## 818. Race Car

DescriptionHintsSubmissionsDiscussSolution

---

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.

Now for some target position, say 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.
```

**Note:**

- `1 <= target <= 10000`.

---

Seen this question in a real interview before?

- Difficulty:Hard
- Total Accepted:1K
- Total Submissions:4.2K
- Contributor:awice

- 
- Subscribe to see which companies asked this question.

  Related Topics BFS

- 

```
int racecar(int target) {
    //(pos,speed)
  unordered_set<string> visited;
  queue<pair<int,int>> q;
  q.push({0,1});
  visited.insert("(0,1)");
  int cnt = 0;
  while(!q.empty())
  {
        int sz = q.size();
        for(int i=0;i<sz;++i)
        {
            pair<int,int> elem = q.front();
            q.pop();
            int p1 = elem.first;
            int s1 = elem.second;
            p1+=s1;s1*=2;
            if(p==target) return cnt;
            q.push({p1,s1});
            int p2 = elem.first;
            int s2 = elem.second>0?-1:1;
            char visitchr[30];
            sprintf(visitchr,"(%d,%d)",p2,s2);
            if(!visited.count(visitchr))
            {
                q.push({p2,s2});
                visited.insert(visitchr);
            }
        }
        cnt+=1;
    }
    return -1;
}
```