User Input and While Loops

How the `input()` Function Works

```
message = input("Tell me something, and I will repeat it back to you: ")
print(message)
~
~
~
```

```
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$ python parrot_1
.py
Tell me something, and I will repeat it back to you: Hello everyone!
Hello everyone!
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$
```

Writing Clear Prompts

```
prompt = "If you tell us who you are, we can personalize the messages you see."
prompt += "\nWhat is your first name? "

name = input(prompt)
print(f"\nHello, {name}!")
~
~
~
```

```
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$ python greeter.
py
If you tell us who you are, we can personalize the messages you see.
What is your first name? Joshua

Hello, Joshua!
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$
```

Using `int()` to Accept Numerical Input

```
>>> age = input("How old are you? ")
How old are you? 21
>>> age
'21'
>>>
```

```
>>> age = input("How old are you? ")
How old are you? 21
>>> age >= 18
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
TypeError: '>=' not supported between instances of 'str' and 'int'
>>>
```

```
>>> age = input("How old are you? ")
How old are you? 21
>>> age = int(age)
>>> age >= 18
True
>>>
```

```
height = input("How tall are you, in inches? ")
height = int(height)

if height >= 48:
    print("\nYou're tall enough to ride!")
else:
    print("\nYou'll be able to ride when you're a little older.")
~
~
~
~
```

```
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$ python rollerco
aster.py
How tall are you, in inches? 71

You're tall enough to ride!
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$
```

The Modulo Operator

```
>>> 4 % 3
1
>>> 5 % 3
2
>>> 6 % 3
0
>>> 7 % 3
1
>>>
```

```
number = input("Enter a number, and I'll tell you if it's even or odd: ")
number = int(number)

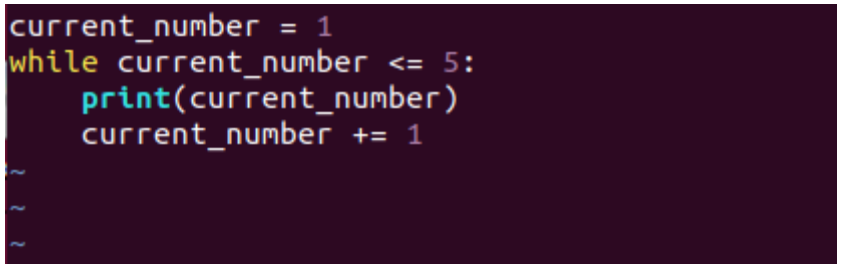
if number % 2 == 0:
    print(f"\nThe number {number} is even.")
else:
    print(f"\nThe number {number} is odd.")
~
~
```

```
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$ python even_or_
odd.py
Enter a number, and I'll tell you if it's even or odd: 42

The number 42 is even.
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$
```

Introducing `while` Loops

The `while` Loop in Action



```
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$ python counting
_1.py
1
2
3
4
5
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$
```

Letting the User Choose When to Quit

```
prompt = "\nTell me something, and I will repeat it back to you:"
prompt += "\nEnter 'quit' to end the program. "
message = ""
while message != 'quit':
    message = input(prompt)
    print(message)
~
~
```

```
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$ python parrot_2
.py

Tell me something, and I will repeat it back to you:
Enter 'quit' to end the program. Hello everyone!
Hello everyone!

Tell me something, and I will repeat it back to you:
Enter 'quit' to end the program. Hello again.
Hello again.

Tell me something, and I will repeat it back to you:
Enter 'quit' to end the program. quit
quit
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$
```

- This program works well, except that it prints the word `'quit'` as if it were an actual message.

```
prompt = "\nTell me something, and I will repeat it back to you:"
prompt += "\nEnter 'quit' to end the program. "
message = ""
while message != 'quit':
    message = input(prompt)

    if message != 'quit':
        print(message)
~
~
~
```

```
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$ python parrot_3
.py

Tell me something, and I will repeat it back to you:
Enter 'quit' to end the program. Hello everyone!
Hello everyone!

Tell me something, and I will repeat it back to you:
Enter 'quit' to end the program. Hello again.
Hello again.

Tell me something, and I will repeat it back to you:
Enter 'quit' to end the program. quit
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$
```

Using a Flag

```
prompt = "\nTell me something, and I will repeat it back to you:"
prompt += "\nEnter 'quit' to end the program. "

active = True
while active:
    message = input(prompt)

    if message == 'quit':
        active = False
    else:
        print(message)
~
~
~
```

```
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$ python parrot.p
y

Tell me something, and I will repeat it back to you:
Enter 'quit' to end the program. Hello everyone!
Hello everyone!

Tell me something, and I will repeat it back to you:
Enter 'quit' to end the program. Hello again.
Hello again.

Tell me something, and I will repeat it back to you:
Enter 'quit' to end the program. quit
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$
```

Using `break` to Exit a Loop

```
prompt = "\nPlease enter the name of a city you have visited:"
prompt += "\n(Enter 'quit' when you are finished.) "

while True:
    city = input(prompt)

    if city == 'quit':
        break
    else:
        print(f"I'd love to go to {city.title()}!")
~
~
~
```

```
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$ python cities.p
y

Please enter the name of a city you have visited:
(Enter 'quit' when you are finished.) New York
I'd love to go to New York!

Please enter the name of a city you have visited:
(Enter 'quit' when you are finished.) San Francisco
I'd love to go to San Francisco!

Please enter the name of a city you have visited:
(Enter 'quit' when you are finished.) quit
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$
```

Using `continue` in a Loop

```
current_number = 0
while current_number < 10:
    current_number += 1
    if current_number % 2 == 0:
        continue

    print(current_number)
~
~
~
```

```
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$ python counting
.py
1
3
5
7
9
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$
```

Avoiding Infinite Loops

- ```
  # This loop runs forever!
  x = 1
  while x <= 5:
      print(x)
  ```
  ```

- To avoid writing infinite loops, test every while loop and make sure the loop stops when you expect it to.

Using a `while` Loop with Lists and Dictionaries

Moving Items from One List to Another

```
# Start with users that need to be verified,
#  and an empty list to hold confirmed users.
unconfirmed_users = ['alice', 'brian', 'candace']
confirmed_users = []

# Verify each user until there are no more unconfirmed users.
#  Move each verified user into the list of confirmed users.
while unconfirmed_users:
    current_user = unconfirmed_users.pop()

    print(f"Verifying user: {current_user.title()}")
    confirmed_users.append(current_user)

# Display all confirmed users.
print("\nThe following users have been confirmed:")
for confirmed_user in confirmed_users:
    print(confirmed_user.title())
~
~
~
```

```
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$ python confirme
d_users.py
Verifying user: Candace
Verifying user: Brian
Verifying user: Alice

The following users have been confirmed:
Candace
Brian
Alice
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$
```

Removing All Instances of Specific Values from a List

```
pets = ['dog', 'cat', 'dog', 'goldfish', 'cat', 'rabbit', 'cat']
print(pets)

while 'cat' in pets:
    pets.remove('cat')

print(pets)
~
~
~
~
```

```
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$ python pets.py
['dog', 'cat', 'dog', 'goldfish', 'cat', 'rabbit', 'cat']
['dog', 'dog', 'goldfish', 'rabbit']
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$
```

Filling a Dictionary with User Input

```
responses = {}

# Set a flag to indicate that polling is active.
polling_active = True

while polling_active:
    # Prompt for the person's name and response.
    name = input("\nWhat is your name? ")
    response = input("Which mountain would you like to climb someday? ")

    # Store the response in the dictionary.
    responses[name] = response

    # Find out if anyone else is going to take the poll.
    repeat = input("Would you like to let another person respond? (yes/ no) ")
    if repeat == 'no':
        polling_active = False

# Polling is complete. Show the results.
print("\n--- Poll Results ---")
for name, response in responses.items():
    print(f"{name} would like to climb {response}.")
~
~
```

```
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$ python mountain
_poll.py

What is your name? Eric
Which mountain would you like to climb someday? Denali
Would you like to let another person respond? (yes/ no) yes

What is your name? Lynn
Which mountain would you like to climb someday? Devil's Thumb
Would you like to let another person respond? (yes/ no) no

--- Poll Results ---
Eric would like to climb Denali.
Lynn would like to climb Devil's Thumb.
(base) joshua@joshua-VirtualBox:~/Documents/Python_Crash_Course_2nd_Edition/ehmatthes-pcc_2e-00ff4d9/chapter_07$
```