

**Solve the following problems:**

Suppose there are eight students with IDs 197354883, 933185971, 132489992, 134152075, 216500325, 106500325, 216510325, 197354884. Suppose hash table, HT, is of the size 19, indexed 0, 1, 2, . . ., 18. Show how these students' IDs, in the order given, are inserted in HT using the hashing function  $h(k) = k\%19$ . Use linear probing to resolve collision.

**Solution***Table 1 HT Students*

INDEX	H(k) = HT[K%19]	
0		
1		
2	197354883	
3	933185971	First collision
4	197354884	Second collision
5	216510325	
6	216510325	First collision
7		
8		
9	132489992	
10	134152075	
11		
12		
13		
14		
15		
16		
17		
18	216500325	

Suppose there are six workers, in a workshop, with IDs 147, 169, 580, 216, 974, and 124. Suppose hash table, HT, is of the size 13, indexed 0, 1, 2, . . ., 12. Show how these workers' IDs, in the order given, are inserted in HT using the hashing function  $h(k) = k \% 13$ . Use linear probing to resolve collision.

### Solution

Index	$h(k) = TH[k\%13]$	
0	169	Fortunately, there is no any collision.
1		
2		
3		
4	147	
5		
6		
7	124	
8	580	
9		
10		
11		
12	974	
13	216	

Suppose there are five workers, in a shop, with IDs 909, 185, 657, 116, and 150. Suppose hash table, HT, is of the size 7, indexed 0, 1, 2, . . ., 6. Show how these workers' IDs, in the order given, are inserted in HT using the hashing function  $h(k) \% k \% 7$ . Use linear probing to resolve collision.

### Solution:

Index	$h(k) = TH[k\%13]$	
0	169	Only two collisions at indexes: fourth and six.
1	657	
2		
3	150	
4	185	
5	116	
6	909	