Double Hashing → 2 Hash functions

m = 10

Values = 50, 75, 99, 20, 35, 88, 45, 23, 55, 67

→ $DH(v, i) = (hf_1(v) + i\,hf_2(v)) \% m$

$hf_2(v) = 1 + v \bmod (m-2)$

$hf_1(v) = v \% m$

$hf_1(v) = 50 \% 10 = 0$

$DH(50, 0) = (0 + 0) \% 10 = 0$

$hf_1(75) = 75 \% 10 = 5$

$DH(75, 0) = (5 + 0) \% 10 = 5$

$hf_1(99) = 99 \% 10 = 9$

$DH(99, 0) = (9 + 0) \% 10 = 9$

$hf_1(20) = 20 \% 10 = 0$

$DH(20, 0) = (0 + 0) \% 10 = 0$

$DH(20, 1) = (0 + 1 *$

$hf_2(20) = 1 + 20 \% 8$

$= 1 + 4$

$= 5$

$DH(20, 2) = (0 + 2 * 5) \% 10$

$= (0 + 10) \% 10$

$= 0$

$hf_1(20) = 0$

$hf_2(20) = 5$

Hash Table

key	value
0	50
1	45
2	
3	35
4	
5	75
6	
7	
8	88
9	99

(0, 5)

$DH(20,3) = (0 + 3*5) \% 10$

$= 5$

$hf_1(35) = 35 \% 10 = 5$, $hf_2(35) = 1 + 35 \% 8$

$= 1 + 3$

$= 4$

$DH(35,0) = (5 + 0) \% 10 = 5$

$DH(35,1) = (5 + 1*4) \% 10 = 9$

$DH(35,2) = (5 + 2*4) \% 10$

$13 \% 10 = 3$

$hf_1(88) = 88 \% 10 = 8$

$DH(88,0) = (8 + 0) \% 10 = 8$

$hf_1(45) = 45 \% 10 = 5$, $hf_2(45) = 1 + 45 \% 8$

$= 1 + 5$

$= 6$

$DH(45,0) = (5 + 0) \% 10$

$= 5$

$DH(45,1) = (5 + 1*6) \% 10$

$= 11 \% 10 = 1$

(23, 55, 67) ——— Hash Table

Note

1) Space is available → but still not able to insert all the elements
   ↳ inside hash table

2) Search, Delete, Insertion
   - Best case → O(1)
   - Worst case → O(n)

3) Not using any extra space outside the hash table.