

CS2 20 5-5-20

More on Lists ...

Recall controlling loops:

```
for i in [0, 1, 2]:  
    ...  
end for
```

or

```
for i in range(3):  
    ...  
end for
```

note: a range object is not a List object, but you can turn it in to one.

Ex.

`L = list(range(3))`

L is now [0, 1, 2]

Ex

`L = list(range(5, 10))`

L is now [5, 6, 7, 8, 9]

Ex.

`L = list("happy")`

L is now ["h", "a", "p", "p", "y"]

Ex. ~~bad~~ not that good

$L = \text{list}(\text{range}(10\text{-}000\text{-}000))$

~~#~~ now $L = [0, \dots, 9\text{-}999\text{-}999]$

for x in L :

 Pass ~~#~~do nothing

~~#~~end for

Ex. better

for x in $\text{range}(10\text{-}000\text{-}000)$:

 Pass

~~#~~end for

Variations on range()

$\text{list}(\text{range}(3, 10)) \neq [3, 4, \dots, 9]$

$\text{list}(\text{range}(10, 3)) \neq []$ empty

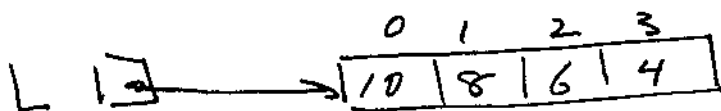
$\text{list}(\text{range}(3, 10, 2)) \neq [3, 5, 7, 9]$

$\text{list}(\text{range}(3, 11, 2)) \neq [3, 5, 7, 9]$

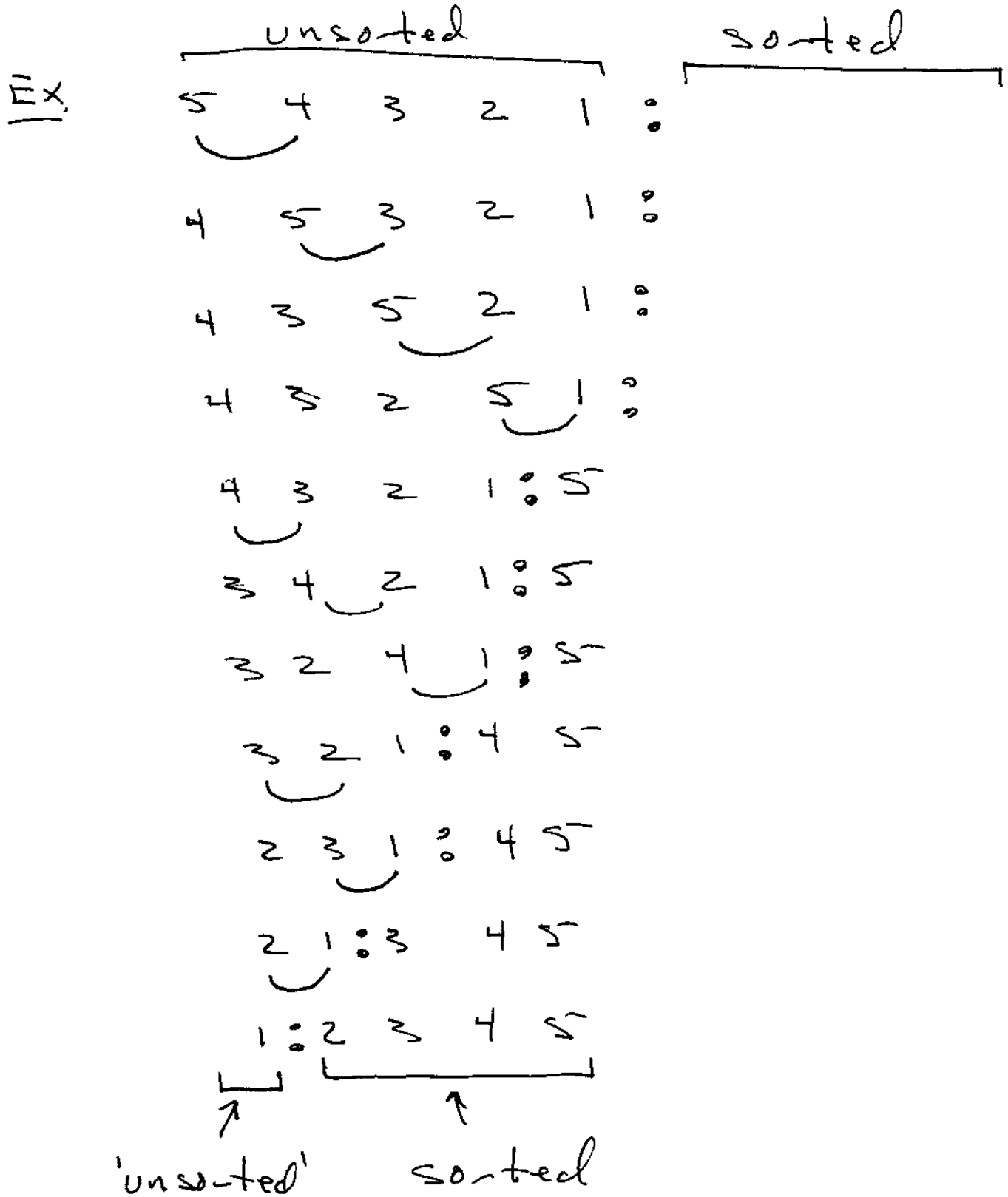
$\text{list}(\text{range}(10, 3, -1)) \neq [10, 9, 8, 7, 6, 5, 4]$

$L = \text{list}(\text{range}(10, 3, -2)) \neq [10, 8, 6, 4]$
 indices: 0 1 2 3

Picture:



Bubble Sort



Invariant

- everything in unsorted section is $\leq$ everything in sorted section.

Ex BubbleSort.py

Ex Nested Loop.py

while loops

boolean expression
loop repetition condition

```

while cond :
    start
    start
    ...
# end while
start
...
  
```

indent →

← loop body

Ex. Sum.Py

To create a list

$L = []$ # create empty list

$L = \text{list}()$ # same thing.

$x = 1$

$y = 2.0$

$z = \text{"three"}$

$L = [x, y, z]$ # $[1, 2.0, \text{"three"}]$

$x = 5$ # Exercise: do this to
see if L is $[1, 2.0, \text{"three"}]$
or $[5, 2.0, \text{"three"}]$