HATFD1020

Find the Majority Element in an Array

Write a program to find the majority element in an array (an element that appears more than n/2 times).

For example, in the array [3, 3, 4, 2, 4, 4, 2, 4, 4], the output should be 4. Do not use any

built-in functions for array manipulation or counting.

Instructions: Implement a manual count and comparison logic to find the majority element.

Program:

```
def find_majority_element(arr):

    candidate = None

    count = 0

    # First pass to find the candidate for majority element

    for num in arr:

        if count == 0:

            candidate = num

            count = 1

        elif num == candidate:

            count += 1

        else:

            count -= 1

    # Second pass to confirm if the candidate is the majority element

    count = 0

    for num in arr:

        if num == candidate:

            count += 1

    # Check if candidate appears more than n/2 times

    if count > len(arr) // 2:

        return candidate

    else:
```

```
        return "No majority element found"
```

```
# Taking input from the user
```

```
user_input = input("Enter the elements of the array separated by spaces: ")
```

```
arr = [int(num) for num in user_input.split()]
```

```
# Finding and printing the majority element
```

```
result = find_majority_element(arr)
```

```
print("Majority Element:", result)
```

output:1

Enter the elements of the array separated by spaces: 3 3 4 2 4 4 2 4 4

Majority Element: 4

output:2

Enter the elements of the array separated by spaces: 1 1 1 2 2

Majority Element: 1

output:3

Enter the elements of the array separated by spaces: 5 5 4 4 6

Majority Element: No majority element found