

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

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

Output:

```
0
1
2
3
```

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

```
for elem in xs:
```

iterates over

```
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

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

```
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"

```
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