Experiment 1.2

Student Name: Vansh Aneja **UID: 22BCS15689**
Branch: CSE **Section: KRG_IOT_2A**
Semester: 6th **DOP: 27/01/25**
Subject: AP **Subject Code:22CSP-351**

Aim:

Problem 1.2.1: Two Sum

- **Problem Statement:** Given an array of integers nums and an integer target, return the indices of the two numbers such that they add up to target. Each input has exactly one solution, and you cannot use the same element twice.

Problem 1.2.2: Jump Game II

- **Problem Statement:** You are given a 0-indexed array nums of length n. You are initially positioned at nums[0]. Each element nums[i] represents the maximum length of a forward jump from index i. Return the minimum number of jumps to reach nums[n - 1].

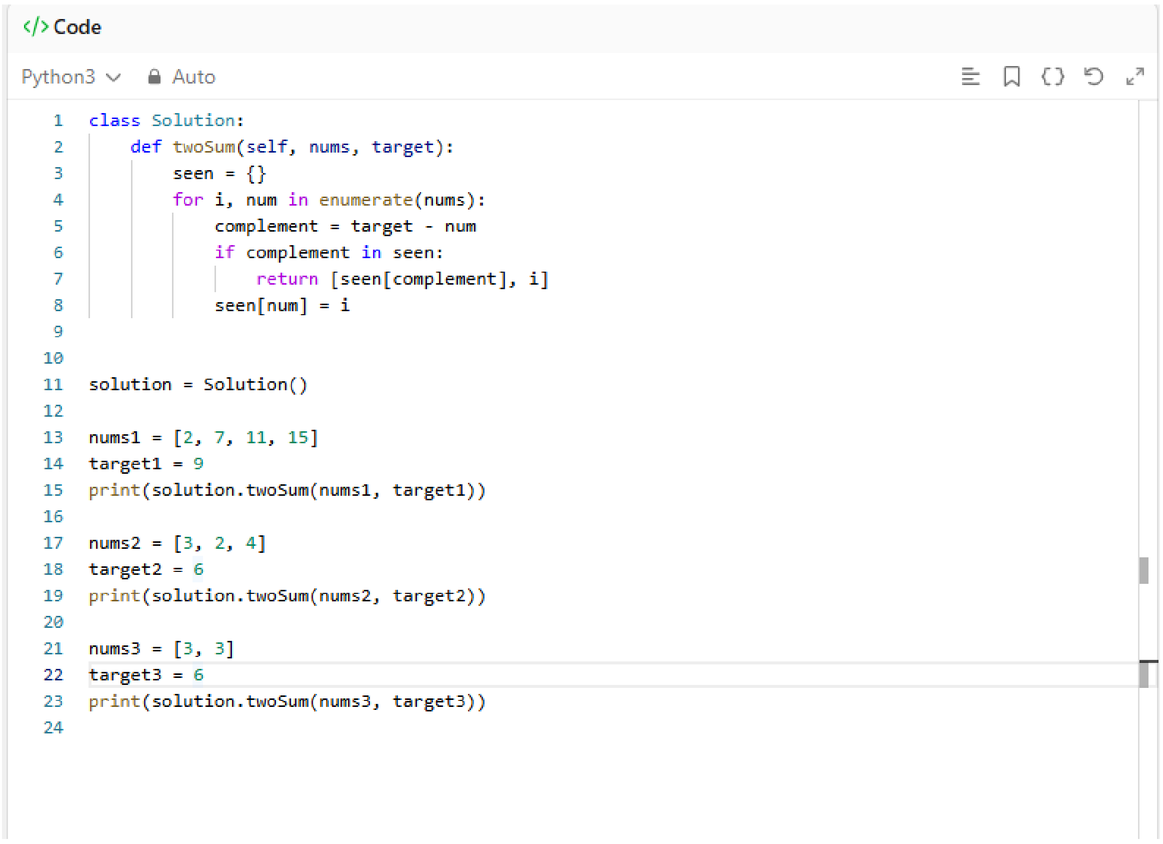
Problem 1.2.3: Simplify Path

- **Problem Statement**: Given a string path, which is an absolute path to a file or directory in a Unix-style file system, convert it to the simplified canonical path.

Algorithm:

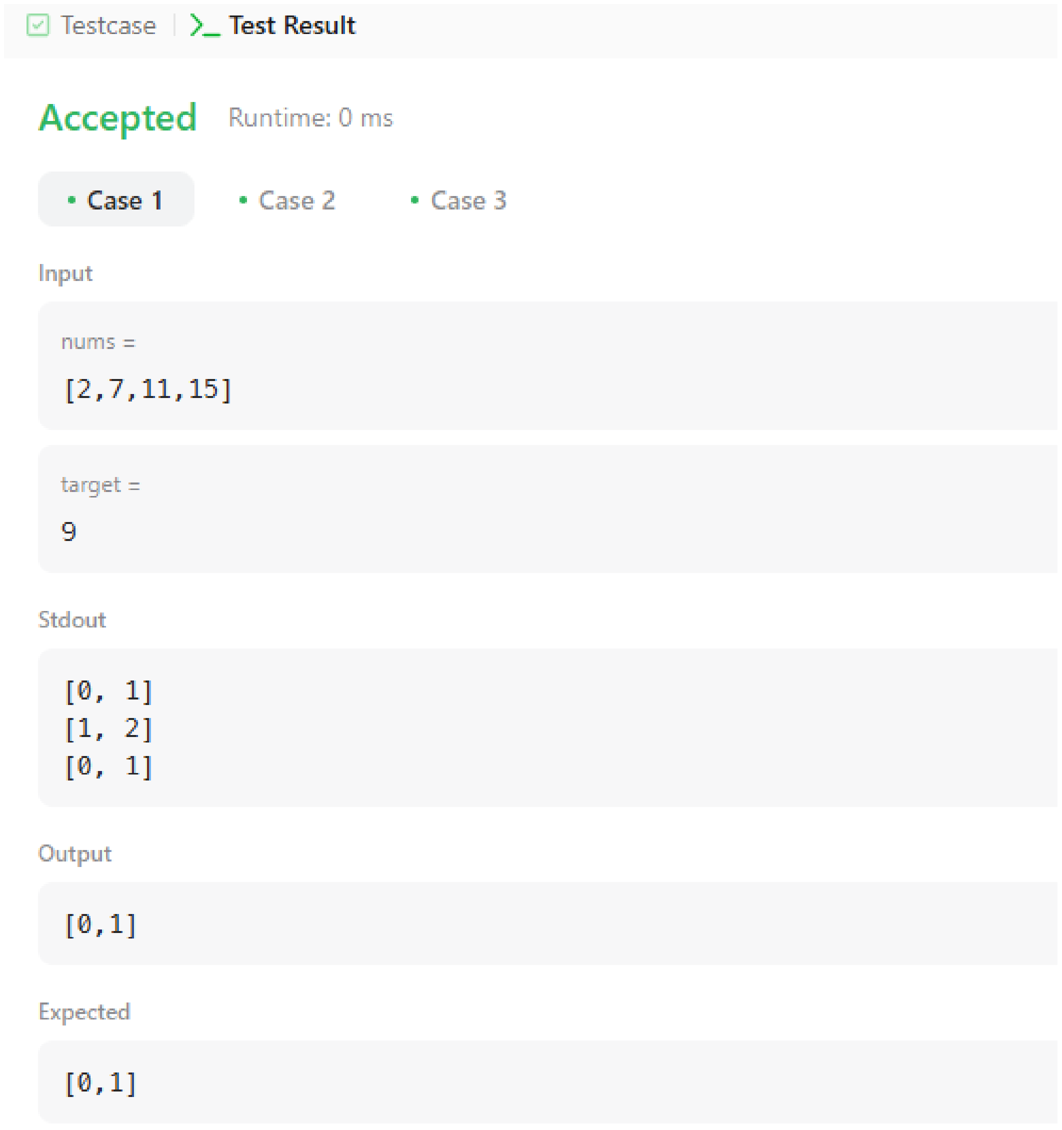
1. Initialize an empty hash map (dict).
2. Iterate through the nums array:
   - For each element num, calculate the complement: complement = target - num.
   - Check if the complement exists in the hash map:
     - If it does, return the indices of the complement and the current number.
     - If it doesn't, add the current number and its index to the hash map.
3. Return the indices of the two numbers that add up to the target.

Code: 1.2.1



```python
class Solution:
    def twoSum(self, nums, target):
        seen = {}
        for i, num in enumerate(nums):
            complement = target - num
            if complement in seen:
                return [seen[complement], i]
            seen[num] = i


solution = Solution()

nums1 = [2, 7, 11, 15]
target1 = 9
print(solution.twoSum(nums1, target1))

nums2 = [3, 2, 4]
target2 = 6
print(solution.twoSum(nums2, target2))

nums3 = [3, 3]
target3 = 6
print(solution.twoSum(nums3, target3))

```

Output:


Testcase | >_ Test Result

Accepted Runtime: 0 ms

• Case 1 • Case 2 • Case 3

Input

nums =

```
[2,7,11,15]
```

target =

```
9
```

Stdout

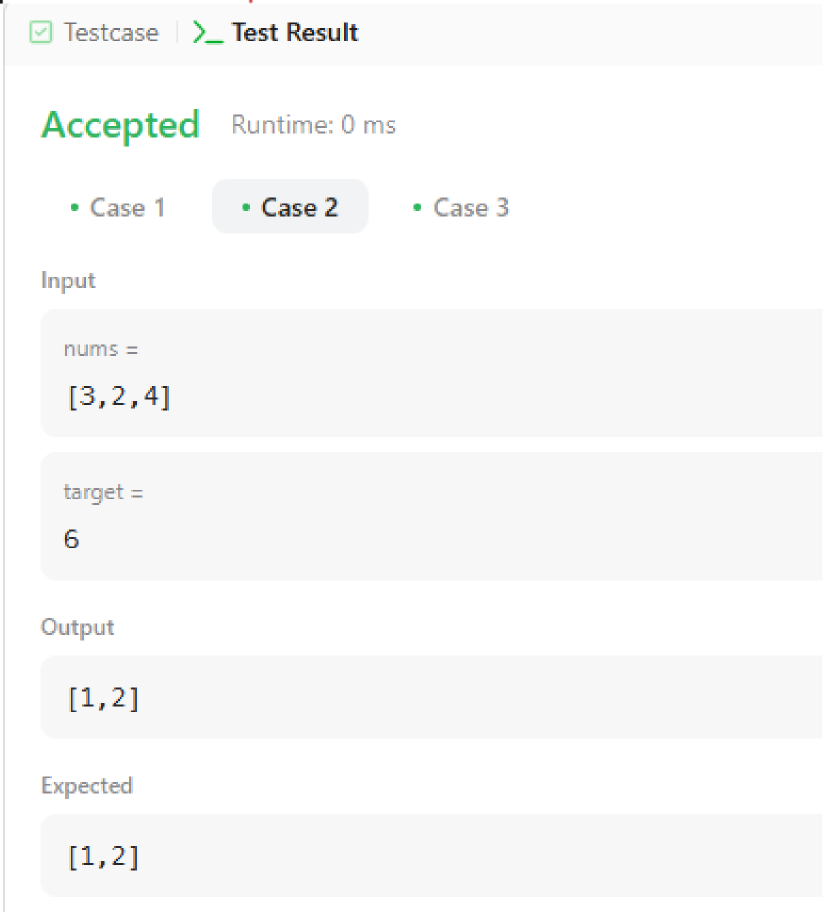
```
[0, 1]
[1, 2]
[0, 1]
```

Output

```
[0,1]
```

Expected

```
[0,1]
```


Testcase | >_ Test Result

Accepted Runtime: 0 ms

• Case 1 • Case 2 • Case 3

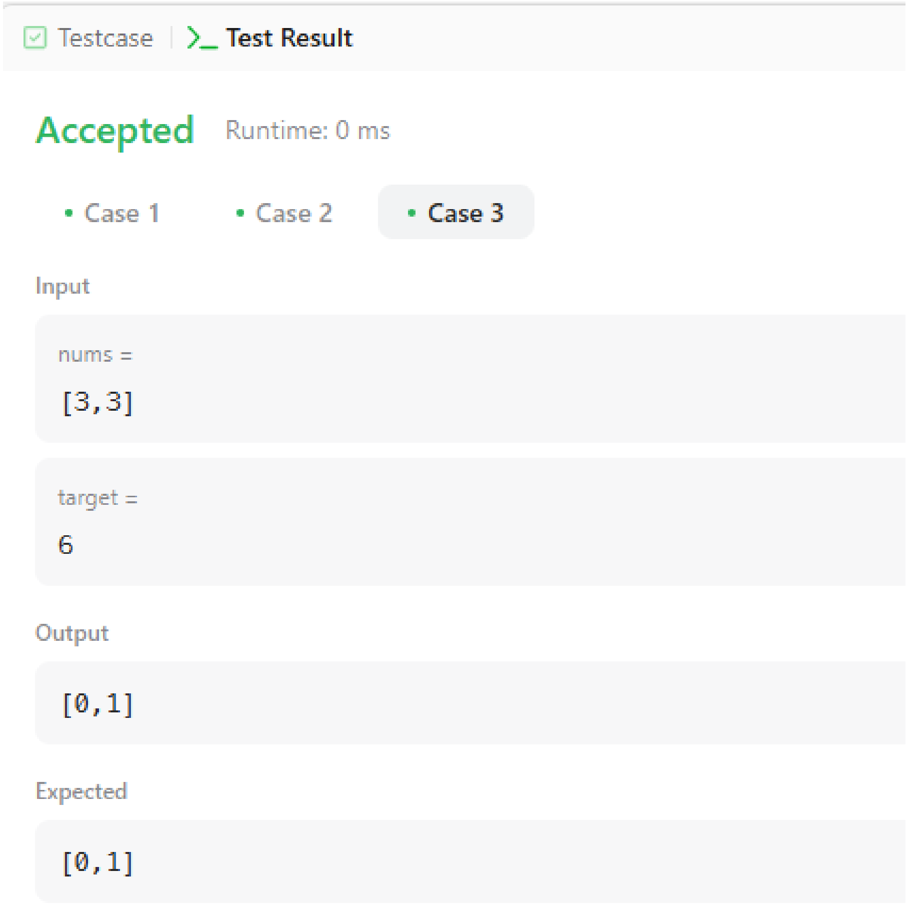
Input

nums =
```
[3,2,4]
```

target =
```
6
```

Output
```
[1,2]
```

Expected
```
[1,2]
```


Testcase | >_ Test Result

Accepted Runtime: 0 ms

• Case 1 • Case 2 • Case 3

Input

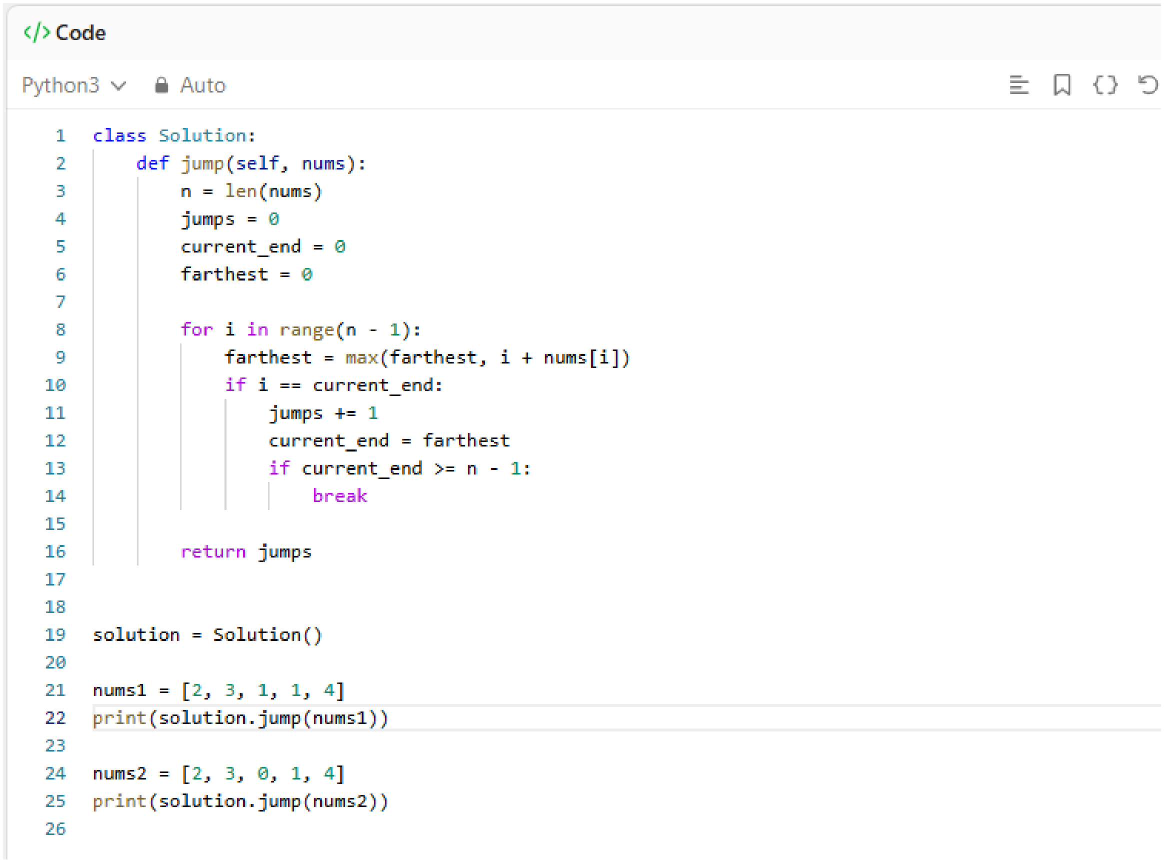
nums =
```
[3,3]
```

target =
```
6
```

Output
```
[0,1]
```

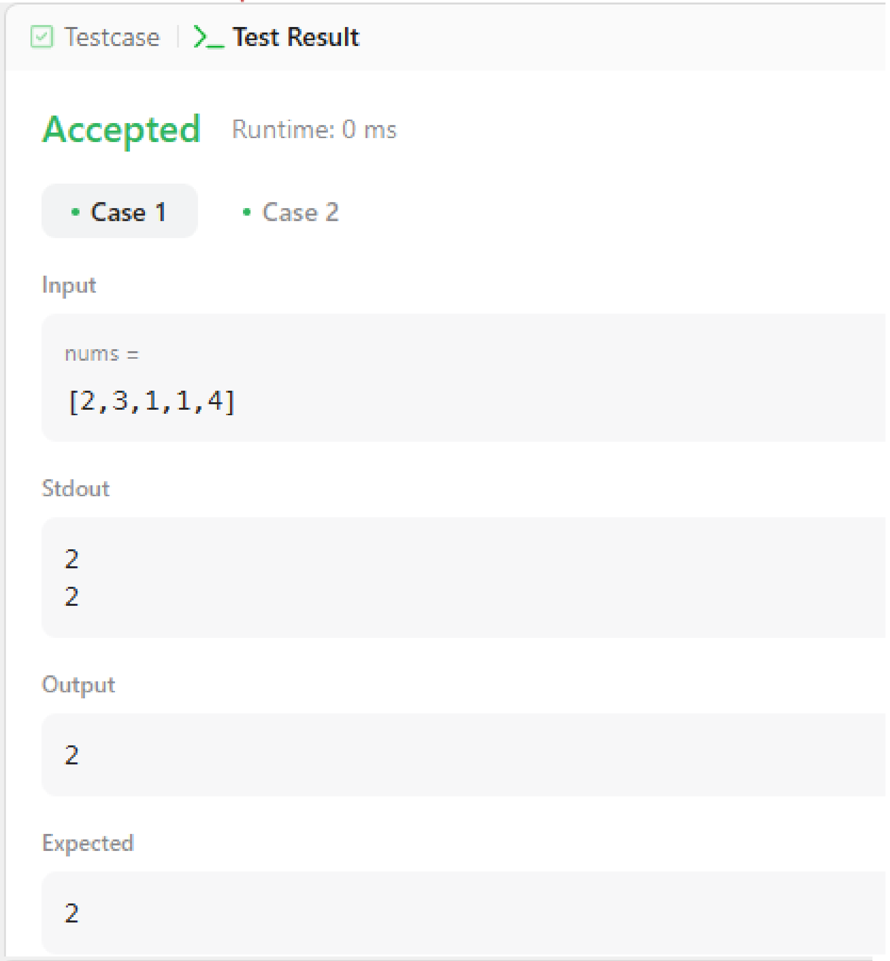
Expected
```
[0,1]
```

CODE: 1.2.2



```python
class Solution:
    def jump(self, nums):
        n = len(nums)
        jumps = 0
        current_end = 0
        farthest = 0

        for i in range(n - 1):
            farthest = max(farthest, i + nums[i])
            if i == current_end:
                jumps += 1
                current_end = farthest
                if current_end >= n - 1:
                    break

        return jumps


solution = Solution()

nums1 = [2, 3, 1, 1, 4]
print(solution.jump(nums1))

nums2 = [2, 3, 0, 1, 4]
print(solution.jump(nums2))
```

OUTPUT:


Testcase | Test Result

Accepted Runtime: 0 ms

• Case 1 • Case 2

Input

```
nums =
[2,3,1,1,4]
```

Stdout

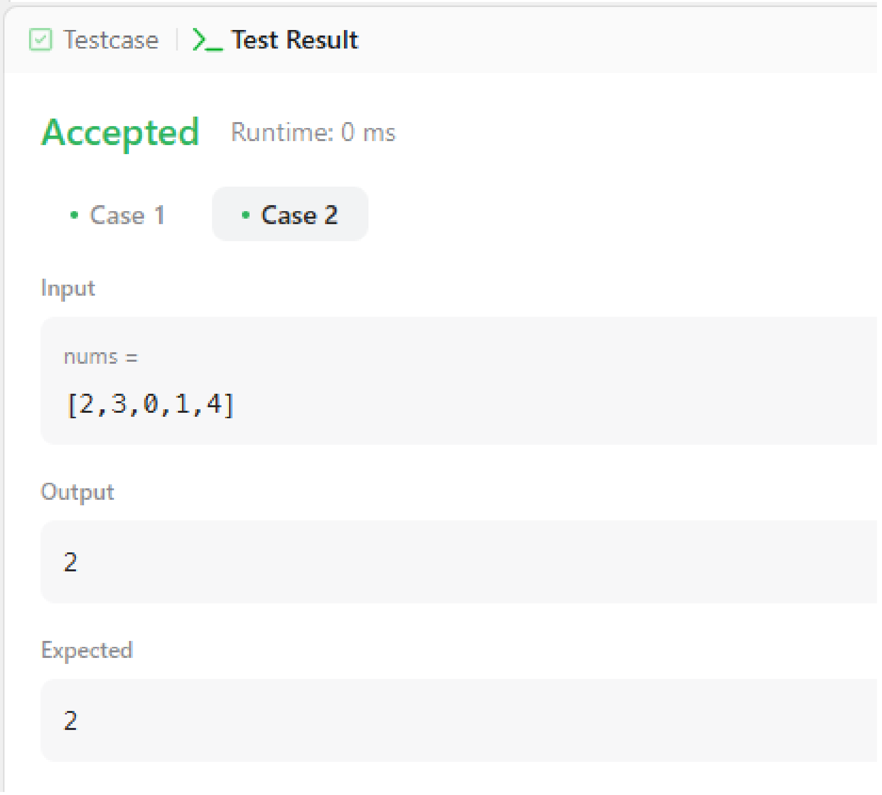
```
2
2
```

Output

```
2
```

Expected

```
2
```


Testcase | Test Result

Accepted Runtime: 0 ms

• Case 1 • Case 2

Input

```
nums =
[2,3,0,1,4]
```

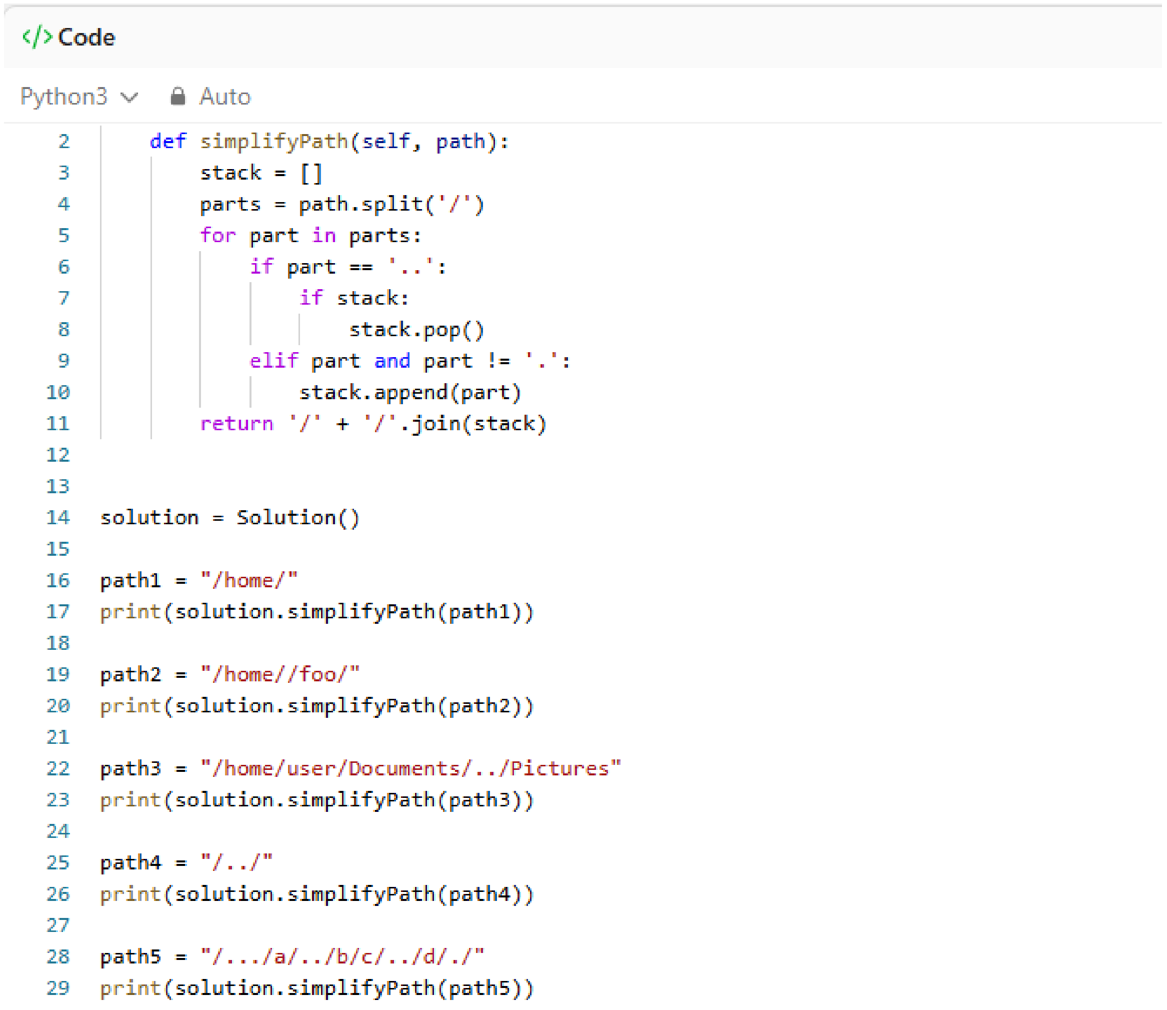
Output

```
2
```

Expected

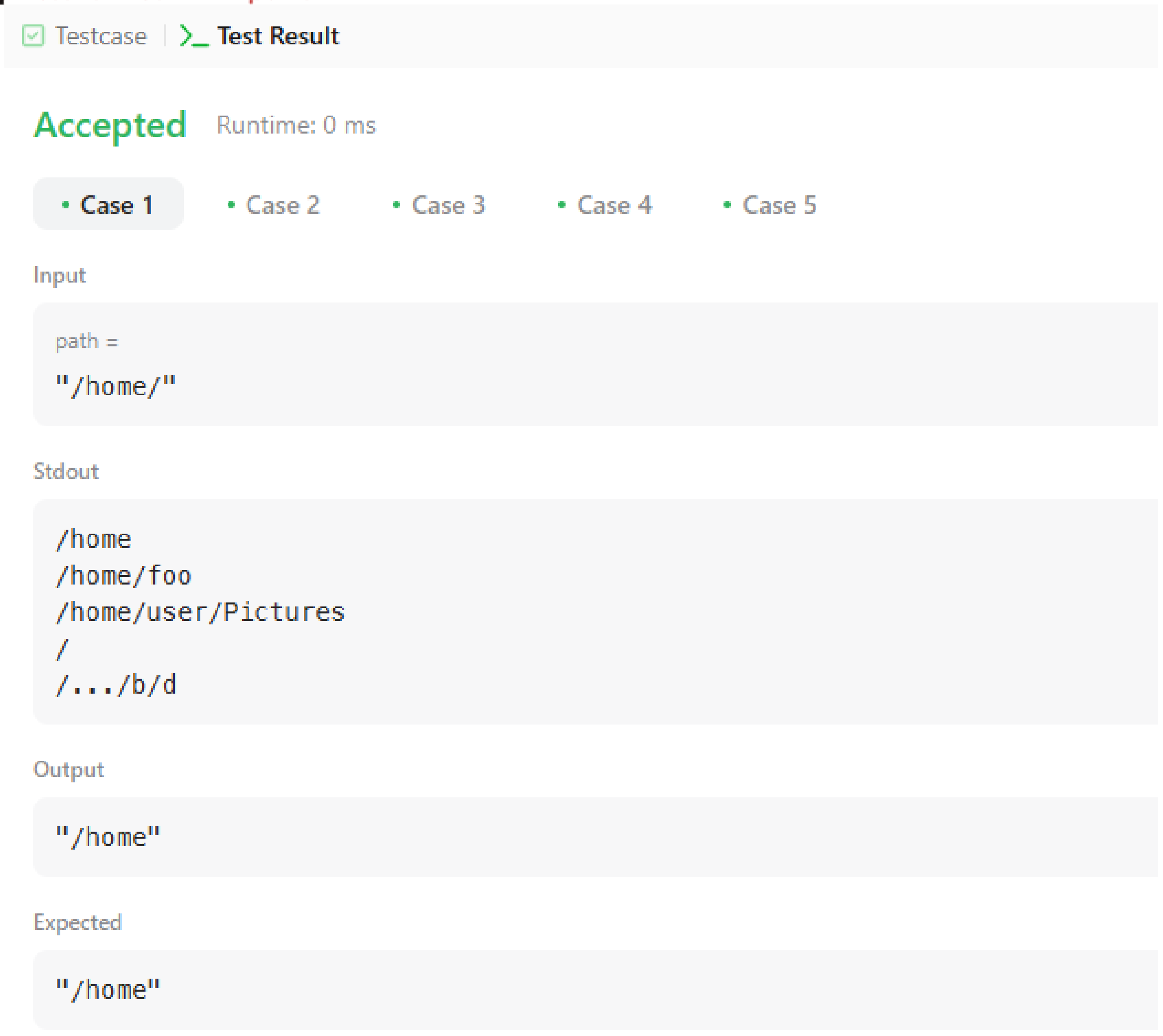
```
2
```

CODE: 1.2.3



```python
    def simplifyPath(self, path):
        stack = []
        parts = path.split('/')
        for part in parts:
            if part == '..':
                if stack:
                    stack.pop()
            elif part and part != '.':
                stack.append(part)
        return '/' + '/'.join(stack)


solution = Solution()

path1 = "/home/"
print(solution.simplifyPath(path1))

path2 = "/home//foo/"
print(solution.simplifyPath(path2))

path3 = "/home/user/Documents/../Pictures"
print(solution.simplifyPath(path3))

path4 = "/../"
print(solution.simplifyPath(path4))

path5 = "/.../a/../b/c/../d/./"
print(solution.simplifyPath(path5))
```

OUTPUT:



Accepted Runtime: 0 ms

Input

path =

```
"/home/"
```

Stdout

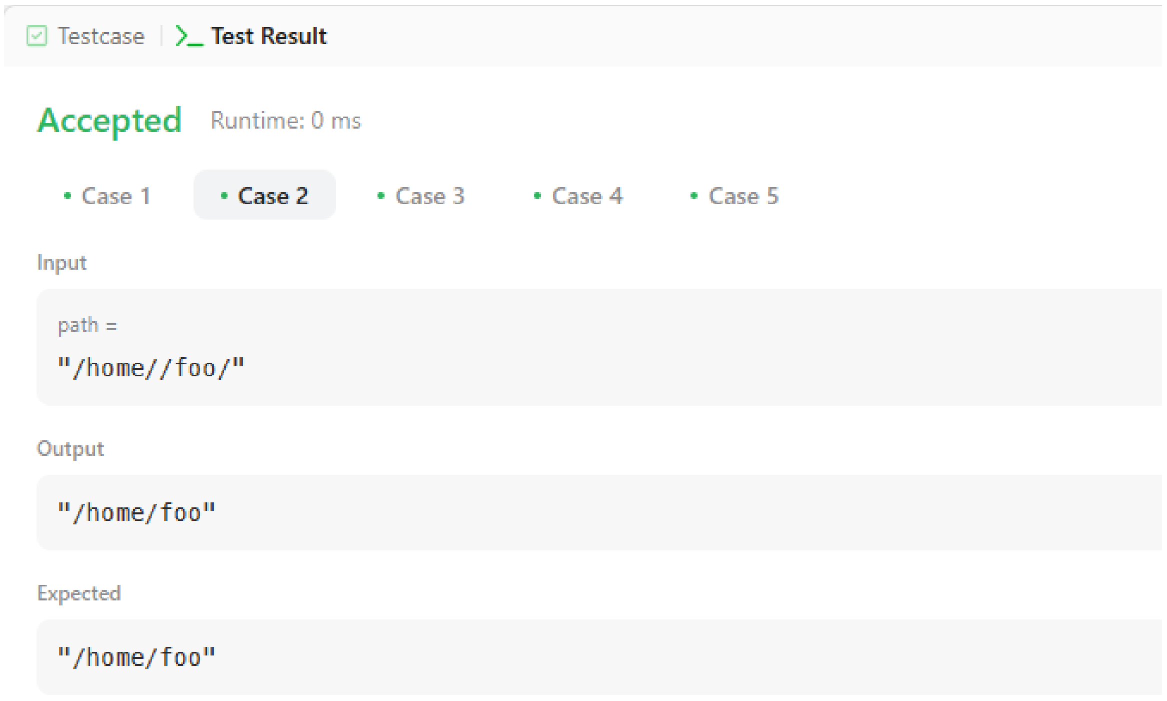
```
/home
/home/foo
/home/user/Pictures
/
/.../b/d
```

Output

```
"/home"
```

Expected

```
"/home"
```



Accepted Runtime: 0 ms

Input

path =

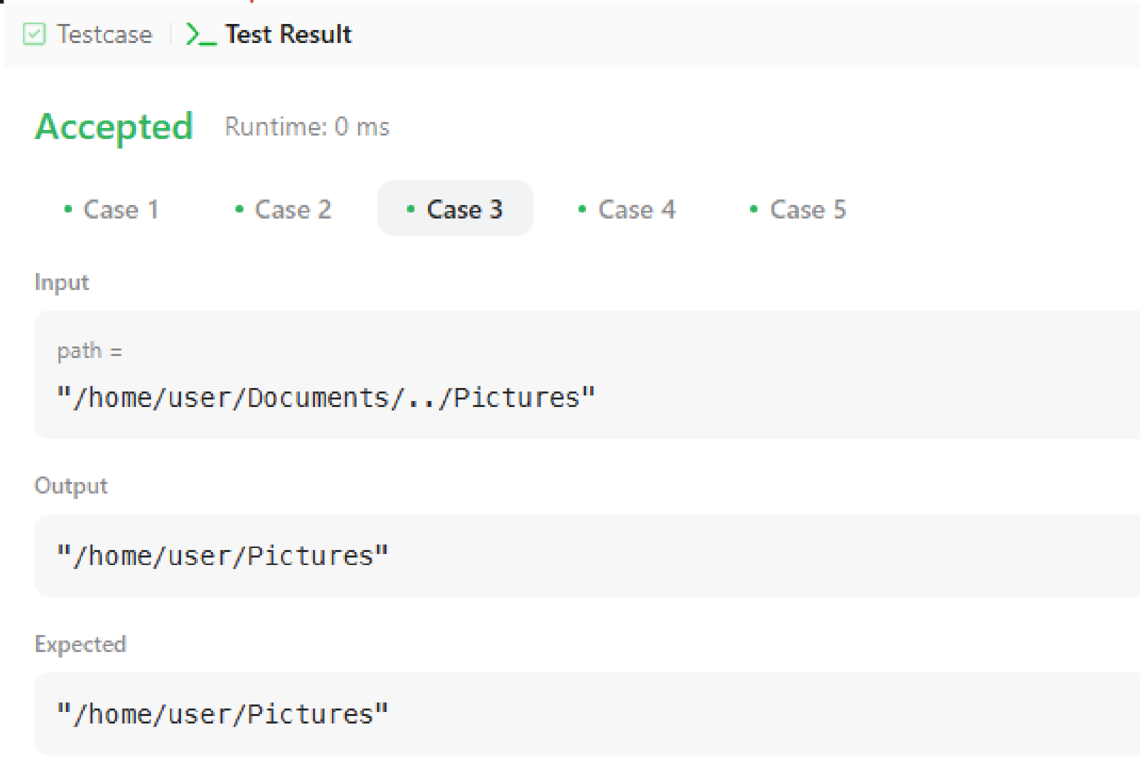
```
"/home//foo/"
```

Output

```
"/home/foo"
```

Expected

```
"/home/foo"
```



Accepted Runtime: 0 ms

Input

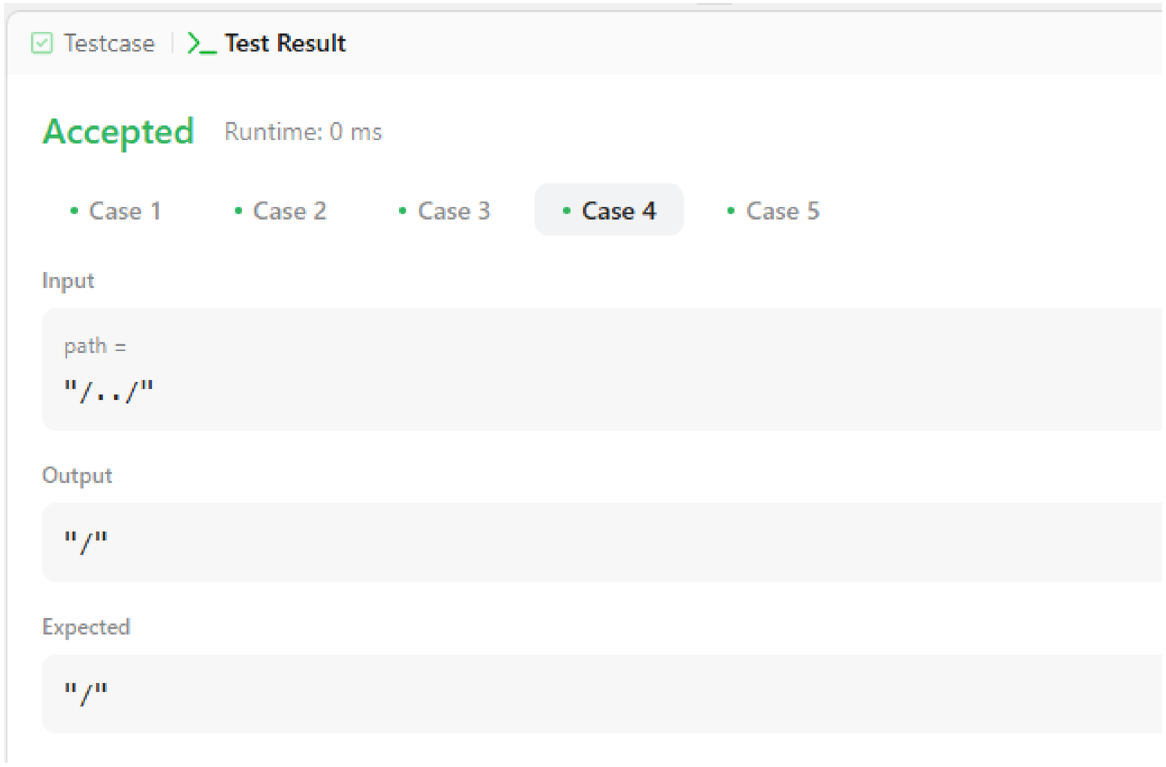
```
path =
"/home/user/Documents/../Pictures"
```

Output

```
"/home/user/Pictures"
```

Expected

```
"/home/user/Pictures"
```



Accepted Runtime: 0 ms

Input

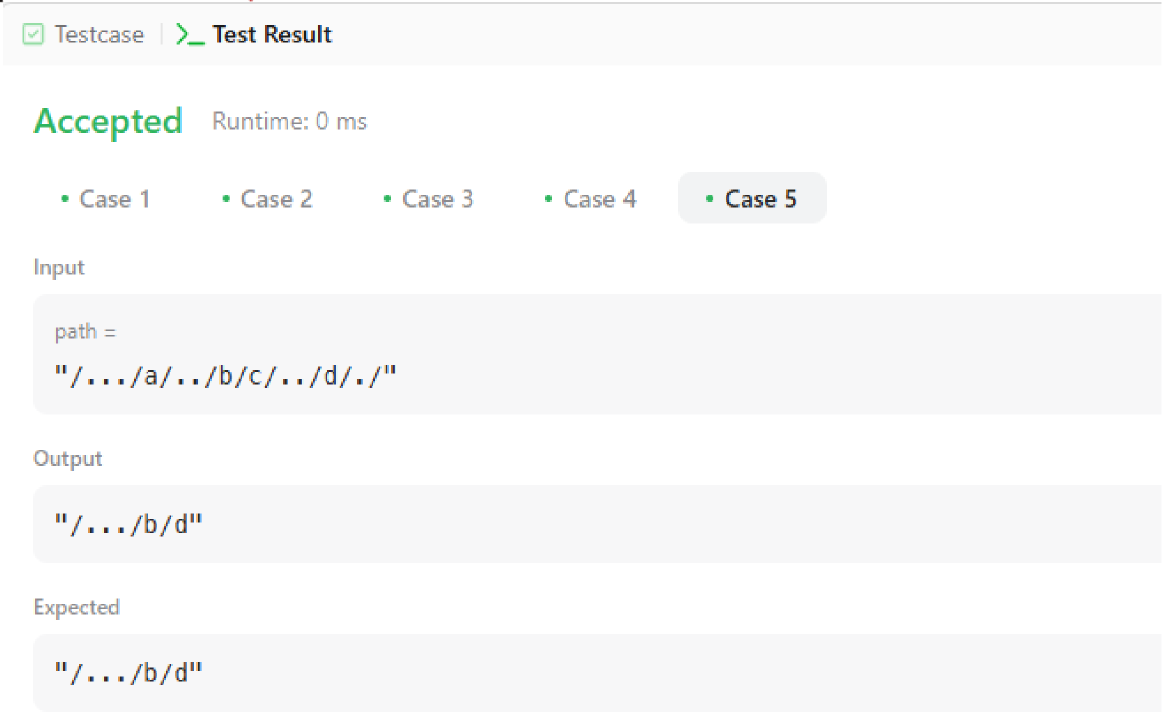
```
path =
"/../"
```

Output

```
"/"
```

Expected

```
"/"
```



Testcase | Test Result

Accepted Runtime: 0 ms

• Case 1 • Case 2 • Case 3 • Case 4 • Case 5

Input

path =

```
"/.../a/../b/c/../d/./"
```

Output

```
"/.../b/d"
```

Expected

```
"/.../b/d"
```