

CSC 101

Today

- List Comprehensions  
→ For Statements

Quiz #4 today

Assignment #3  
Wednesday

def admit-people (people : List[Person], age-limit : int)  $\rightarrow$   
List[Person] :

new-list [person : age  
 $> \text{age-limit}$  for person in people]

return new-list

[ Person("Bob", 12), Person("Fatima", 27) ... ]  
 $\geq \text{age-limit}$  17  $\cancel{\downarrow}$   $\downarrow$   
[ false, true, ... ]

```
def admit-people (people : List[Person], age-limit : int) →  
    List[Person] :  
    new-list = [ P for P in people  
                if P.age ≥ age-limit ]  
    return new-list
```

resulting value put in new list

filter condition

call each element

```
def ticket-prices(people: List[Person], time: int,  
age_limit: int) → List[float]:
```

```
return [ticket-price(person.age, time)  
for person in people  
if person.age >= age_limit]
```

age\_limit = 13

[ Person("—", 5), Person("—", 21), Person("—", 18) ]

[ 17, 17 ]

```
graph TD; A[age_limit = 13] --> B[age_limit]; C[Person("—", 5)] --> D[person]; E[Person("—", 21)] --> D; F[Person("—", 18)] --> D;
```

```
def ticket_prices(people: List[Person], time: int,  
                  age_limit: int) → List[Tuple[Float,  
                                         Person]]
```

admitted = admit\_people(people, age\_limit)

return [(ticket\_price(p; <sup>age</sup>time), p) for  
 p in admitted]

---

$$x = a + b \backslash  
* c$$

$x = f(a, \dots, \dots)$

$\xrightarrow{4}$   
4 spaces

List comprehension simplifies for statement

$\text{new} = [x + 1 \text{ for } x \text{ in } L]$

~~Map~~  $\text{tmp} = []$

for  $x$  in  $L$ : *iterate over every element in  $L$ , calling each  $x$*

$\text{tmp.append}(x + 1)$

$\text{new} = \text{tmp}$  *adds to map computation list*

$L = [2, 9, 4, 7]$

$\text{sum} = 0$

for  $x$  in  $L$ :

$\text{sum} = \text{sum} + x$

↑  
current  
value

update  
w/ new value

~~sum~~  $\boxed{0}$

$x$   $\boxed{2}$   $\boxed{9}$   $\boxed{4}$   $\boxed{7}$   
 $\leftarrow$   $\text{sum}$   $\boxed{2}$   $\boxed{11}$   $\boxed{15}$   $\boxed{22}$   
 $\leftarrow$

$\text{sum} += x$

Filter new = [ x for x in L  
if is\_even(x) ]

new = []

for x in L :

if iseven(x) :

new.append(x)

[ 3, 2, 9, 7, 4 ]  
↑ ↑ ↑ ↑ ↑  
x x x x x

↓ ↓  
[ 2, 4 ]

```
def admit-people(people: List[Person], age-limit: int)
    → List[Person]:
    result = []
    for person in people:
        if person.age >= age-limit:
            result.append(person)
    return result
```

new = []

for x in L:

if iseven(x):

    new.append(0)

else:

    new.append(x)

```
def compute(x: float) -> float
    if isEven(x):
        return 0
    else:
        return x
```

new = []

for x in L:

new.append(compute(x))

new = [compute(x) for x in L]