

## Lab Overview

- Review lab 8
- Prep for lab 9

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## Using Lists

- Lab 8: lots of practice with lists
  - Differentiate between using the *positions* and using the *values*
  - Which way to iterate: by positions or by values
- How can we quickly create a list with a constant "step" between values?
- How do we find out what value is in a list at position *p*?

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## Lab 8 Feedback: Mostly Minor Issues

- Not closing file objects
  - `fileobj.close()`
- Not testing invalid cases
  - Never checked if user entered an invalid case
- Missing author name in comments
- Missing function comments
  - *If I provide comments for functions/methods, you should use/keep them*
- Column formatting issues
- Inefficient solutions
  - Often because of not understanding some concept

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## Other Feedback

- Generating a list of even numbers:
  - `even_nums = range(2, 21, 2)`
- Shorthand Generator
  - May be best indicator of understanding of list contents
  - Review to make sure it still makes sense

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## Printing Board

```
border = "***30
print
print border
print " The Board: "

for count in xrange(len(amtos)/2):
    if amtos[count] != CHOSEN:
        print "%10.2f" % amtos[count],
    else:
        print "%11s" % "----",

    second_col = count + len(amtos)/2
    if amtos[second_col] != CHOSEN:
        print "    %10.2f" % amtos[second_col]
    else:
        print "    %11s" % "----"

print border
```

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## Difference btw File *Name* and *Object*

- File name is a string
- File object is a file
- Need the file name to create the file object

• Need to remember data types because not explicit in Python  
• Use good variable names to help

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## Review: Dictionaries

- How do you create a new dictionary?
- How do you find out if there is a mapping for a key in the dictionary?
- How do you access the value for a key?
- How do you add a mapping?
- How can you iterate through a dictionary?

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## Review: Defining our own classes

- Each object has its own data/attributes/instance variables
  - Card objects have a rank and a suit
- What are defined methods like?
- Special method name for constructor?
- Special name for method that helps with printing?
- Keyword that must be first parameter of every defined method?

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## Card Class (Incomplete)

```
class Card:
    """ A class to represent a standard playing card.
    The ranks are ints: 2-10 for numbered cards, 11=Jack,
    12=Queen, 13=King, 14=Ace.
    The suits are strings: 'clubs', 'spades', 'hearts',
    'diamonds' """
    def __init__(self, rank, suit):
        """Constructor for class Card takes int rank and
        string suit."""
        self.rank = rank
        self.suit = suit
    def getRank(self):
        """Returns the card's rank."""
        return self.rank
    def getSuit(self):
        """Returns the card's suit."""
        return self.suit
```

card.py

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## Review: Algorithm for Creating Classes

1. Identify need for a class
2. Identify state or attributes of a class/an object in that class
  - Write the constructor (`__init__`) and `__str__` methods
  - Test those methods
3. Identify methods the class should provide
  - How will a user call those methods (parameters, return values)?
    - Develop API
  - Implement methods

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## Lab 9: Dealing with Real Data

- **Problem:** Determine most common first and last names at W&L
  - 4 data files, containing student names
    - Last names, female first names, male first names, all first names
    - 1 name per line
  - Print results in special format for use in Gnuplot
  - What data structure to use?
- Create your own class to help with data
- Create output file used by another application

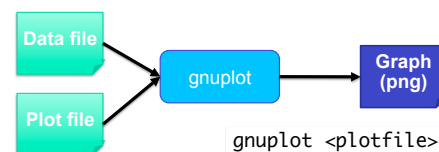
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## Gnuplot

- Portable command-line driven interactive data and function plotting utility for many platforms
- Like a *free* Excel (for the graphing part)



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## Plot File

```
set terminal png large
set output "bars.png"
set data style boxes
set boxwidth 0.4
set xtics nomirror
set border 11

set xrange [0:13]
set yrange [0:32]

set xlabel "Months"
set ylabel "Days in Month"

set xtics ("Jan" 1, "Feb" 2, "Mar" 3, "Apr" 4, "May" 5, "June" 6, \
"July" 7, "Aug" 8, "Sep" 9, "Oct" 10, "Nov" 11, "Dec" 12)
set key below

plot 'bars.dat' using 1:2 fs solid title "Num Days"
```

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## Data File

```
# number of days in each month of 2010
1 31
2 28
3 31
4 30
5 31
6 30
7 31
8 31
9 30
10 31
11 30
12 31
```

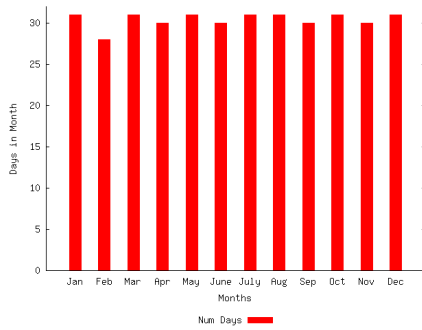
X-coordinate

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## Generates Graph (PNG)



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## Lab Outline

- Broken into smaller pieces
- Process data file
  - Determine how many people at W&L have various names
- Generate Gnuplot Data files in Python
  - Has specific format
- Create Gnuplot Plot files
  - In jEdit, create a plot file for each data file
- Generate graphs using Gnuplot

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