

134. Gas Station

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- Greedy

Description

There are N gas stations along a circular route, where the amount of gas at station i is `gas[i]`.

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

Return the starting gas station's index if you can travel around the circuit once, otherwise return -1.

Note:

The solution is guaranteed to be unique.

1. Thought line



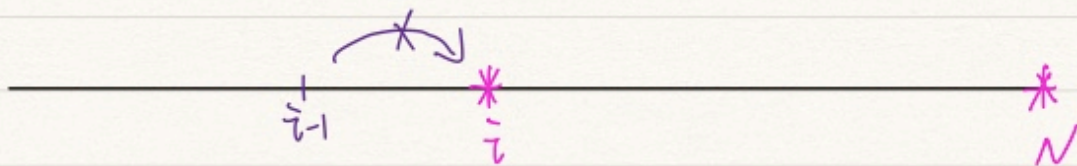
2) Unique Answer

⇒ ① if $\sum_0^N \text{gas}[i] < \sum_0^N \text{cost}[i]$, impossible.

② if $\text{gas}[i] < \text{cost}[i]$, i is impossible to be start!

③ To $\forall i$, $\text{current gas} = \text{left gas} + \text{gas}[i] - \text{cost}[i]$

④ if \exists result, result is unique!



• if i is result,

a) i can reach N

b) $[0, i-1]$ cannot reach i

2. Greedy

```
class Solution {
public:
    int canCompleteCircuit(vector<int>& gas, vector<int>& cost) {
        int candidateRes = 0;
        int curGas = 0, netGas = 0;
        for(int i = 0; i < gas.size(); ++i){
            netGas += gas[i] - cost[i];
            curGas += gas[i] - cost[i];
            if (curGas < 0){
                curGas = 0;
                candidateRes = i+1;
            }
        }
    }
}
```

```
};  
    }  
    if (netGas<0) return -1;  
    return candidateRes;  
}  
};
```