SHE LOVES DATA

Introduction to Python

September 2020 | Virtual Workshop

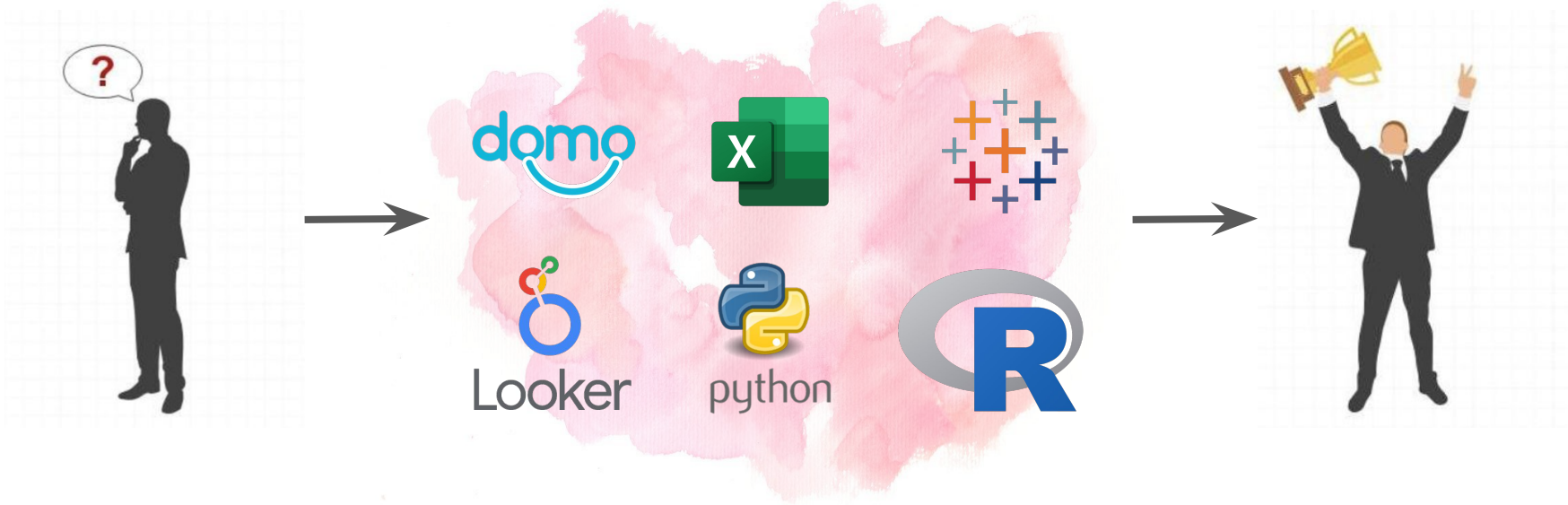
INTRODUCTION

- B.S. Math/Econ
- M.S. Mechanical Engineering
- Marketing Analytics
- Python for 4+ years
- Programming for much longer
    - Matlab & R

AGENDA

- Introduction to Python Basics
- Breakout Session 1
- Live Coding
- Breakout Session 2
- Live Coding
- Project

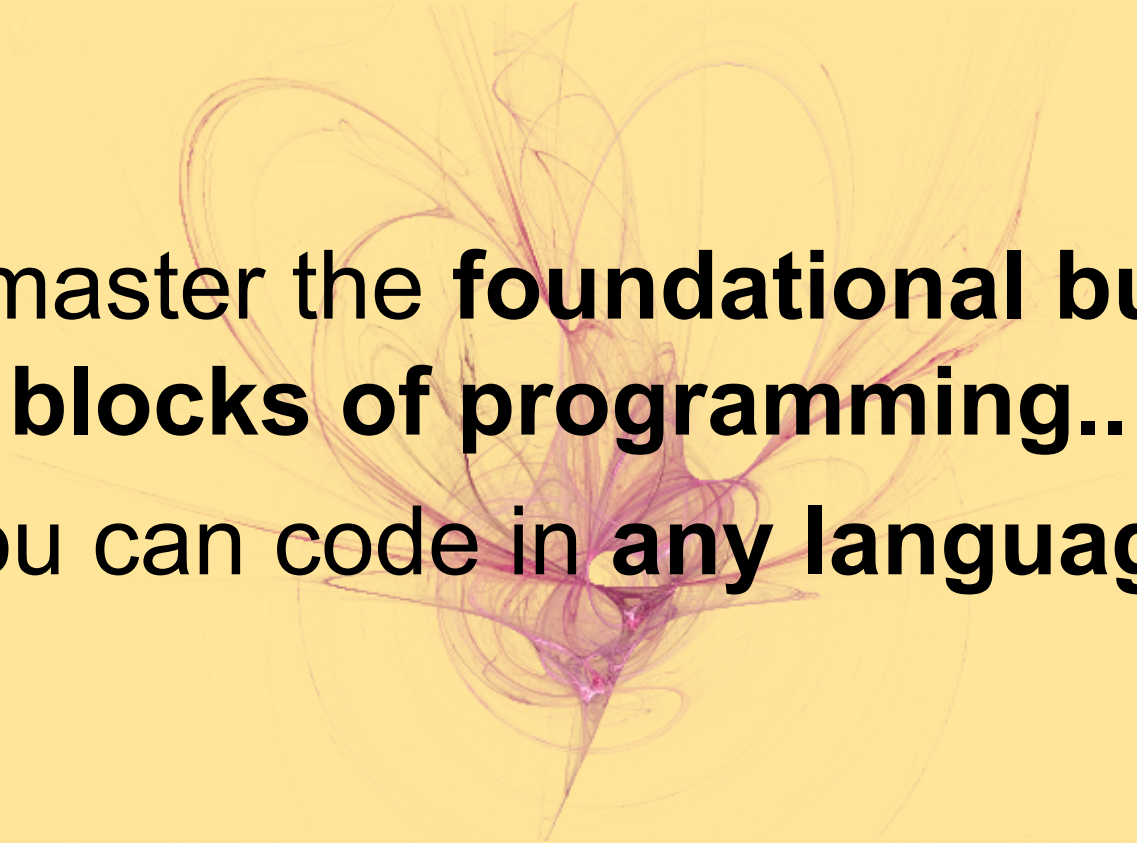
PYTHON AS A TOOL FOR DATA ANALYSIS



Business Problem **BI Tool Box** **Result**

What do all these tools have in common?

CODING



If you master the **foundational building blocks of programming..**

you can code in **any language**

WHY PYTHON?

- General purpose language

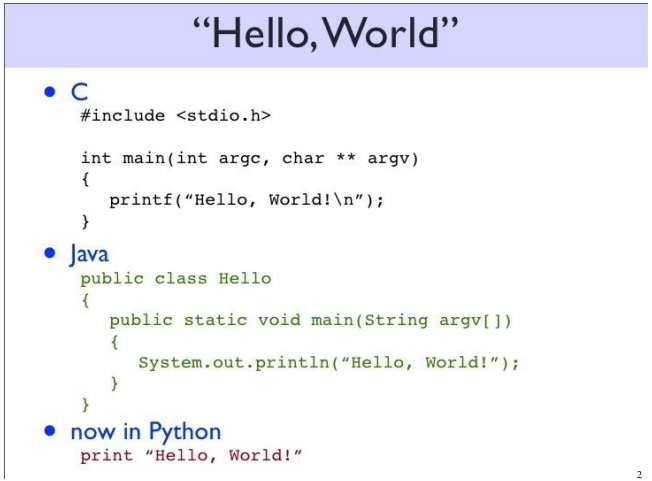
You can build..

- Desktop / Mobile Applications
- Web Applications
- Visualizations
- Predictive Models
- Automation

WHY PYTHON?

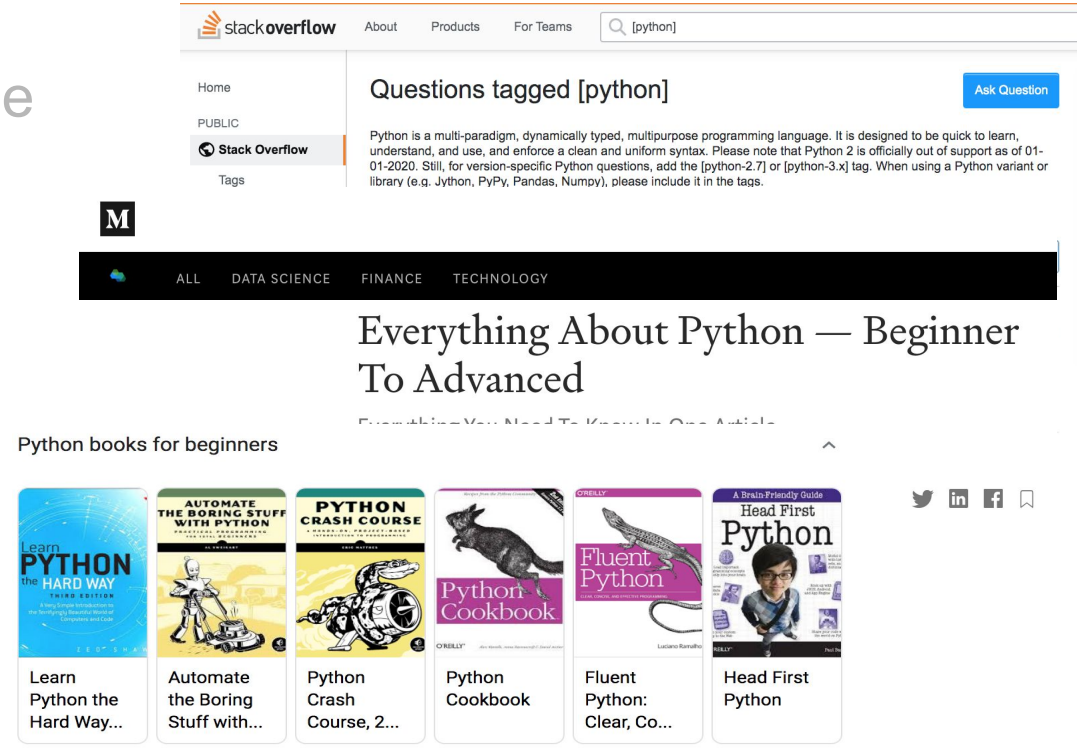
- General purpose language
- Easy to learn

The cleanliness of Python's syntax has led some to call it **"executable pseudocode"**



WHY PYTHON?

- General purpose language
- Easy to learn
- Large active community

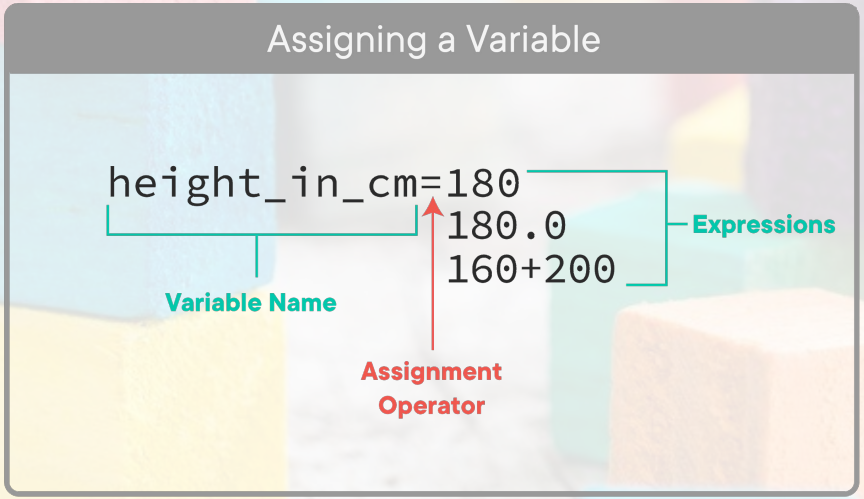


FOUNDATIONAL BUILDING BLOCKS

- Variables
- Sequences
- Loops
- If/Then (or Case/When)
- Functions

VARIABLES

Variables are containers for storing data values. A variable is created the moment you first assign a value to it.



DATA TYPES

Variables can store data of different types. Python has the following data types **built-in by default**:

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`

Example	Data Type
`x = "Hello World"`	str
`x = 20`	int
`x = 20.5`	float
`x = 1j`	complex
`x = ["apple", "banana", "cherry"]`	list
`x = ("apple", "banana", "cherry")`	tuple
`x = range(6)`	range
`x = {"name" : "John", "age" : 36}`	dict
`x = {"apple", "banana", "cherry"}`	set
`x = frozenset({"apple", "banana", "cherry"})`	frozenset
`x = True`	bool

VARIABLES CONT.

- Data types will expand if/when you load in different modules (ex. Pandas DataFrame, datetime objects, etc)
- Variables do not need to be declared with any particular type and can **change type** after they have been set.
- String variables can be declared either by using **single** or **double** quotes

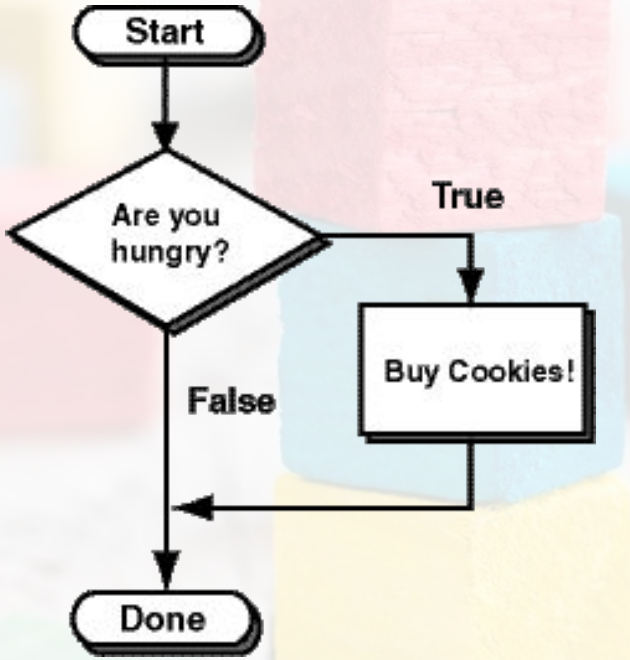
```
#Legal variable names:
myvar = "John"          # letters
my_var = "John"         # underscore between letters
_my_var = "John"        # underscore at the beginning
myVar = "John"          # caps
MYVAR = "John"          # all caps
myvar2 = "John"         # mix with numbers

# Note: Python is case sensitive,
# meaning myvar and myVar are not the same variables

#Illegal variable names:
2myvar = "John"
my var = "John"
my-var = "John"
my%var = "John"
```

SEQUENCES

There are four collection data types in the Python programming language:

- **List** is a collection which is **ordered** and **changeable**. Allows duplicate members.
- **Tuple** is a collection which is **ordered** and ***un*changeable**. Allows duplicate members.
- **Set** is a collection which is unordered and unindexed. No duplicate members.
- **Dictionary** is a collection which is unordered, changeable and indexed. No duplicate members.

IF/THEN



- Equals: `a == b`
- Not Equals: `a != b`
- Less than: `a < b`
- Less than or equal to: `a <= b`
- Greater than: `a > b`
- Greater than or equal to: `a >= b`

LOOPS

We can iterate over a sequence using a **for** loop.

Have a look at the recipe for the “for loop.”

```
for var in seq :
    expression
```

```
collection = ['hey', 5, 'd']
for x in ['hey', 5, 'd']:
    print(x)
```

```
1  collection = ['hey', 5, 'd']
2  for x in collection:
3      print(x)
```

```
hey
5
d
```

FUNCTIONS

A **function** is a block of code which only runs when it is called. You can pass data, known as parameters, into a function.

A function can return data as a result.

Example

```
def my_function():
  print("Hello from a function")

my_function()
```

POINT A TO POINT B

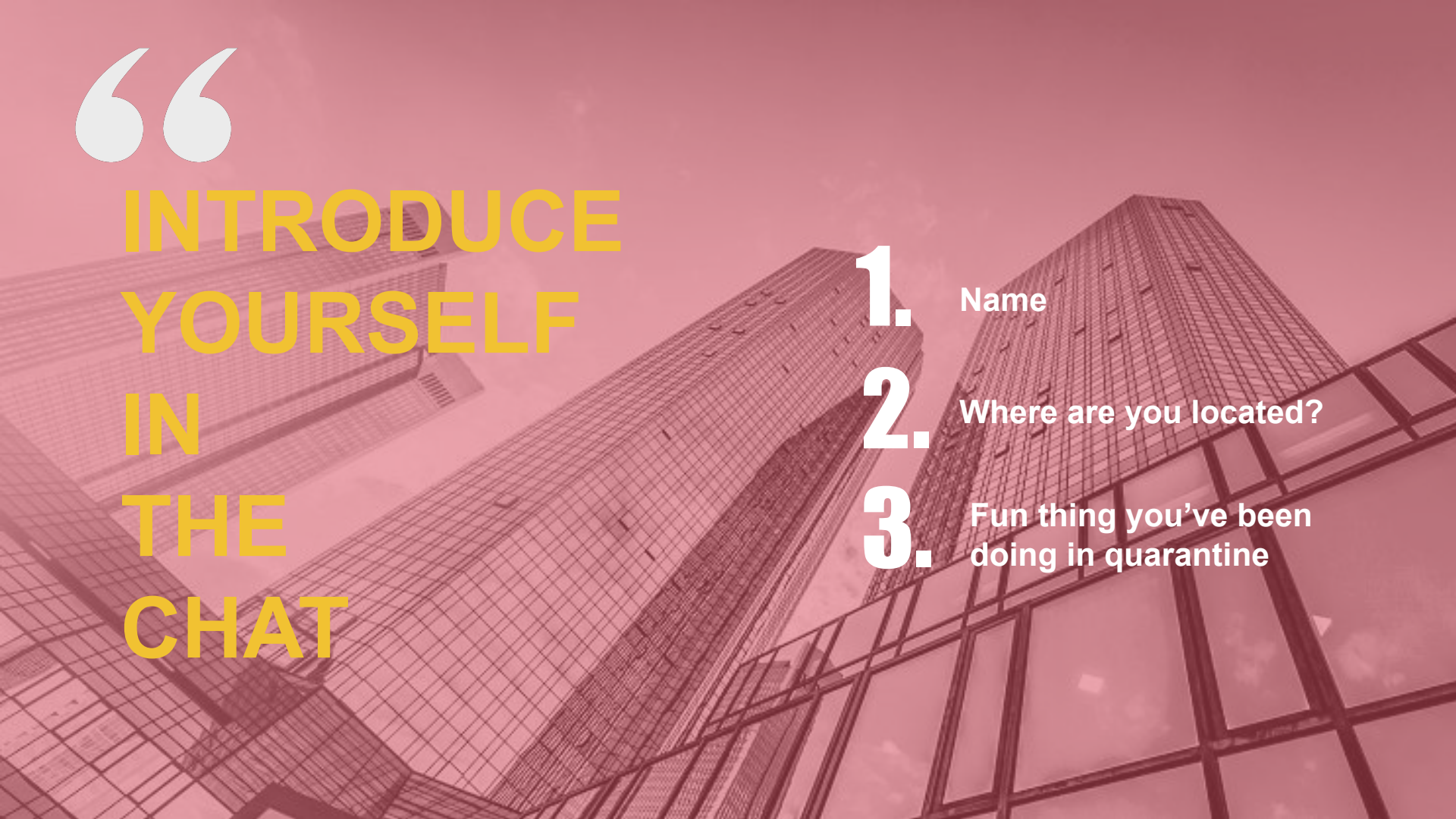
Business Problem

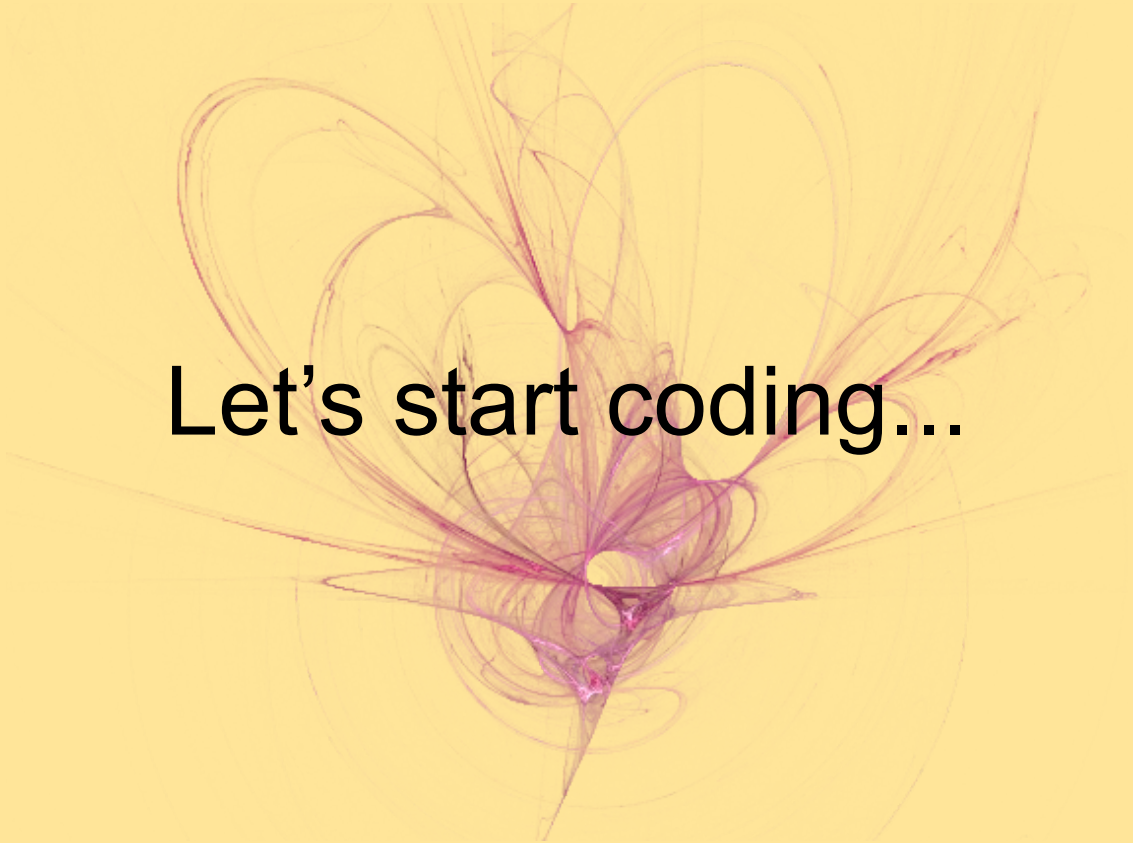
- Variables
- Sequences
- Loops
- If/Then (or Case/When)
- Functions

Result

Foundational Blocks of Programming

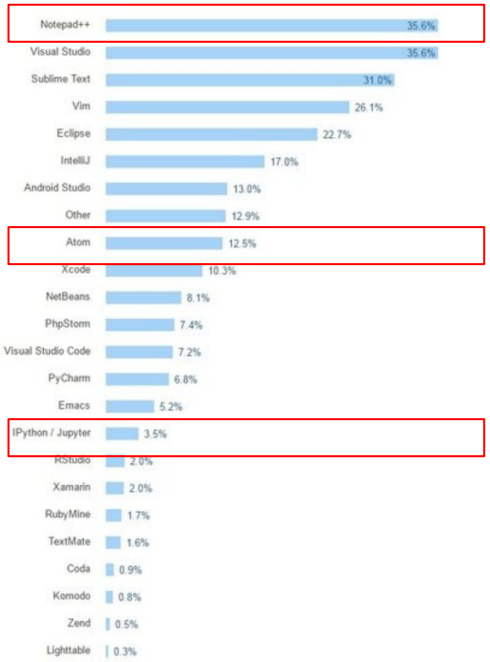
Breakout Session


“
INTRODUCE YOURSELF IN THE CHAT
1. Name
2. Where are you located?
3. Fun thing you’ve been doing in quarantine



Let’s start coding...

PYTHON IDE SELECTION



IDE stands for Integrated Development Environment. It's a coding tool which allows you to write, test, and debug your code in an easier way, as they typically offer code completion or code insight by highlighting, resource management, debugging tools

1. Python IDE's selection
2. Datacamp's Top 5 Selected IDEs