

Common list processing idioms:

Counting all items in a list that match a pattern:

```
total = 0
for pos in range(0, len(lst)):
    if <test lst[pos] for something>:
        total = total + 1
```

Example: if the if-test is `lst[pos] > 10`, then the loop above counts the number of items in the list that are greater than 10.

Filtering all items in a list that match a pattern: (to make a new list of all the items that match)

```
newList = []
for pos in range(0, len(lst)):
    if <test lst[pos] for something>:
        newList.append(lst[pos])
```

Example: if the if-test is `lst[pos] > 10`, then the loop creates a new list of all items from `lst` that are greater than 10.

Transforming all items in a list: (turning each item into a new item)

```
newList = []
for pos in range(0, len(lst)):
    newList.append(<something that does something to lst[pos]>)
```

Example: if the piece inside `append` is `lst[pos] + 1`, then we get a new list of all the items from the old list with 1 added to them.

The code above makes a *copy* of the original list `lst`, leaving `lst` unchanged. So you end up with `newList`, which has the updated elements, and `lst`, which still has the old items.

Transforming all items in a list without making a copy:

```
for pos in range(0, len(lst)):
    lst[pos] = <something different>
```

(The code above does not make a copy of `lst`; the original values of `lst` are modified by this code.)

PRACTICE:

1. Write code to take a list of integers and count the number of integers that are odd.
2. Write code to take a list of integers and create a new list containing only the odd integers.
3. Write code to take a list of strings and change the first letter of each string to uppercase.
4. Write a function called `count_initial_vowels` that takes a list of names and returns the number of names that start with a vowel.
5. Write a function called `filter_one_vowel` that takes a list of names and returns a list of the people in class who only have one vowel *in their name*.

Hint: first write a function called `count_vowels` that takes a string and counts the number of vowels in it.