**CMSC204 : Hashing Lab**

Class : CMSC204 CRN 33244

 Program: Junit Lab

Instructor: Huseyin Aygun

 Summary of Description: Junit Test

 Due Date: 03/06/2024

 Integrity Pledge: I pledge that I have completed the programming assignment independently.

 I have not copied the code from a student or any source: **Fatima Mbodji**

Exercise 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: pk = key)

1. Linear array of 10 elements using division hashing and the linear-quotient collision path algorithm

N = 13, 4k+3 prime = **19**

**LQHashing:**

1. ip = pk % N

2. q=pk/N

if (q%N != 0)

offset = q

else

offset = 4k+3 prime

3. While collisions:

ip’ = (ip + offset) % N

4. Set Array[ip]=key

**Array:**

**0: 49**

**1: 174**

**2: 26**

**3:**

**4:**

**5: 53**

**6:**

**7:**

**8: 138**

**9:**

**10: 10**

**11: 24**

**12:**

**h**

1. Bucket hashing of 10 elements (N=10) ip = (pk) % N

**Array:**

**0: 10**

**1:`**

**2:**

**3: 53 -> 13**

**4: 174 -> 24**

**5:**

**6: 26**

**7: 27**

**8: 138**

**9: 109 -> 49**

Exercise 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 | 2 |
| 138 | 1 | 1 |
| 109 | 2 | 2 |
| 49 | 2 | 2 |
| 174 | 2 | 2 |
| 26 | 2 | 2 |

**Files uploaded on GitHub**