

Problem 4: Given an array of N integers. Find the elements that appear more than $N/3$ times in the array. If no such element exists, return an empty vector.

```
def majority_element(nums):
```

```
    candidate1, candidate2 = None, None
```

```
    count1, count2 = 0, 0
```

```
    for num in nums:
```

```
        if candidate1 == num:
```

```
            count1 += 1
```

```
        elif candidate2 == num:
```

```
            count2 += 1
```

```
        elif count1 == 0:
```

```
            candidate1, count1 = num, 1
```

```
        elif count2 == 0:
```

```
            candidate2, count2 = num, 1
```

```
        else:
```

```
            count1 -= 1
```

```
            count2 -= 1
```

```
    count1, count2 = 0, 0
```

```
    for num in nums:
```

```
        if num == candidate1:
```

```
            count1 += 1
```

```
        elif num == candidate2:
```

```
            count2 += 1
```

```
n = len(nums)

result = []

if count1 > n // 3:

    result.append(candidate1)

if count2 > n // 3:

    result.append(candidate2)

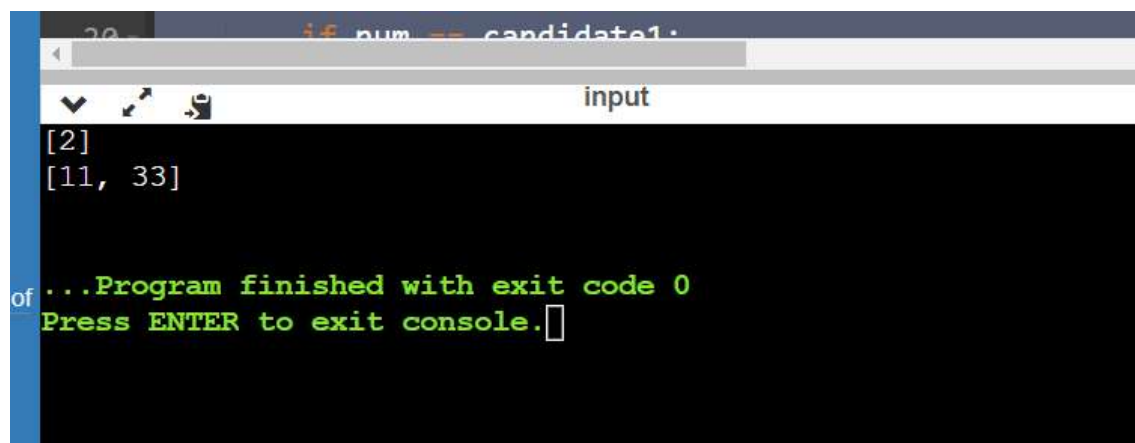

return result
```

```
nums1 = [1, 2, 2, 3, 2]

print(majority_element(nums1))
```

```
nums2 = [11, 33, 33, 11, 33, 11]

print(majority_element(nums2))
```



The screenshot shows a terminal window with a dark background. At the top, there is a title bar with the text "input". Below the title bar, the output of the program is displayed in green text. The first line shows the output for the first test case: `[2]`. The second line shows the output for the second test case: `[11, 33]`. Below these outputs, a message indicates that the program has finished with exit code 0 and prompts the user to press ENTER to exit the console.

```
if num == candidate1:
    count1 += 1
if num == candidate2:
    count2 += 1

if count1 > n // 3:
    result.append(candidate1)
if count2 > n // 3:
    result.append(candidate2)

return result
```

```
nums1 = [1, 2, 2, 3, 2]
print(majority_element(nums1))
```

```
nums2 = [11, 33, 33, 11, 33, 11]
print(majority_element(nums2))
```

```
[2]
[11, 33]

...Program finished with exit code 0
Press ENTER to exit console.
```