CS150 - Recursion

Announcements

- HW4 grade emailed Friday
- HW8 is up - due next Monday
- Review Tuesday, exam Wednesday (next week)
- No class Friday or Monday
- Get sample midterm 2 - no inheritance or Ch.10

List Comprehension (Ch 4.5, p 148)

A short cut when working on lists

Example: l = [0, 1, 2, 3, 4]

```
m = []
for e in l:
    m.append(e*e)
```

put these in new list

Shorter: m = [e*e for e in l]

for all elements in a list

List comprehension, cont

Can also <u>filter</u>:

m = [e*e for e in L if e%2==0]

Multiple comprehensions:

[x+y for x in "SPAM" for y in "spam"]

→ [`Ss`, ...]

(but gets hard to read, so don't get carried away)

Program design (Ch. 7)

Designing larger systems

Example: a library

- books } check-out
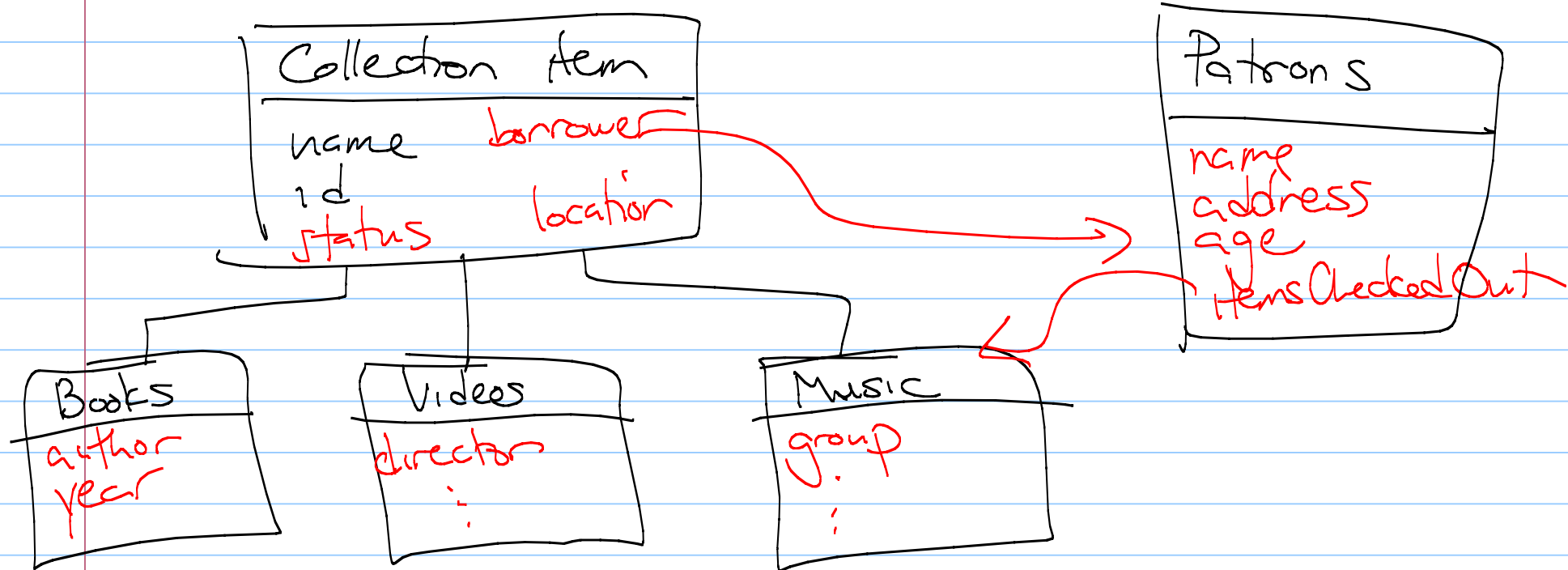- users
- music
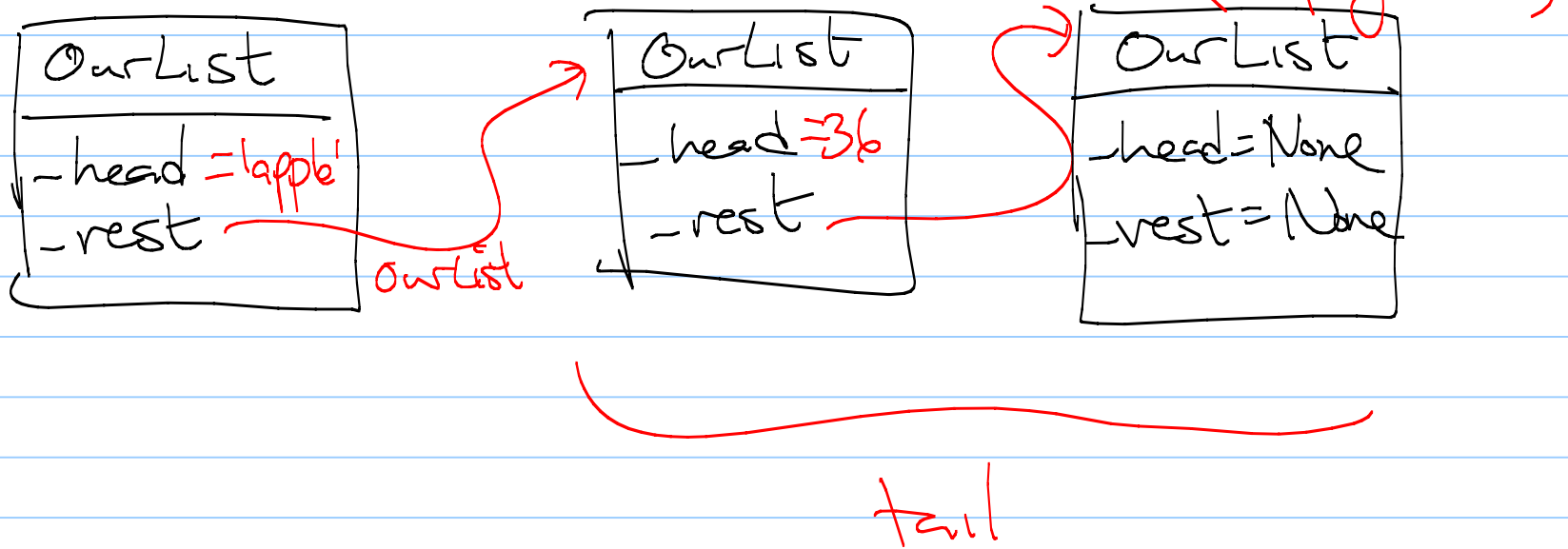- games
- movies

all have id & title, location

Collection Item

name   borrower
id
status   location

Patrons

name
address
age
ItemsCheckedOut

Books

author
year

Videos

director
:

Music

group
:

who has checked what

(Ch. 11)

Back to recursion: Data structures

Designing a list: class OurList:

(empty list)

OurList		OurList		OurList
_head = 'apple'	→	_head = 36		_head = None
_rest		_rest		_rest = None

OurList

tail

Appending: mylist. append (12)

value

mylist

OurList
_head = 15
_rest

OurList
_head = 2
_rest

OurList
_head = None 12
_rest = None
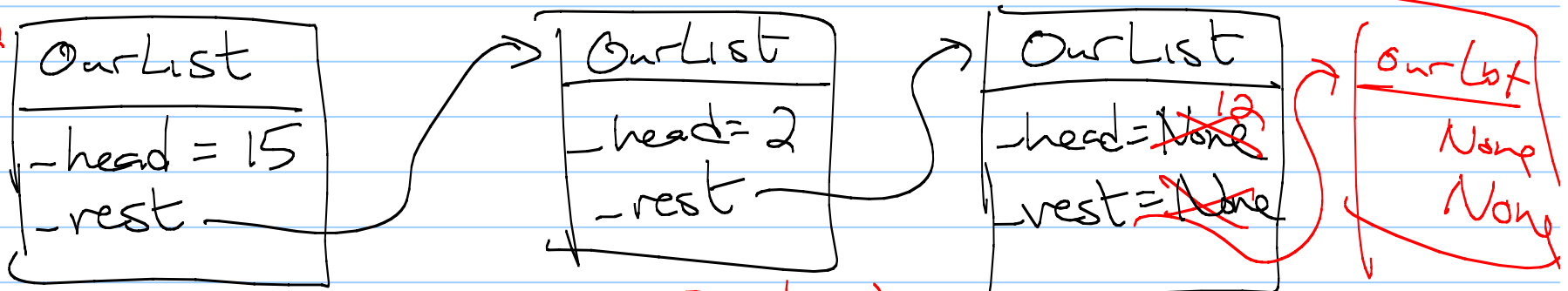
OurList
None
None

self. isEmpty()

if   self._head == None:
        self._head = value
        self._rest = OurList()
else:
        self._rest. append (value)

} base case

Functions

- __init__
- is Empty()
- append
- count
- __contains__
  ⋮