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

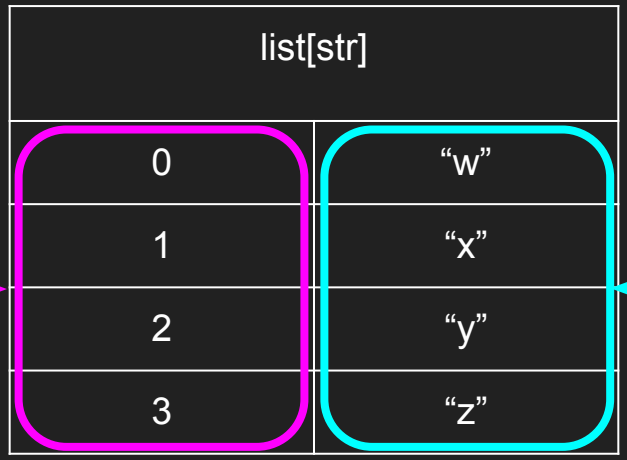
while

for … in …

xs: list[str] = [“w”, “x”, “y”, “z”]

while idx < len(xs):

iterates over



for elem in xs:

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

```
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!

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

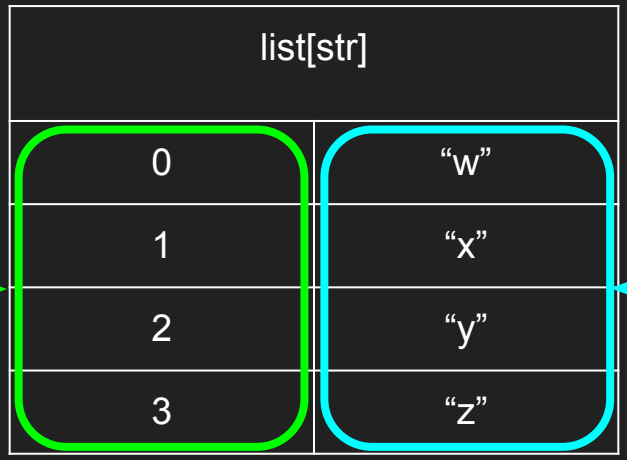
range() in Memory

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

my_list = [“w”, “x”, “y”, “z”]

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

iterates over



for elem in my_list:

iterates over

my_list = [“w”, “x”, “y”, “z”]

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

iterates over

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

iterates over

for elem in my_list:

```
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

Friday's Challenge Question:

In your workspace, in the **lessons** folder, create the file **sum.py**

We are going to write the same function *three different ways!*

This function sums all the elements of the input vals: list[float] and returns the sum.

For example, w_sum([1.1, 0.9, 1.0]) should compute 1.1 + 0.9 + 1.0 and return the simplified value 3.0.

- Version A: Write a function called w_sum that uses a while loop to iterate through vals
- Version B: Write a function called f_sum that uses a for ... in ... loop.
- Version C: Write a function called f_range_sum that uses a for … in range(0,len(xs)) loop.

More info + submission instructions on the website!