

# Lecture 4: For Loops

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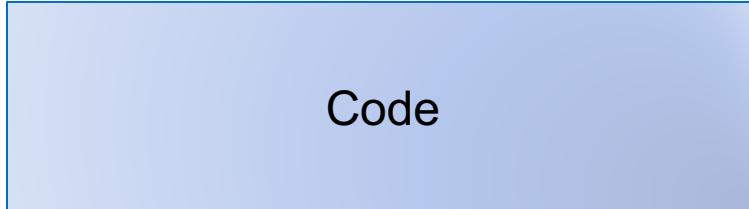
CS 51P

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# Last Time: for loops

- When you want some set of statements to execute repeatedly . . . once for each element in a sequence.

```
for <var> in <sequence>:
```



Code



whitespace  
matters

# Last Time: range

- `range([start,] stop [, step])`
- generates a sequence of numbers
- to see the elements, call the function `list`

`range(5)`

`range(1,10)`

`range(1,15,2)`

`range(1,15,-1)`

`range(10,-5,-3)`

# Example

Write a program using a for-loop that asks the user for a positive integer and then counts down from that value to 1 (all on one line!) and then prints "GO!" on the next line. For example, if the user enters 5, it should print:

5, 4, 3, 2, 1

GO!

# Strings as sequences

- Example: write a program that asks the user for a string and then prints each letter of the string on a new line

```
string?
```

```
hello
```

```
h
```

```
e
```

```
l
```

```
l
```

```
o
```

- a string is a sequence of characters!

# Exercise

Write a program that asks the user for a string and then prints that string with every letter doubled.

```
string?
```

```
hello
```

```
hheelllloo
```

# Example: Nested loops

Without using multiplication, write a program that asks the user for two inputs (a width and a height) and then prints a rectangle of plus signs that is width across and height high.

```
width?
```

```
3
```

```
height?
```

```
4
```

```
+++
```

```
+++
```

```
+++
```

```
+++
```

# Exercise: Nested Loops

What gets printed when the following code is executed?

```
x = 3
print("a")
for idx1 in range(x):
    print("b"+str(idx1))
    for idx2 in range(x):
        print("c"+str(idx1)+str(idx2))
    print("d"+str(idx1))
print("e")
```

# Exercise: Nested Loops

Write a program that asks the user for a positive integer and then prints out the times table up to that value

```
pos int?
```

```
4
```

```
1: 1 2 3 4 5 6 7 8 9 10
```

```
2: 2 4 6 8 10 12 14 16 18 20
```

```
3: 3 6 9 12 15 18 21 24 27 30
```

```
4: 4 8 12 16 20 24 28 32 36 40
```