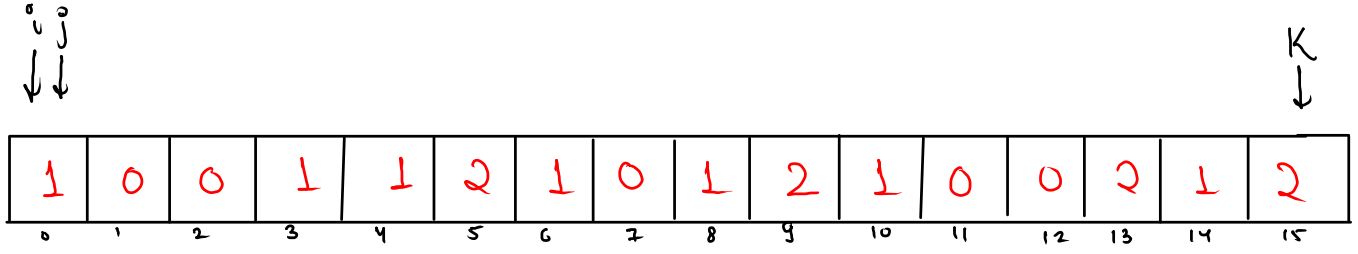
⇒ Sort 012

arr

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	0	0	1	1	2	1	0	1	2	1	0	0	2	1	2

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2

dry run



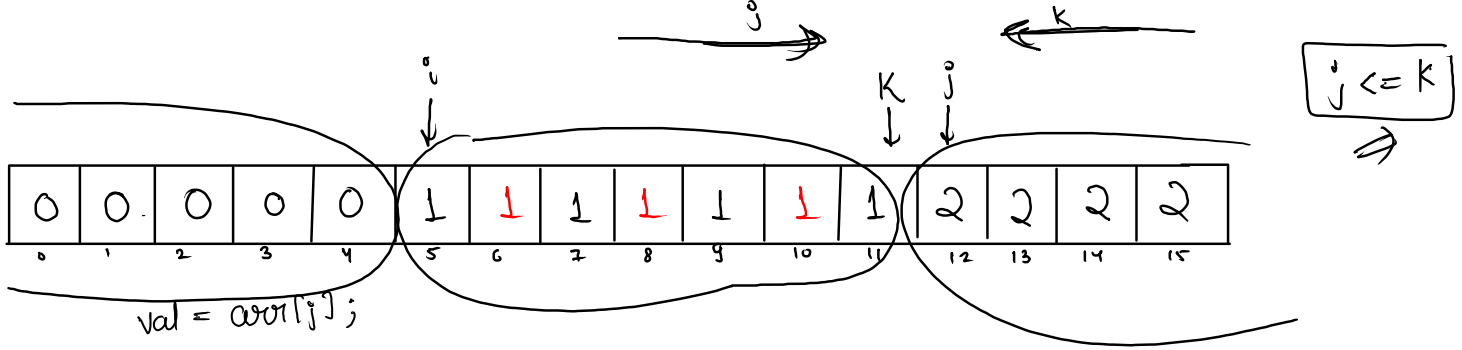
faith

i → all elements before i will 0 (0^{th} index) (initially)

j → all elements b/w i and j will be 1 (0^{th} index)

k → all elements after k will be 2 (

(all remaining elements are unexplored)



j <= k

val = arr[j];
if val is 1
    j++
else if val is 0
    swap(i, j)
    i++
    j++
else if val is 2
    swap(j, k)
    k--;

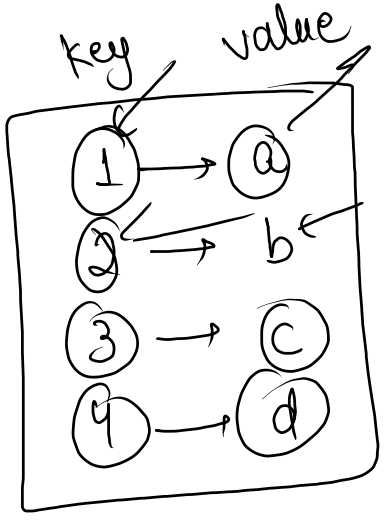
j <= k

```java
public static void swap012(int[] arr, int n) {
    int i = 0;      // all elements before i will be 0
    int j = 0;      // all elements between i and j will be 1
    int k = n - 1;  // all elements after k will be 2

    while (j <= k) {
        int val = arr[j];
        if ( val == 1 ) {
            j++;
        } else if ( val == 0 ) {
            swap(arr, i, j);
            i++;
            j++;
        } else {    // 2
            swap(arr, j, k);
            k--;
        }
    }

    for (int a = 0; a < n; a++) {
        System.out.print(arr[a] + " ");
    }
}
```

for (int i=0, j=0, k=n-1; j<=k;) {

⇒ Arrays as Hashmap

↳ a DS which is used to store key and value as a pair



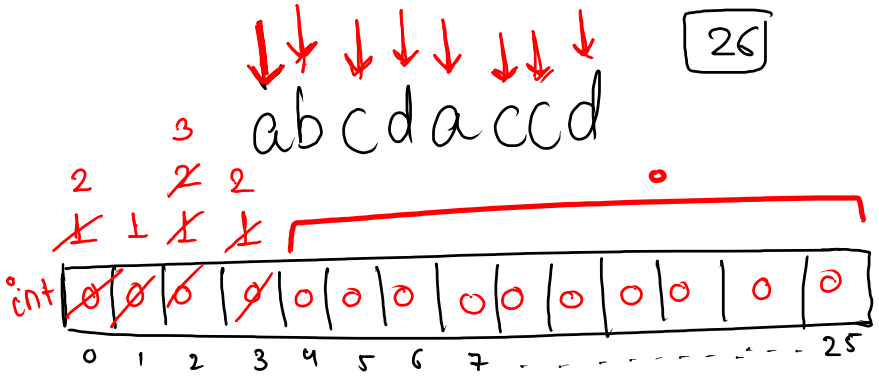
Print Freq of Alphabet in String

Sample Input 0

```
abcdaccd
```

Sample Output 0

```
a-2
b-1
c-3
d-2
```



alphabets → freq

a → 2
b → 1
c → 3
d → 2

a → 0
b → 1
c → 2
z → 25

ASCII

concept

97 97

'a' − 'a' = 0
'b' − 'a' = 1
'c' − 'a' = 2
'd' − 'a' = 3
'e' − 'a' = 4
'z' − 'a' = 25

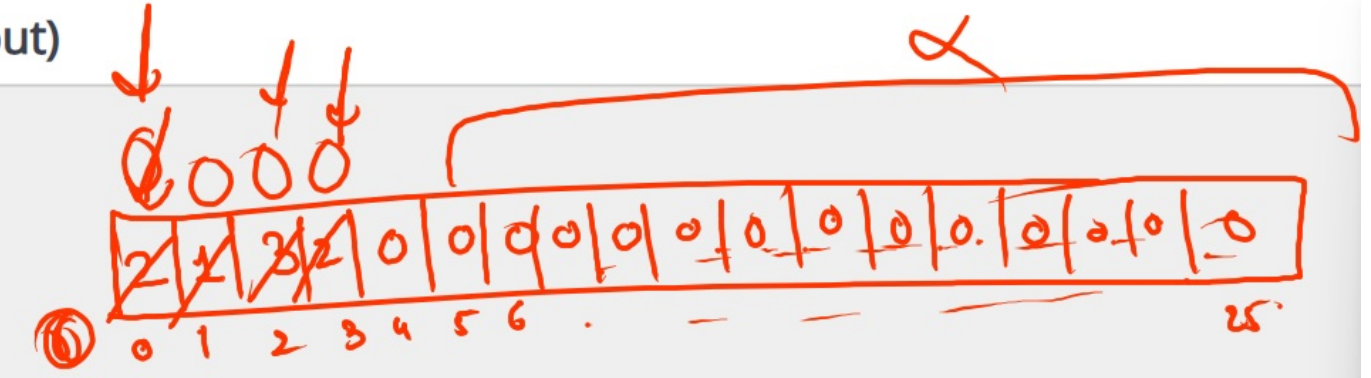
→ index

Input (stdin)

```
abcdaccd
```

Your Output (stdout)

```
a-2
b-1
c-3
d-2
a-2
c-3
c-3
d-2
```



Expected Output

```
a-2
b-1
c-3
d-2
```

```java
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    String str = scn.nextLine();

    // main logic
    int[] freq = new int[26];
    for (int i = 0; i < str.length(); i++) {
        char ch = str.charAt(i); // a
        int idx = ch - 'a'; // 0

        freq[idx]++;
    }

    for (int i = 0; i < str.length(); i++) {
        char ch = str.charAt(i);
        int idx = ch - 'a';

        if ( freq[idx] != 0 ) {
            System.out.println(ch + "-" + freq[idx]);
            freq[idx] = 0;
        }
    }
}
```

freq[idx] , ch

badcdbacc

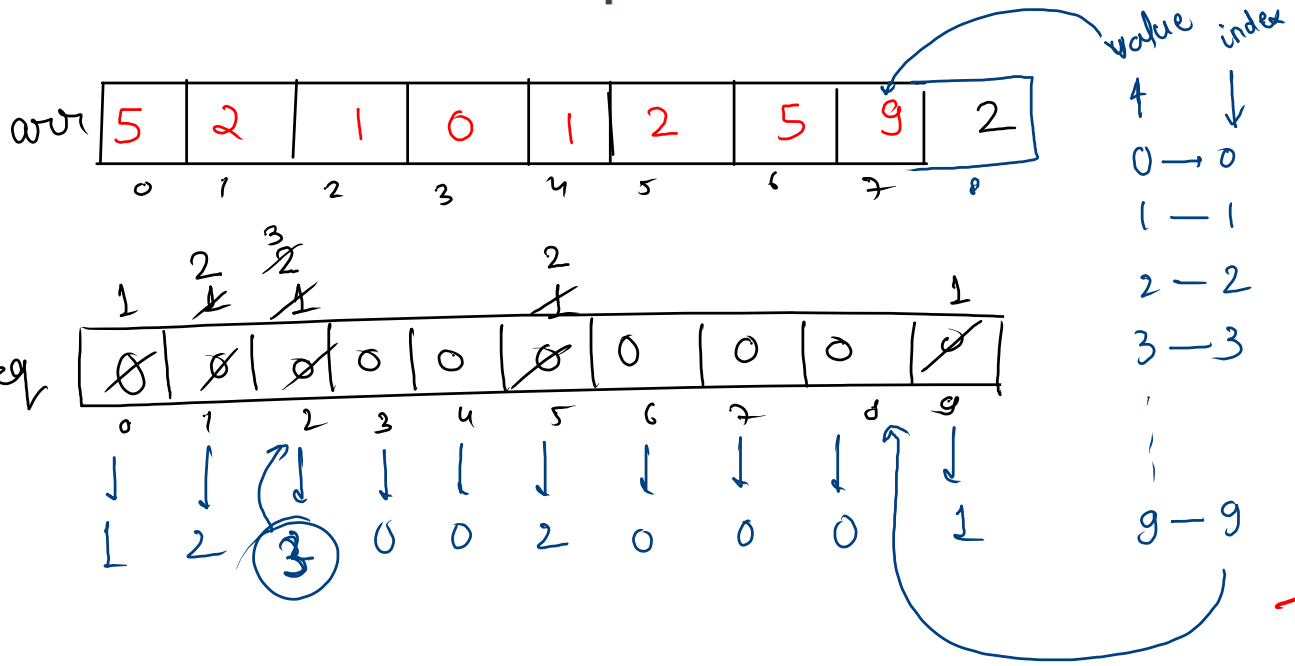
int

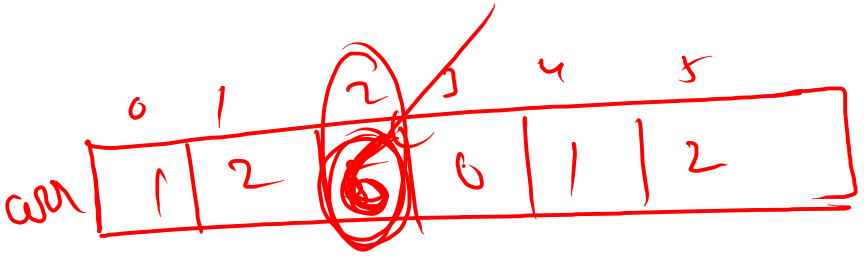
0	1	2	3	4	5	...
2	2	3	2	0	0	0

a - 0
b - 1
c - 2
d - 3
e - 4
...
z - 25

b → 2
a - 2
d → 2
c → 3

Int with Maximum Freq





arr[2]++;

to print

```java
public static void maxFreq(int[] arr, int n) {
    int[] freq = new int[10];
    for (int i = 0; i < n; i++) {
        int val = arr[i];
        freq[val]++;
    }

    int maxi = -1;
    int ans = -1;
    for (int i = 0; i < freq.length; i++) {
        if ( freq[i] > maxi ) {
            maxi = freq[i];
            ans = i;
        }
    }

    System.out.println(ans);
}
```

build hashmap