CompSci 101
Introduction to Computer Science

TOP 10 NAMES over the last 100 years

Male:
1. James
2. John
3. Robert
4. Michael
5. William
6. David
7. Richard
8. Joseph
9. Charles
10. Thomas

Female:
1. Mary
2. Patricia
3. Elizabeth
4. Jennifer
5. Linda
6. Barbara
7. Susan
8. Margaret
9. Jessica
10. Dorothy

March 19, 2015
Prof. Rodger
Announcements

• Reading and RQ 15 next time RQ 7
• Assignment 6 out, APT 7 due Tuesday
• Exam 2 – two weeks from today

• 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

Students

Astrachan
Sun
Rodger
Forbes

Ice Cream Flavors

Chocolate
Chocolate Chip
Strawberry
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)
  – \texttt{listKeys} = \texttt{somemap.keys}()

• Get all the values (as a list)
  – \texttt{listValues} = \texttt{somemap.values}()

• Other methods
  – \texttt{clear} – empty dictionary
  – \texttt{items} – return (key,value) pairs
  – \texttt{iteritems} – return (key,value) pairs more efficiently, \texttt{iterator} – must use with for
  – \texttt{update} – update with another dictionary
Change Astrachan’s value
somemap["Astrachan"] = Coffee Mocha
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

• We will write three dictionaries for practice
• First one is:
  – Map first name to count of corresponding last names

```python
def mapNameToNumberLastNames(countmap, data):
```

• popularMap.py
Now use a dictionary/map


• Next dictionary
  – Map first name to list of corresponding last names

def mapNameToLastNames(namememap, data):

Now use a dictionary/map

• Next dictionary
  – First name to set of corresponding last names

```python
def mapNameToSetLastNames(namesetmap, data):
```

• Which dictionary is most useful to solve this problem?
Compare

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