Problem 818: Race Car

Problem Information

Difficulty: Hard
Acceptance Rate: 44.48%
Paid Only: No
Tags: Dynamic Programming

Problem Description

Your car starts at position `0` and speed `+1` on an infinite number line. Your car can go into negative positions. Your car drives automatically according to a sequence of instructions `'A'` (accelerate) and `'R'` (reverse):

* When you get an instruction `'A'`, your car does the following: * `position += speed` * `speed *= 2` * When you get an instruction `'R'`, your car does the following: * If your speed is positive then `speed = -1` * otherwise `speed = 1` Your position stays the same.

For example, after commands `"AAR"`, your car goes to positions `0 --> 1 --> 3 --> 3`, and your speed goes to `1 --> 2 --> 4 --> -1`.

Given a target position `target`, return _the length of the shortest sequence of instructions to get there_.

Example 1:

Input: target = 3 **Output:** 2 **Explanation:** The shortest instruction sequence is "AA". Your position goes from 0 --> 1 --> 3.

Example 2:

Input: target = 6 **Output:** 5 **Explanation:** The shortest instruction sequence is "AAARA". Your position goes from 0 --> 1 --> 3 --> 7 --> 7 --> 6.

Constraints:

* `1 <= target <= 104`

Code Snippets

C++:

```
class Solution {
public:
int racecar(int target) {

}
};
```

Java:

```
class Solution {
public int racecar(int target) {

}
}
```

Python3:

```
class Solution:
def racecar(self, target: int) -> int:
```