

Double hashing uses a hash function of the form  $h(k,i) = (h_1(k) + ih_2(k)) \bmod M$  here,

$h_1$  and  $h_2$  are auxiliary hash function.

The value of  $h_2(k)$  must be relative prime to the hash table size  $M$  for the entire hash table to be searched. Otherwise,  $m$  and  $h_2(k)$  have greatest common divisor  $d > 1$  for some key  $k$ , then search for the key  $k$  only examine  $(1/d)^{\text{th}}$  hash table.

Consider an example :

Here,

$m$  is prime and let

$$h_1(k) = k \bmod m$$

$$h_2(k) = 1 + (k \bmod m')$$
 here  $m'$  is less than  $m$

If  $k = 123456$ ,  $m = 601$ ,  $m' = 600$  then  $h_1(k) = 92$  and  $h_2(k) = 347$ .

So, here first position 92 is examined and then every 347<sup>th</sup> slot (mod  $m$ ) until the key is found.