

Lecture 6: While Loops

CS 50

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Review: 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

What about...

- What if we wanted a program that asks the user for a number between 1 and 10 and keeps asking until the user enters a number in the range [1, 10]?
- Example run:

```
Pick a number between 1 and 10:
```

```
-10
```

```
Pick a number between 1 and 10:
```

```
50
```

```
Pick a number between 1 and 10:
```

```
7
```

```
Thanks!
```

while loops

- When you want some set of statements to execute repeatedly . . . until some stopping criteria is met.

`while <boolean expression>:`

Code


whitespace
matters

True
`x < 5`
`(x < 0) or (x > 1000000)`
`not str.isdigit(x)`

Example 1: Using a while loop

- Define a function `get_num` that asks the user for a number between 1 and 10 and keeps asking until the user enters a number in the range `[1, 10]`, then prints "Thanks!" and returns the requested number

```
x = get_num()  
print(x)
```

```
Pick a number between 1 and 10:  
-10  
Pick a number between 1 and 10:  
50  
Pick a number between 1 and 10:  
7  
Thanks!  
7
```

Exercise 1

Define a function `authenticate` that takes one argument `correct`, a string, and prompts user for a password, repeating until the correct password is entered, then prints "Login Successful" and returns the number of attempts.

```
count = authenticate("123456")  
print(str(count)+" attempts")
```

```
Enter your password:  
password  
Enter your password:  
abc123  
Enter your password:  
123456  
Login Successful  
3 attempts
```

Exercise 2

Using an infinite loop, define a function `authenticate2` that takes one argument `correct`, a string, and prompts user for a password, repeating until the correct password is entered, then prints "Login Successful" and returns the number of attempts.

```
count = authenticate("123456")  
print(str(count)+" attempts")
```

```
Enter your password:  
    password  
Enter your password:  
    abc123  
Enter your password:  
    123456  
Login Successful  
3 attempts
```

Example 2: Replacing for loops

```
def pyramid(height):  
    string = ""  
    for x in range(height):  
        string = string + "*" * x + "\n"  
  
    return string
```

```
full_string = pyramid(5)  
print(3*full_string)
```