Processing sequences: The **map** Function

General form: `map(f, x)`

- if `x` is a sequence of `n` items and `f` is a function with one parameter:
  - `map(f, x)`
  - `map(m, x)`

### Example: Mapping a function over a list

```python
def is_vowel(c):
    return c.lower() in 'aeiou'
y = map(is_vowel, 'Anacondas')
>>> y
True False True False True False True False
```

### Example: Mapping a method over a list

```python
def is_vowel(c):
    return c.lower() in 'aeiou'
y = map(str.lower, x)
>>> y
['lee', 'python', 'cs1110', 'a+']
```

### Example: Mapping a function over a string

```python
def is_vowel(c):
    return c.lower() in 'aeiou'
y = map(is_vowel, 'Anacondas')
>>> map(int, y)
[1, 0, 1, 0, 0, 1, 0, 0]
```

Mapping a function over a list

### Example: Mapping a function over a list

```python
x = [1.2, 3.9, -4.8, 0.1]
y = map(round, x)
>>> y
[1.0, 4.0, -5.0, 0.0]
```

Processing lists: The **for** Statement

General form: `for (variable) in (sequence):`

```python
for a in x:
    print 3 * a
```

In this case you could also use `string.lower` instead, which is the function lower in the module string.
### Processing sequences: The `for` Statement

**General form:**

```
for (variable) in (sequence):
  (statements)
```

(assume x refers to a list of n items)

```
for a in x:
  print 3 * a
```

Before each iteration, the value of the next list item is assigned to the loop variable.

### Iterating over a list with for

```
x = [1.2, 3.9, -4.8, 0.1]
for a in x:
  print round(a)
```

```
a = 1.2
print round(a)
a = 3.9
print round(a)
a = -4.8
print round(a)
a = 0.1
print round(a)
```

### Iterating over a string with for

```
s = 'Python'
for c in s:
  print 'Gimme a ' + c + '!
```

```
c = 'P'
print 'Gimme a ' + c + '!
c = ' + y
print 'Gimme a ' + c + '!
c = ' + h
print 'Gimme a ' + c + '!
...```

### Extended example: spell checker

- **Goal:** A simple spell checker for plain text files
- **Plan:**
  - put all the words in a dictionary into a list
  - check each word in the file to see if it’s in the list
  - if it’s not in the list, complain that it’s misspelled.
- **We’ll play more word games in Lab 6…**