

Hash Data Structure

A Hash Table is a data structure with 2 main components:

Key (like a person's name)

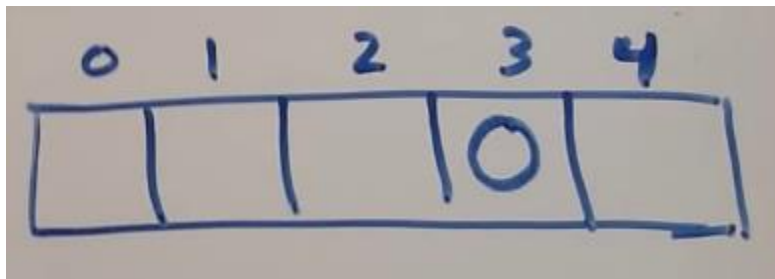
Value (a person's phone number)

A Hash Table uses an **associative array**.

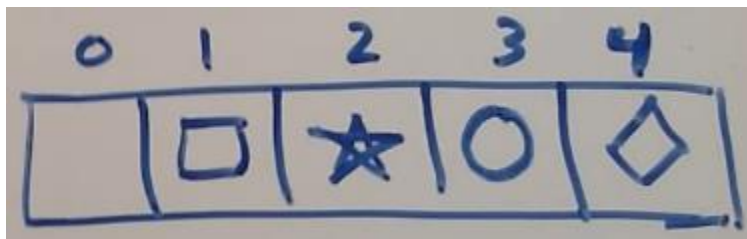
A Hash Function that evaluates the key and provides an index to locate its value.

For example, Paul is indexed at 3 and he is represented by a circle:

$\text{Hash}(\text{Paul}) \rightarrow 3$

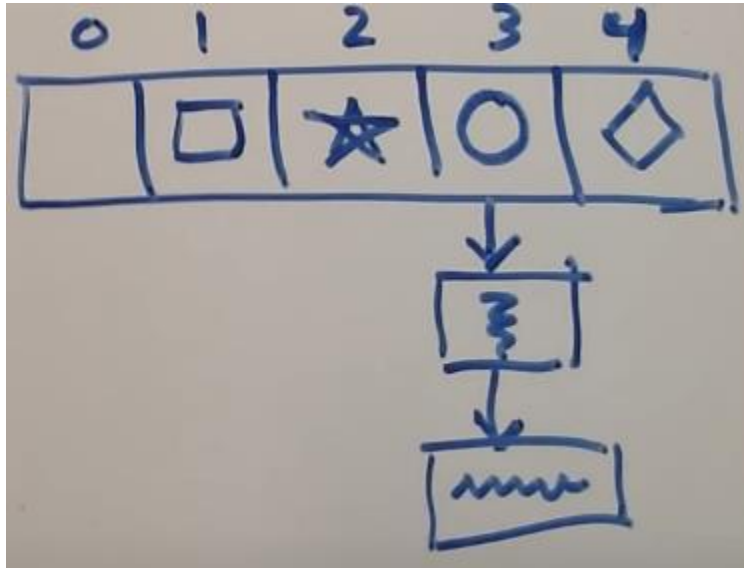


... now let's say more people are represented by other shapes in their respective indices:



What if more than one person is assigned to the same index? This is called **collision**.

To resolve this, we would assign links... this is called **chaining**. For example, a second person in index 3 is represented by a squiggly line, and a third person is represented by a sideways squiggly line:

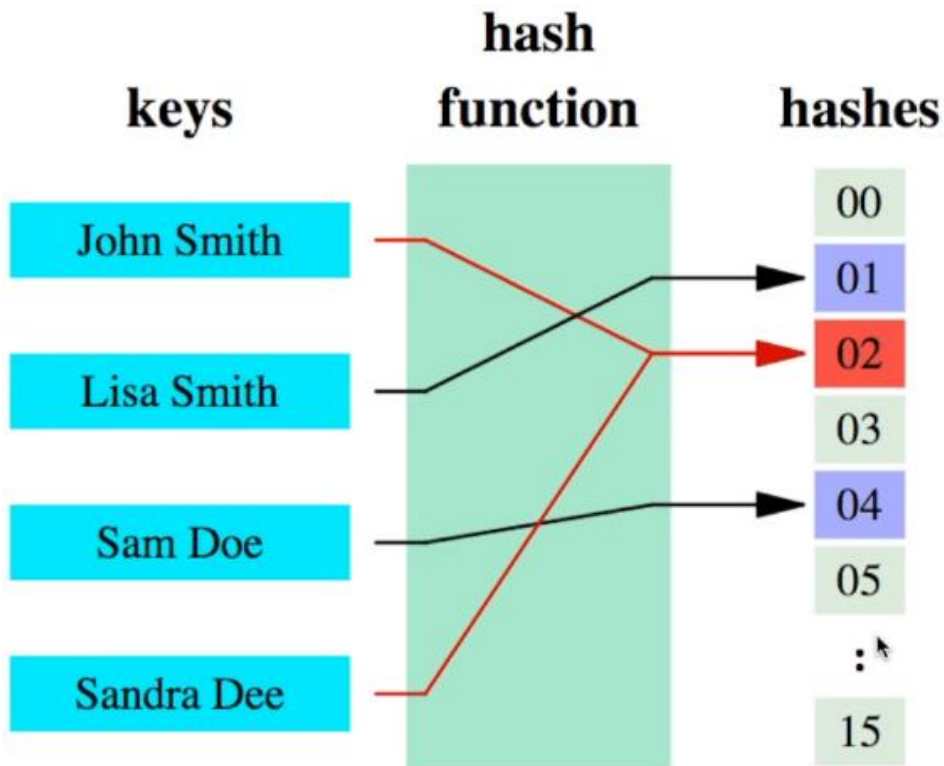


... this is how we represent more than one person in the same index. This allows many people to occupy the same index.

If we wish to retrieve a person in a shared index, we search by their key in the Hash function:

$\{ \text{Hash}(\text{somebody}) \rightarrow 3$

Another example:



... to resolve John and Sandra both being stored in 02, we iterate through their values in the buckets:

