost = [1, 2, 2]

A) 0

B) 1

C) 2

D) -1

Submit Answer

Question 1 of 3
0 attempted

Reset Quiz

Figure it out!

We have a game for you to play: re-arrange the logical building blocks to develop a clearer understanding of how to solve this problem.

Drag and drop the cards to rearrange them in the correct order.

Calculate the total gas and total cost from the arrays. If the total gas is less than the total cost, return -1, since we can never complete a loop

from any station. Otherwise, initialize the starting index and current gas to 0.

Iterate over each gas station, subtract the current element of the gas station array from the element in the cost array with the corresponding index, and add the result to the current gas.

If, at any point, the current gas becomes less than 0, it means we cannot complete a loop form this starting index, so we increment the starting index by 1.

Return the starting index at the end of the traversal.

Reset | Show Solution | Submit

Try it yourself

Implement your solution in the following coding playground:

Java

```
public class GasStations{
    public static int gasStationJourney(int[] gas, int[] cost) {

        // Your code will replace this placeholder return statement

        return -1;
    }
}
```

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Test Cases | Results

Case 1 | Case 2 | Case 3

Input #1

[1,2,3,4,5]

Input #2

[3,4,5,1,2]

Gas Stations

Back

Solution: Boats to Sav...

Next

Solution: Gas Stations

Mark as Completed