Python

Getting started

What is Python?

Python is a high-level programming language that is designed to simplify certain types of programming approaches

High-level does not mean better

C++ is Low Level - close to the machine

Python is High Level - further from the Machine!

What can it do?

Python can do almost anything

Mostly, Python interacts with native (C) code under the hood.

It vastly simplifies many complex operations - specifically handling large amounts of data.

However, it’s not very fast

And is useless for real-time, interactive applications

When should I use Python?

It’s the most powerful way to create web applications

It’s the easiest way to begin to understand Data Science and Machine Learning (because it makes managing data much easier)

It’s a great way to connect things together to build prototypes without requiring large amounts of programming skill

How Do I Get Python

Python is installed by default on macOS but it’s not the most up to date version.

It is a bit more tricky to install on windows. But it's not too difficult.

The easiest way to get Python is to use Anaconda.

https://www.anaconda.com/products/individual

How Do I Get Python

Python has a huge number of libraries and packages

You need to install these each individually to make things work

We can install packages using something called ‘**pip**’.

We can also use ‘**conda**’.

What is a Python ‘environment’?

Because Python has a huge number of libraries and packages, sometimes they conflict / break each other.

We can have different Python environments, each with different versions of software in them.

Anaconda (and **conda**) can take care of this for us.

If you use PIP to install something, it ends up in every environment you have.

The easiest way to get around this is to **NOT use ‘pip’ to install packages until you know what you are doing**, and to use ‘**conda**’ instead.

How do I use Python

There are lots of different ways of using Python.

You can use the terminal.

You can use jupyter notebook (which is what we’re doing today).

You can also use about 1000 other tools including PyCharm, Jupiter Lab, Visual Studio Code etc.

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What is Python 2? Should I care?

Python is annoying because:

Python2 is a bit easier to learn than Python3

But Python2 is no longer in use

Luckily the differences aren’t actually that hard to get your head round.

range / xrange

Some of the most useful objects have been renamed

xrange is now called range.

(it generates a range of numbers, e.g. 1-100)

Programming in Python

https://www.w3schools.com/python/default.asp

Super easy tutorial

Programming in Python

Printing to the console

Printing

Print statements need brackets

```
print “hello world” # python 2

vs

print (“hello world”) # python 3
```

Programming in Python

string concatenation, using quotes

String Concatenation

String concatenation and substitution has changed a bit and is not really standardised.

You will see people using different approaches

e.g.

```
x = "awesome"
```

```
print("Python is " + x) # very similar to JS
```

You can use the .format method and this always works.

e.g. print("{}, it's {}”.format(“hey”,"ok"))

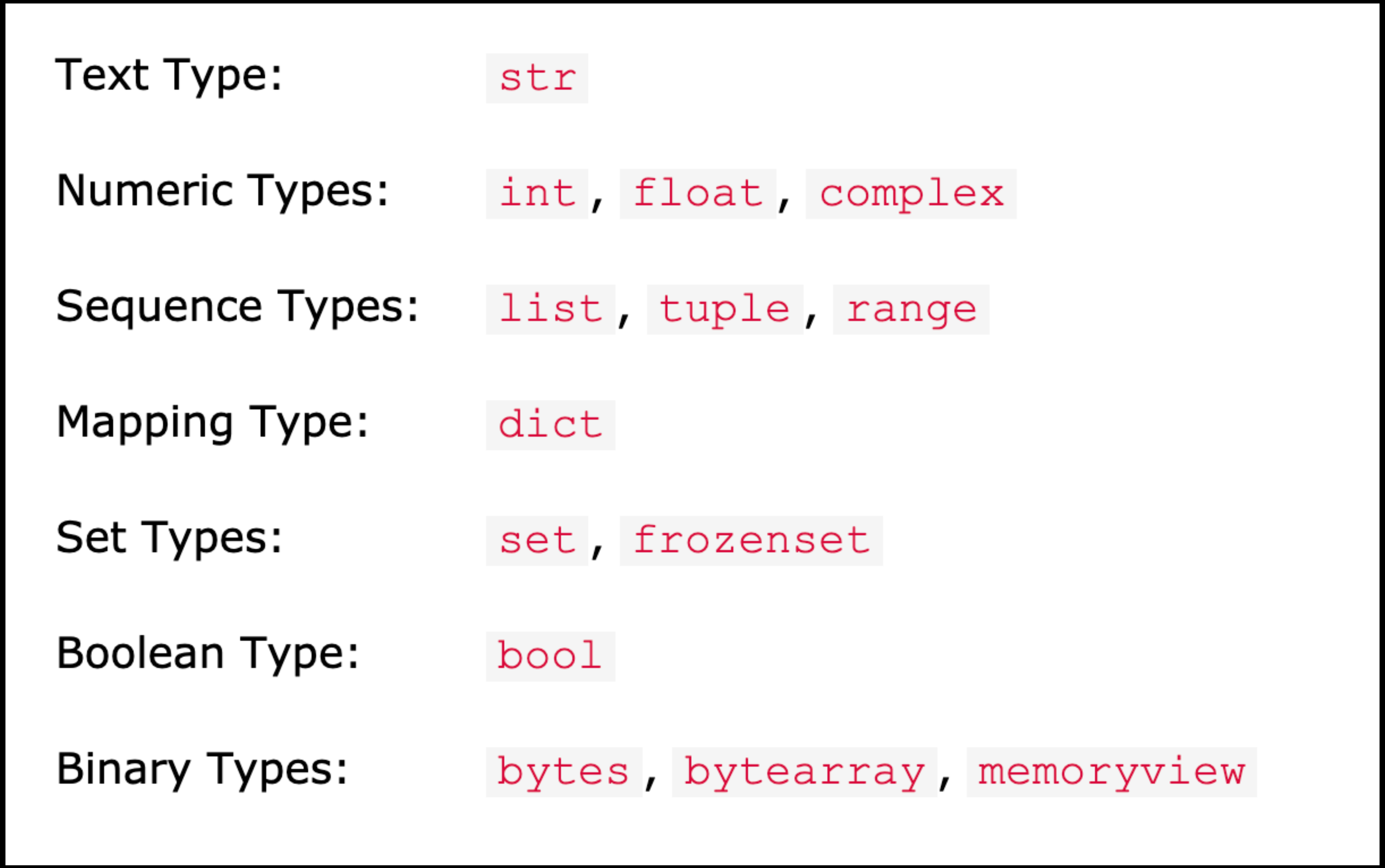
Programming in Python

variables don’t need to be declared!

ints, floats, strings

Print (type(data)) will tell you the type

Python Data Types



Text Type:	`str`
Numeric Types:	`int`, `float`, `complex`
Sequence Types:	`list`, `tuple`, `range`
Mapping Type:	`dict`
Set Types:	`set`, `frozenset`
Boolean Type:	`bool`
Binary Types:	`bytes`, `bytearray`, `memoryview`

Python Arrays

Four different types of arrays:

List is a collection which is ordered and changeable. Allows duplicate members.

Tuple is a collection which is ordered and unchangeable. Allows duplicate members.

Set is a collection which is unordered and unindexed. No duplicate members.

Dictionary is a collection which is unordered and changeable. No duplicate members.

Lists

Mostly you will just use **Lists** and **Dictionaries**

A list:

```
myList = ["Creative", "Art", "Project"]
```

Lists

Accessing elements of a list just like an array in JS or C / C++

```
print (myList[0])
```

Prints “Creative”

Dictionaries

A dictionary:

```
myDict = {
  "Artist": “Nam June Paik",
  "Artwork": “TV BUDDHA",
  "year": 1974
}
```

Dictionaries

Accessing an element in a Dict

print (myDict[“Artist”])

Prints “Nam June Paik”

The Usual Stuff

Basic operators

Conditionals, loops, functions

```
for letter in 'Python': print 'Current Letter :', letter
```

Other important things..

keywords

https://www.w3schools.com/python/python_ref_keywords.asp

comments #

import statements ..

TASK