Plan for 11/9 and 11/11

- Reviewing Concepts for test
  - Loops: index and by element
  - Strings, Lists, Sets, Dictionaries
  - List Comprehensions

- Lab and assignment concepts
  - While loops, Global Variables, Computer-aided Game Play
  - Image processing, RGB, simulation/random, CSV files

Reminder of APT quiz

- How to solve it: APT Quiz style
  - Looking at problems from last time
  - Goals in time-driven APT-solving

- CountUp
  - Ideas

- Maker
  - Ideas

- Anonymous

Looping by index or by element

- Strings and lists: use either
  - range(len(x)) for index, can get element

- Sets and Dictionaries: element only
  - Loop over d or d.keys() for dictionary
  - The keys are a set, so similar to set loop

- Which is best when choice? It depends!
  - Can you get element from index?
  - Can you get index from element?

Questions

Unpacking a list comprehension

\[
[f(x) \text{ for } x \text{ in } \text{foo if condition with } x] \\
[w \text{ for } w \text{ in } \text{words if } w\.\text{endswith('e')} ] \\
[(w, \text{words}.\text{count}(w)) \text{ for } w \text{ in } \text{set(words)}] \\
\]

Always possible to use a loop

```python
build = []
for x in foo:
    if condition with x:
        build.append(f(x))
```

```python
build = []
for w in set(words):
    build.append((w, words.count(w)))
```

Questions


Set Concepts

- Set union, intersection, difference
  - \( s\.\text{intersection}(t) \) is the same as \( s \& t \)
  - \( s\.\text{union}(t) \) is the same as \( s \mid t \)
  - \( s\.\text{difference}(t) \) is the same as \( s \- t \)

- Sets aren't in order during iteration
  - Convert to list, create from list
  - Sets are really, really efficient for add/search