Sunbeam Institute of Information Technology
Pune and Karad
PG - DESD

Module – Data Structures

Trainer - Devendra Dhande
Email – devendra.dhande@sunbeaminfo.com

Hash Table

- The implementation of hash tables is frequently called as **Hashing**.
- Hashing is a technique used for performing insertions, deletions and finds in constant average time.
- The ideal hash table is an **array of some fixed size**, containing the **keys**, where each key is a string with an associated value.
- Each Key is mapped into some number in the range 0 to TableSize-1 and placed in the appropriate cell (slot).
- The mapping of keys with its corresponding cell is called a **hash function**.

0	
1	
2	
3	John 25000
4	Phil 31500
5	
6	Dave 27500
7	Mary 28000
8	
9	

In this example, john hashes to 3, phil hashed to 4, dave hashes to 6 and marry hashes to 7.

Hash Table

- **Hash function**
  - The mapping is called a hash function.
  - It is mathematical function of the key that yields slot of the hash table where key-value is stored.
  - Ideally it should be simple to compute and should ensure that any two distinct keys get different cells.
  - Since there are a finite number of cells and infinite supply of keys, this is clearly impossible and thus we seek a hash function that distributes the keys evenly among the cells.
  - Simplest example is: f(k) = k % size.
- **Collision:**
  - There is possibility that two keys hash to the same value(cell). This is called collision.
  - Must be handled using one of the **collision handling technique.**
    - **Open Addressing**
      1. Linear Probing
      2. Quadratic Probing
      3. Double Hashing
    - **Closed Addressing**
      1. Chaining / Separate chaining

Thank you!

Devendra Dhande
<devendra.dhande@sunbeaminfo.com>