## **Double Hashing**

Difficulty Level: Medium

**Double hashing** is a collision resolving technique in <u>Open Addressed</u> <u>Hash tables</u>. Double hashing uses the idea of applying a second hash function to key when a collision occurs.

Double hashing can be done using :

(hash1(key) + i \* hash2(key)) % TABLE\_SIZE

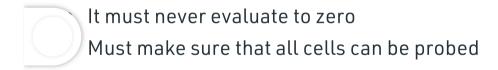
Here hash1() and hash2() are hash functions and TABLE\_SIZE is size of hash table.

(We repeat by increasing i when collision occurs)

First hash function is typically hash1 (key) = key % TABLE\_SIZE

A popular second hash function is: hash2(key) = PRIME - (key % PRIME) where PRIME is a prime smaller than the TABLE\_SIZE.

A good second Hash function is:



## Lets say, Hash1 (key) = key % 13

Hash2 (key) = 
$$7 - (key \% 7)$$

Hash1(36) = 36 % 13 = 10

Hash2(10) = 7 - (10%7) = 4

(Hash1(10) + 1\*Hash2(10))%13= 1

Collision

(Hash1(10) + 2\*Hash2(10))%13= 5