

CompSci 6

Programming Design and Analysis

```
offering      [213]
old           [25, 329]
on            [33, 58, 86]
on,           [215]
on, ''        [108]
on.           [178]
once          [127]
one           [30, 58, 93, 96, 224, 230, 245]
one.          [186]
only          [9, 325]
opportunity,   [23]
or            [226, 227]
orbs          [111]
orders        [91, 92]
ornamented    [222]
other         [19, 244, 245]
our           [214, 216, 301]
```

April 20, 2010

Prof. Rodger

Announcements

- Next time: More maps
- Assignment 9 out – Due Thursday

Last Time – Recursive Art

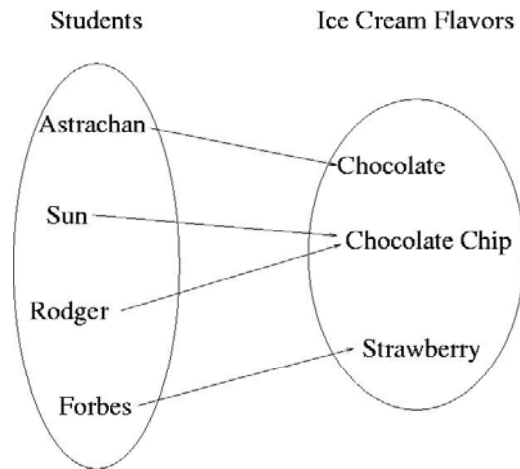
- Two ways to draw art recursively
 - One object
 - Repeatedly draw the same object smaller
 - Multiple objects
 - Each object is “linked” to a smaller object
 - Each object draws itself
 - See the myNext variable

Maps

- 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 Map

- We will use TreeMap in Java

- Example:

```
Map<String, String> fav =  
new TreeMap<String,  
String>();
```

- Keys map to values

To use a Map

- Put in a key and its value

```
fav.put("Forbes", "Strawberry");
```

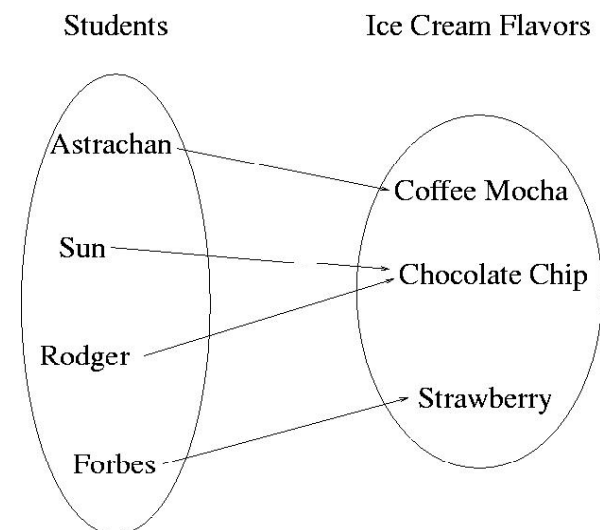
- Get a value for a key

```
val = fav.get("Forbes");
```

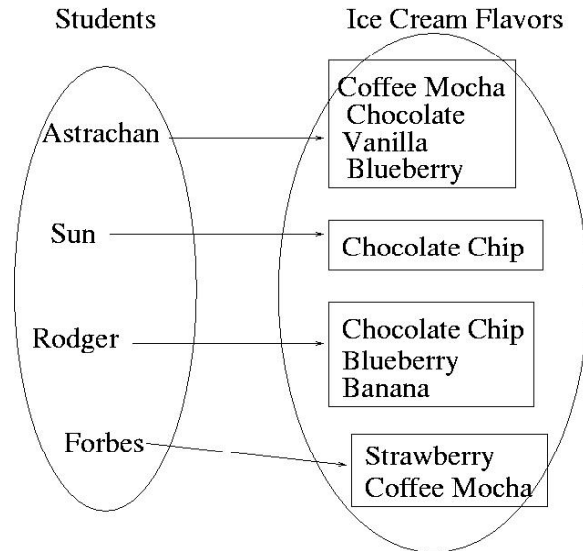
- Change value for key

```
fav.put("Astrachan", "Coffee  
Mocha");
```

Change Astrachan's value



Value could be a set



Classwork today

- File of words
 - Determine number times each words appears
 - For each word, determine all line numbers it appears on
 - For each alphabetical letter, determine all the words that start with that letter.

First look at methods given

- main
- getWordcounts
 - Given a Scanner bound to a file
 - Return a Map of words to counts
- printResults
 - Given a map print key followed by value

```
public Map<String, Integer> getWordCounts (Scanner input)
{
    Map<String, Integer> results = new TreeMap<String, Integer>();

    while (input.hasNext())
    {
        String word = input.next();

        Integer count = results.get(word);
        if (count == null)
        {
            results.put(word, 1);
        }
        else
        {
            results.put(word, count + 1);
        }
    }

    return results;
}
```

printResults

```
public void printResults (Map<String, ?> results)
{
    for (String key : results.keySet())
    {
        System.out.println(key + "\t" +
            results.get(key).toString());
    }
}
```

Output

```
aid      1
aided,   1
air      1
alarming      1
all      2
all,      1
aloud-     1
am        1
among     2
an        6
and       54
another 2
answer    1
answer.    1
answered      1
any        1
aperture      1
```

Todo: getLineNumbers

- Map each word to a set of line numbers it occurs on

```
offering      [213]
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```

Todo: getFrequencies

- Map each letter of alphabet to words

```
T      [The, Then, There, These, They, Three, Throwing,
U      [Unsheatheing]
W      [We, When, Will, With, Withdrawing, Within]
Y      [You, You,, Your]
`      [``A, ``Amontillado!``, ``Amontillado?, ``And,
a      [a, about, above, absconded, accosted, admired,,
b      [back, back., back;, backed, bargain.``, be, bec
c      [called, came, cannot, cap, carnival, carnival!
d      [d'or,, damp, damp., dampness, dampness.``, dear,
e      [each, earliest, earth,, eighth,, ejaculated, e.
f      [fabric, face,, fails, fall, familiarly,, famil
g      [gait, gave, gemmary,, gesticulation, getting,
h      [ha!, ha!-he!, had, hairs, half, hand, hand,``
i      [idea, ignoramus,``, ill,, imbedded, immediate,
j      [jest,``, jest., jingled, jingled., jingling, j
k      [key, kill, knew,, knocked, know]
l      [labour., labours, laccessit.``, laid, largely,
m      [made, madness, make, man, man., manner., many,
```