upGrad

#LifeKoKaroLift

Introduction to Python
Live Session 1

upGrad

Course : Introduction to Python

Lecture On : Python Fundamentals

Instructor : Dr. Reena Duggal

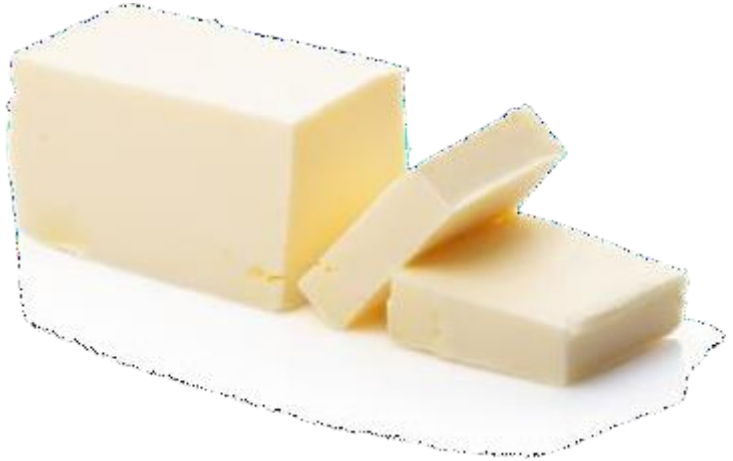
upGrad

In this session, we will cover..

1. Introduction to Data Science
2. Python overview
3. Environment Setup
4. Variables and basic data types
5. Operators
6. String Operations

How many of you have seen this?

+



=

Example to reflect on

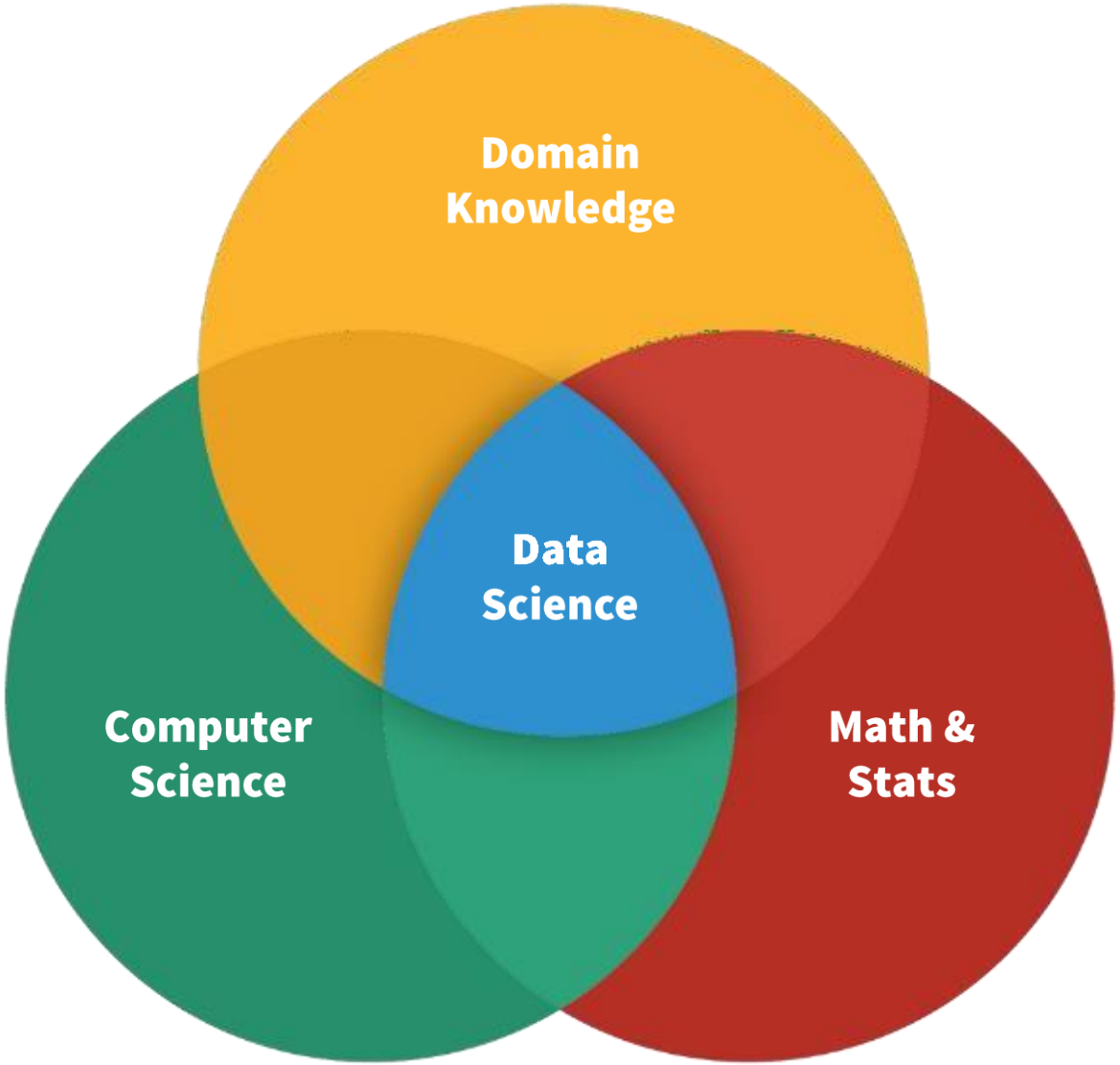
*Source: Venturebeat

What is Data Science?

Data science is the study of:

- Where information comes from
- What it represents, and
- How it can be turned into a valuable resource

for business strategies.



Harvard Business Review

DATA

Data Scientist: The Sexiest Job of the 21st Century

by Thomas H. Davenport and D.J. Patil

FROM THE OCTOBER 2012 ISSUE

When Jonathan Goldman arrived for work in June 2006 at LinkedIn, the business networking site, the place still felt like a start-up. The company had just under 8 million accounts, and the number was growing quickly as existing members invited their friends and colleagues to join. But users weren't seeking out connections with the people who were already on the site at the rate executives had expected. Something was apparently missing in the social experience. As one LinkedIn manager put it, "It was like arriving at a conference reception and realizing you don't know anyone. So you just stand in

Reference:
https://hbr.org/2012/10/data-scientist-the-sexiest-job-of-the-21st-century

Show me the money!

Why do Data Scientists get paid a lot?

Severe shortage of talent

Directly impact business value

Organizations face enormous data challenges

Need not restricted to Tech Giants anymore

Problems that Data Scientists solve

Is this A or B?

Classification

Will this applicant be able to repay the loan?

Spam or no-Spam mail?

Problems that Data Scientists solve

Is this weird?

Anomaly

Is this a fraud transaction on a credit card?

Is someone riding bike on a walkway?

Problems that Data Scientists solve

How much

or

How many?

Regression

How much will this used car sell for?

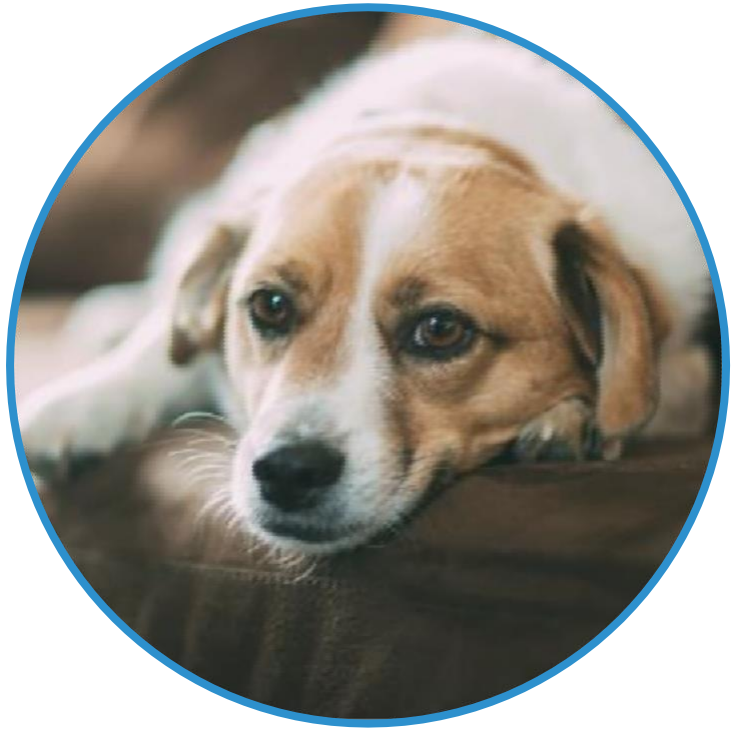
Predict how much product sales will be achieved in this month?

Problems that Data Scientists solve

How is this organized?

Clustering

Which viewers like the same kind of movies?



Which pet owner groups have the same purchase behaviour for pet foods?

Data Science: Applications in Industry

Retail & e-commerce

- Shelf-space Optimization
- Market Basket Analysis
- Product Bundling
- Promotions
- Up-sell / Cross-sell

Data Science: Applications in Industry

Healthcare

- Clinical trials of new drugs
- A / B Testing
- Genetics Analysis
- Epidemic Forecasting and Control

Data Science: Applications in Industry

Banking & Finance

- Fraud detection and prevention
- Customer Segmentation
- Risk management
- Portfolio Optimization

Poll 1

Which of the following is one of the key data science skills?

a) Statistics

b) Machine Learning

c) Data Visualization

d) All of the mentioned

Poll 1(Answer)

Solution: **(d)**

Python

Programming Language

Introduction

What is Python?

Programming Language

Easy

Useful

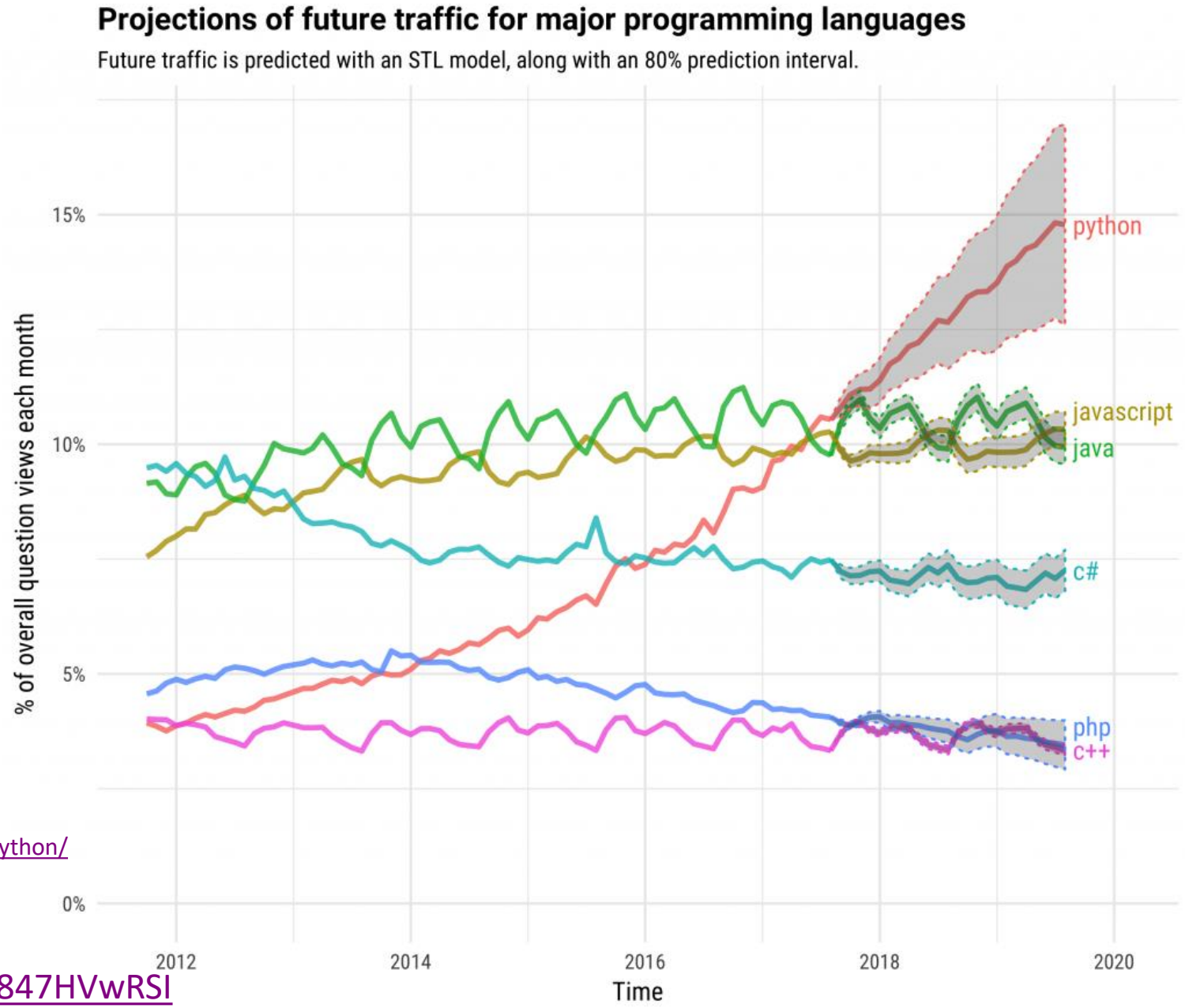
Powerful

Popular

General Purpose

Large Libraries

How popular is Python?



https://stackoverflow.blog/2017/09/06/incredible-growth-python/

https://www.youtube.com/watch?v=Og847HVwRSI

Excel vs. Python

- Can’t handle large amounts of data
- Time consuming
- Issues with VBA
- Limited Capabilities wr.t. high level statistical operations
- Cost of Excel

Python Stats

Companies using Python

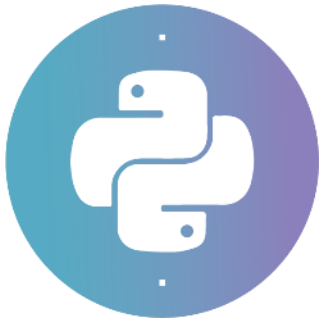
History of Simplicity

Guido van Rossum

- **“Anybody can Code”**

- Python was conceptualized by **Guido Van Rossum** in the late **1980s**.
- Rossum published the first version of Python code (0.9.0) in February **1991** at the CWI (Centrum Wiskunde & Informatica) in the Netherlands, Amsterdam.
- Rossum chose the name "**Python**", since he was a big fan of Monty Python's Flying Circus.

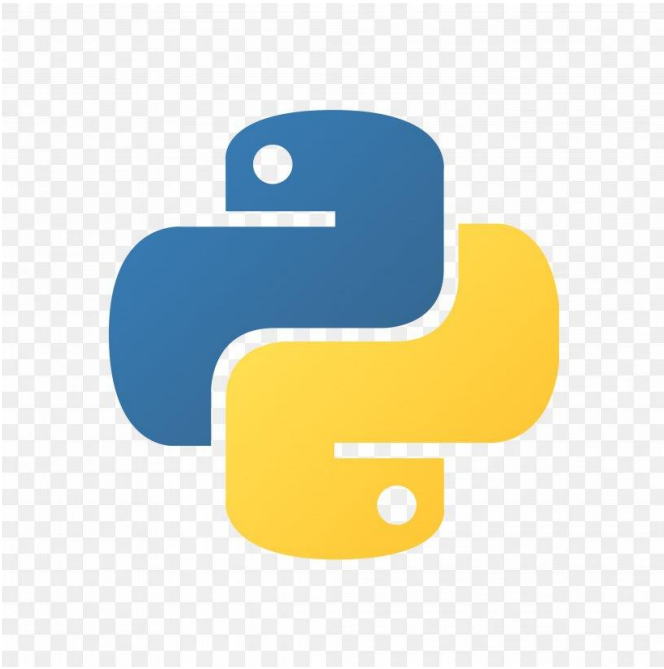
Features of Python



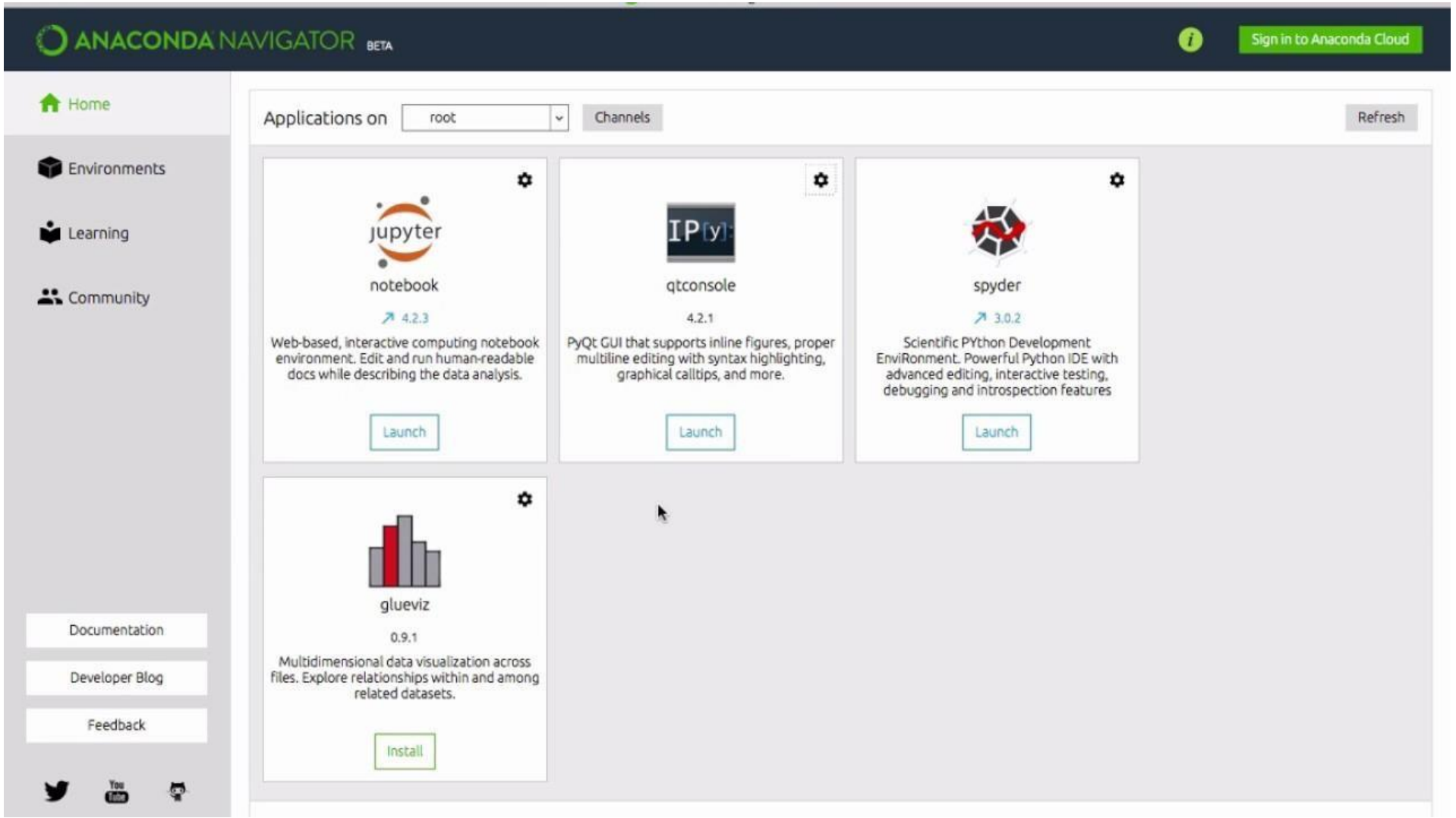
- High level interpreter language
- Platform independent
- Simple to understand & learn
- Open Source
- GUI Programming
- Object oriented structure
- Pre-built Libraries

Setting up Python

Install Python using Anaconda

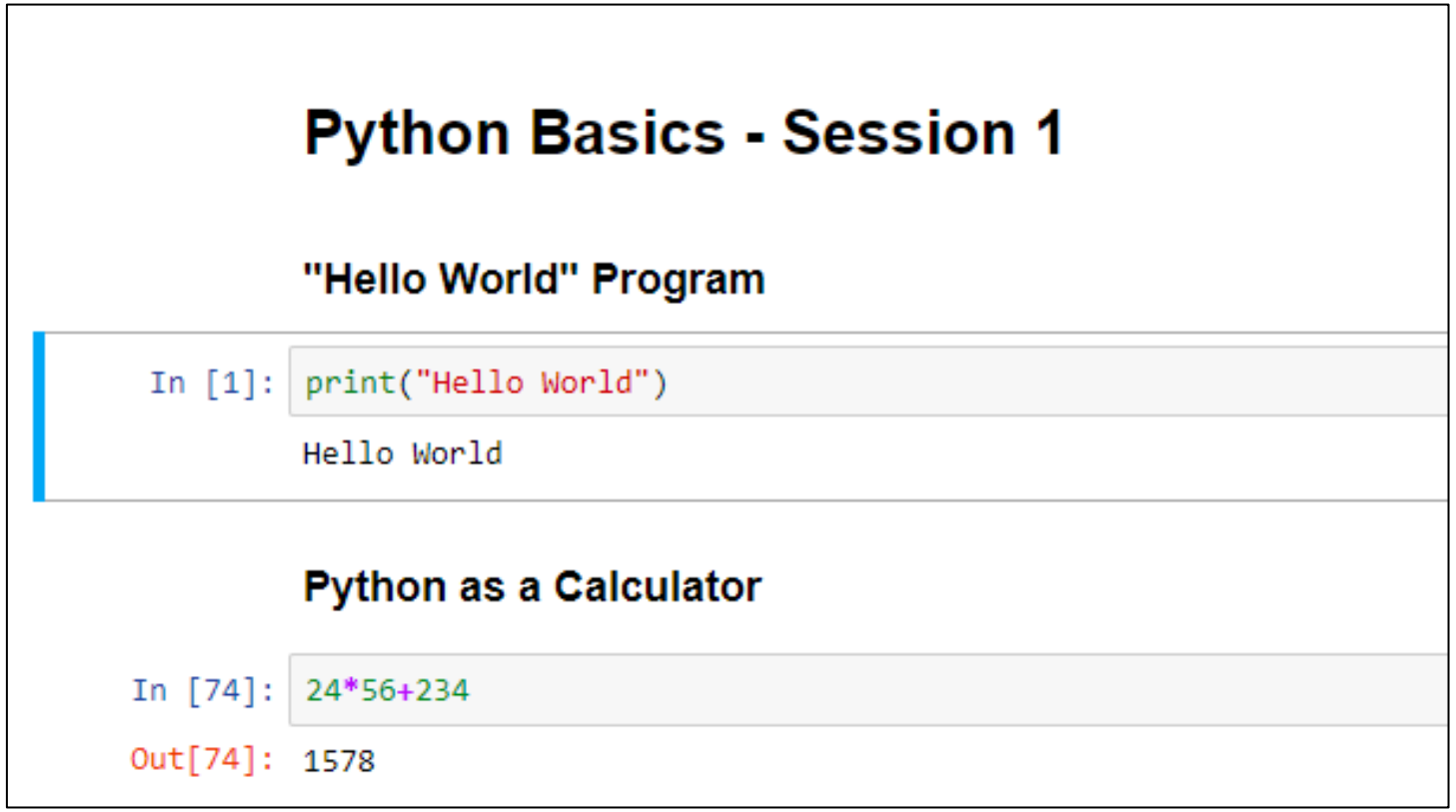


Anaconda Navigator



Programming in Jupyter

- The main advantage of using a Jupyter Notebook is that you can write both codes and normal text (using the Markdown format in Jupyter) in the notebooks.
- These notebooks are easy to read and share and can even be used to present your work to others.



Programming in Python

Variables

Data Types

Operators

Loops

Conditions

Functions

Variables

Variables

Data Types

Operators

Loops

Conditions

Functions

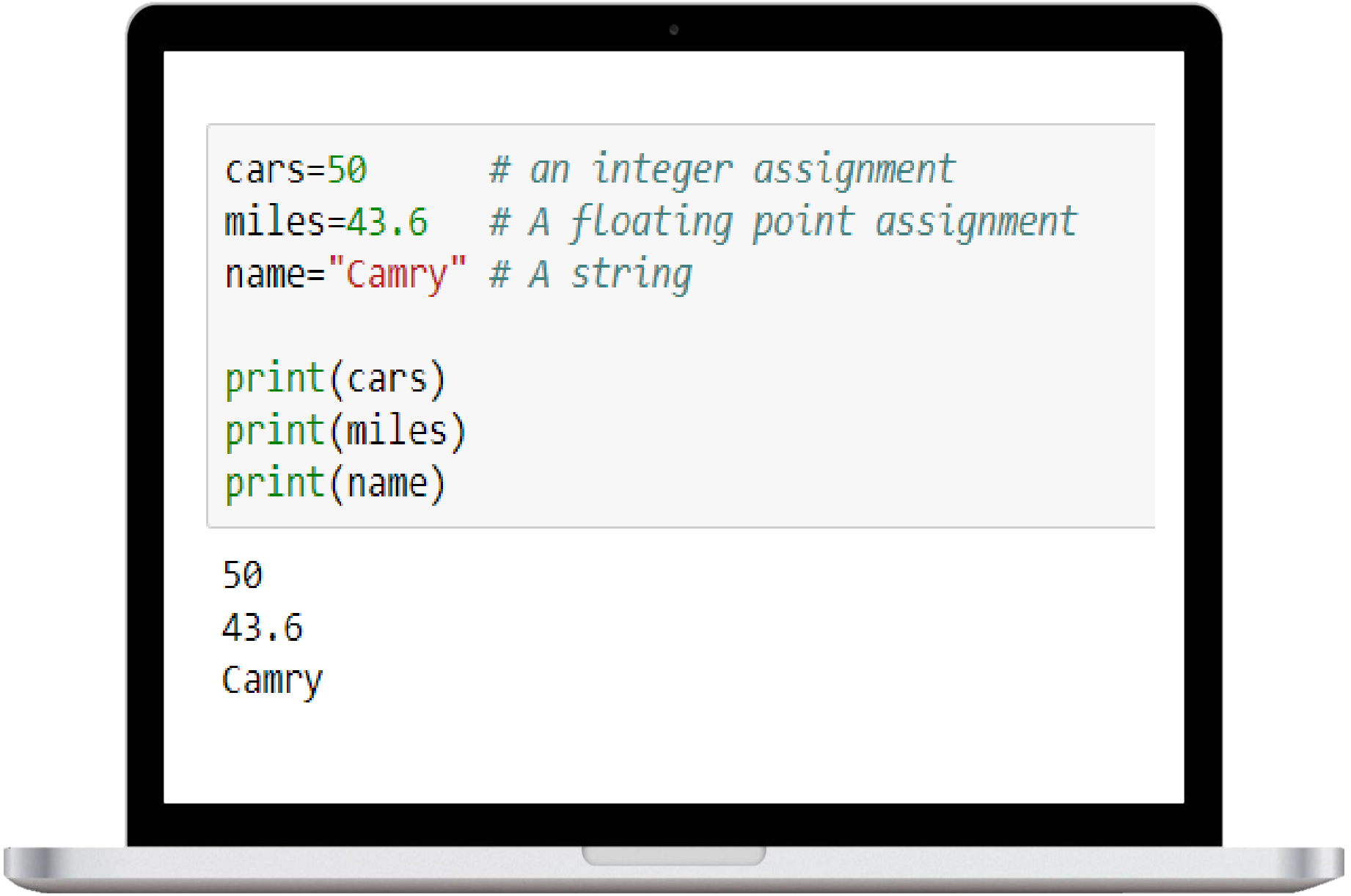
Variables

Variables are reserved memory locations to store values

cars = 50

miles = 43.60

name = “Camry”



```
cars=50       # an integer assignment
miles=43.6    # A floating point assignment
name="Camry" # A string

print(cars)
print(miles)
print(name)
```

```
50
43.6
Camry
```

Practical LAB

Data Types

Variables

Data Types

Operators

Loops

Conditions

Functions

Data Types

A classification to specify which type of a value a variable has

Numeric

List

Tuple

Strings

Dictionary

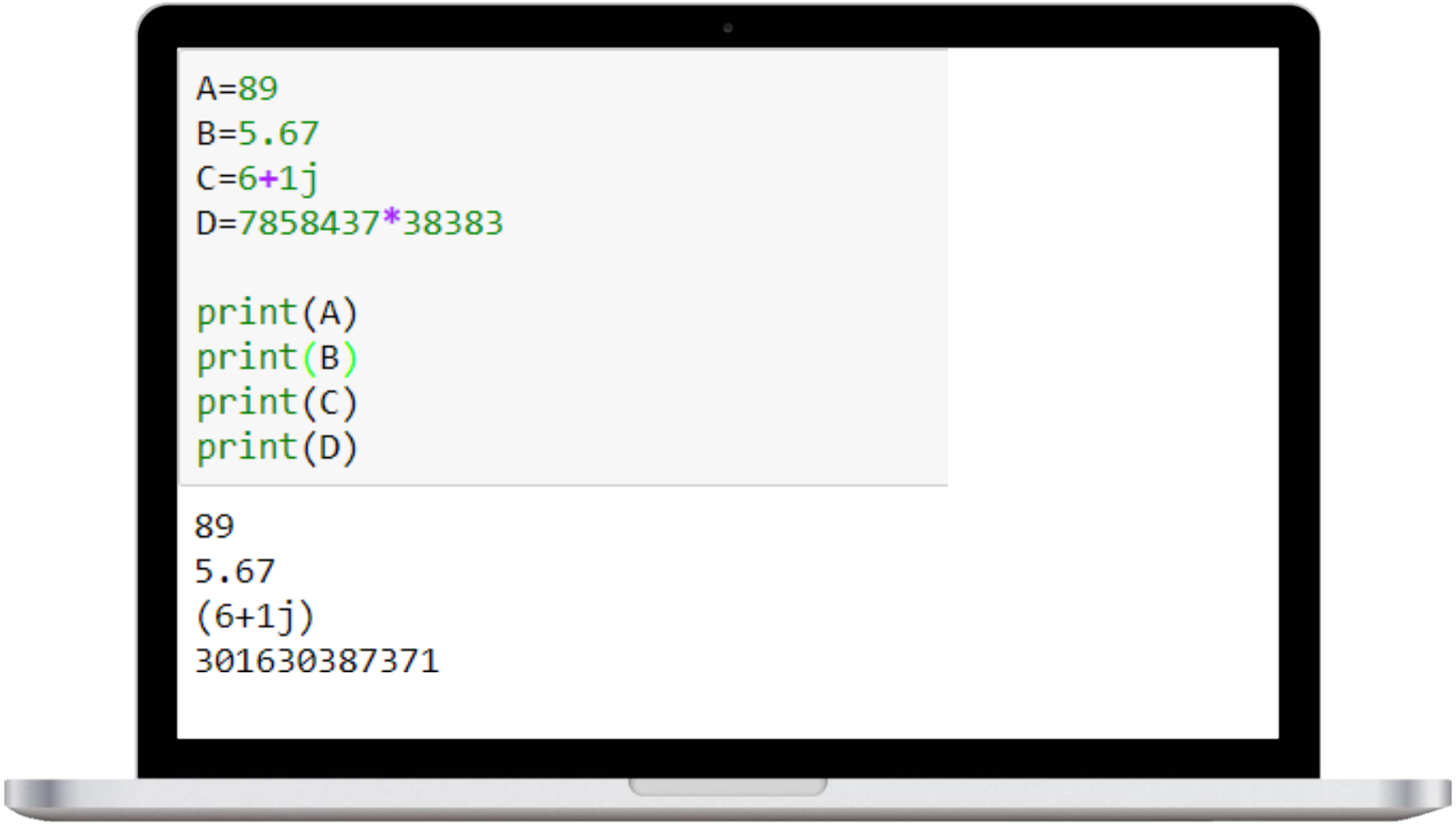
Data Types

Numeric Data Type

Store numeric values

Integer type [A = 89]

Float type [B = 5.67]



Data Types

String Data Type

- A string in Python is a sequence of characters.
- Strings are created by enclosing characters in quotes.
- Python treats single quotes the same as double quotes.

Single line Strings
A = “Mastering Python”

Multi line Strings
B = “““ Mastering Python takes time”””

Poll 2

upGrad

How will you extract word “Python” from the string word = "I love Python programming"?

a) word[7:13]

b) word[7:12]

c) word[-18:-12]

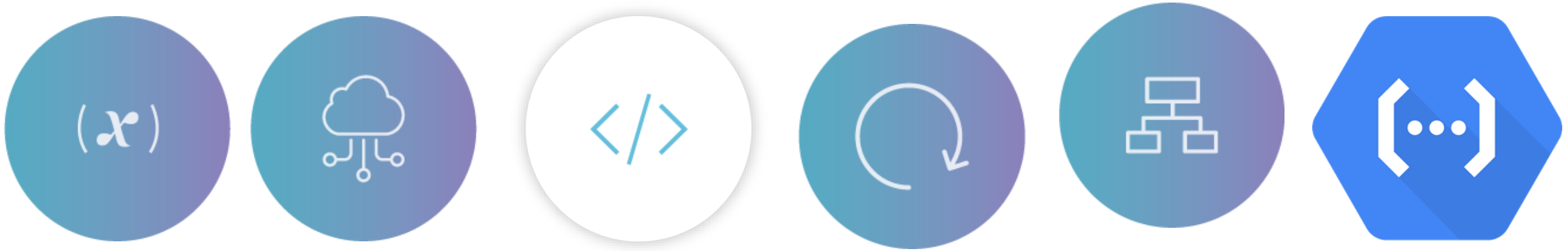
d) word[-12:-18]

e) Both a and c

Poll 2(Answer)

Solution: **(e)**

Programming in Python



Variables | Data Types | **Operators** | Loops | Conditions | Functions

Operators

Arithmetic & Comparison Operators

- \+ Addition a = a + b
- − Subtraction a = a - b
- * Multiplication a = a * b
- / Division a = a / b
- % Modulus a = a % b
- ** Exponent a = a ** b

Operators

Arithmetic & Comparison Operators

- Equal to a = b
- Not equal to a != b
- Greater than a > b
- Lesser than a < b
- Greater than equal to a >= b
- Lesser than equal to a <= b

Operators

Logical Operators