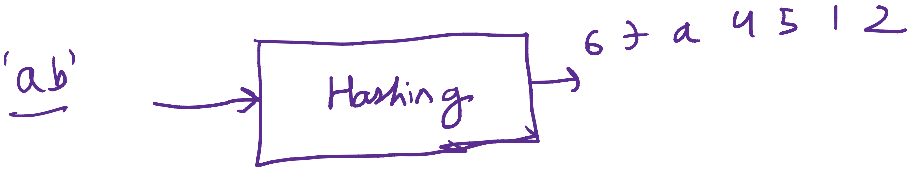
14/15th March

14 March 2022 21:10



$$x \Rightarrow \left(\frac{x \times 100}{23} + 55\right) \times 3 \Rightarrow x'$$

String s = "Hello World";

HASH MAP := O(1)

// Key Value

Rollno. Marks

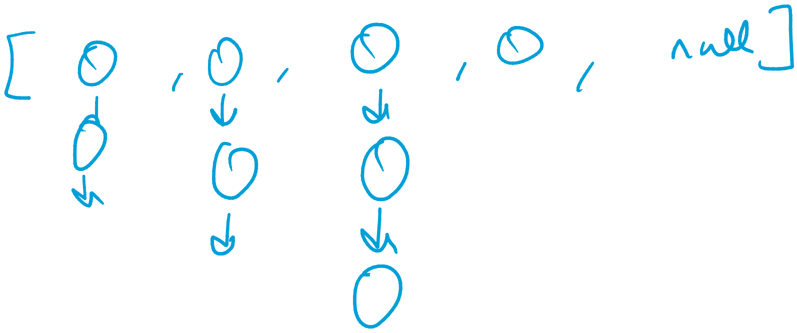
R	M
0	1
70	47
3	35
56	
31	

Fetch = O(n)

checkifExist : O(n)

HM Structure

LinkedList [ ]



node = (25, 88) ⇒ HC ⇒ 23891

23891 % 4 = abs (0, 1, 2, 3

Math.abs(

Template

LL<Node>

K V

Node(K, V)

Math.abs(

25

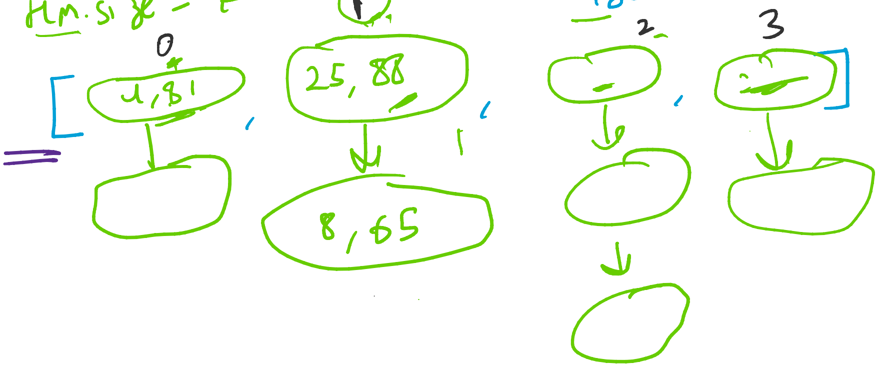
)

Node(K, V)
↓
hashCode()

int
Integers

Hm.size = ~~1~~ 4. 9

size = 4



Node (8, 65)
↓
59177 %4 = 1

landa ≤ 2.0

$$\frac{\text{size of HM}}{\text{size of array}} = \frac{2}{4} = 0.5$$

$\frac{9}{8} = 1.1$

28 % 8 = 4

[, , , , , , ,]

O(1) ~ 8

① 8, ~~24~~ 36

② 8, 36

hm.get(25)

25 % size of array = 1

https://www.geeksforgeeks.org/string-constant-pool-in-java/

Pair sum divisible by K

[1,2,3,4,5], K=4 (1,3),(3,5) = 2

Naive :- $O(n^2)$

Naive :- $O(n^2)$

HashMap

K Integer	V Integers
1	0
2	1
3 →	~~2~~ 3 4
4	
5	

$O(n)$

0 1 2 3 4
[1, 2, 3, 4, 5]

$K - (arr[i] \% K) =$

$(4 - (1 \% 4)) = 3$

$(4 - (2 \% 4)) = 2$

$(4 - (3 \% 4)) = 1$

$(4 - (4 \% 4)) = 4$

!

5

(k=4) 0 1 2 3 4 5
1, 2, 3, 1, 3, 5

(1,3) (0, 2) (2, 3) (3, 4) (4, 5) (2, 5) (0, 4)

$k - (i \% k) \Rightarrow$

K	V
1	~~2~~ 1
2	~~1~~ 0
3	~~2~~ ~~1~~ 0

2 + 0 + 2 + 1 + 1 + 0

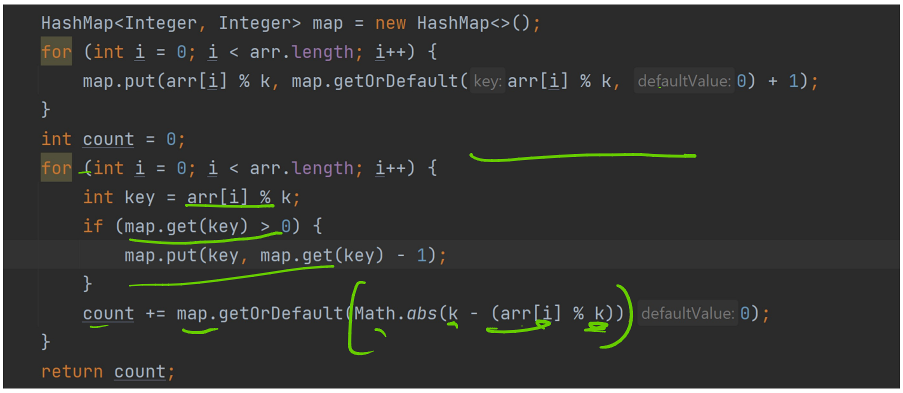
6

0 + (i + 1)

10, 6, 3, 3

0 — ~~2~~ 1

1 — 2



```
HashMap<Integer, Integer> map = new HashMap<>();
for (int i = 0; i < arr.length; i++) {
    map.put(arr[i] % k, map.getOrDefault( key: arr[i] % k,  defaultValue: 0) + 1);
}
int count = 0;
for (int i = 0; i < arr.length; i++) {
    int key = arr[i] % k;
    if (map.get(key) > 0) {
        map.put(key, map.get(key) - 1);
    }
    count += map.getOrDefault(Math.abs(k - (arr[i] % k)) defaultValue: 0);
}
return count;
```

$2 - (10 \% 2) = 2$

c=0

上