Plan for the week in Compsci 6/101

- Guidance for APTs
  - How to leverage the power of Python sorting
  - How to 'customise' sorting
  - Toward understanding recursion, more later

- Model View Controller and Global Variables
  - Making the Jotto program work
  - Lightening assignment

- Working to understand the pickle module

APTs Sorted and Sortby Frequencies

- What are the organizing principles in SortedFreqs?
  - Alphabetized list of unique words?
  - Count of number of times each occurs?
  - Is efficiency an issue? If so what recourse?

- What are organizing principles in SortByFreqs?
  - How do we sort by frequency?
  - How do we break ties?
  - \[ \{(t[1],t[0]) \text{ for } t \text{ in dict.items()}\]
Python Sort API by example, (see APT)

- Sort by frequency, break ties alphabetically

```python
def sort(data):
    d = {}
    for w in data:
        d[w] = d.get(w, 0) + 1
    ts = sorted([(p[1], p[0]) for p in d.items()])
    print(ts)
    return [t[1] for t in ts]
```

- How to change to high-to-low: `reverse=True`
- How to do two-pass: `itemgetter(1)` from operator

Jotto: The Program Architecture

- You write `jottoModel.py`
  - This is the guts, brains, state of the program
  - Keeps track of how the game is progressing
  - Functions communicate via global state
    - Maintain state between function calls
- We provide two views: command-line and GUI
  - Allow you to `view` and `control` the model
  - Both view-controllers: `jottoMain.py` and `jottoGui.py` know about the model, but model doesn't know about them (atypical MV/MVC)

Model View Controller (MVC)

<table>
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<tr>
<th>Year</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
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<tr>
<td>2010</td>
<td>225</td>
</tr>
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</table>

What are global variables?

- Accessible to all functions in a module
  -Declared as `global varname` in functions
    - Mandatory for writing global variables
    - Good idea for reading global variables
  - Defined at 'top' of module for reading code
- Why are global variables are bad idea?
  - Very difficult to reason about correct code
  - Very difficult to extend, modify code
  - Non-locality makes maintenance difficult