Ainsley McLaughlin
9/30/24

CS 5012: Open and Closed Hashing In-Class Activity

Q1) Insert the following keys into the hash table of size 13 below, using each conflict resolution method: (75 points)

h(k) = k mod 13

• 18 m 13 = 5 • 22 m 13 = 9 • 59 m 13 = 7 • 31 m 13 = 5 → C
• 41 m 13 = 2 • 44 m 13 = 5 → C • 32 m 13 = 6 → C
↳ (5+1) m 13 = 6 → C ↳ (6+1) m 13 = 7 → C
↳ (7+1) m 13 = 8
↳ 6+1 m 13 = 7
↳ 7+1 m 13 = 8
↳ 8+1 m 13 = 9
↳ 9+1 m 13 = 10

~~18~~ ~~41~~ ~~22~~ ~~44~~ ~~59~~ ~~32~~ ~~31~~ ~~73~~ ~~85~~ ~~94~~ ~~105~~ ~~117~~

• 73 m 13 = 8 → C
8+1 m 13 = 9 → C
9+1 m 13 = 10 → C
10+1 m 13 = 11
• 85 m 13 = 7
+1 = 8 +1 = 12
+1 = 1
+1 = 10
+1 = 11
• 94 m 13 = 3
• 105 m 13 = 1
• 117 m 13 = 0

Hash table: Linear Probing

0	1	2	3	4	5	6	7	8	9	10	11	12
117	105	41	94		18	44	59	32	22	31	73	85

• 18 m 13 = 5 • 22 m 13 = 9 • 59 m 13 = 7 • 31 m 13 = 5 • 73 m 13 = 8 • 94 m 13 = 3 • 117 m 13 = 0
• 41 m 13 = 2 • 44 m 13 = 5 • 32 m 13 = 6 • 85 m 13 = 7 • 105 m 13 = 1
↳ 5+1² m 13 = 6 ↳ 6+1² = 7 ↳ 5+1² = 6 ↳ 7+1² = 8 1+1² = 2
↳ 5+2² = 9 ↳ 7+2² = 11 1+2² = 5
↳ 5+3² = 14 m 13 = 1 1+3² = 10
1+4² = 17 m 13 = 4

Hash table: Quadratic Probing

0	1	2	3	4	5	6	7	8	9	10	11	12
117	31	41	94	105	18	44	59	73	22	32	85	

Hash table: Chaining

0	1	2	3	4	5	6	7	8	9	10	11	12
117	105	41	94		18	32	59	73	22			
					44		85					
					31							

Q2) Insert the following keys into the hash table of size 13 below, using linear probing conflict resolution method:(25 points)

h(k) = k mod 13

open DSA ascii calc - find ascii of each that number mod 13 then do linear

• 530 m 13 = 10
• 609 m 13 = 11
• 527 m 13 = 7
• 530 m 13 = 10
↳ 10+1 = 11 , 10+2 = 12
• 513 m 13 = 6
• 548 m 13 = 2
• 446 m 13 = 4
• 539 m 13 = 6 → C
↳ 6+1 = 7
↳ 6+2 = 8
• 436 m 13 = 7
↳ 7+1 = 8
↳ 7+2 = 9

~~"apple"~~, ~~"banana"~~, ~~"grape"~~, ~~"mango"~~, ~~"peach"~~, ~~"berry"~~, ~~"plum"~~, ~~"melon"~~, ~~"kiwi"~~, ~~"pear"~~

530 609 527 530 513 548 446 539 436 424

0	1	2	3	4	5	6	7	8	9	10	11	12
pear		berry		plum		peach	grape	melon	kiwi	apple	banana	mango

• 427 m 13 = 11
11+1 = 12
11+2 = 13 → 0