

## Jump Game II

For this problem we need the minimum number of jumps to reach the last index, guaranteed reachable.

Key Idea:

Greedy Level Traversal:

Think of the array as levels of BFS:

- $\text{farthest}$  = farthest index reachable within current level.
- $\text{end}$  = end of current level
- Each time we pass  $\text{end}$ , increment jumps and set  $\text{end} = \text{farthest}$ .

Algorithm:

1. Initialize:

·  $\text{jumps} = 0$

·  $\text{end} = 0$  (current level boundary)

·  $\text{farthest} = 0$  (max reachable index so far)

2. Iterate from  $i = 0$  to  $n - 2$ :

· Update  $\text{farthest} = \max(\text{farthest}, i + \text{nums}[i])$

· If  $i == \text{end}$ :

· Increment jumps

· Update  $\text{end} = \text{farthest}$

3. Return jumps

Complexity:

· Time:  $O(n)$  - single pass

· Space:  $O(1)$  - constant extra space.