CMSC 204 - Hashing Lab: Calculations
Module 13 - "Searching & Hashing"

Key Values:

15   54   13   10   135   114   49   174   27   24

Linear Probing:

N = 13

Array Index	Key Value	Reasoning
0	13	13 % 13 = **0**
1	27	27 % 13 = **1**
2	15	15 % 13 = **2**
3	54	54 % 13 -> (2 + (1 *collision*)) % 13 = **3**
4	24	24 % 13 -> (11 + (6 *collisions*)) % 13 = **4**
5	135	135 % 13 = **5**
6	174	174 % 13 -> (5 + (1 *collision*)) % 13 = **6**
7		
8		
9		
10	10	10 % 13 = **10**
11	114	114 % 13 -> (10 + (1 *collision*)) % 13 = **11**
12	49	49 % 13 -> (10 + (2 *collisions*)) % 13 = **12**

Key Values:

15   54   13   10   135   114   49   174   27   24

Quadratic Probing:

N = 13

Array Index	Key Value	Reasoning
0	13	13 % 13 = **0**
1	49	49 % 13 = 10 -> (10 + (2 *collisions*)^2) % 13 = **1**
2	15	15 % 13 = **2**
3	54	54 % 13 = 2 -> (2 + (1 *collision*)^2) % 13 = **3**
4	27	27 % 13 = 1 -> (1 + (4 *collisions*)^2) % 13 = **4**
5	135	135 % 13 = **5**
6	174	174 % 13 = 5 -> (5 + (1 *collision*)^2) % 13 = **6**
7		
8		
9		
10	10	10 % 13 = **10**
11	114	114 % 13 = 10 -> (10 + (1 *collision*)^2) % 13 = **11**
12	24	24 % 13 = 11 -> (11 + (1 *collision*)^2) % 13 = **12**

Key Values:

15 54 13 10 135 114 49 174 27 24

Linear-Quotient:

N = 13, 4k + 3 = 19

Array Index	Key Value	Reasoning
0	13	13 % 13 = **0**
1	27	27 % 13 = **1**
2	15	15 % 13 = **2**
3	49	49 % 13 = 10 -> q = 49 / 13 = 3 -> (10 + 3) % 13 = 0 -> (0 + 3) % 13 = **3**
4		
5	135	135 % 13 = 5
6	54	54 % 13 = 2 -> q = 54 / 13 = 4 -> (2 + 4) % 13 = **6**
7		
8	114	114 % 13 = 10 -> q = 114 / 13 = 8 -> (10 + 8) % 13 = 5 -> (5 + 8) % 13 = 0 -> (0 + 8) % 13 = **8**
9		
10	10	10 % 13 = **10**
11	174	174 % 13 = 5 -> q = 174 / 13 = 13 -> q % 13 = 0 -> offset = 4k + 3 = 19 -> (5 + 19) % 13 = **11**
12	24	24 % 13 = 11 -> q = 24 / 13 = 1 -> (11 + 1) % 13 = **12**