

# Hash Table

A **hash table** (also called a **hash**, **hash map**, **map**, **unordered map** or **dictionary**) is a data structure that pairs keys to values.

```
HashMap<String, Integer> lightBulbToHoursOfLight = new HashMap<>();  
  
lightBulbToHoursOfLight.put("incandescent", 1200);  
lightBulbToHoursOfLight.put("compact fluorescent", 10000);  
lightBulbToHoursOfLight.put("LED", 50000);
```

Java ▼

Hash tables:

- take on average  $O(1)$  time for insertions and lookups
- are **unordered** (the keys are not guaranteed to stay in the same order)
- can use **many types of objects as keys** (commonly strings)

Hash tables can be thought of as arrays, if you think of array indices as keys!

In fact, hash tables are *built on* arrays. So if you ever want to use a hash table but know your keys will be sequential integers (like 1..100), you can probably save time and space by just using an array instead.

**Note:** hash tables have an **average case** insertion and lookup cost of  $O(1)$ . In industry, we often confuse the average-case cost with *worst case* cost, but they're not really the same. Because of hash collisions and rebalancing, a hash table insertion or lookup can cost as much as  $O(n)$  time in the worst case. But usually in industry we assume hashing and resizing algorithms are clever enough that collisions are rare and cheap.

# Hash Table/Hashing Coding Interview Questions

## 11 **MillionGazillion »**

I'm making a new search engine called MillionGazillion(tm), and I need help figuring out what data structures to use. keep reading »

**(/question/compress-url-list)**

## 14 **Inflight Entertainment »**

Writing a simple recommendation algorithm that helps people choose which movies to watch during flights keep reading »

**(/question/inflight-entertainment)**

## 30 **Permutation Palindrome »**

Check if any permutation of an input string is a palindrome. keep reading »

**(/question/permutation-palindrome)**

## 32 **Top Scores »**

Efficiently sort numbers in an array, where each number is below a certain maximum. keep reading »

**(/question/top-scores)**

## 34 **Word Cloud Data »**

You're building a word cloud. Write a function to figure out how many times each word appears so we know how big to make each word in the cloud. keep reading »

**(/question/word-cloud)**

## 42 Find Duplicate Files »

Your friend copied a bunch of your files and put them in random places around your hard drive. Write a function to undo the damage.

keep reading »

**(/question/find-duplicate-files)**

**All Questions → (/all-questions)**

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