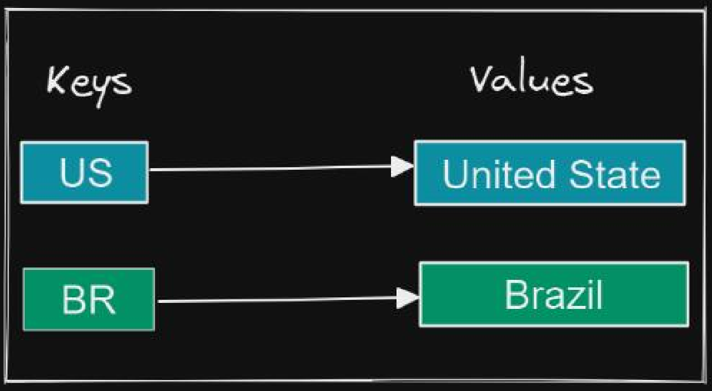
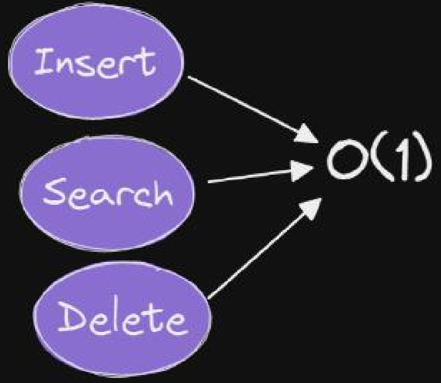
HashMap Notes:-

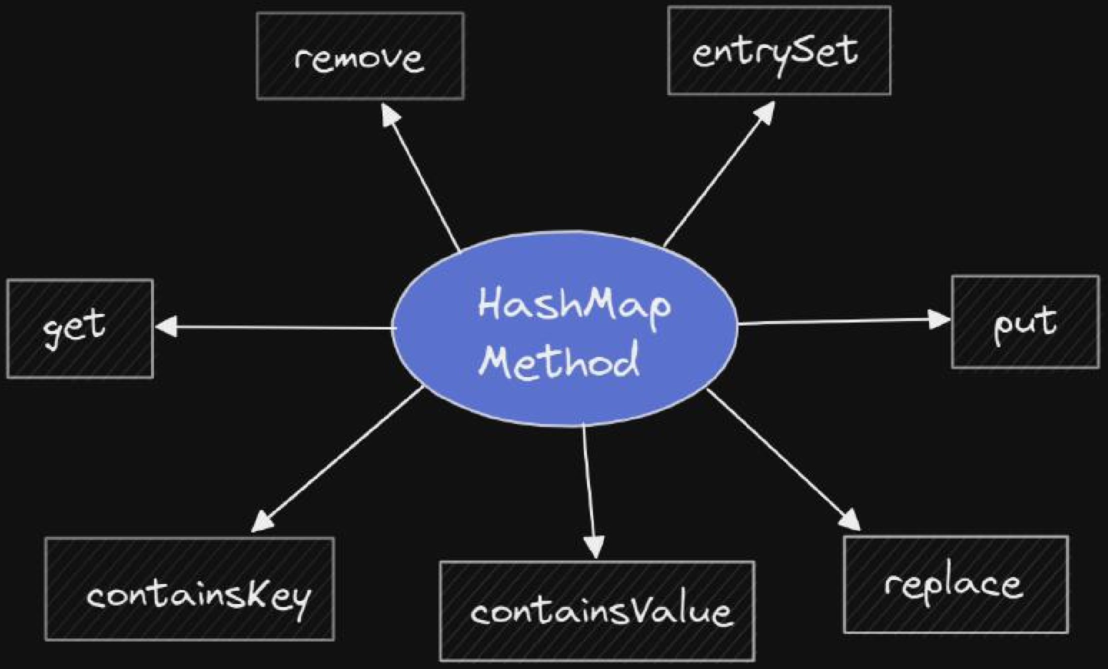
→ Hashing is a technique which is used to efficiently find or store an item in a collection.

→ Elements of Map are stored in key/value pairs.

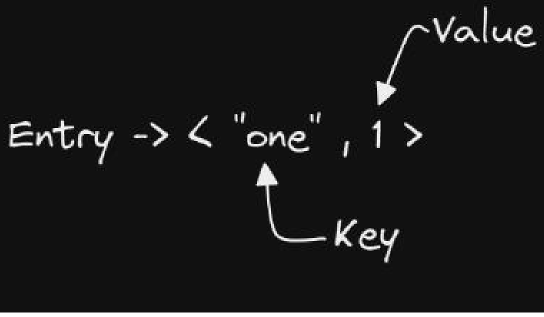


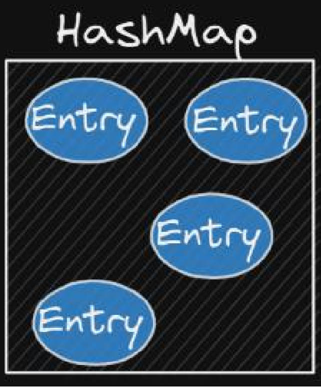


→ Remember that worst case complexity of hashing is still O(n), but it gives O(1) on the average.



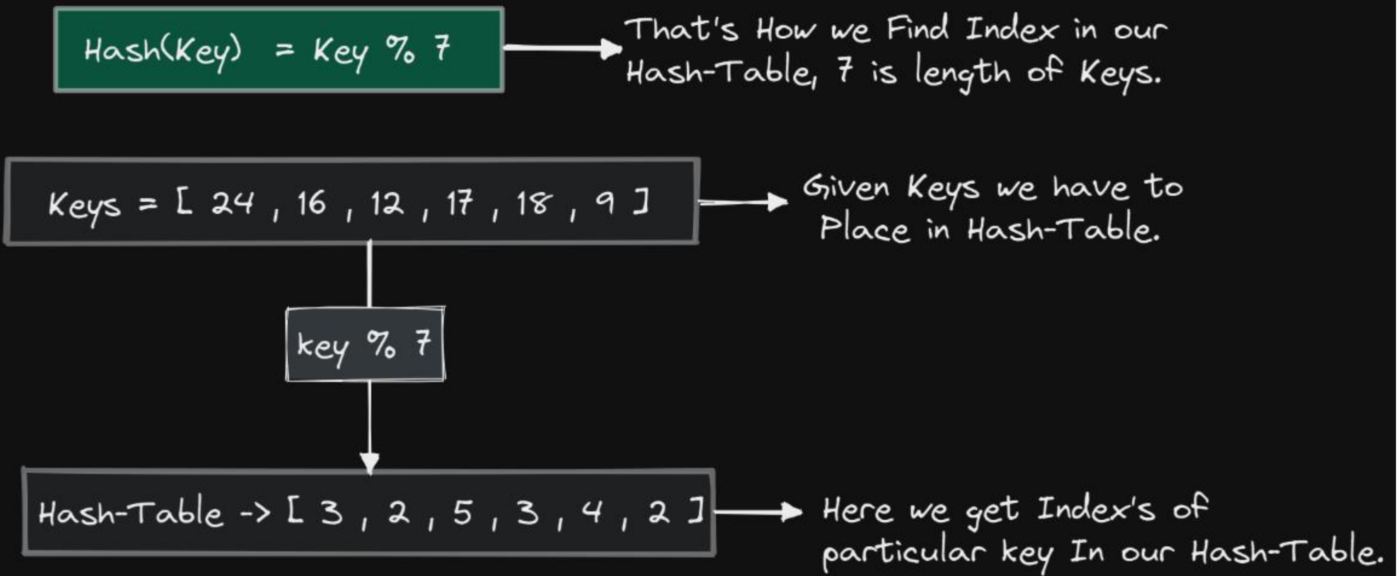
→ Entry is an object that maps keys to values in HashMap.





HashMap Internal-Working

- In Internal working of HashMap, we just need to divide that particular key to its length. through which we can get particular index in Hash-Table.



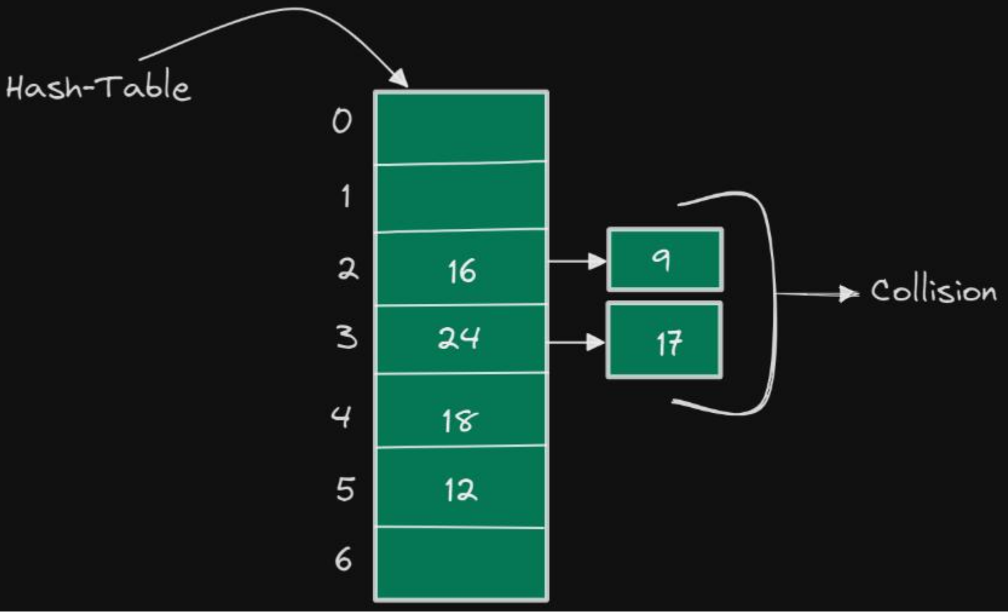
Hash(Key) = Key % 7 → That's How we Find Index in our Hash-Table, 7 is length of Keys.

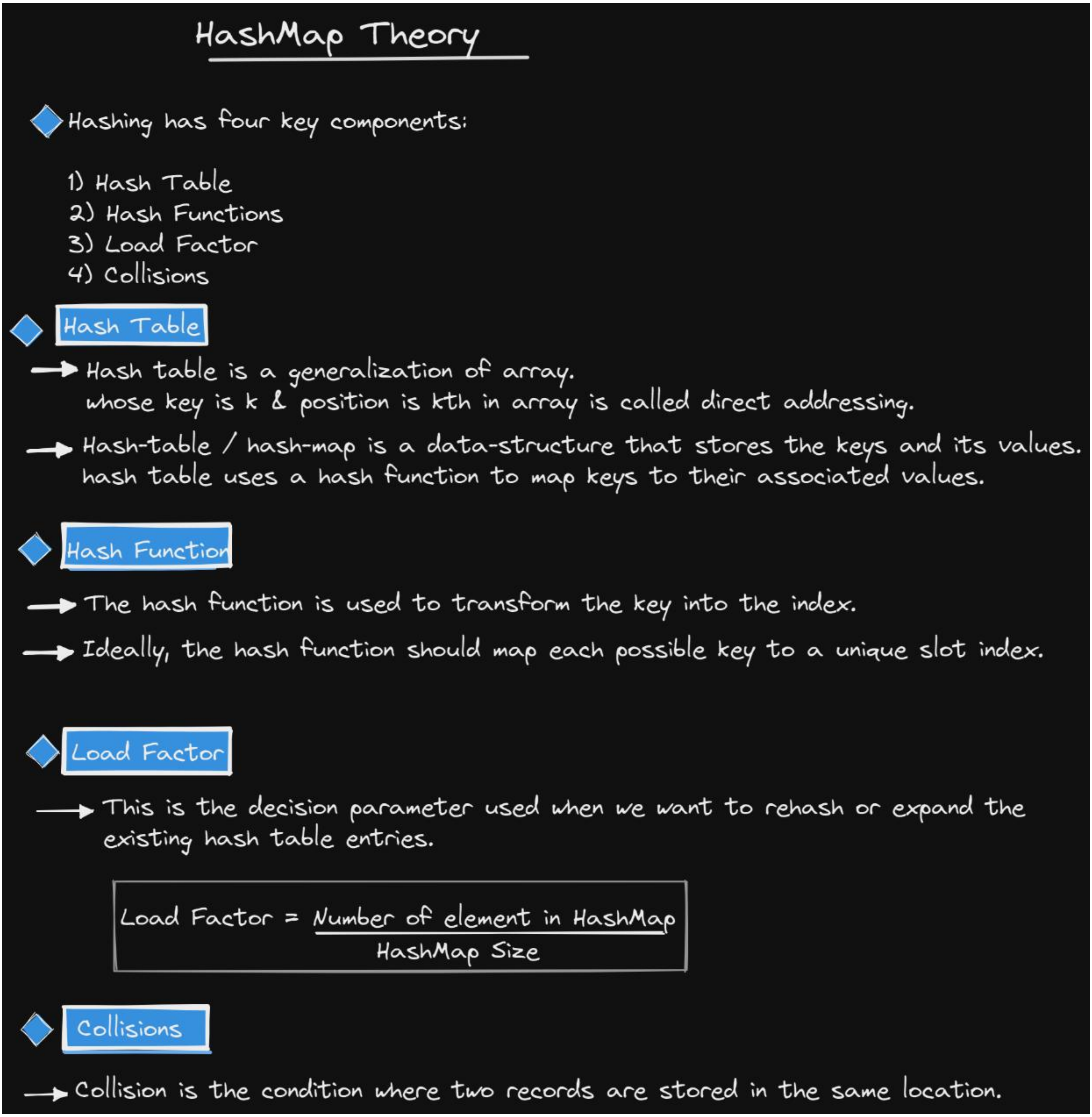
Keys = [24 , 16 , 12 , 17 , 18 , 9] → Given Keys we have to Place in Hash-Table.

key % 7

Hash-Table -> [3 , 2 , 5 , 3 , 4 , 2] → Here we get Index's of particular key In our Hash-Table.

- So, In Our Hash-Table put "KEY" at "Key % 7". Like -> 24 at 3.





HashMap Theory

- Hashing has four key components:

1) Hash Table
2) Hash Functions
3) Load Factor
4) Collisions

Hash Table

→ Hash table is a generalization of array.
whose key is k & position is kth in array is called direct addressing.

→ Hash-table / hash-map is a data-structure that stores the keys and its values.
hash table uses a hash function to map keys to their associated values.

Hash Function

→ The hash function is used to transform the key into the index.

→ Ideally, the hash function should map each possible key to a unique slot index.

Load Factor

→ This is the decision parameter used when we want to rehash or expand the existing hash table entries.

$$\boxed{\text{Load Factor} = \frac{\text{Number of element in HashMap}}{\text{HashMap Size}}}$$

Collisions

→ Collision is the condition where two records are stored in the same location.