Algorithms and Data Structures for Data Science
lab_hash
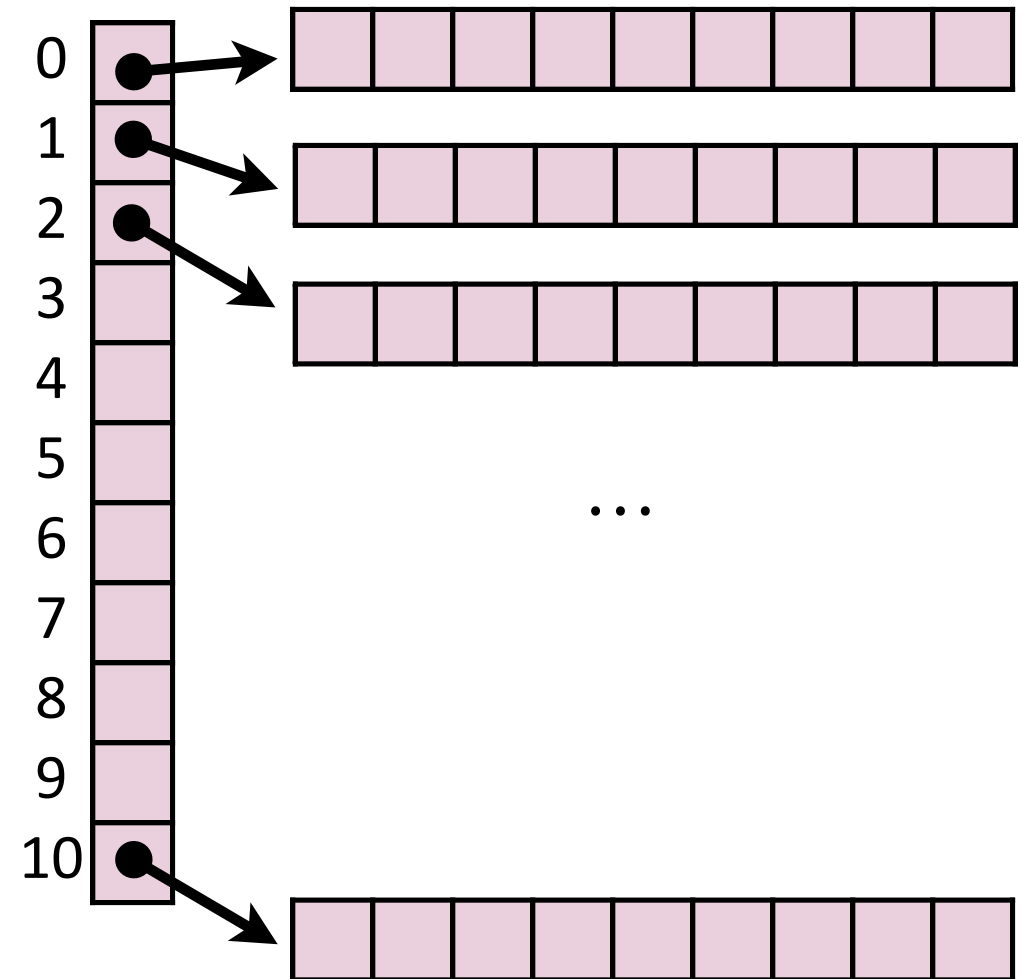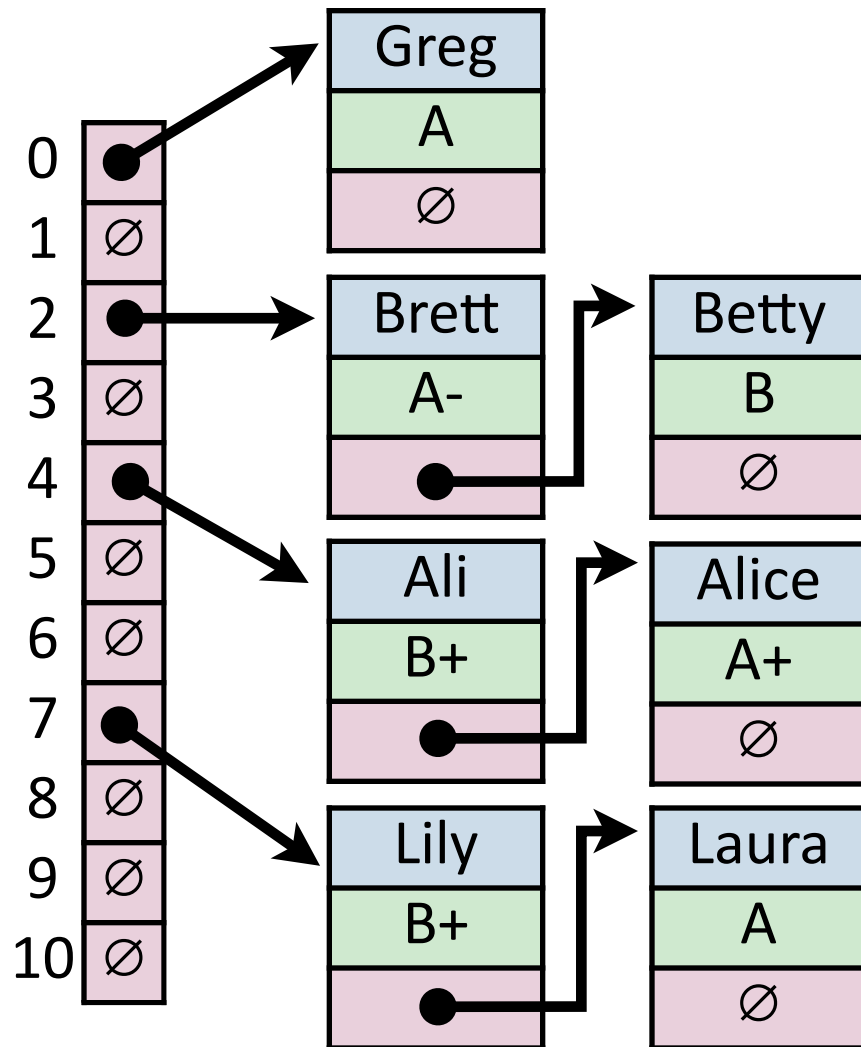
CS 277

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Learning Objectives

Implement multiple forms of hashing

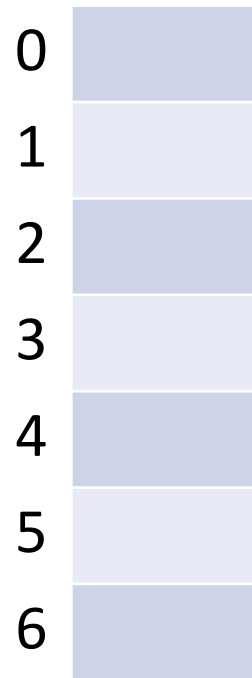Determine collision frequency and run-time differences in hashing

Separate Chaining

Collision Handling: Linear Probing

S = { 16, 8, 4, 13, 29, 11, 22 } |S| = n

h(k) = k % 7 |Array| = m

0	
1	
2	
3	
4	
5	
6	

h(k, i) = (k + i) % 7

Try h(k) = (k + 0) % 7, if full...

Try h(k) = (k + 1) % 7, if full...

Try h(k) = (k + 2) % 7, if full...

Try ...

Collision Handling: Double Hashing

S = { 16, 8, 4, 13, 29, 11, 22 } |S| = n

$h_1(k) = k \% 7$

$h_2(k) = 5 - (k \% 5)$

|Array| = m

$h(k, i) = (h_1(k) + i*h_2(k)) \% 7$

Try $h(k) = (k + 0*h_2(k)) \% 7$, if full...

Try $h(k) = (k + 1*h_2(k)) \% 7$, if full...

Try $h(k) = (k + 2*h_2(k)) \% 7$, if full...

Try ...

0	
1	8
2	16
3	
4	4
5	
6	13

Coding the lab

1) Make sure you understand how to use each hash function

2) Work out how to code each of the collision strategies

3) After you figure out how to build the hash table, work out find.

Tip: Make sure you don't go out of bounds!

Tip: Read the instructions for double hash carefully!