COMP 110

for loops + range()

Looping Through Sequences

- You can use a loop to iterate over every element in a sequence!
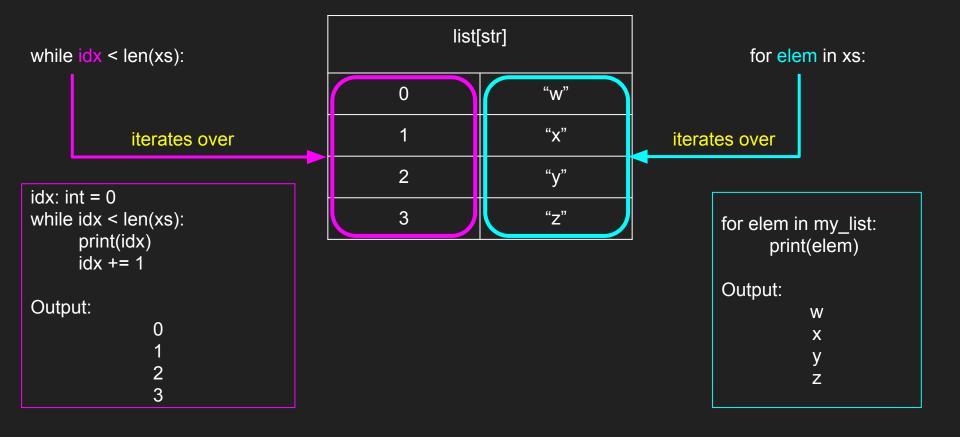
for … in … loops

xs: list[str] = ["w", "x", "y", "z"]

Print every element of xs

while   **for … in …**

xs: list[str] = ["w", "x", "y", "z"]

list[str]	
0	"w"
1	"x"
2	"y"
3	"z"

while idx < len(xs):

for elem in xs:

iterates over

iterates over

```
idx: int = 0
while idx < len(xs):
        print(idx)
        idx += 1

Output:
                0
                1
                2
                3
```

```
for elem in my_list:
        print(elem)

Output:
                w
                x
                y
                z
```

for … in … loops in Memory

```python
1   """Practice of for Loops"""
2
3   my_list: list[str] = ["hello", "world"]
4   new_list: list[str] = []
5   for elem in my_list:
6   |     new_list.append(elem)
7   print(new_list)
```

Writing for loops

pets: list[str] = ["Louie", "Bo", "Bear"]

Using a for … in … loop, write code to tell each pet they're a good boy!

Challenge: call each elem something other than "elem"

Output should be:

Good boy, Louie!

Good boy, Bo!

Good boy, Bear!
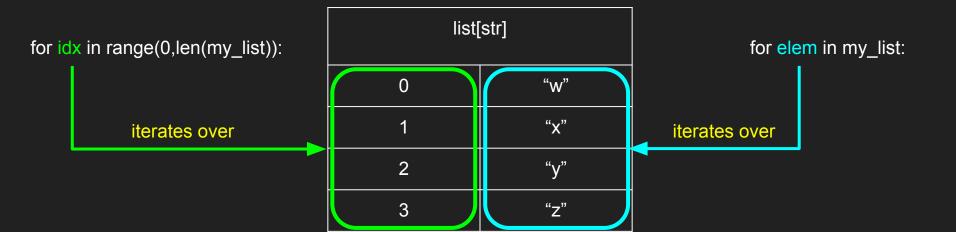
Why "while" loop over "for" loop?

Range

- A type of sequence you can loop over.
- Includes start point, does **not** include end point, and *steps* through every point in between
- Constructor: range(start, end, [step = 1])
- Examples:
  - range(1, 5) stops at numbers 1, 2, 3, 4
  - range(1, 6, 2) stops at numbers 1, 3, 5

range() in Memory

On the heap, but don't worry about it. :-)

my_list = ["w", "x", "y", "z"]

for idx in range(0,len(my_list)):

for elem in my_list:

list[str]	
0	"w"
1	"x"
2	"y"
3	"z"

iterates over

iterates over

my_list = ["w", "x", "y", "z"]

list[str]	
indexes	elements
0	"w"
1	"x"
2	"y"
3	"z"

for idx in range(0,len(my_list)):

iterates over

for elem in my_list:

iterates over

```
for idx in range(0,len(my_list)):
    print(idx)

Output:
        0
        1
        2
        3
```

```
for idx in range(0,len(my_list)):
    print(my_list[idx])

Output:
        w
        x
        y
        z
```

```
for elem in my_list:
    print(elem)

Output:
        w
        x
        y
        z
```

Using range() in a for … in … loop.

names: list[str] = ["Alyssa", "Janet", "Vrinda"]

Print every element's index and value:

0: Alyssa

1: Janet

2: Vrinda