

# Hashing Data Structure

→  $O(1) \Rightarrow$  constant

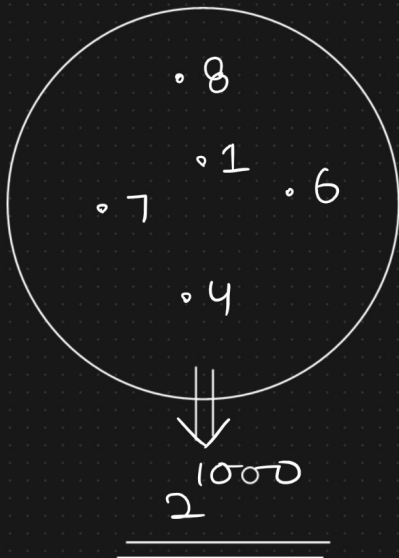
(key, value)

→ searching

unique

Hash Table

key	value
1	1
2	
3	
4	
5	
6	6
7	7
8	8



Direct  
addressing  
table

Hash functions

→ Types

Division modulo

Hash function

$$\text{Key} = \text{Value} \% \text{size of hash table}$$

$n = 10$

collision

Hash table

key	value
0	550
1	
2	342
3	
4	
5	
6	476
7	
8	498
9	749



Hash function

$$550 \% 10 = 0$$

$$498 \% 10 = 8$$

$$749 \% 10 = 9$$

$$476 \% 10 = 6$$

$$342 \% 10 = 2$$

Collision

$$490 \% 10 = \underline{\underline{0}} \text{ (key)}$$

$$\underline{\underline{899 \% 10 = 9 \text{ (key)}}}$$

Collision Resolution Techniques

Open

addressing

chaining



Linked List