

CMSC 123 Data Structures

Pen-and-Paper Exercise on Hashing

Given the following input: hash table size $m = 23$ and
keys = {34, 56, 2, 86, 59, 11, 20, 17, 39, 1, 15}, insert them into the
hash table using:

Linear Probing: $h(k) = (k \% m + i) \% m$
Quadratic Probing: $h(k) = (k \% m + i^2) \% m$
Double Hashing: $h(k) = (k \% m + i * h_2(k)) \% m$
 $h_2(k) = 5 - (k \% 5)$

Linear Probing

0		
1	1	
2	2	
3		
4		
5		
6		
7		
8		
9		
10	56	
11	34	11
12	11	11 + 1
13	59	
14		
15	15	
16	39	
17	86	17
18	17	17 + 1
19		
20	20	
21		
22		

Quadratic Probing

0		
1	1	
2	2	
3		
4		
5		
6		
7		
8		
9		
10	56	
11	34	11
12	11	11 + 1
13	59	
14		
15	15	
16	39	
17	86	17
18	17	17 + 1
19		
20	20	
21		
22		

Double Hashing

0	17	17 + 2*3	
1	1		
2	2	15 + 2*5	
3			
4			
5			
6			
7	15	15 + 3*5	
8			
9			
10	56		
11	34	11	
12			
13	59		
14			
15	11	11 + 1*4	15
16	39		
17	86	17	
18			
19			
20	20	17 + 1*3	15 + 1*5
21			
22			