

# Hashing Lab(3) 2

Wednesday, March 6, 2024 7:48 PM



Hashing  
Lab(3) 2

## Hashing Lab

1. Given the following key values, show what the data structures would look like after insertions  
27 53 13 10 138 109 49 174 26 24  
(no preprocessing necessary:  $p_k = \text{key}$ )

a. Linear array of 10 elements using division hashing and the linear-quotient collision path algorithm  
 $N = 13, 4k+3 \text{ prime} = 19$

**LQHashing:**

- $ip = pk \% N$
- $q=pk/N$   
if ( $q\%N \neq 0$ )  
offset = q  
else  
offset =  $4k+3 \text{ prime}$
- While collisions:  
 $ip' = (ip + \text{offset}) \% N$
- Set  $\text{Array}[ip]=\text{key}$

**Array:**

0	13
1	27
2	26
3	109
4	
5	53
6	49
7	
8	138
9	
10	10
11	174
12	24

b. Bucket hashing of 10 elements ( $N=10$ )  
 $ip = (p_k) \% N$

**Array:**

0		$\rightarrow 10$
1		
2		
3		$\rightarrow 53 \rightarrow 13$
4		$\rightarrow 174 \rightarrow 24$
5		
6		$\rightarrow 26$
7		$\rightarrow 27$
8		$\rightarrow 128$
9		$\rightarrow 108 \rightarrow 49$

2. Fill in the table based on exercise 1

Number of comparisons to retrieve this element

Key	Linear array - (Length of Collision Path +1)	Buckets - (# of elements in linked list compared)
53	2	1
138	1	1
109	4	1
49	4	2
174	2	1
26	2	1