

LeetCode #128

Longest Consecutive Sequence

Hash Set

To solve this problem we will use a hash set. First, we store all the elements from the input array in a hash set. We initialize a variable result with 0 (this is important because it handles the corner case when the input array is empty). Then, we iterate through the hash set. On each iteration, we check whether the current element $- 1$ is present in the hash set. If it is not, we initialize two variables: one to count the length of the current sequence (starting from 1), and another representing the next element in the sequence (initialized to the current element $+ 1$). We then launch a loop that continues while the next element is present in the hash set. In each iteration of the loop, we increment both the count and the next element by one. After finishing the inner loop, we update the result by taking the maximum between the current result and the count of consecutive elements found. Finally, we return the result.

nums

100	4	200	1	3	2
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nums

2	200	3	1	100	4
---	-----	---	---	-----	---

res = 0

Since the original input array is no longer needed, we convert it into a hash set by inserting all its elements.

```
nums = set(nums)
```

nums

2	200	3	1	100	4
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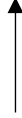


res = 0

if $\text{nums}[i] - 1$ in nums $\rightarrow 2 - 1 = 1 \rightarrow 1$ in nums \rightarrow continue

nums

2	200	3	1	100	4
---	-----	---	---	-----	---



res = 0

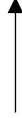
if $\text{nums}[i] - 1$ in nums $\rightarrow 200 - 1 = 199 \rightarrow 199$ not in nums \rightarrow

count = 1

next = $\text{nums}[i] + 1 = 200 + 1 = 201$

nums

2	200	3	1	100	4
---	-----	---	---	-----	---



res = 1

count = 1

next = 201

while next in nums:

since 201 not in nums, the loop is finished

res = max(res, count) = max(0, 1) = 1

nums

2	200	3	1	100	4
---	-----	---	---	-----	---



res = 1

if $\text{nums}[i] - 1$ in nums -> $3 - 1 = 2$ -> 2 in nums -> continue

nums

2	200	3	1	100	4
---	-----	---	---	-----	---



res = 1

if $\text{nums}[i] - 1$ in nums $\rightarrow 1 - 1 = 0 \rightarrow 0$ not in nums \rightarrow

count = 1

next = $\text{nums}[i] + 1 = 1 + 1 = 2$

nums

2	200	3	1	100	4
---	-----	---	---	-----	---



res = 1

count = 1

next = 2

while next in nums:

since 2 in nums, increment count and next

count += 1 = 2

next += 1 = 3

nums

2	200	3	1	100	4
---	-----	---	---	-----	---



res = 1

count = 2

next = 3

while next in nums:

since 3 in nums, increment count and next

count += 1 = 3

next += 1 = 4

nums

2	200	3	1	100	4
---	-----	---	---	-----	---



res = 1

count = 3

next = 4

while next in nums:

since 4 in nums, increment count and next

count += 1 = 4

next += 1 = 5

nums

2	200	3	1	100	4
---	-----	---	---	-----	---



res = 4

count = 4

next = 5

while next in nums:

since 5 not in nums, the loop is finished

res = max(res, count) = max(1, 4) = 4

nums

2	200	3	1	100	4
---	-----	---	---	-----	---



res = 4

if $\text{nums}[i] - 1$ in nums $\rightarrow 100 - 1 = 99 \rightarrow 99$ not in nums \rightarrow

count = 1

next = $\text{nums}[i] + 1 = 100 + 1 = 101$

nums

2	200	3	1	100	4
---	-----	---	---	-----	---



res = 4

count = 1

next = 101

while next in nums:

since 101 not in nums, the loop is finished

res = max(res, count) = max(4, 1) = 4

nums

2	200	3	1	100	4
---	-----	---	---	-----	---



res = 4

if $\text{nums}[i] - 1$ in nums $\rightarrow 4 - 1 = 3 \rightarrow 3$ in nums \rightarrow continue

nums

2	200	3	1	100	4
---	-----	---	---	-----	---



res = 4

Iteration has been finished, the result is 4.