Aim : Given a File of N employee records with a set K of Keys(4-digit) which uniquely determine the records in file F. Assume that file F is maintained in memory by a Hash Table(HT) of m memory locations with L as the set of memory addresses (2-digit) of locations in HT. Let the keys in K and addresses in L are Integers. Design and develop a Program in C that uses Hash function H: K ®L as H(K)=K mod m (remainder method), and implement hashing technique to map a given key K to the address space L. Resolve the collision (if any) using linear probing

Objective of the Experiment:

1. Understanding the hashing functions and collision resolution techniques.

Theory :

Hash-Tables:

A hash table is a dictionary in which keys are mapped to array positions by a *hash function*. Having more than one key map to the same position is called a *collision*.

There are many ways to resolve collisions, but they may be divided into two primary strategies: separate chaining and open addressing.

- Advantages:
    - Reduce the range of array indices handled: m instead of |U|
    - Storage is also reduced
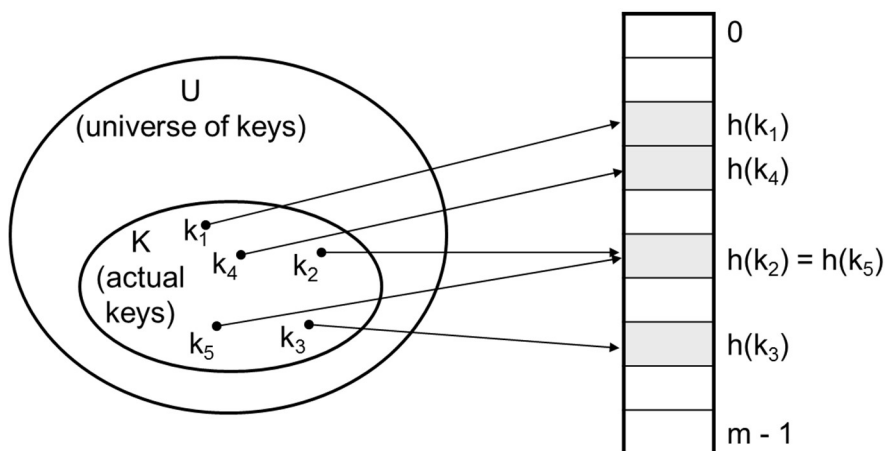
Basic Operations:

Search – search an element in a hashtable.

Insert – insert an element in a hashtable.

delete – delete an element from a hashtable.

DataItem

Define a data item having some data, and key based on which search is to be conducted in hashtable.

```
struct DataItem
{
    int data;
    int key;
};
```

HashMethod:

 Define a hashing method to compute the hash code of the key of the data item.

```
int hashCode(int key)
{
    return key % SIZE;
}
```

Algorithm:

Step 1: Start.

Step 2: Given a File of N employee records with a set K of Keys (4-digit) which uniquely determine the records in file F.

Step 3: Assume that file F is maintained in memory by a Hash Table(HT) of m memory locations with L as the set of memory addresses (2-digit) of locations in HT. Let the keys in K and addresses in L are Integers

Step 4: Hash function H: K ®L as H(K)=K mod m (remainder method)

Step 5: Hashing as to map a given key K to the address space L, Resolve the collision (if any) is using linear probing.

Step6: Stop.

 Source code for the implementation:

 (Write only important functions)

 Post Lab Assignment:

> 1. Differentiate between Open addressing and chaining.
> 2. Explain any four hash functions.
> 3. Explain double hashing with example.