



## Group Anagrams

↘ str1 & str2

↳ equal occ. of each character.

string[] words = { "cat", "dog", "tac", "god", "act" }

✓ { {cat, tac, act}, {dog, god} } ans!

$\{ \tau_0, \tau_1, \tau_2, \tau_3, \tau_4 \}$  vis array  
 $\{ \text{cat}, \text{dog}, \text{tac}, \text{god}, \text{act} \}$

(cat) → dog → tac → god → act

cat = { cat, tac, act }

dog = { dog, god }

any length of string  
 $O(M) \times O(N) \times O(N)$   
 length of words array

Brute Force Method:
  $\left\{ \begin{array}{l} TC: O(N^2 M) \\ SC: O(26) + O(N) \approx O(N) \end{array} \right\}$

Hashmap      vis array

{ cat, dog, tac, god, act }

↑      ↑      ↑      ↑      ↑

→

HashMap



key

value

group\_name

list of group

{ c → 1  
a → 1  
t → 1

{ d → 1  
g → 1  
o → 1

{ cat, tac, act } ✓

{ dog, god } ✓

to get map

to go to all words

TC :  $O(M) \times O(N)$   
 $\approx O(N \times M)$

SC :  $O(N) + O(26) \approx O(N)$

HashMap < HashMap < —, + >, List < > >

↓  
4k → { }

4k  
a → 1

5k  
a → 1

hp — m

# Encoding .

Char freq

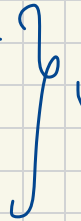
a → 1  
c → 1  
t → 1



"a1c1t1"

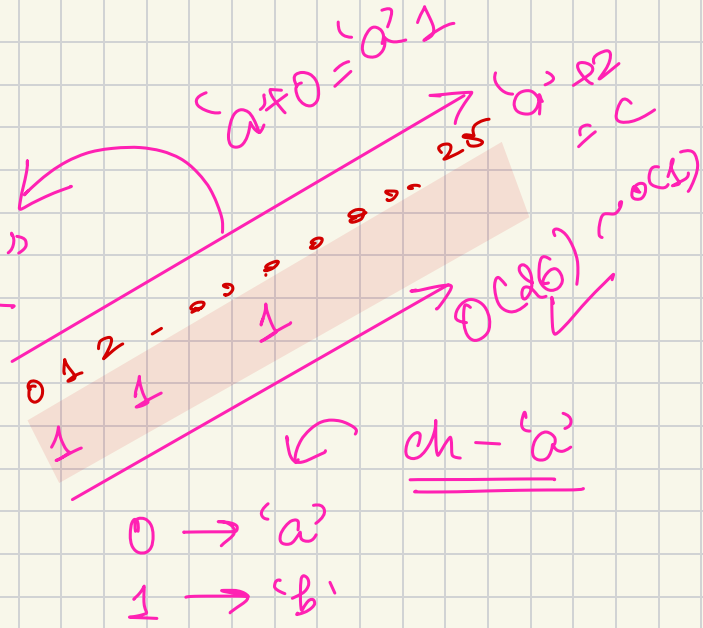


c → 1  
a → 1  
t → 1



"a1c1t1"

Calc  $c - a = 2$



## Minimum window substring

str1 : d b a e c b b a b d c a a f b d c

str2 : a b b c d c

Brute Force

↳ generate all the substrings of str1 and try to accumulate all char of str2.

$$\left\{ \begin{array}{l} TC: O(N^2) \times O(M) \sim O(N^2 M) \\ SC: O(N) + O(M) \sim O(M+N) \end{array} \right\}$$

→  $N \rightarrow$  length of str1  
→  $M \rightarrow$  length of str2

str 1 : d b a c c b b a b d c a a f b d c

str2: { a b b c d c } ↑  
exc

$$\begin{aligned} \text{len} &= \text{inc} - \text{exc} \\ &= \cancel{1} \cancel{1} \quad \cancel{1} \cancel{0} \end{aligned}$$

fnmap 2

TC:  $O(N) \times O(M)$   
 $\approx O(N \times M)$   
 SC:  $O(N + M)$

$$a \rightarrow 1$$
$$b \rightarrow 2$$
$$C \longleftrightarrow Z$$
$$d \rightarrow 1$$

## Imap

$$d \rightarrow \cancel{A} \cancel{B} \cancel{C} 2$$

$b \rightarrow \cancel{x} \cancel{x} \cancel{3} \cancel{4} \cancel{3} \cancel{4} \cancel{2} \cancel{1}$

$a \rightarrow \cancel{1} \cancel{2} \cancel{3} \cancel{4} \cancel{5} 2$

$$f \rightarrow 1$$

$C \rightarrow \cancel{1} \cancel{2} \cancel{3} 2$

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str1 : d b a e c b b a b d c a a f b d c

str2 : a b b c d c

length = 6

TC :  $O(M) + O(N)$   
 $\sim O(M+N)$   
SC :  $O(M+N)$

map 2

a  $\rightarrow$  1

b  $\rightarrow$  2

c  $\rightarrow$  2

d  $\rightarrow$  1

map 1

d  $\rightarrow$  ~~1~~ ~~2~~ 1

b  $\rightarrow$  ~~1~~ ~~2~~ ~~3~~ ~~4~~ 3

a  $\rightarrow$  ~~1~~ ~~2~~ 1

~~e  $\rightarrow$  1~~

c  $\rightarrow$  ~~1~~ ~~2~~ 1

count = ~~1~~ ~~2~~ ~~3~~ ~~4~~ 5

Design Hashset

{ chaining }