# Intro to Coding with Python– Loops

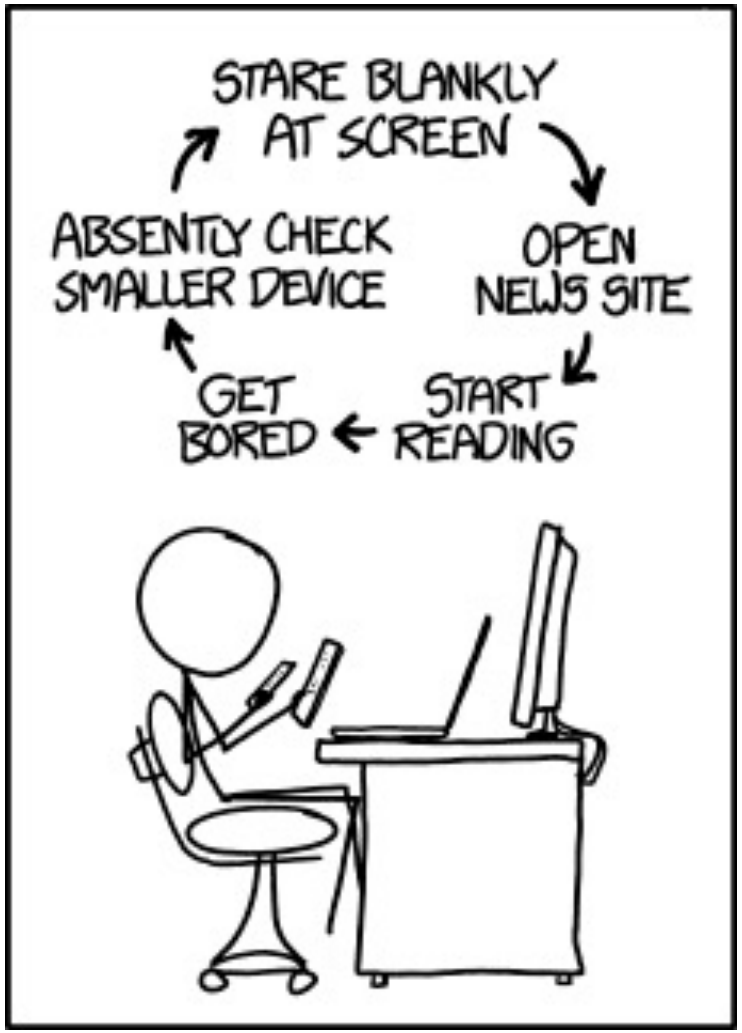
Dr. Ab Mosca (they/them)

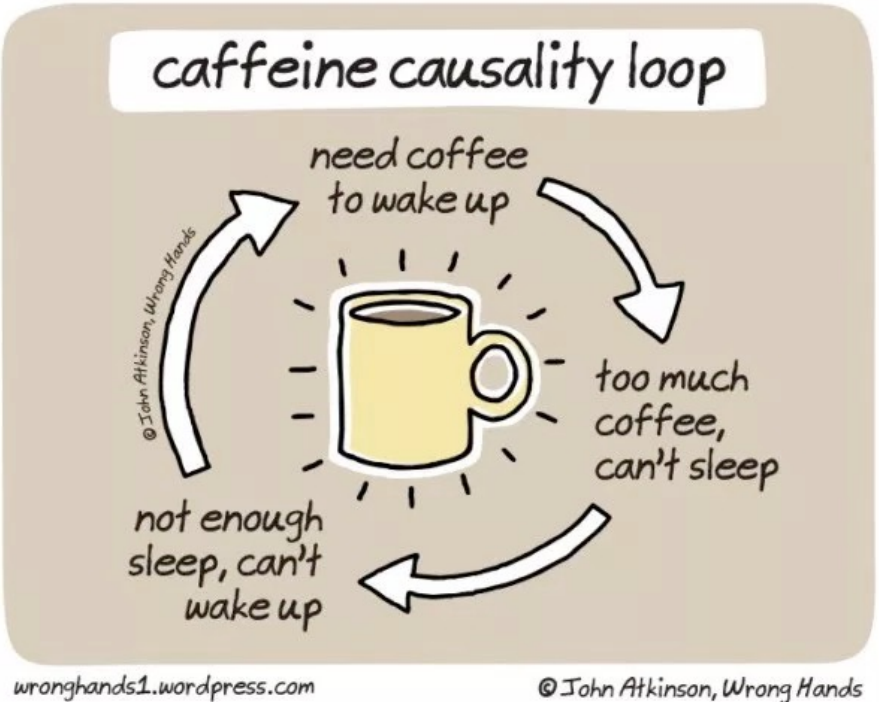
Slides based off slides courtesy of Jordan Crouser (https://jcrouser.github.io/)

# Plan for Today

- While loops

# Loops: a familiar idea




https://xkcd.com/1411/

# Loops in computer programming

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  - run for **each item** in a list
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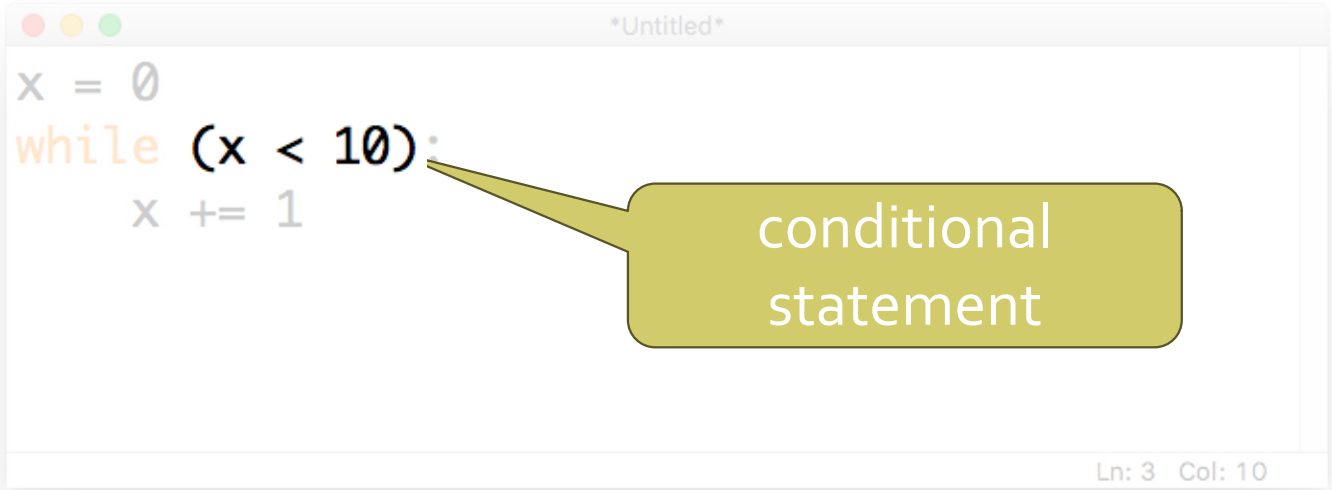

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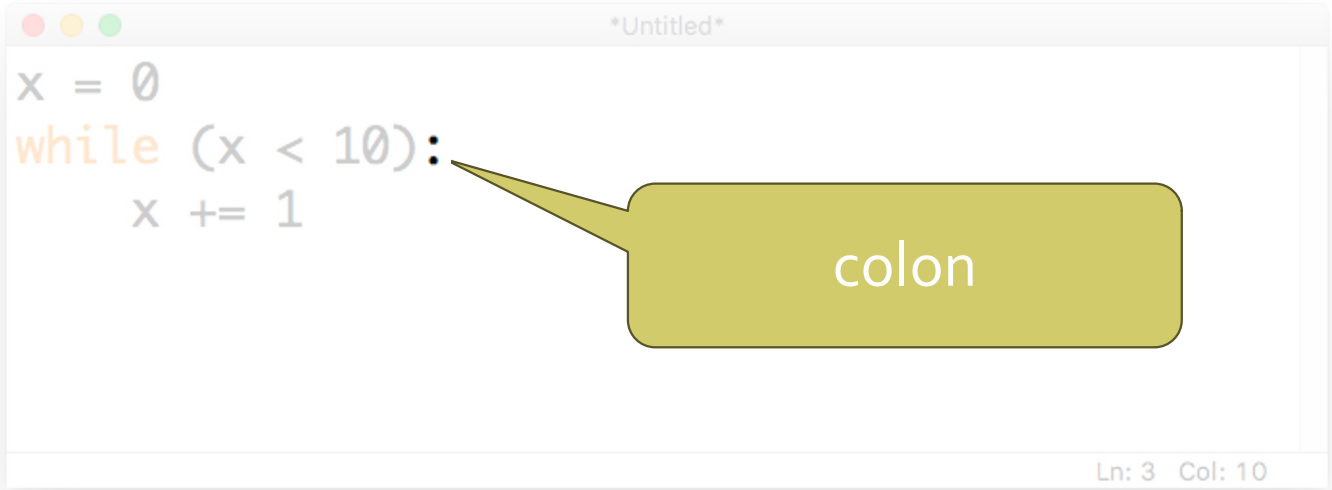

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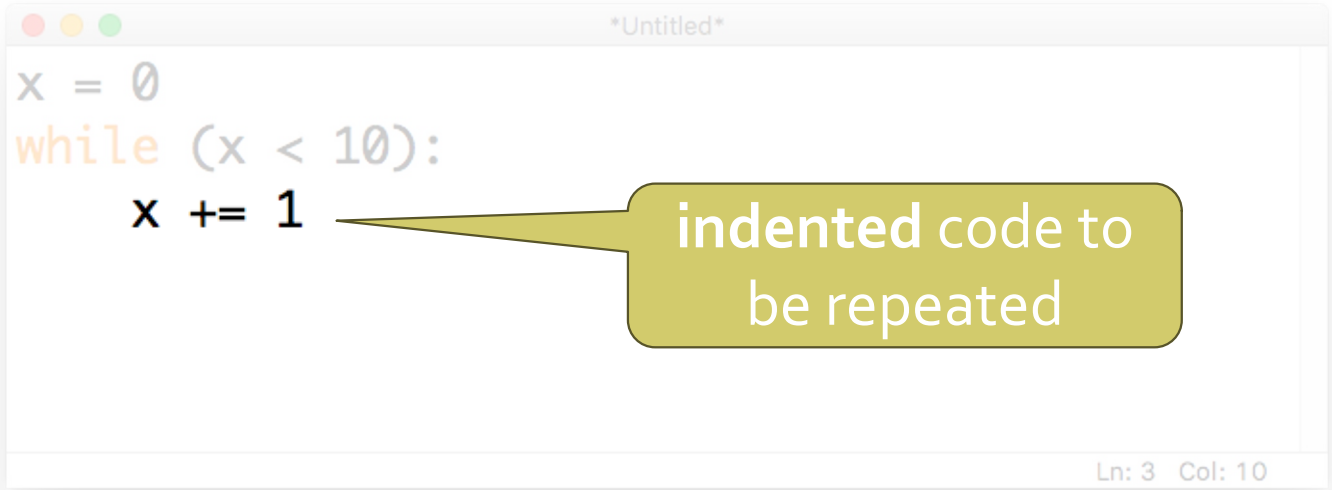

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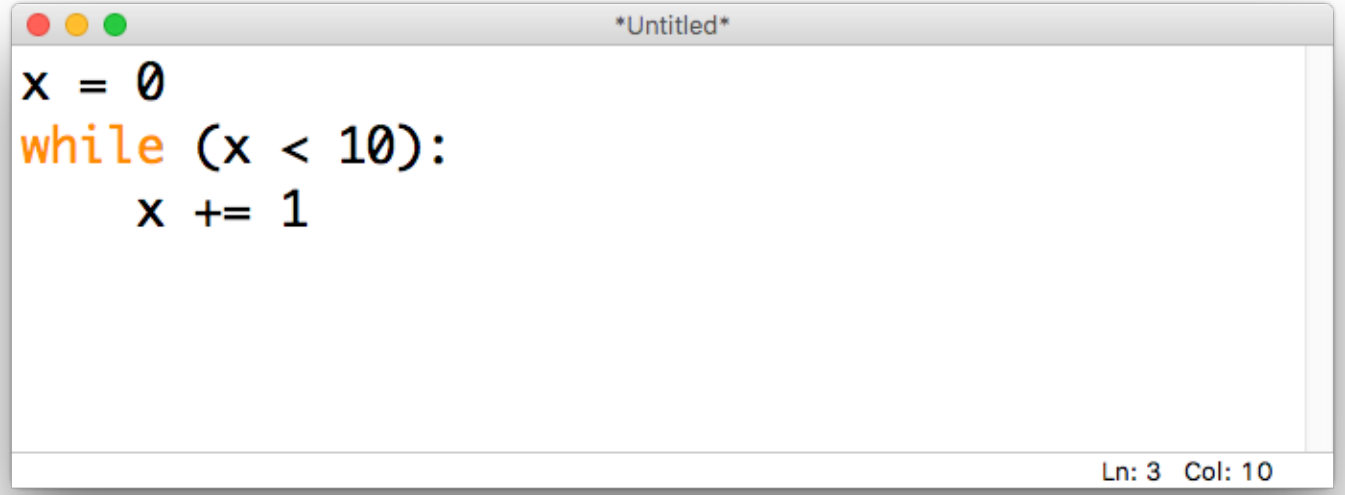
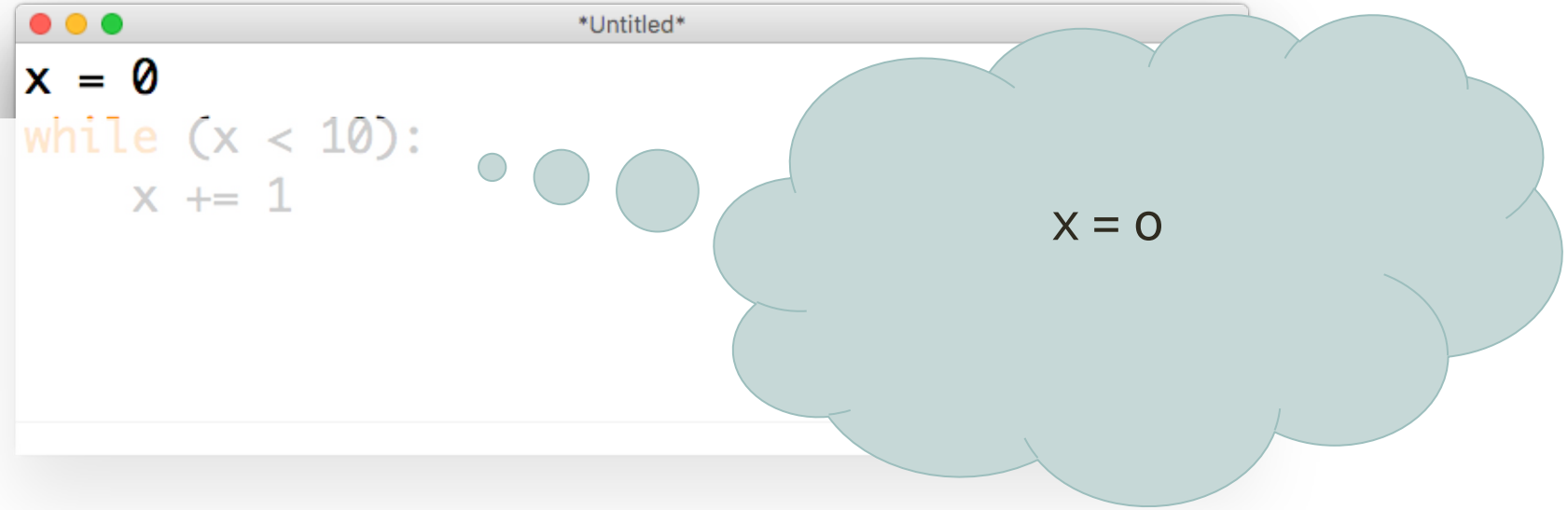



- What happens when we run this code?
- Python reads from top down
- When it enters the while loop, the indented code block will repeat until the condition is FALSE

# `while` loops

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# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 0
Is 0 < 10? Yes, proceed to indented code chunk

- What happens when we run this code?
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# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 1
Is 1 < 10? Yes, proceed to indented code chunk

- What happens when we run this code?
- Python reads from top down
- When it enters the while loop, the indented code block will repeat until the condition is FALSE

# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 2
End of code chunk, check condition again

- What happens when we run this code?
- Python reads from top down
- When it enters the while loop, the indented code block will repeat until the condition is FALSE

# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 2
Is 2 < 10? Yes, proceed to indented code chunk

- What happens when we run this code?
- Python reads from top down
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# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 3
End of code chunk, check condition again

- What happens when we run this code?
- Python reads from top down
- When it enters the while loop, the indented code block will repeat until the condition is FALSE

# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 3
Is 3 < 10? Yes, proceed to indented code chunk

- What happens when we run this code?
- Python reads from top down
- When it enters the while loop, the indented code block will repeat until the condition is FALSE

# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 4
End of code chunk, check condition again

- What happens when we run this code?
- Python reads from top down
- When it enters the while loop, the indented code block will repeat until the condition is FALSE

# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 4
Is 4 < 10? Yes, proceed to indented code chunk

- What happens when we run this code?
- Python reads from top down
- When it enters the while loop, the indented code block will repeat until the condition is FALSE

# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 5
End of code chunk, check condition again

- What happens when we run this code?
- Python reads from top down
- When it enters the while loop, the indented code block will repeat until the condition is FALSE

# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 5
Is 5 < 10? Yes, proceed to indented code chunk

- What happens when we run this code?
- Python reads from top down
- When it enters the while loop, the indented code block will repeat until the condition is FALSE

# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 6
End of code chunk, check condition again

- What happens when we run this code?
- Python reads from top down
- When it enters the while loop, the indented code block will repeat until the condition is FALSE

# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 6
Is 6 < 10? Yes, proceed to indented code chunk

- What happens when we run this code?
- Python reads from top down
- When it enters the while loop, the indented code block will repeat until the condition is FALSE

# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 7
End of code chunk, check condition again

- What happens when we run this code?
- Python reads from top down
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# `while` loops

```
x = 0
while (x < 10):
    x += 1
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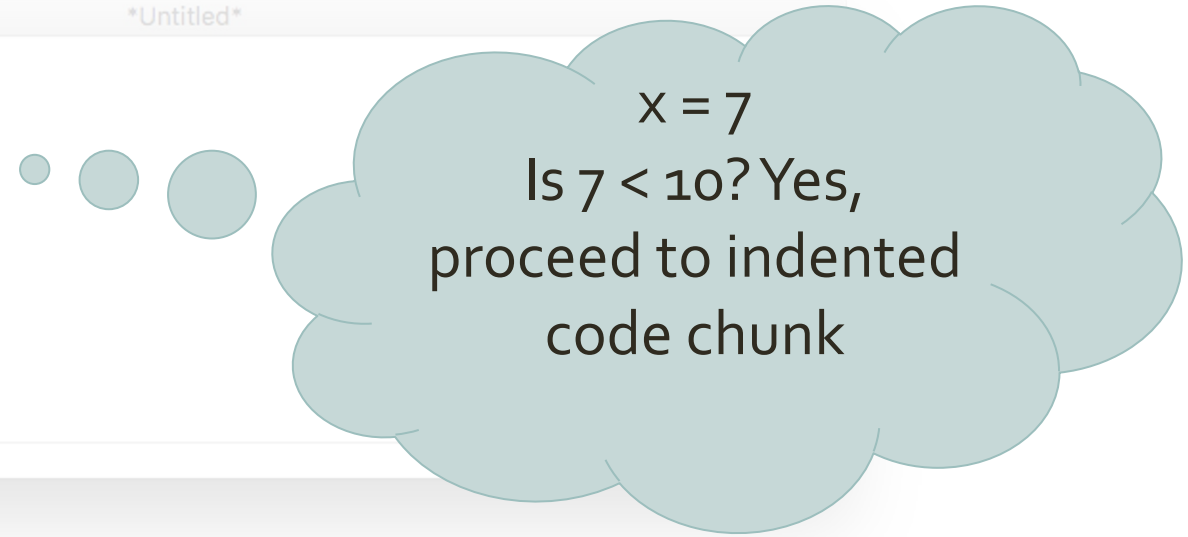


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- Python reads from top down
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# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 8
End of code chunk, check condition again

- What happens when we run this code?
- Python reads from top down
- When it enters the while loop, the indented code block will repeat until the condition is FALSE

# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 8
Is 8 < 10? Yes, proceed to indented code chunk

- What happens when we run this code?
- Python reads from top down
- When it enters the while loop, the indented code block will repeat until the condition is FALSE

# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 9
End of code chunk, check condition again

- What happens when we run this code?
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# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 9
Is 9 < 10? Yes, proceed to indented code chunk

- What happens when we run this code?
- Python reads from top down
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# `while` loops

```
x = 0
while (x < 10):
    x += 1
```

x = 10
End of code chunk, check condition again

- What happens when we run this code?
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# `while` loops

```
x = 0
while (x < 10):
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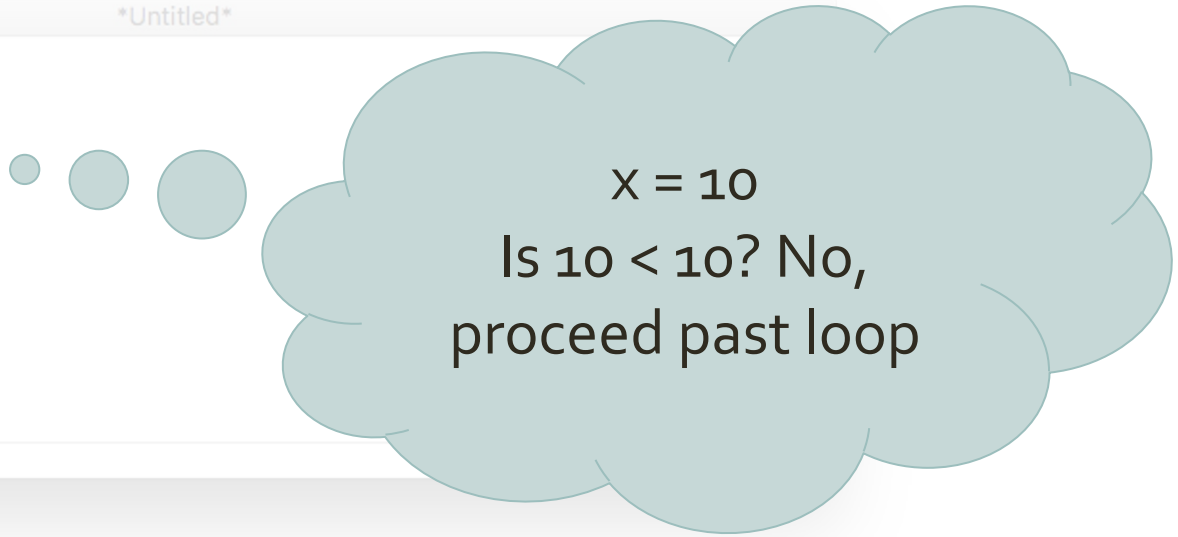


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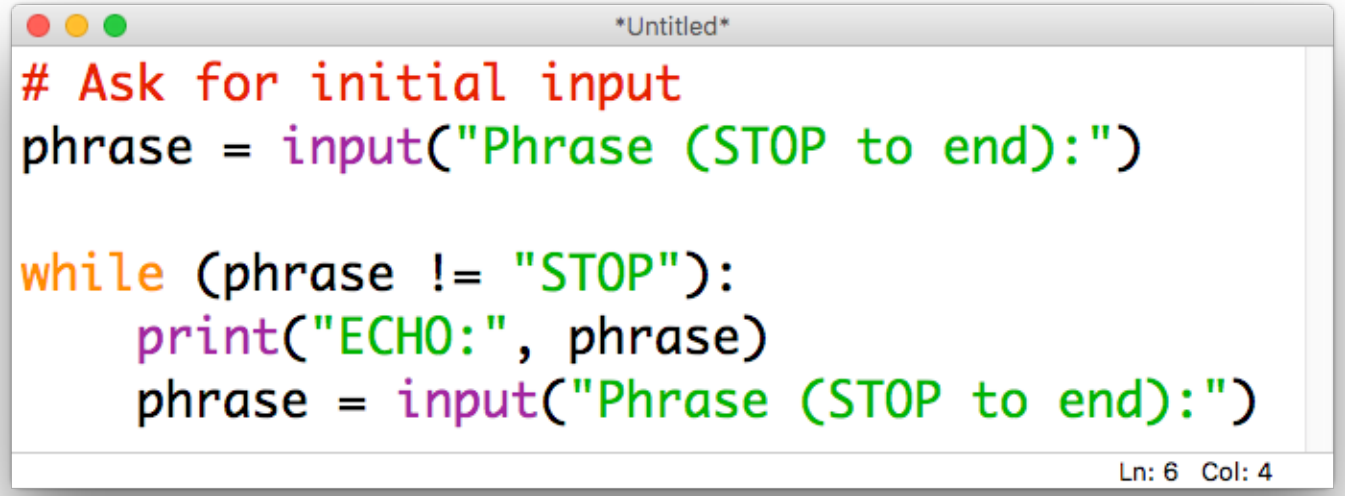
# `while` loops

- **`while`** loops can be especially useful when combined with the **`input()`** function
- For example, we may want to continue asking for input until the user tells us they are done:



# **15 minute activity**: compute a sum

1. Write a program that
   - Uses a while loop to get a series of numbers from the user
     - Ask for numbers one at a time and store them in a list
     - Stop asking when the user enters a blank
2. Modify your program to compute the running total of the numbers the user has entered
     - Every time the user enters a new number, print the running total

# Discussion

What did you come up with?

# **15 minute activity**: Memory game

Write a program that plays a memory game with the user.

- Ask the user for animals one at a time and store them in a list
- After the user inputs an animal, check if they already input it previously
- If the animal is already in the list print "Repeat! You lose!". Otherwise, ask for another animal

# Discussion

What did you come up with?