

Pattern-4 (Frequency Counting Pattern)

A pattern where we count how many times each element appears using a hashmap / dictionary / array.

When to use -

Use this pattern when the problem involves.

- Counting occurrences
- Finding Duplicates
- Finding unique elements
- Majority / most frequent element
- character or number frequency

Core Idea - Store element → count → use counts to answer

Time Complexity - $O(n)$

Space Complexity $O(n)$

Template -

Python -

```
freq = {}  
for x in arr:  
    freq[x] = freq.get(x, 0) + 1
```

C++ -

```
unordered_map<int, int> freq;  
for (auto x : arr) {  
    freq[x]++;  
}
```

One liner -

"Frequency counting uses a hash map to store occurrences and solve counting duplicate & majority problems efficiently."

→ Questions on Day 12 at the skillians sheet.