

Pattern-4 (Frequency Counting Pattern)

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

Q 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

Q Core Idea - Store element → Count → Use counts to answer

Time Complexity - $O(n)$

Space Complexity $O(n)$

Q 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]++;
}
```

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

→ Questions on Day 12 at the skillion sheet.