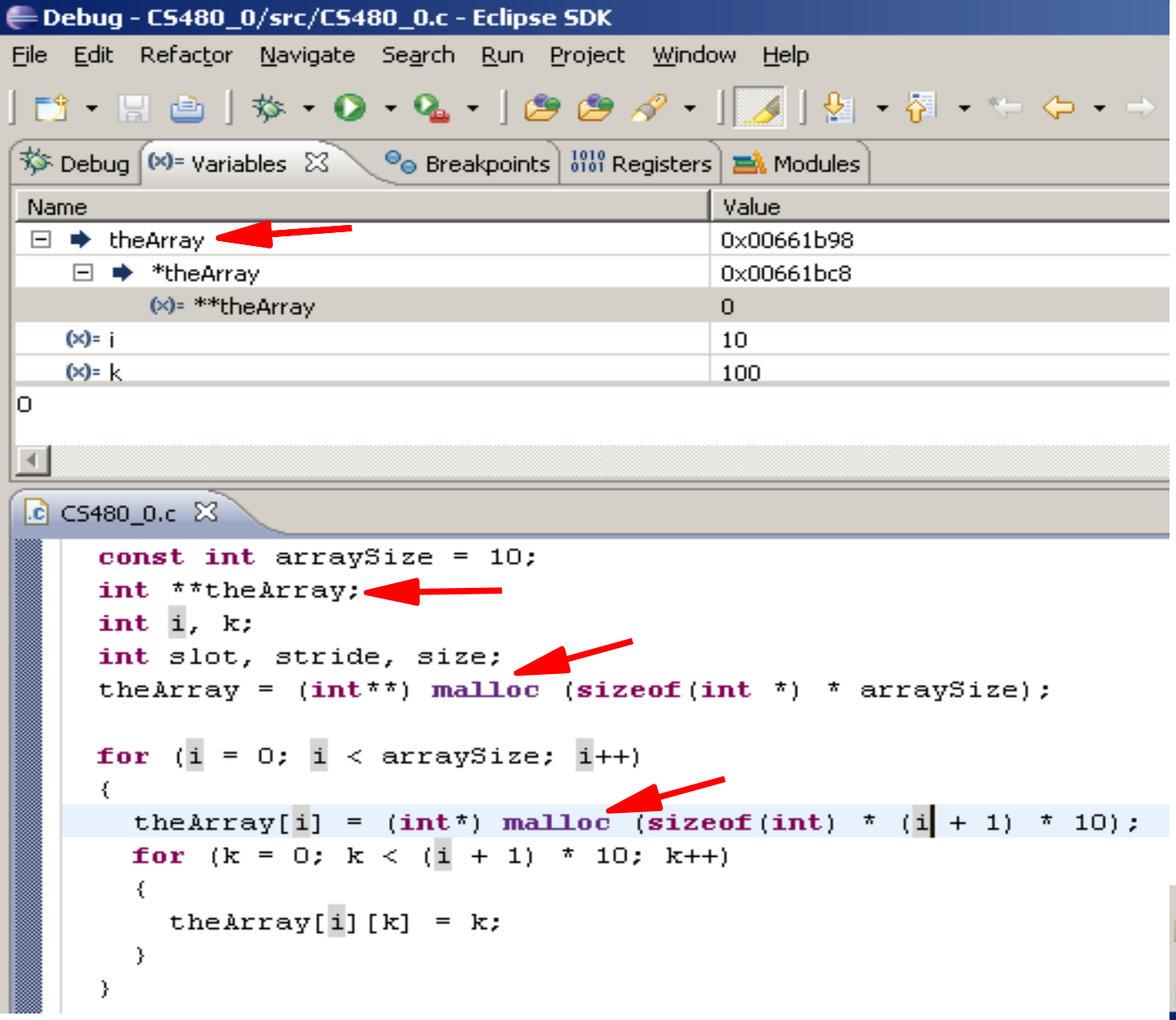
CS480

Hash Tables, Dynamic Memory & the Eclipse Debugger

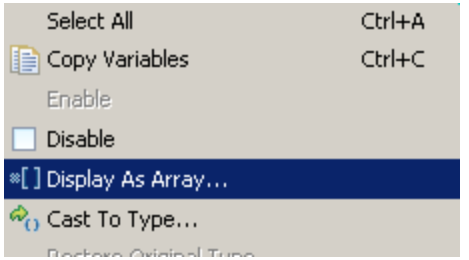
January 30, 2015

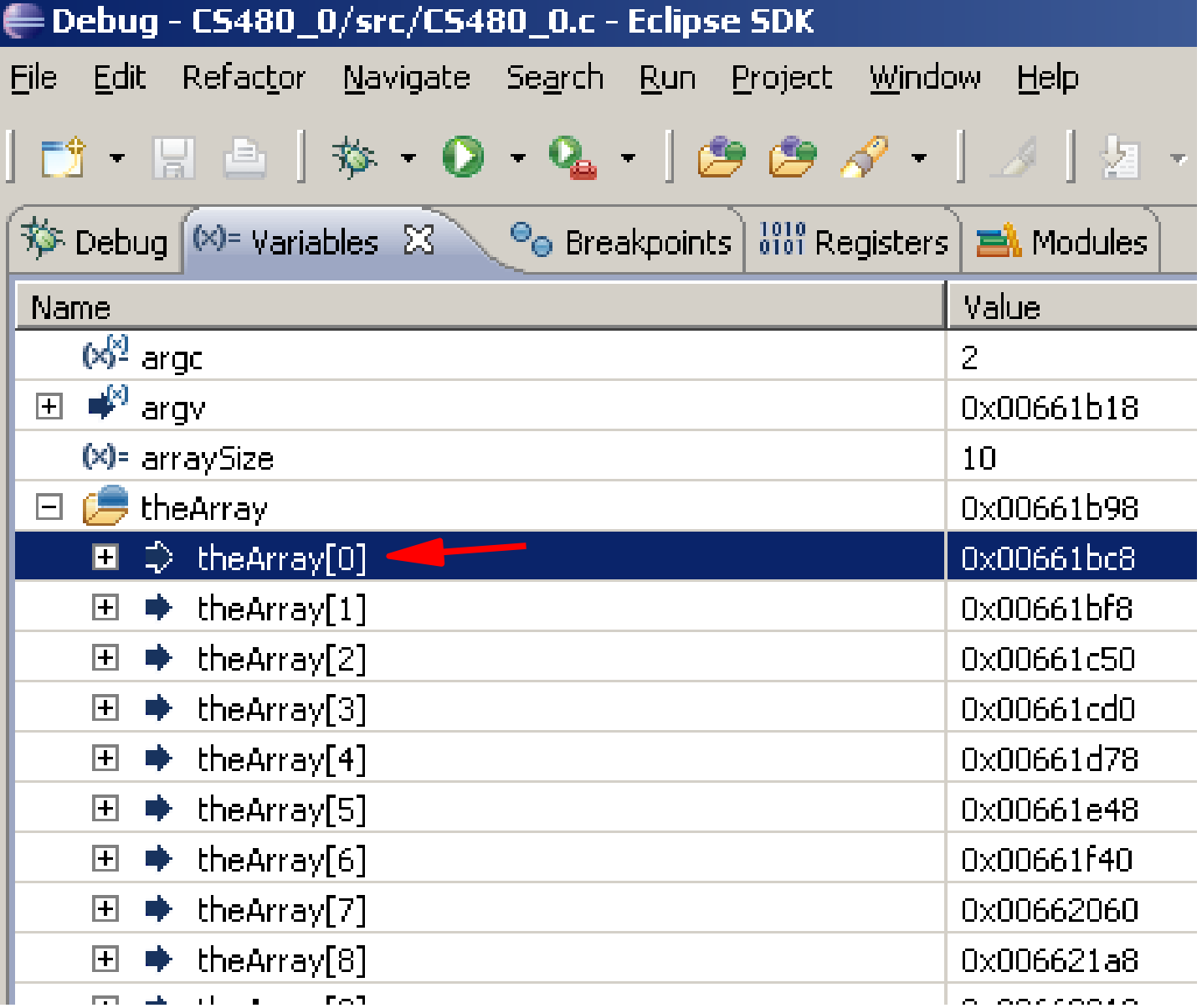


Notice the array declaration and mallocs. The array is not shown properly in the variable listing.

Right click on the array variable and select Display as Array

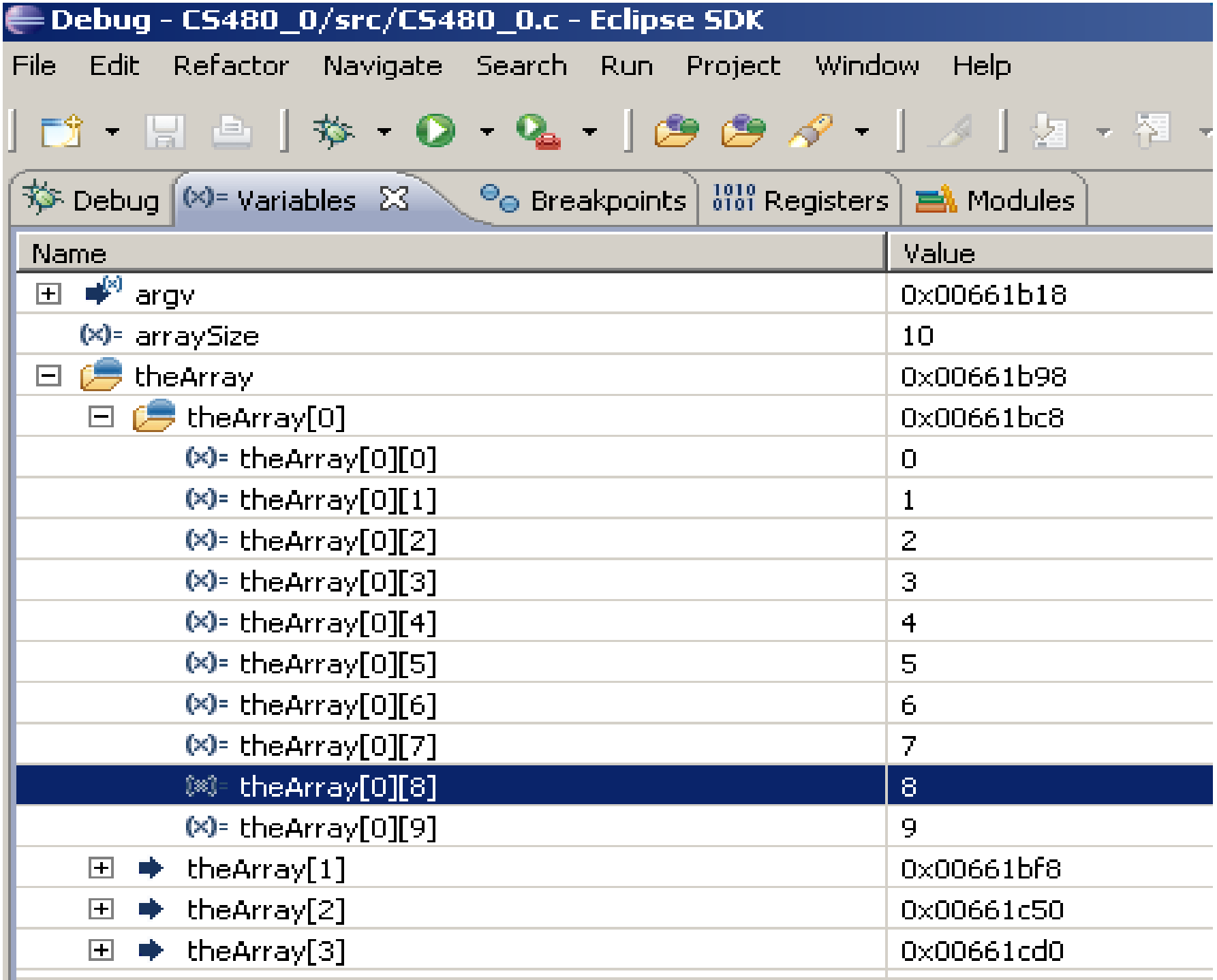
You must specify the size.





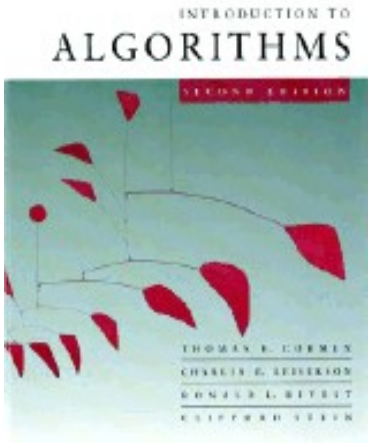
Now the first dimension of the array is shown.

Right click on theArray[0] and repeat the above process.

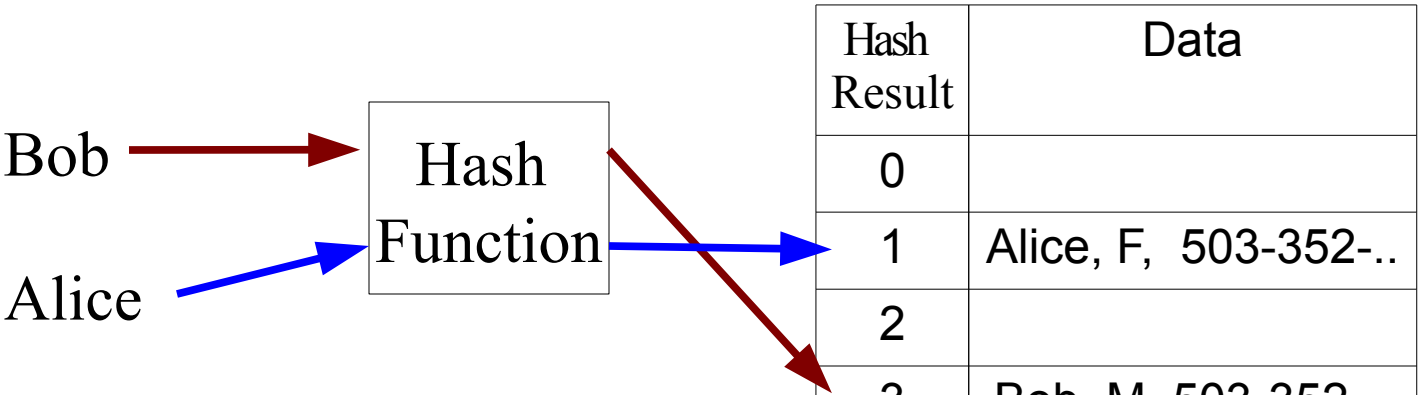

Debug - CS480_0/src/CS480_0.c - Eclipse SDK
File Edit Refactor Navigate Search Run Project Window Help
Debug
Variables
Breakpoints
Registers
Modules
Name
Value
argv
0x00661b18
arraySize
10
theArray
0x00661b98
theArray[0]
0x00661bc8
theArray[0][0]
0
theArray[0][1]
1
theArray[0][2]
2
theArray[0][3]
3
theArray[0][4]
4
theArray[0][5]
5
theArray[0][6]
6
theArray[0][7]
7
theArray[0][8]
8
theArray[0][9]
9
theArray[1]
0x00661bf8
theArray[2]
0x00661c50
theArray[3]
0x00661cd0

Hash Tables!

- Turn data into a numeric key
  - Hash function
- Use that key to index into a table



Cormen,
Leiserson,
Rivest
ISBN-13: 978-0262032933



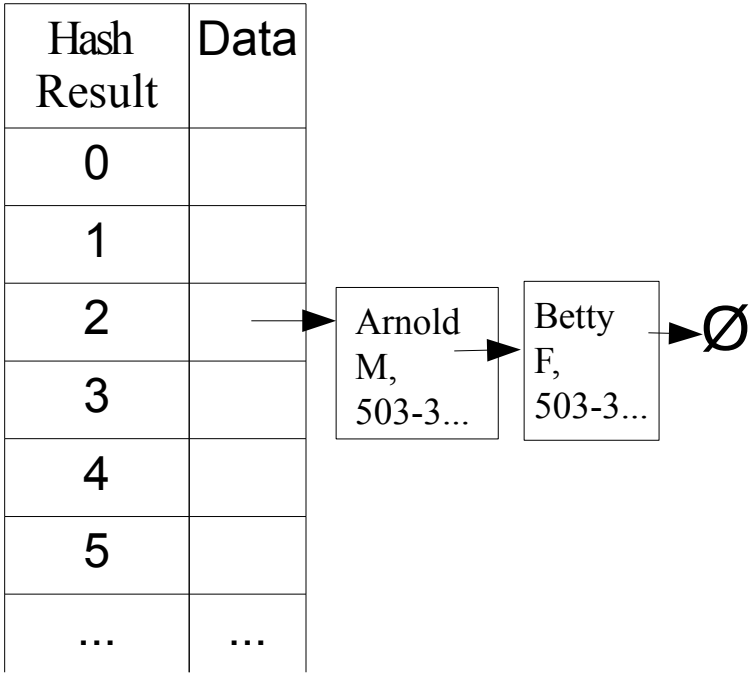
Hash Result	Data
0	
1	Alice, F, 503-352-..
2	
3	Bob, M, 503-352-..
4	
5	
...	...

- The data entry in the table can contain the meaningful data

http://en.wikipedia.org/wiki/Hash_tables

Hash Function

- Good hash function: spread data across the table (hash results) evenly
  - Few collisions
- Many good algorithms available
  - Check CLR
- Collision
  - Two pieces of data produce the same hash value
  - Resolve by *chaining*
    - Have table *data* entry point to linked list



/*

- How does gcc handle:

```
int *pInteger;
int value  =4;
pInteger = &value;

printf("%d", 8/*pInteger);
```