CompSci 101
Introduction to Computer Science

Students

Astrachan
Sun
Rodger
Forbes

Ice Cream Flavors

Chocolate
Chocolate Chip
Strawberry

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)
  \[-\text{listKeys} = \text{somemap}.\text{keys}()\]

• Get all the values (as a list)
  \[-\text{listValues} = \text{somemap}.\text{values}()\]

• Other methods
  \[-\text{clear} \rightarrow \text{empty dictionary}\]
  \[-\text{items} \rightarrow \text{return (key,value) pairs}\]
  \[-\text{iteritems} \rightarrow \text{return (key,value) pairs more efficiently}, \text{iterator \textit{must use with for}}\]
  \[-\text{update} \rightarrow \text{update with another dictionary}\]
Change Astrachan’s value

somemap[“Astrachan”] = Coffee Mocha

Students

- Astrachan
- Sun
- Rodger
- Forbes

Ice Cream Flavors

- Coffee Mocha
- Chocolate Chip
- Strawberry
Value could be a set or list

Students

Astrachan
Sun
Rodger
Forbes

Ice Cream Flavors

Coffee Mocha
Chocolate
Vanilla
Blueberry

Chocolate Chip

Chocolate Chip
Blueberry
Banana

Strawberry
Coffee Mocha
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