Maps

Another ADT

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Maps

- Stores a collection of records
  - A unique **key** identifies each record
  - Records are selected by key value
- aka **Dictionary**
  - Python provides a built-in dictionary
  - Great example for comparing different implementations

Example Use

- Collection of student records managed by a university egisterar

The Map ADT

- A map is a container for storing a collection of data records
  - Each record is associated with a unique key
  - Key components must be comparable

```
MyMap()
length()
contains()
add(key, value)
remove(key)
value_of(key)
iterator()
```

Map: Which Data Structure?

- Evaluate each DS/ADT option
  - Dictionary
  - Array
  - list
  - Set

## Map: Which Data Structure?

- Array
  - can store key/value pairs
  - lacks the functionality
- List
  - can store key/value pairs
  - provides the functionality
- Set
  - same as a list
  - not a simple implementation
  - may not be efficient

Map: List Implementation

- At this point, the list is the best choice
- How should the data be stored and organized within the list?
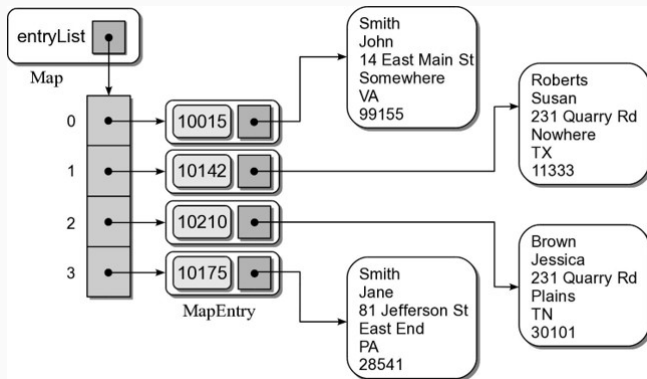
Map: Using the Dual Lists

- Use 2 lists in parallel
  - one for the keys
  - one for the records
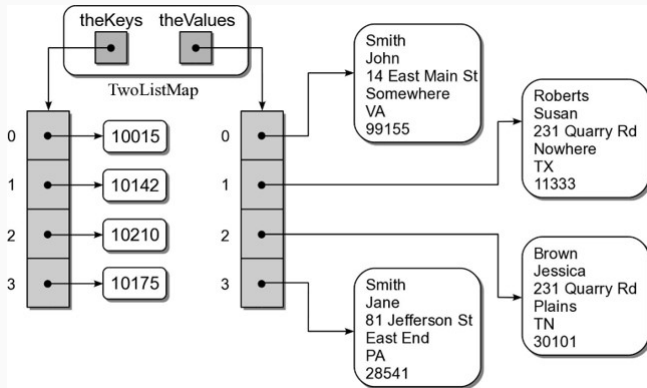
Map: Using the Dual Lists

- Use 2 lists in parallel
  - must store both key and value at the same position
  - use a storage class

Summary

Summary

- ADT
- Choose the appropriate Data Structure
- Iterator

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