CoGrammar

Lecture 1: Getting Started with your Bootcamp

SKILLS FOR LIFE
SKILLS BOOTCAMPS

Department for Education

Lecture Housekeeping

- The use of disrespectful language is prohibited in the questions, this is a supportive, learning environment for all - please engage accordingly. **(FBV: Mutual Respect.)**
- No question is daft or silly - **ask them!**
- There are **Q&A sessions** midway and at the end of the session, should you wish to ask any follow-up questions. Moderators are going to be answering questions as the session progresses as well.
- If you have any questions outside of this lecture, or that are not answered during this lecture, please do submit these for upcoming Open Classes. You can submit these questions here: **Open Class Questions**

Data Science Lecture Housekeeping cont.

- For all **non-academic questions**, please submit a query: **www.hyperiondev.com/support**
- Report a **safeguarding** incident: **www.hyperiondev.com/safeguardreporting**
- We would love your **feedback** on lectures: **Feedback on Lectures**

Lecture Objectives

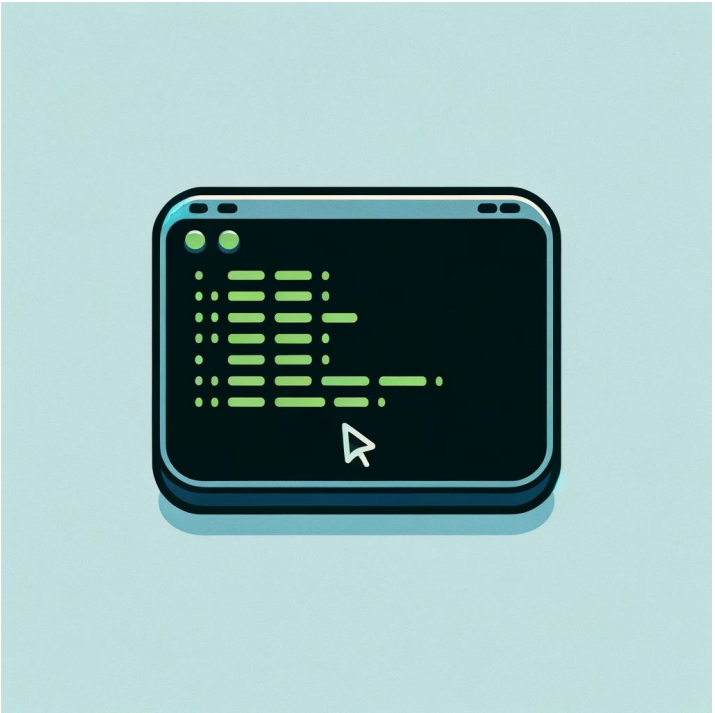
- The basics of how to navigate your Command Terminal.
- How to script commands for you terminal.
- Introduction to Python.
- Cover Python data types

What is the Command Terminal?

What does it do?

Why do we need it?

Why do we need to know how to use it?



Command Terminal

The Command Terminal allows for efficient interaction with the system's core functionalities and file management.

It also offers more control and precision than graphical user interfaces.

It can help enable automation of repetitive tasks through scripting, saving time and reducing errors and it’s also fundamental for programming, managing databases, version control (like Git), and accessing cloud services.

Common Commands

Description	Windows cmd	Windows Powershell (alias)	macOS/Linux
Displays the current working directory	chdir	pwd	pwd
Changes the directory	cd	cd	cd
Move up one level in the directory	cd ..	cd ..	cd ..

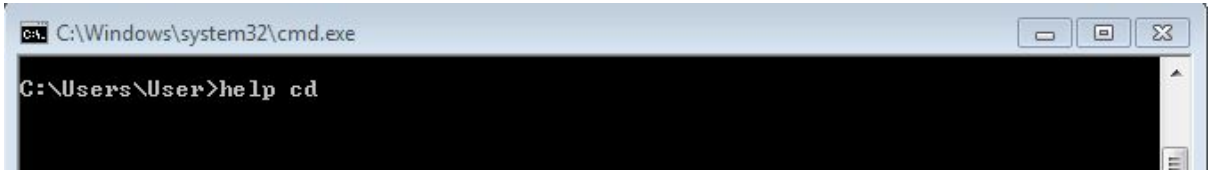
Common Commands

Description	Windows cmd	Windows Powershell (alias)	macOS/Linux
Displays a list of a directories files and subfolders	dir	dir	ls
Create a new directory	mkdir	mkdir	mkdir
Remove files and directories	del / rmdir	del / rmdir	rm

Command Line Built-in Help

- ★ This can be used to view all the commands that are executable.
- ★ Examples:

On windows type “help cd”



On Mac OS or Linux type “man cd” or “what is cd”

What is a Batch file?

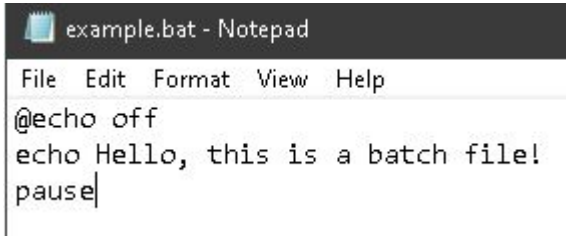
A batch file is simply a text file containing a series of commands that are executed by the command line interpreter in a Windows operating system.

It helps us automate repetitive tasks, running multiple commands sequentially without manual input.

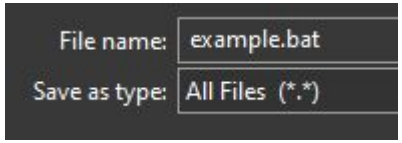
These have the following extensions:
.bat or .cmd

Batch file example:

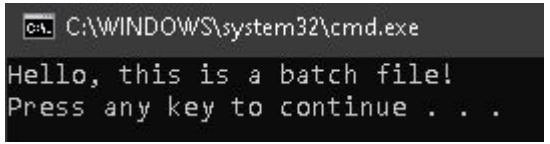
Open up a text editor:
(Even notepad can work)



Save the file but include ".bat"
at the end and set type as "All Files"



Run the batch file:



What is a Bash script?

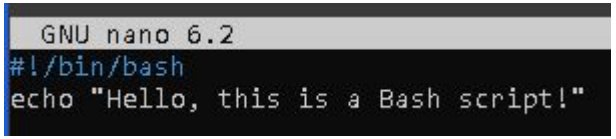
A Bash script is a text file containing a series of commands to be executed by the Bash shell, primarily used in Unix and Linux systems.

Just like Batch files, it automates tasks, streamlines processes, and executes complex sequences of commands efficiently.

These have the following extension:
.sh

Bash file example:

Open up a text editor:



Save the file and include “.sh”

Make the Script Executable:

Run the script:

How do you change the directory in the command terminal?

A. pwd
B. dir
C. cd
D. mkdir

How do you create a new directory in the command terminal?

A. cd [filename]
B. dir
C. cp
D. mkdir

Let’s Breathe

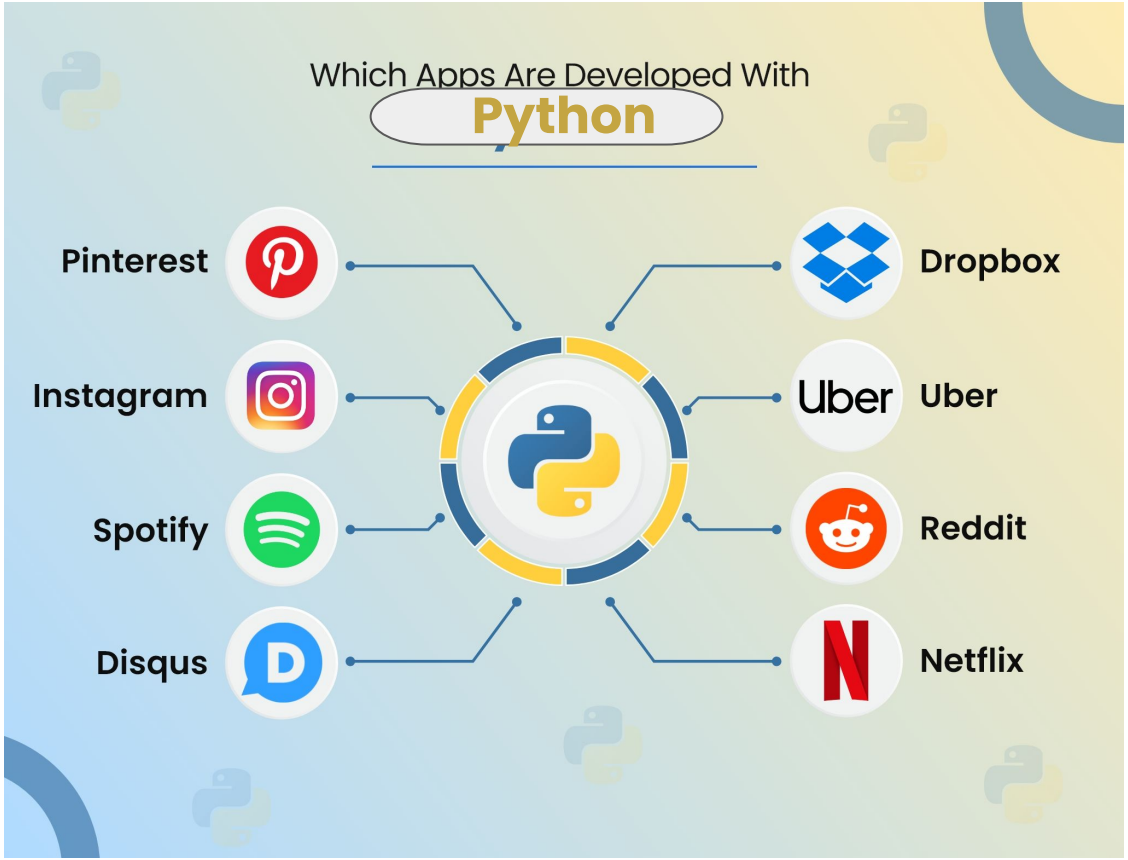
Let’s take a small break before moving on to the next topic.

What is Python?

Python is a widely used, high level programming language, mainly utilised for general purpose programming.

Although Python is old (around 32 years old), it is still being improved on a regular basis. It is well embedded into the market, making it a good learning investment.

Python was originally created by Guido van Rossum and first released on the 20th of February 1991. These days, Python is maintained by the Python Software Foundation.


Which Apps Are Developed With
Python
Pinterest
Instagram
Spotify
Disqus
Dropbox
Uber
Uber
Reddit
Netflix

Python Basics

★ **We will be covering the following to become more familiar with the basics of Python :**

- **The print() function and the input() function.**
- **Creating variables and variable naming conventions.**
- **The 4 basic data types**

The Print Function

- ★ The print() function is used when the output of the program needs to be displayed.
- ★ This is achieved by entering the print command with an argument, which creates a statement
  - command + argument = statement
- ★ Example:

```
print("Hello World")
```

The Input Function

- ★ The input() function is a means to receive user input, should it be required.
- ★ To achieve this, we enter the input command along with the instructions for the user.
- ★ What happens then is that the program will be halted, until it receives input from the user.
- ★ Example :

```
name = input("Please enter your name : ")
```

Variables

- ★ Variables are a named storage location in memory for values to be stored, e.g. name = “Jimmy”.
- ★ All variables need a descriptive name.
- ★ The value is what the variable stores.
- ★ To create a variable, we first type the name, then an equals to sign (=), then the value. This is known as variable assignment.

More on Variables

- ★ **Variables can be assigned to other variables.**
- ★ **In Python, the variable's value can be updated as the program runs.**
- ★ **Several variables can be assigned at the same time in one line.**

More on Variables

★ **Example :**

```
python_is_cool = 100

another_variable = python_is_cool

python_is_cool = 1000

multiple, variables, assigned = 5, 10, 15
```

Variable Naming

- ★ **Selecting a good name for your variables is key to making your programmes easier to understand.**
- ★ **For example, a variable tracking a player's health points in a game could be effectively named health_points, instead of something ambiguous or difficult to understand such as hp or points.**

Variable Naming Rules

- ★ It is vital that variables are given descriptive names that reference the value stored.
- ★ Here are a few rules to follow when naming variables :
  - Variables must start with a letter or underscore.
  - The remainder of the name can consist of letters, numbers and underscores.
  - Variables are case sensitive, meaning that name and Name are treated as two different variables.

Variable Naming Rules

- ★ Keep in mind that Python keywords should not be used as a variable name.
- ★ Python keywords are reserved and has a fixed meaning which cannot be redefined by the programmer.
- ★ For instance, you should not name a variable print, since Python already recognises this as a keyword.
- ★ Naming must also comply with PEP8 standards

Variable Data Types

- **What is a Data Type :**
  - **It is the type of value within a variable**
- **Python has several data types, however we will look into the most common ones, which are:**
  - **Integers**
  - **Floats**
  - **Strings**
  - **Booleans**

Python Syntax Rules

- ★ All programming languages have syntax rules.
- ★ Syntax meaning the “spelling and grammar rules” of a programming language.
- ★ Common syntax errors consist of:
  - Not closing quotation marks (“”)
  - Not closing parenthesis
  - Case sensitivity : remember that Python will read print() and Print() differently.
- ★ Syntax errors will prevent your program from running and will also display an error.

What are Strings?

- ★ **Strings are essentially any data made up of a sequence of letters or other characters.**
- ★ **Simply put, strings are just characters that have been “strung” together.**

The String Data Type

- ★ Strings in Python are detected by quotation marks (“”) or inverted commas (‘’)
- ★ Example :

```
quotation_str = "The quick brown fox jumps over the lazy dog"

inverted_comma_str = 'Strings are rather useful, what do you think?'
```

Numbers in Python

- Here we will speak of 3 types of numbers used in Python:
  - Integers : whole numbers that are either positive or negative :
    - E.g. -32, 0, 600, 138227, etc.
  - Floats : decimal numbers that are also either positive or negative:
    - E.g. 6.2, -27.157, 33.3333, etc.
  - Complex : numbers that have a real and imaginary part, both of which are floats.

Declaring Numeric Variables

- ★ **Python is able to determine what data type a variable is based on the data's characteristics:**

- ★ **num_one = 7 → no decimal point, no quotation marks, meaning it has to be an integer.**

- ★ **avg_grade = 8.3 → decimal point, no quotation marks, meaning it has to be float.**

Casting Data Types

- **In Python, we can convert variables into other data types should we need to. This is known as casting.**
  - **Cast to String → str()**
  - **Cast to Integer → int()**
  - **Cast to Float → float()**

Booleans

- Booleans can only store one of two values : True or False.
- These are mainly used for conditional checks.
- Booleans should be declared with capitals. Using lowercase for booleans will return an error in Python.
- Example :

```
var = True

var2 = False

# Notice how 'true' and 'false' lights up a
# different colour.
```

Booleans

We can call values that result in True , or values that result in False.

Besides False conditional checks, there are other things that are naturally falsy. These include : empty strings, None and Zero.

Integers & Floats as Booleans

- ★ **Both integers and floating point numbers can be converted to boolean using the bool() function.**
- ★ **An int, float, or complex number set to zero will return as False.**
- ★ **An int, float, or complex number set to any other value that is not zero, returns True.**

How do you define a variable in Python?

A. x = 1
B. int x = 1
C. x == 1
D. x: 1

Which function can be used to display a variable in Python?

A. input()
B. print()
C. display()
D. Print()

Which of the below is an example of a bad variable name?

A. name = “Tom”
B. x = 23
C. total_count = 42
D. Is_running = True

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Q & A SECTION

Please use this time to ask any questions relating to the topic, should you have any.

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Thank you for joining!