# Data Analytics with Python

# 1. Introduction to Python and Installation

# What is Programming

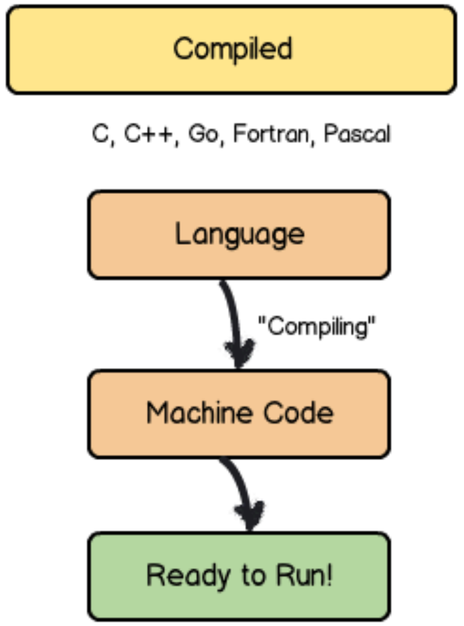
- Programming is the process of writing sets of instructions (code) that tell a computer how to do things.
- It include creating algorithms, developing code in programming languages, testing, debugging, and maintaining code to ensure that it works as expected.
- Some of the common programming languages used are; Python, Java, C, C++, R and JavaScript.

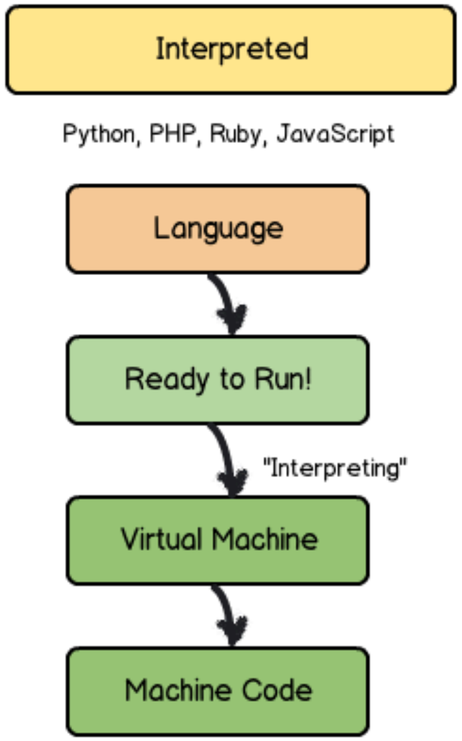
# What is Python?

- First released in 1991, Python is an easy to learn, powerful programming language.
- Python is a general-purpose programming language that passes programs to computers through interpretation rather than compilation.

# How does a Computer Read Code

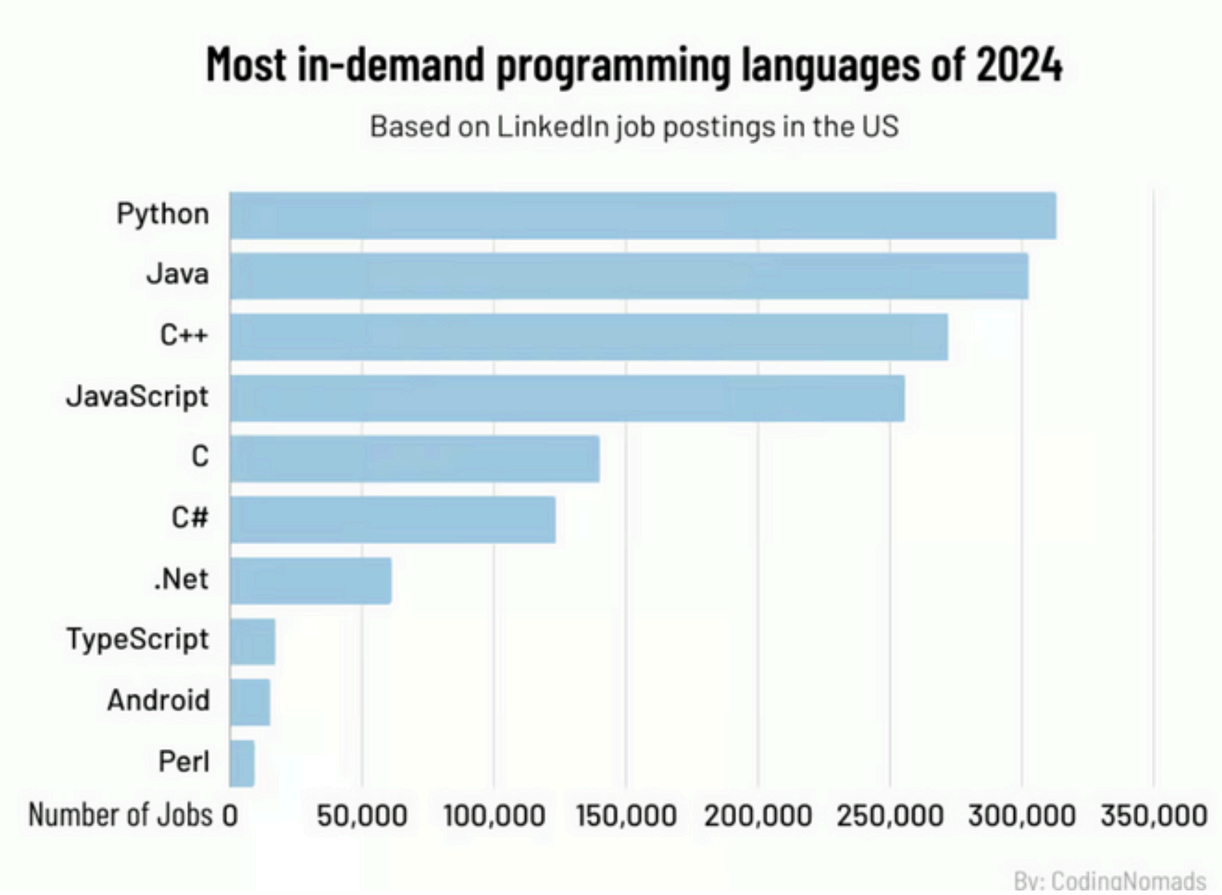
- Interpretation is the process of running source code directly, line by line, and then converting it at runtime into machine code.
- Compilation creates an executable file by translating the source code in its entirety into machine code in advance.
- While compiled languages often give superior speed, interpreted languages are typically more flexible and easier to debug.



# Why Python?

- Python's syntax is easy to understand.
- Python's interpreted nature facilitates debugging and provides for more flexible coding methods.
- Python makes it easy to re-use the code we have already written.
- Python has a large standard library as well as various third-party libraries.

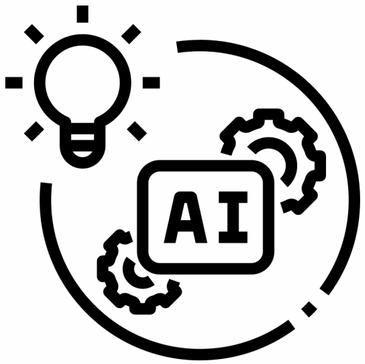


# How is Python Used?

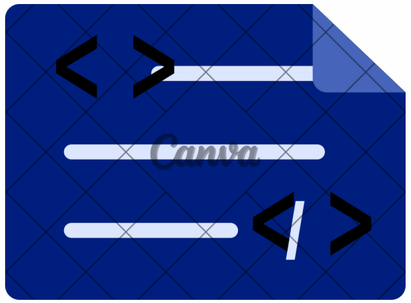

1. Data Analytics


3. Web Development


5. Software Testing




2. Data Science




4. Automation and Scripting

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## Active Python Releases

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| Python version | Maintenance status | First released | End of support | Release schedule |
| --- | --- | --- | --- | --- |
| 3.13 | prerelease | 2024-10-01 (planned) | 2029-10 | PEP 719 |


Python 3.12.3 (64-bit) Setup
Install Python 3.12.3 (64-bit)
Select Install Now to install Python with default settings, or choose
Customize to enable or disable features.
Install Now
C:\Users\Administrator\AppData\Local\Programs\Python\Python312
Includes IDLE, pip and documentation
Creates shortcuts and file associations
Customize installation
Choose location and features
python
for
windows
Use admin privileges when installing py.exe
Add python.exe to PATH
Cancel

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Installing Jupyter Notebooks/Anaconda | Python for Beginners
Installing Jupyter Notebooks
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# 2. Python Syntax, Comments and Data Types

# `2.0 Basic Python Command

## 1. Interactive Mode Programming

```
Microsoft Windows [Version 10.0.22621.3447]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Administrator>python
Python 3.12.3 (tags/v3.12.3:f6650f9, Apr  9 2024, 14:05:25) [MSC v.1938 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> print('Hello World')
Hello World
>>>
```

## 1. Script Mode Programming

# Python Syntax

- A programming language ***syntax*** is a collection of rules and practices that govern how the language's symbols, keywords, and structure are written and processed by computers.

- It specifies the language's grammar, which includes rules for statements, expressions, variables, and control structures, and ensures that code generated in the language is understood and executable by computers.

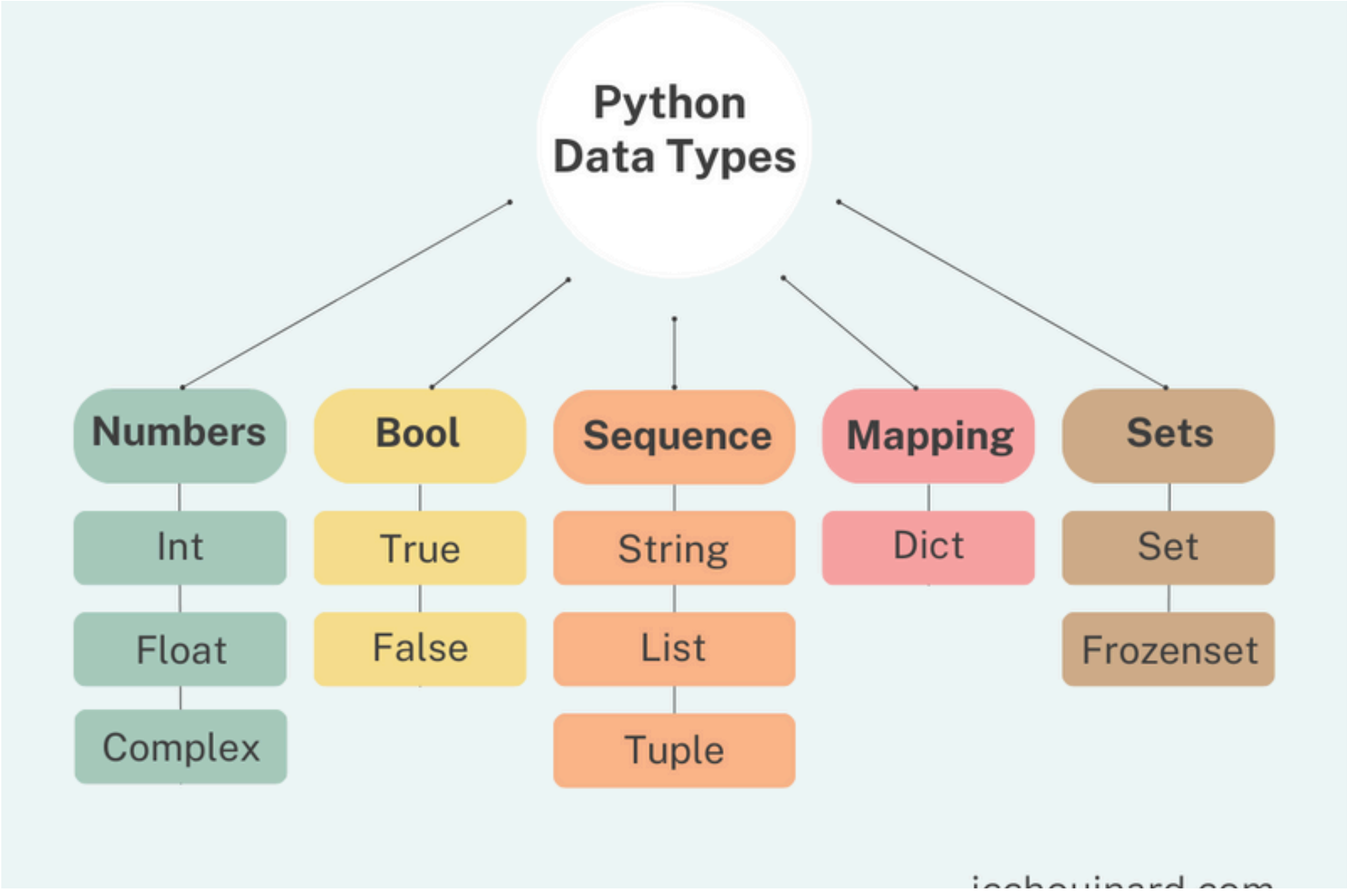
- Python is a case sensitive language.
- You can't use one of python's key words as a variable name.
- Python uses indentation to define blocks of code, such as loops, conditionals, and functions.
- Python statements are typically written one per line. End-of-line terminates a statement unless it is continued by a backslash / , an open parenthesis (, an open square bracket [, or an open curly brace {.
- Comments in Python begin with the hash symbol (#) and continue to the end of the line. They are used to explain code and make it more readable

# 2.1 Python Comments

- ***Comments*** are statements within your code. In Python, comments are initiated with the symbol “#”.

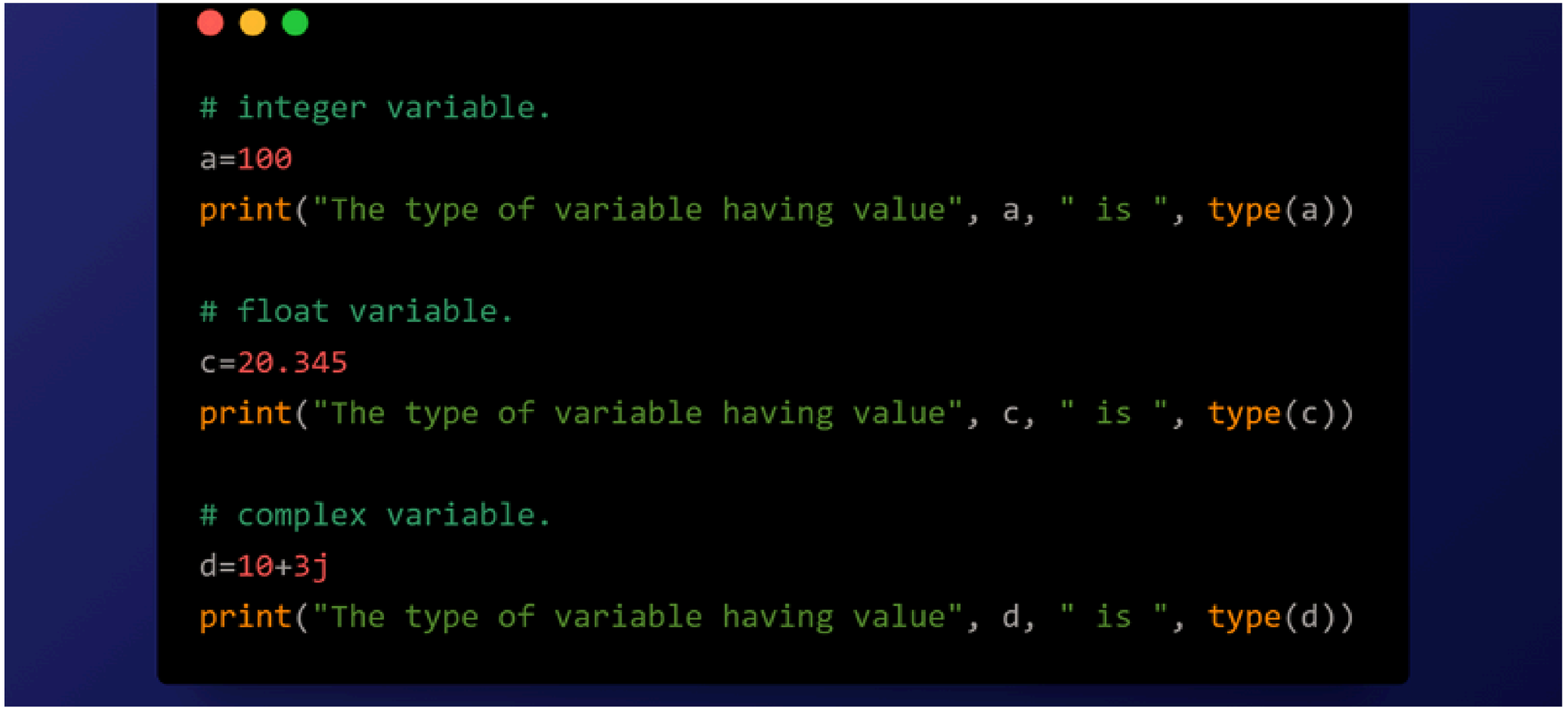
# 2.3 Python Data Types

- A ***data type*** is a representation of the data we have and what operations can be performed on the data.



# Numeric Data Types

There are three types of numerical data types in python;



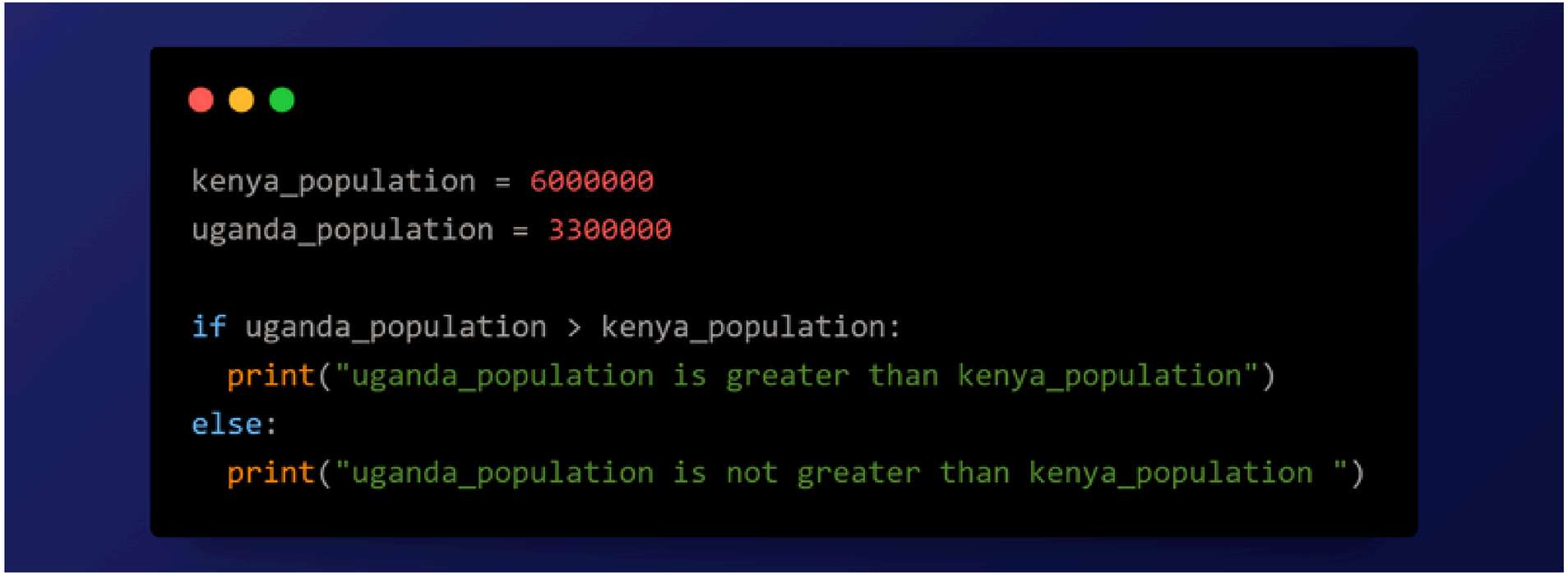
```
# integer variable.
a=100
print("The type of variable having value", a, " is ", type(a))

# float variable.
c=20.345
print("The type of variable having value", c, " is ", type(c))

# complex variable.
d=10+3j
print("The type of variable having value", d, " is ", type(d))
```

# Boolean Data Types

- **Boolean type** is one of built-in data types which represents one of the two values either *True(1)* or False(0).

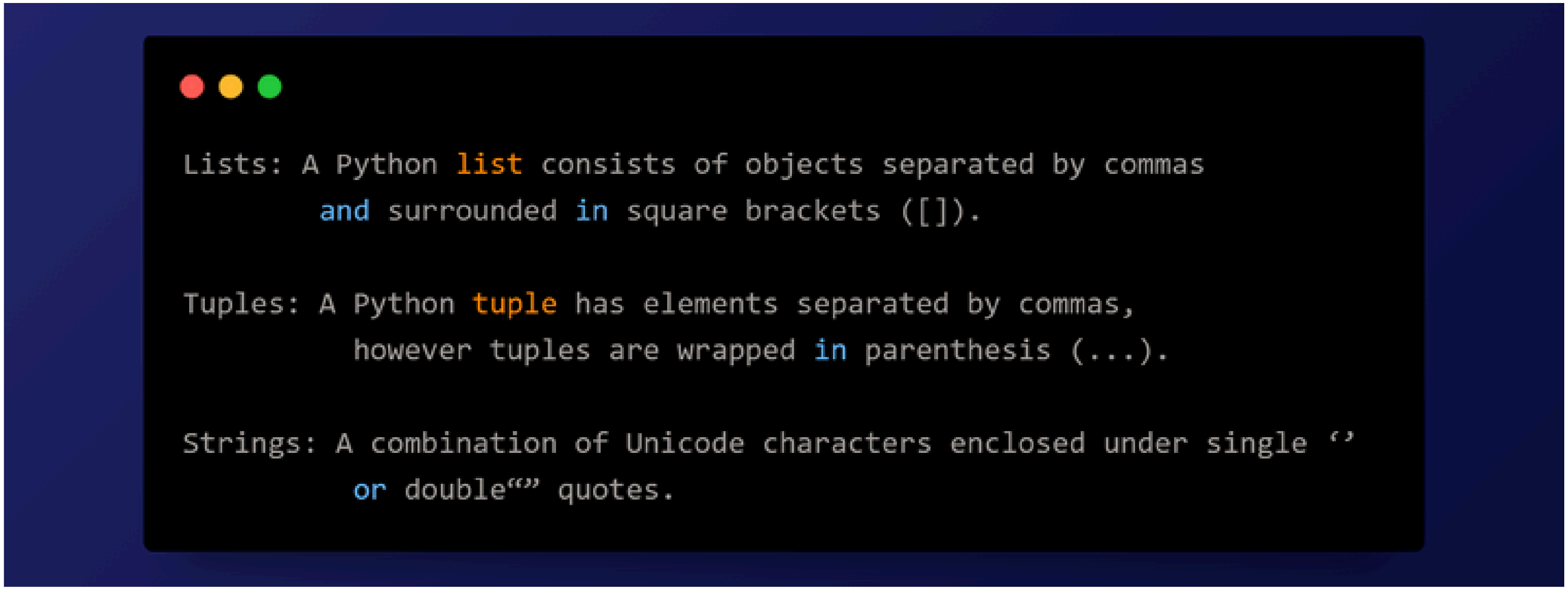


```
kenya_population = 6000000
uganda_population = 3300000

if uganda_population > kenya_population:
  print("uganda_population is greater than kenya_population")
else:
  print("uganda_population is not greater than kenya_population ")
```

# Sequence Data Types

Sequence is a collection of items and there are three types of sequence data types in python;



# 3. Python Variables and Data Structure