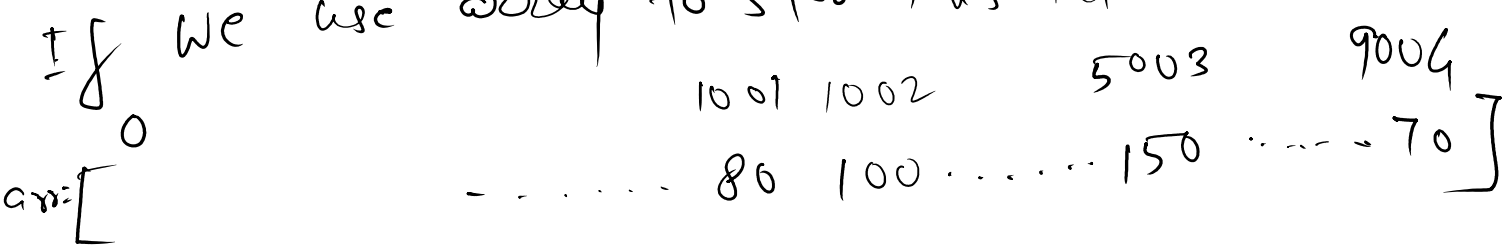
HashMap

↳ It stores data in form of key value pair

Example.

1001 — 80
1002 — 100
5003 — 150
9004 — 70

If we use array to store this data



size of array = 9005
This will result consuming more space
Therefore, instead of using array data structure we use Hashmap

```
HashMap<Integer, Integer> hm
                = new HashMap<>();

hm.put(1001, 80);
hm.put(1002, 100);
```

hm.put(1002,100);
hm.put(5003,150);
hm.put(9004,70);

// put method is used to store key-value inside hashmap

hm.get(9004); => 70
hm.get(5003); => 150.

0 1 2 3 4

arr = [1, 4, 4, 5, 1]

Store the elements into hashmap with its frequency

1 -> 1

4 -> 2

5 -> 1

6 -> 1

```
HashMap<Integer, Integer> hm
                = new HashMap<>();

for(int i=0; i<n; i++){
    if(hm.get(arr[i])==null) {
        hm.put(arr[i],1);   4->1
    }else{
    hm.put(arr[i], hm.get(arr[i])+1);
    }
```

[1, 4, 4, 1, 4, 5]

1 - 1 hm.get(4) -> null

4 -> 1+1

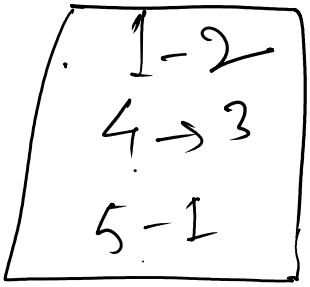
= hm.put(4,2) hm.get(4) -> 1

= hm.put(4,2)

1 → hm.put(1,2)

4 → hm.put(4,3)

5 → hm.put(5,1)



→ hashmap.

hm.keySet() → This will return the set of keys

↳ [1, 4, 5]

```
for(int key: hm.keySet()){
S.O.Pln("Key is "+key+"value is "+hm.get(key));
  }
```

Key is 1 value is 2

Key is 4 value is 3

key is 5 value is 1.

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Int With Maximum Freq

```java
public static void main(String[] args) {
    //System.out.println("Hello World");
    int arr[] = {2,3,6,2,2,6};
    //2-3, 3-1, 6-2
    HashMap<Integer,Integer> hm = new HashMap<>();
    for(int i=0;i<arr.length;i++){
        if(hm.get(arr[i])==null){
            hm.put(arr[i],1);
        }else{
            hm.put(arr[i],hm.get(arr[i])+1);
        }
    }
    int max = Integer.MIN_VALUE;
    int maxKey=arr[0];
    for(int key : hm.keySet()){
        if(hm.get(key)>max){
            max = hm.get(key);
            maxKey=key;
        }

    }
    System.out.println(maxKey +" "+max);
}
```

Print freq of Alphabet in String

Str = abcdaccd

Output

a – 2
b – 1
c – 3
d – 2

```
char charArray[] = str.toCharArray();
```

↳ ['a','b','c','d','a','c','c','d']

```
HashMap<Character, Integer> hm
        = new HashMap<>();
```

TestCase2:

str = "hello"

```
char ch[] = str.toCharArray();
```

['h','e','l','l','o']

key → value
h → 1
e → 1
l → 2
o → 1

```
HashMap<Character, Integer> hm = new HashMap<>();
for(int i=0; i<ch.length; i++){
  if(hm.get(ch[i])==null){
     hm.put(ch[i],1);
   }else{
   hm.put(ch[i], hm.get(ch[i])+1);
   }
```

```
}
for(char key : hm.keySet() ){
  S.O.Pln(key+"-"+hm.get(key));
}
```

e-1
l-2
h-1
o-1

h-1
e-1
l-2
o-1

hello

```
for(int i=0; i<ch.length; i++){
    if(hm.get(ch[i])!=null){
  S.O.Pln(ch[i]+"-"+hm.get(ch[i]));
    hm.remove(ch[i]);
    {
}
```

```
public static void main(String[] args) {
    /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your clas
    Scanner sc = new Scanner(System.in);
    String str = sc.next();
    char ch[] = str.toCharArray();
    HashMap<Character,Integer> hm = new HashMap<>();
    for(int i=0;i<ch.length;i++){
        if(hm.get(ch[i])==null){
            hm.put(ch[i],1);
        }else{
            hm.put(ch[i],hm.get(ch[i])+1);
        }
    }
    for(int i=0;i<ch.length;i++){
        if(hm.get(ch[i])!=null){
            System.out.println(ch[i]+"-"+hm.get(ch[i]));
            hm.remove(ch[i]);
        }
    }
```

Maximum Freq Character

Str : abcdaccd

a → 2

b → 1

c → 3

d → 2

Output → c.