



Introduction to Python

Session 1
Michaelmas 2023
Week 1

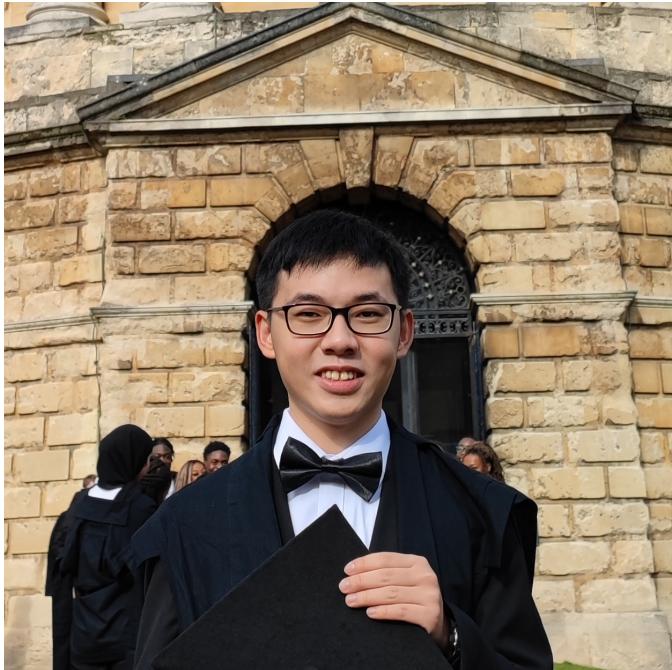
Learn to Code - Python Course

- Complete Beginners
- Able to create a game on your own

Schedule

- Michaelmas Term 2023
- Saturdays 5:30PM – 6:30PM
- G/F Room 1, Digital Hub, Jesus College
- Week 1 14/10
- Week 3 28/10
- Week 5 11/11
- Week 7 25/11
- Please still come if you miss a lesson!

About me



Oscar Mui

- Third year (undergrad)
- Computer Science
- University College
- Learn to code officer
`@ox.compsoc`
- More about me and my projects:
<https://oscarmui.github.io/>

Other events by CompSoc

- Socials on Saturdays after this session (Weeks 1-7 7pm)
- Free food if you are a member
- Talks and Workshops on Thursdays
- Membership fee: £1

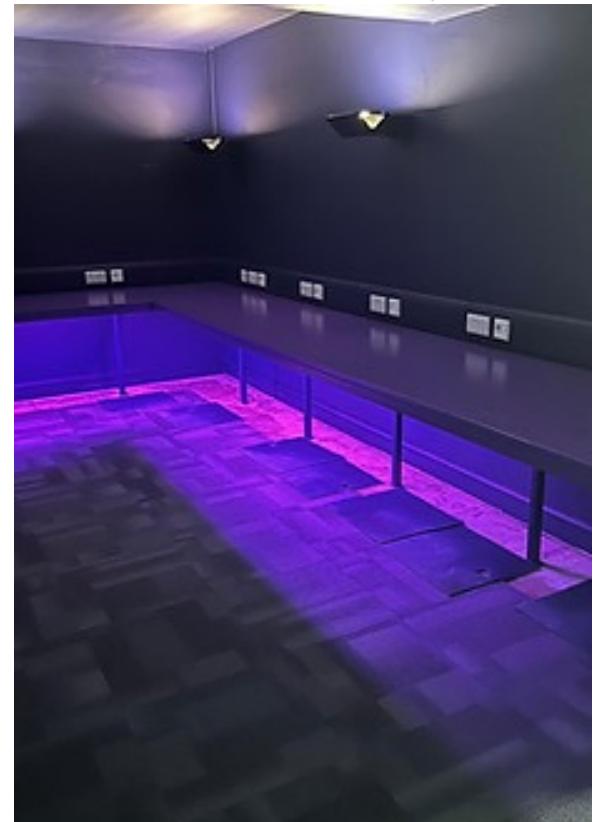
- For more details and **term card** checkout our website
- <https://ox.compsoc.net>





Oxford Gaming and Esports Society

- Oxford's first dedicated gaming and esports space this year based at Jesus College.
- We arrange a myriad of activities across the year, both competitive and for fun.
- For more details and term cards:
<https://www.oxfordesports.co.uk/>



Where can I get the slides?

- <https://gg.gg/pythonLTC> [\(Link\)](#)
 - ^ Session notes, slides, exercises, answers

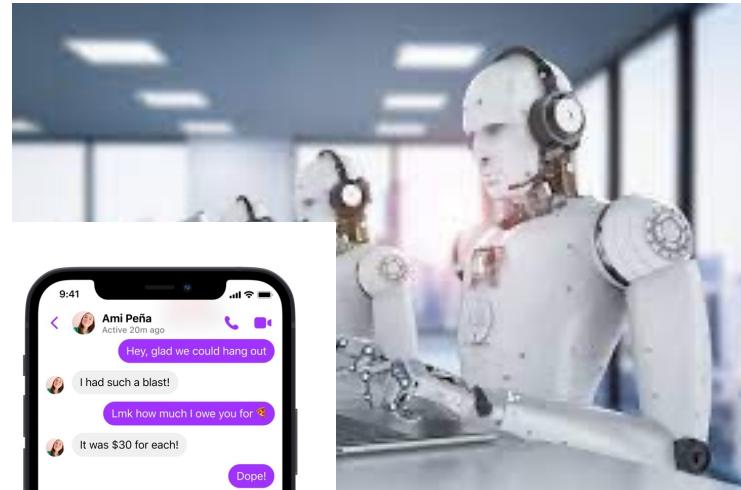
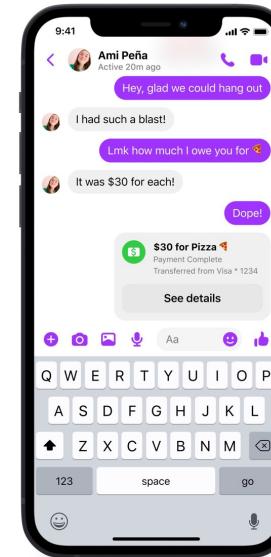
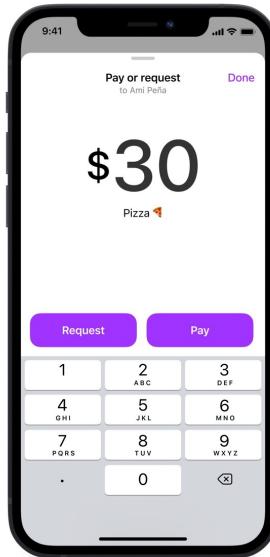
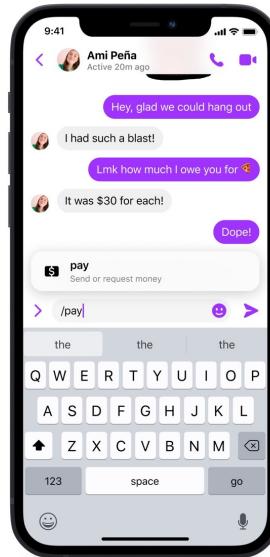
What can programs do?



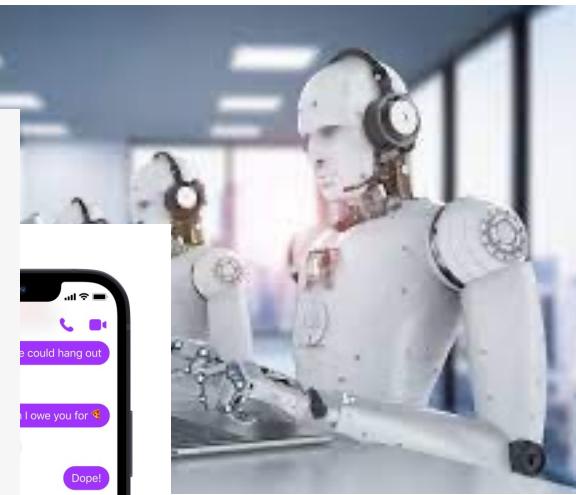
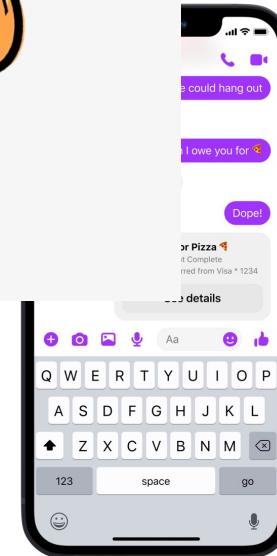
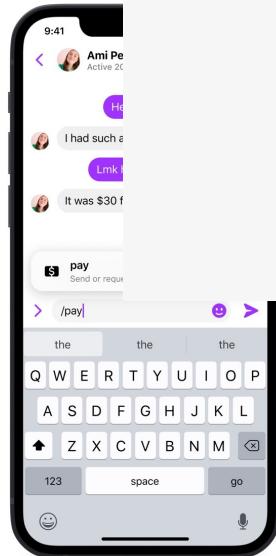
What can programs do?



What can programs do?



What can programs do?





What can WE do with Python?

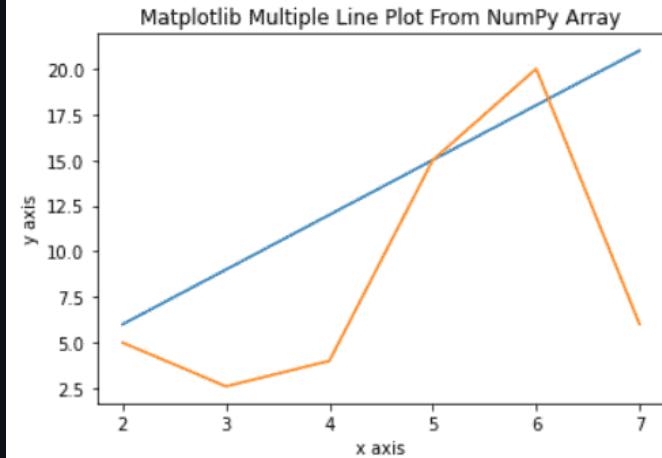
```
How many players are there? 2
Guess a number between 1 and 100
Player 1, please make a choice between 1 and 100: 50
Guess a number between 1 and 49
Player 2, please make a choice between 1 and 49: 25
Guess a number between 1 and 24
Player 1, please make a choice between 1 and 24: 12
Guess a number between 13 and 24
Player 2, please make a choice between 13 and 24: 18
Guess a number between 19 and 24
Player 1, please make a choice between 19 and 24: 22
Guess a number between 19 and 21
Player 2, please make a choice between 19 and 21: 20
Guess a number between 19 and 19
Player 1, please make a choice between 19 and 19: 19
Player 1 guessed the number! It is 19
```

What can WE do with Python?

The image shows a terminal window titled "Snake Eater" with a score of 25. A green snake is visible on the left. To the right, a code editor displays a script for a number-guessing game. The terminal output shows the game's logic, including a while loop that halves the search range until it finds the number 19.

```
rs are there? 2
between 1 and 100
se make a choice between 1 and 100: 50
between 1 and 49
se make a choice between 1 and 49: 25
between 1 and 24
se make a choice between 1 and 24: 12
between 13 and 24
se make a choice between 13 and 24: 18
between 19 and 24
se make a choice between 19 and 24: 22
between 19 and 21
se make a choice between 19 and 21: 20
Guess a number between 19 and 19
Player 1, please make a choice between 19 and 19: 19
Player 1 guessed the number! It is 19
```

What can WE do with Python?



```
between 13 and 24  
se make a choice between 13 and 24: 18  
between 19 and 24  
se make a choice between 19 and 24: 22  
between 19 and 21  
se make a choice between 19 and 21: 20
```

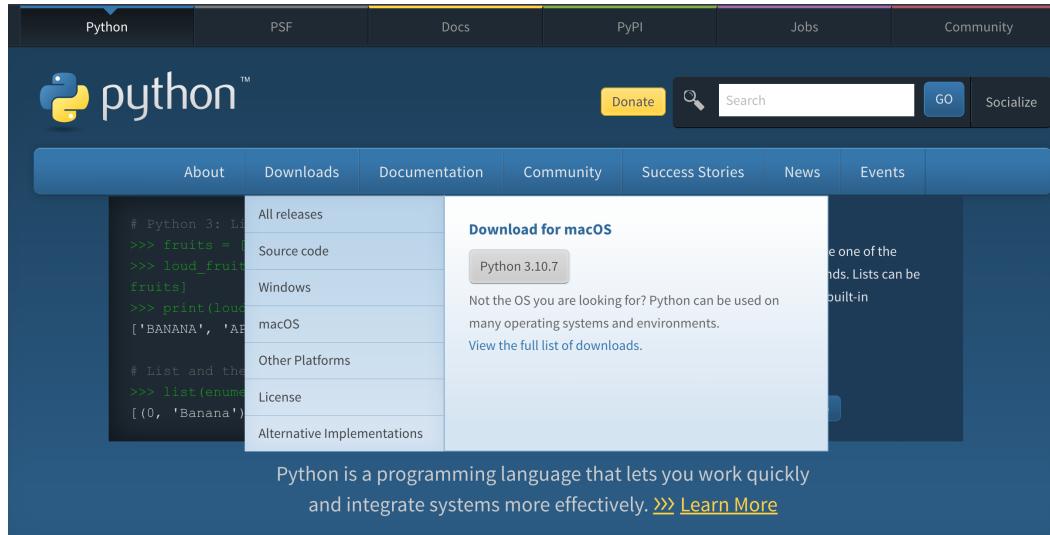
```
Guess a number between 19 and 19  
Player 1, please make a choice between 19 and 19: 19  
Player 1 guessed the number! It is 19
```

Missed a session?

- YouTube recommendation on the materials page
- Please still come to the next one!
- Videos 1, 2, 3, 7 for this session
- <https://www.youtube.com/watch?v=HBxCHonP6Ro&list=PL6gx4CwL9DGAcbMi1sH6oAMk4JHw91nC&index=1>

Installation

- If you have any issues, you can stay behind after the session and we can help.
- For now, use repl.it.
- <https://replit.com/new/python3>



Python as a calculator

```
>>> 3+4
```

```
7
```

```
>>> 3-4
```

```
-1
```

```
>>> 3*4
```

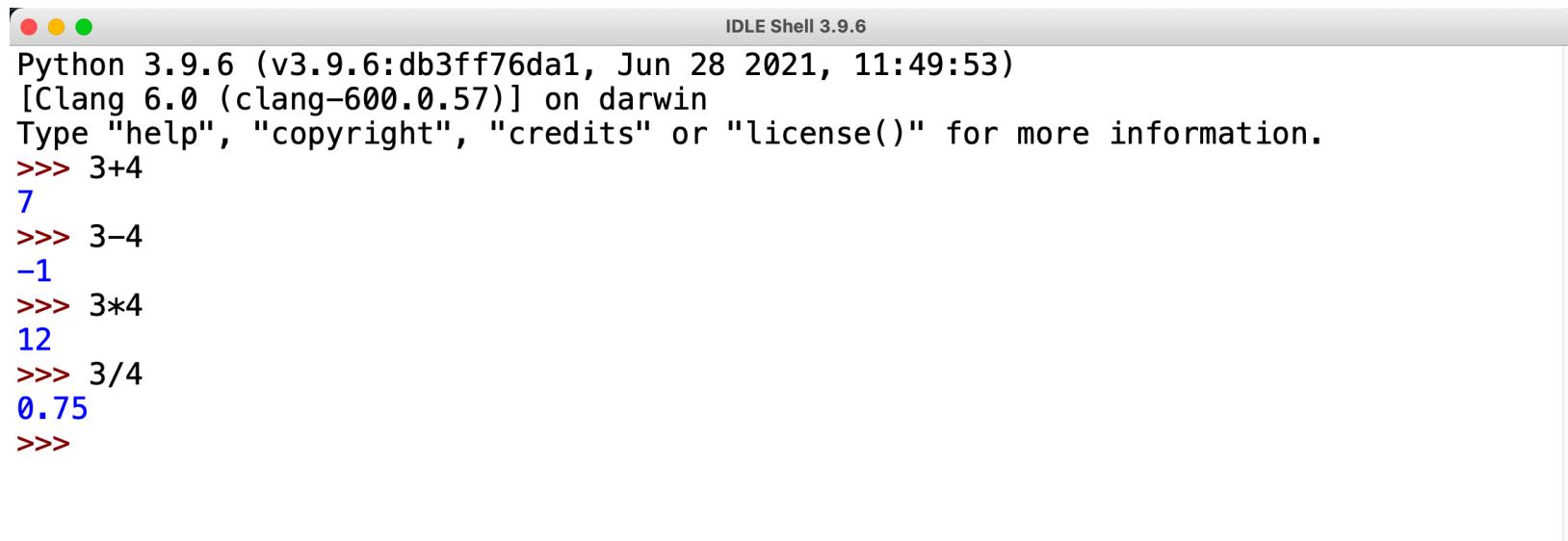
```
12
```

```
>>> 3/4
```

```
0.75
```

IDLE (Interactive Interpreter)

- Where we LEARN the basics, line by line



The screenshot shows the IDLE Shell 3.9.6 interface. The title bar reads "IDLE Shell 3.9.6". The main window displays the following Python session:

```
Python 3.9.6 (v3.9.6:db3ff76da1, Jun 28 2021, 11:49:53)
[Clang 6.0 (clang-600.0.57)] on darwin
Type "help", "copyright", "credits" or "license()" for more information.

>>> 3+4
7
>>> 3-4
-1
>>> 3*4
12
>>> 3/4
0.75
>>>
```

Text editor

- Where we write REAL programs

```
===== RESTART: /Users/oscar/Desktop/session1.py =====
>>>
3+4
3-4
3*4
3/4
```

You need to print them!

```
===== RESTART: /Users/oscar/Desktop/session1.py =====
7
-1
12
0.75
>>> print(3+4)
print(3-4)
print(3*4)
print(3/4)
```

Print

```
print(3+4)
```

Print text

```
print("Hello, world!")
```

Variables - as a box

```
greeting1 = "Hello!"  
my_favourite_number = 3  
pi = 3.14  
_underscore = "_"  
  
print(greeting1)  
print(my_favourite_number)  
print(pi)  
print(_underscore)
```

Variables - can be changed

```
my_favourite_number = 3
print(my_favourite_number) # Prints 3
my_favourite_number = 4
print(my_favourite_number) # Prints 4
```

Naming conventions

- Numbers, alphabets, and underscores
- No spaces
- Cannot start with a number
- Cannot use Python keywords (e.g. print)

Comments - Ignored by program

```
# this is the first comment
spam = 1 # and this is the second comment
# ... and now a third!
text = "# This is not a comment because it's inside
quotes."
print("Hello, world!") # Prints Hello, world!
```

Python as a calculator

```
print(9 / 4) # Division  
print(9 // 4) # Integer division  
print(9 % 4) # Remainder  
print(3 ** 4) # Exponentiation (i.e.  
calculates 3 to the power of 4)
```

Order of Precedence - Same as normal Maths

`2 ** 2 * 3 ** 2 + 4 ** 2`

→

`((2 ** 2) * (3 ** 2)) + 4 ** 2`

Use parenthesis to change the order of precedence

Data Types

1	1.5	"a"
5	40.4550590	"b"
15	1.0	"boy"
15404505	53.4	"I am a boy!"
-455	-0.588	"Hello world"
0	-458.5	"Test"

INTEGERS

Data Types

1	1 . 5	"a"
5	40 . 4550590	"b"
15	1 . 0	"boy"
15404505	53 . 4	"I am a boy!"
-455	-0 . 588	"Hello world"
0	-458 . 5	"Test"

INTEGERS

FLOATS

**(with decimal
points)**

Data Types

1	1.5	"a"
5	40.4550590	"b"
15	1.0	"boy"
15404505	53.4	"I am a boy!"
-455	-0.588	"Hello world"
0	-458.5	"Test"
INTEGERS	FLOATS	STRINGS
		(text)

Strings

- Double quotes!!!!!!
- String "addition"
- print("Hello, " + "world!")
- String "multiplication"
- print("Hello"*3)

Type Conversion

- `int("4") # 4`
- `str(4096.5) # '4096.5'`
- `int("Hello!") # This will cause Python to crash. "Hello!" is not a number!`

Reading input

- `name = input("Please enter your name: ")`
- `print("Hi, " + name + "!")`

Example 1: Our favourite number

```
your_favourite_number = input("Please enter your favourite  
number: ")  
print("Your favourite number times two is: " + 2 *  
your_favourite_number)
```

Example 1: Our favourite number

```
your_favourite_number = int(input("Please enter your  
favourite number: "))  
print("Your favourite number times two is: " + str(2 *  
your_favourite_number))
```

Example 2: Celsius to Fahrenheit

$$^{\circ}\text{F} = 9/5 * ^{\circ}\text{C} + 32$$

Input temperature in Celsius: 25

25.0 Celsius = 77.0 Fahrenheit

Example 2: Celsius to Fahrenheit

```
c = float(input("Input temperature in Celsius: "))
f = 9 / 5.0 * c + 32
print(str(c) + " Celsius = " + str(f) + " Fahrenheit")
```

Exercises

Try to write a similar program that converts Fahrenheit to Celsius

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9$$

```
f = _____(_____("Input temperature in Fahrenheit: "))  
c = _____  
print(_____ + " Fahrenheit = " + _____ + " Celsius")
```

When attempting these exercises, I suggest you type out the code by hand, rather than copy-pasting it. Pay attention to all of the symbols you are typing and see if you can recall why they are there.

Sides and more exercises at: <https://gg.gg/pythonLTC>

If Statements

```
number = int(input("Please enter a number: "))
if number < 10:
    print(number + " is a small number.")
```

If Statements

```
number = int(input("Please enter a number: "))

if number < 10:
    print(number + " is a small number.")

else:
    print(number + " is a large number.")
```

Exercises

1. **One detector:** create a program, which takes an input (an int) and outputs "This number is 1" if the input was 1 and "This input was not 1" otherwise.

```
number = int(input("Please enter a number: "))
if _____:
    print("The number is 1.")
else:
    print("The number is not 1.")
```

2. **Subtraction:** create a program, which takes two integers, and outputs the result of the larger number subtracting the smaller number.

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END

Thanks for coming!
See you next time!