## **HASHING GUIDE**

### What is Hashing and why do we need it?

Hashing is a technique or process of mapping keys, 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.

Ref - <https://www.scaler.com/topics/data-structures/hashing-in-data-structure/#introduction-to-hashing>

Implementation Provided in languages -

1. [Java](#qi2m4u7ubj0v),
2. [C++](#nbpc5xxsq5q6),
3. [Python](#glponjwv09jy),
4. [Javascript](#e8lefla4pbqw),
5. [C#](#cbh52h32q914)

## **HASHMAP IN JAVA**

### **Declaration-** HashMap<Datatype, Datatype> hm=new HashMap<>();

### **Functions in HashMap (**Time complexity of every function is O(1)**)**

1. To Insert a key → hm.put(key,value);

If the key is not present in HashMap, the key and its value gets inserted.

If the key is already present in HAshMap, the value of the key gets updated.

1. To get value of key → hm.get(key);

If the key is present, it will return the value of key

If the key is not present, return null

1. To remove a key → hm.remove(key);

If the key is present, it will get removed

04.To check if HashMap contains the key → hm.containsKey(key);

If the key is present, returns true

If the key is not present, returns false

05.To check size → hm.size();

It returns the size of the map

06.To print complete HashMap → System.out.println(hm);

07. To iterate on keys using for-each loop →

for(Datatype k:hm.keySet()) {

System.out.println( k); //to print keys

System.out. println(map.get(k)) //to print values

}

### **Understanding the functions with an example**

**Question Description**

1. You are given a number n1, representing the size of array a1.

2. You are given n1 numbers, representing elements of array a1.

3. You are given a number n2, representing the size of array a2.

4. You are given n2 numbers, representing elements of array a2.

5. You are required to print all elements of a2 which are also present in a1 (in order of their occurrence in a2). Make sure to not print duplicates (a2 may have the same value present many times).

**Code snippet -** <https://www.interviewbit.com/snippet/7ca33129c3005b5e793d/>

## 

## **Unordered\_map in c++**

### **Declaration-** unordered\_map<key,value> umap;

### **Functions in unordered\_map** (Time complexity of every function is O(1))

1. To insert a key → umap[key]=value;

If the key is not present in unordered\_map, the key and its value gets inserted.

If the key is already present in unordered\_map, the value of key gets updated.

02.To get value of key → umap[key];

If the key is present, it will return the value of key

If the key is not present, return 0

03.To remove a key → umap.erase(key);

If the key is present, it will get removed

04.To check if unordered\_map contains the key → umap.find(key);

if(umap.find(key)!=umap.end) returns true

if(umap.find(key)==umap.end) returns false

05.To check size → umap.size();

It returns the size of the map

06. To iterate on the unordered\_map

unordered\_map<string,int>::iterator p;

for(p=umap.begin();p!=umap.end();p++){

cout<< p → first; // print the keys

cout<< p → second; //print the values

}

### 

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**Code snippet-** <https://www.interviewbit.com/snippet/a7c5f355b66817409013/>

## **Dictionary in Python**

### **Declaration-**

sample\_dict = dict()

type(sample\_dict)

### **Functions in dictionary (**Time complexity of every function is O(1)**)**

1. To insert a key → sample\_dict { key : Value };

If the key is not present in the dictionary, the key and its value gets inserted.

If the key is already present in the dictionary, the value of the key gets updated.

1. To get value of key → sample\_dict [ key ];

If the key is present, it will return the value of key

If the key is not present, it will return None

03.To remove key in dictionary → del sample\_dict [ key ];

04.To check size → size(sample\_dict)

It returns the size of the dictionary

05.To iterate on the keys-

for k in sample\_dict:

print(k) // to print keys

print(sample\_dict[key]); // to print values

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**Code snippet-**<https://www.interviewbit.com/snippet/7cb402d1cc1884080563/>

## **MAP in Javascript**

### **Declaration →** const hm = new Map();

### **Functions in map (**Time complexity of every function is O(1)**)**

1. To Insert a key → hm.set(key,value);

If the key is not present in Map, the key and its value gets inserted.

If the key is already present in Map, the value of the key gets updated.

1. To get value of key → hm.get(key);

If the key is present, it will return the value of key

1. To remove a key → hm.delete(key);

If the key is present, it will get removed

1. To check if HashMap contains the key → hm.has(key);

If the key is present, returns true

If the key is not present, returns false

1. To check size → hm.size();

It returns the size of the map

06.To iterate on keys using loop →

for(let key of hm.keys()) {

console.log(key); //to print keys

console.log(hm.get(key)) //to print values

}

### **Understanding the functions with an example**

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**Code snippet-** <https://www.interviewbit.com/snippet/e6315053e27118d54544/>

**DICTIONARY In C#**

**Declaration-** Dictionary<key,value> hm = new Dictionary<key,value>();

**Functions in HashMap (Time complexity of every function is O(1))**

1. To Insert a key → hm.Add(key,value);

If the key is not present in the Dictionary, the key and its value gets inserted.

If the key is already present in the Dictionary, the value of the key gets updated.

1. To get value of key → hm[key];

If the key is present, it will return the value of key

1. To remove a key → hm.Remove(key);

If the key is present, it will get removed

1. To check if Dictionary contains the key → hm.ContainsKey(key);

If the key is present, returns true

If the key is not present, returns false

1. To check size → hm.Count;

It returns the size of the map

1. To iterate on keys using for-each loop →

foreach (KeyValuePair<key, value> k in dict) {

Console.WriteLine( k.Key); //to print keys

Console.WriteLine( k.Value); //to print values

}

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**Code snippet-** <https://drive.google.com/file/d/1aG_ePKM4sAr-kVYaQs9uh9i4eUro8LL2/view?usp=share_link>