



University
of Glasgow

Programming with Python: Day 1

Dr Iain Martin, Mr Laurynas Mince,
Mr Aaron Peat, Mr Dwayne Spiteri

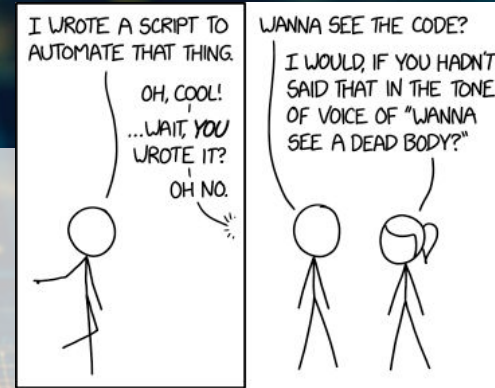
**WORLD
CHANGERS
WELCOME**

Make sure you have received a username and a password



What is Programming?

- A way of getting computers to do what you want them to
 - But computers don't speak English ...
- Programming languages allow you to tell a computer what you want it to do.
- Like spoken languages there are many and each one is written differently, but they share similar principles.
- These languages include C++, JavaScript, BASIC, and ...





Python

- Here are some of the many types of objects that a Python programmer can use,
 - *Numbers*
 - Integers
 - Floats
 - *Words*
 - Strings
 - *Lists*
 - Can be of numbers or strings
 - *Dictionaries*
 - A list of words with entries attached
 - *True/False*
 - Booleans





Jupyter (the 'py' is short for python)

- If Python was a written language, Jupyter is the paper it is written on.
- Jupyter is a web based interface for using Python.
- It breaks your code into chunks which makes it easier to find problems, and is therefore simple to use.





Two days of Snek Madness: The Course

- Today - [IntroductionToPython.ipynb](#)
 - *Python basics*
 - Types of objects you can use in Python (types of words)
 - How to use those types of things (phrases/sentence structure)
 - *Advanced Python (optional)*
 - Advanced types of things you can use (exceptions)
 - Advanced combinations of these (poetry)
- Tomorrow - [Exoplanets.ipynb](#)
 - Manipulating Astronomical Datasets



Getting Started

- Enough from us for now. You should have all received a slip of paper with a username and password.
- The Jupyter notebooks can be accessed in the **'Introduction_To_Python'** folder
 - [IntroductionToPython.ipynb](#)
- Run the notebook and complete the exercises and we will be around to help.



University
of Glasgow

Programming with Python: Day 2

Dr Iain Martin, Mr Laurynas Mince,
Mr Aaron Peat, Mr Dwayne Spiteri

**WORLD
CHANGERS
WELCOME**

Now we get to the interesting stuff...



Python Recap

- There are a few things we should go over from yesterday before getting started today.
- **For loops**
 - They allow you to loop over something. Like a range of numbers.
- **Ifs**
 - They allow you execute some code only if a condition is met.
- **Typecasting**
 - Allows you to turn a variable of one type into another.

```
In [1]: for i in range(0, 5):  
        print(i)
```

```
0  
1  
2  
3  
4
```

```
In [2]: i=4  
        if i==4:  
            print("i is 4!")
```

```
i is 4!
```

```
In [3]: print(float('5'))
```

```
5.0
```




Today's Task

- Searching through a real astronomical data set to investigate exoplanets that orbit nearby stars.
- There are three things you need to know today.
 - Don't worry if they don't make sense yet!



The database is in a comma separated variable format or .csv

1) You will import the database as a **'list' of 'dictionaries'**.

Each element in the list is a dictionary.
To get Jacobs height for example:

```
PeopleDict[3]['height']
```

entry wanted

Place in list (python counts from 0)

```
[{'given_name': 'john', 'number': '01105144449', 'height': '1.54m'},  
{ 'given_name': 'jane', 'number': '09272440787', 'height': '1.61m'},  
{ 'given_name': 'joey', 'number': '05963105034', 'height': '1.15m'},  
{ 'given_name': 'jacob', 'number': '0953608210', 'height': '1.24m'},  
{ 'given_name': 'jenny', 'number': '03605038731', 'height': '1.35m'},  
{ 'given_name': 'janet', 'number': '', 'height': '1.78m'}]
```

2) Some of the entries in the dictionary are empty.

You can refer to something that is empty using single quotes (' '). You will need an **'if'** statement to skip over these if you looping over numbers

3) Functions do not have to return anything.

```
def squareaddone(num):  
    sao=num*num+1  
    return(sao)
```

```
def plotthis(image):  
    plt.plot(image)
```




Getting Stuck into Day 2

- Today's jupyter notebooks can be accessed in the '**Introduction_To_Python**' folder
 - [Exoplanets.ipynb](#)
- Run the notebook and complete the exercises and we will be around to help.