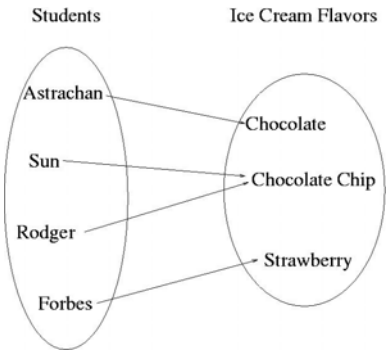
CompSci 101
Introduction to Computer Science



October 30, 2014

Prof. Rodger

Announcements

- Reading for next time on calendar page
  - RQ 14
- Assignment 5 due today
  - Assignment 6 due next Thursday
- APT 7 is due on Tuesday

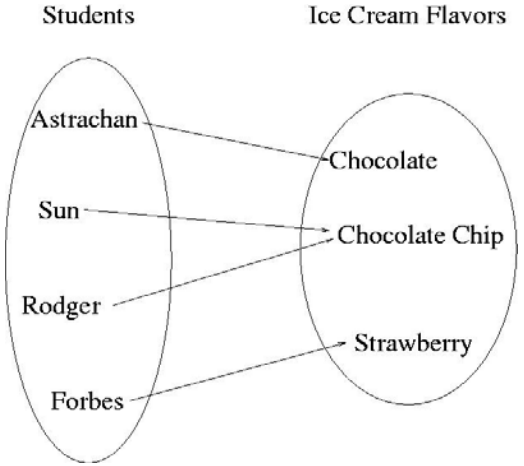
- Finish lecture notes from last time
- Today Dictionaries/Maps

Dictionaries/Maps

- Dictionaries/maps are another way of organizing data
- Keys and Values
  - Each key maps to a value
  - Some keys can map to the same value
  - Can change the value a key maps to

Example

- Each student could be mapped to their favorite ice cream flavor



Implementing a Dictionary/Map
Keys map to values

- Create Empty dictionary

  somemap = {}
- Put in a key and its value

  somemap[“Forbes”] = “Strawberry”
- Get a value for a dictionary

  value = somemap[“Forbes”]

  OR value = somemap.get(“Forbes”, “default”)
- Change a value for a dictionary

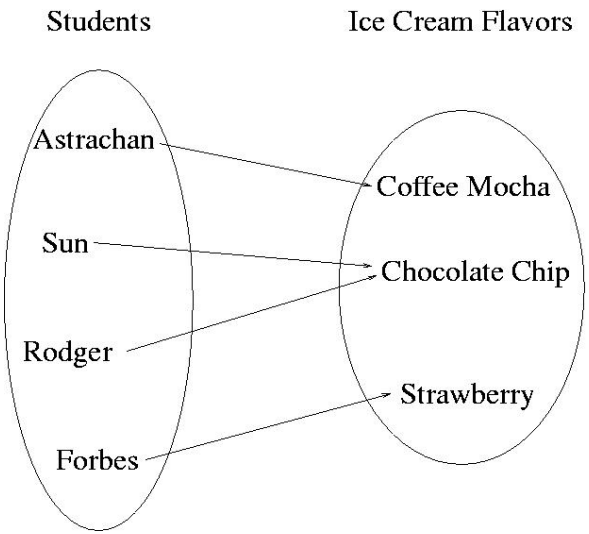
  somemap[“Forbes’] = “Chocolate”

More on using a Dictionary/Map

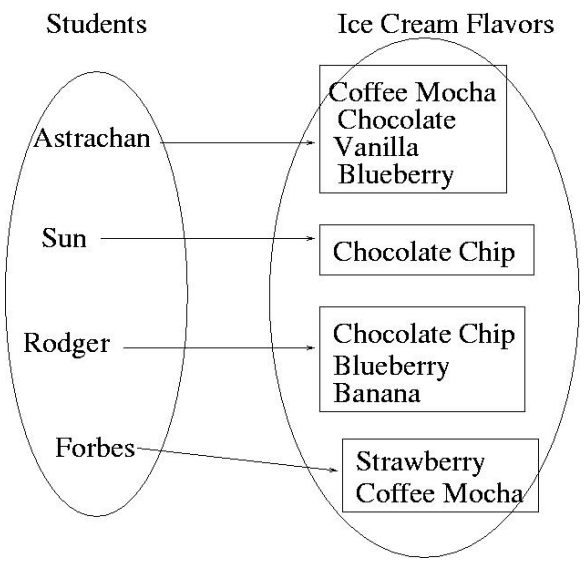
- Get all the keys (as a list)
  - `listKeys = somemap.keys()`
- Get all the values (as a list)
  - `listValues = somemap.values()`
- Other methods
  - `clear` – empty dictionary
  - `items` – return (key,value) pairs
  - `iteritems` – return (key,value) pairs more efficiently, *iterator – must use with for*
  - `update` – update with another dictionary

Change Astrachan’s value

somemap[“Astrachan”] = Coffee Mocha



Value could be a set or list



Back to Popular Name Problem:

- Given a list of names, determine the most popular first name and print that name with all of its last names.
- Input: Names are always two words, names are in a file. If multiple names are on the same line they are separated by a ":"
- Output: Most popular first name, followed by a ":", followed by corresponding last names separated by a blank

Example Input File with 5 lines

```
Susan Smith:Jackie Long:Mary White
Susan Brandt
Jackie Johnson:Susan Rodger:Mary Rodger
Eric Long:Susan Crackers:Mary Velios
Jack Frost:Eric Lund
```

Corresponding Output

```
Susan: Smith Brandt Rodger Crackers
```

Now use a dictionary/map

www.bit.ly/101fall14-1030-01

- We will write three dictionaries for practice
  - First name to count of corresponding last names
  - First name to list of corresponding last names
  - First name to set of corresponding last names
- Which dictionary is most useful to solve this problem?
- popularMap.py

Compare

- Using two parallel lists?
- Using one dictionary/map