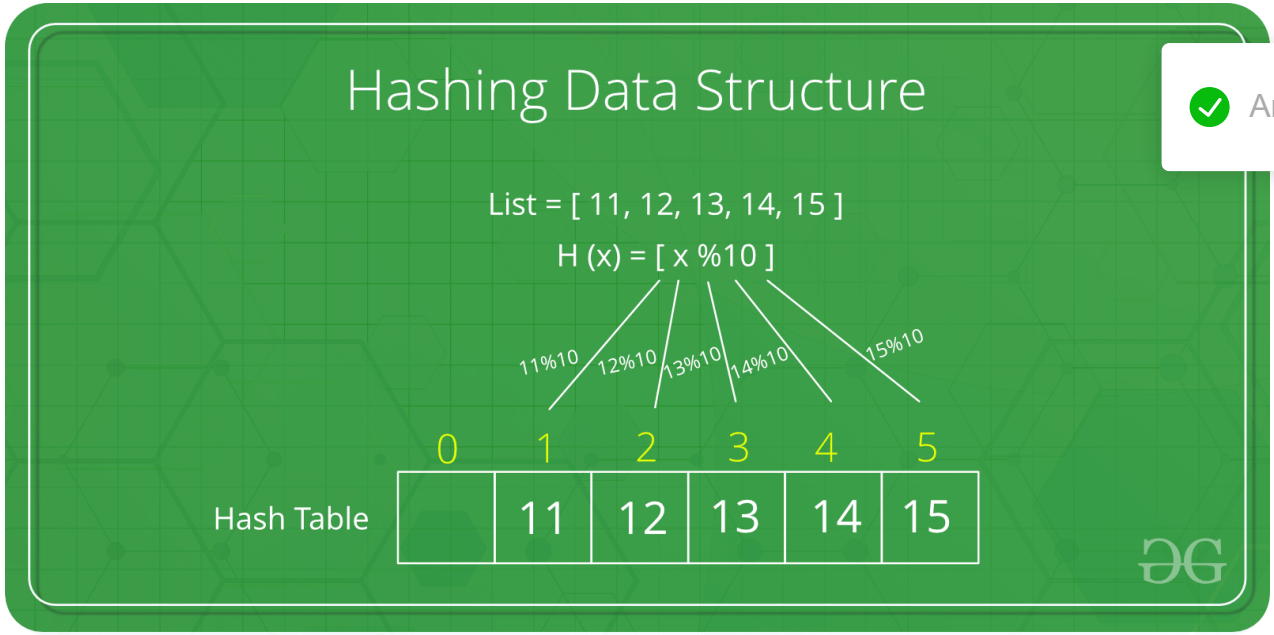
Hashing Functions

Hashing is a technique or process of mapping keys, and values into the hash table by using a hash function. It is done for faster access to elements. The efficiency of mapping depends on the efficiency of the hash function used.

Let a hash function H(x) maps the value

x

at the index **x%10** in an Array. For example if the list of values is [11,12,13,14,15] it will be stored at positions {1,2,3,4,5} in the array or Hash table respectively.



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remainder of key divided by table_size. That is, the hash function is

```
h(key) = key mod table_size

i.e. key % table_size
```

For Example

```
37599 % 17 = 12
```

- But for **key = 573**, its hash function is also

```
573 % 17 = 12
```


1. **The multiplication method:**
   - In multiplication method, we multiply the key **k** by a constant real number **c** in the range **0 < c < 1** and extract the *fractional part of* ***k * c***.
   - Then we multiply this value by table_size **m** and take the floor of the result. It can be represented as

```
h(k) = floor (m * (k * c mod 1))
                    or
h(k) = floor (m * frac (k * c))
```