

# Direct Addressing + Open Addressing

Note Title

10/4/2007

## Data Structures of Set ADT

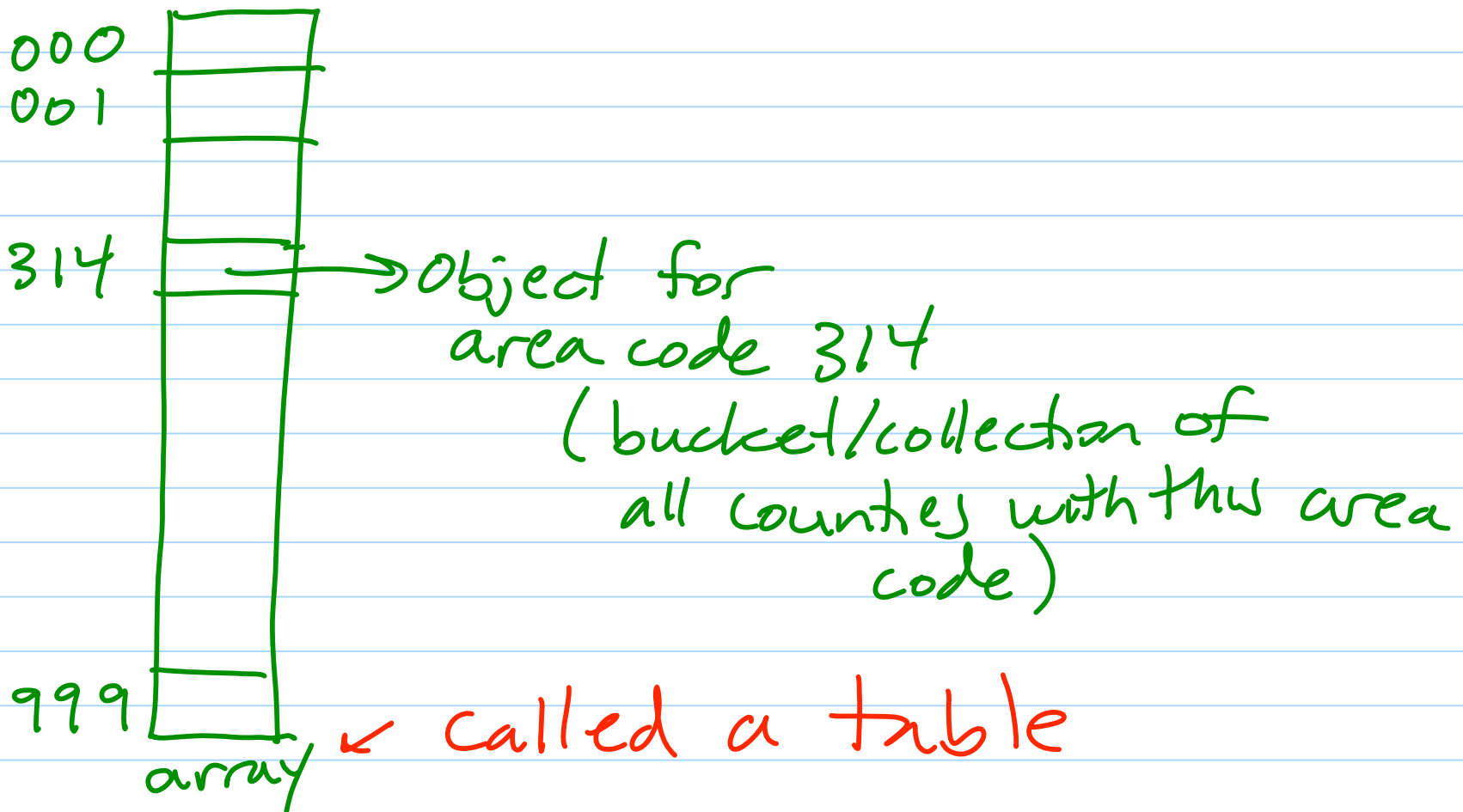
next class: Separate Chaining

Suppose we have a set of  $n$  area codes that we want to maintain

area code, for example, could be one instance var in a "County" object

# Direct Addressing

insert, locate, remove



Key here

every element you might possibly  
insert into set has a dedicated

index  $\rightarrow$  slot in the table

worst-case

insert - table[slot] = element  $\Theta(1)$

locate - access table[slot]  $\Theta(1)$

remove - table[slot] = null  
EMPTY  $\Theta(1)$

Let's make this a little more  
general

equivalence tester

define how check for equivalence

hasher

hashCode mapping from object to  
some integer in  $\{0, 1, \dots, m-1\}$

size of table  
↓

What is the big limitation?

Size of table is as big as  
 $\cup$  { universe of all possible elements  
that might be inserted

Consider a univ of 5000 students  
where SS # is the id #.

$10^9$

Direct addressing is only a reasonable choice (in terms of space usage) when

roughly  $n > \frac{|U|}{4}$

# elements held in set