# Code For Change -Kathmandu Presents

PythonwithAI.py

DAY_1.ipynb

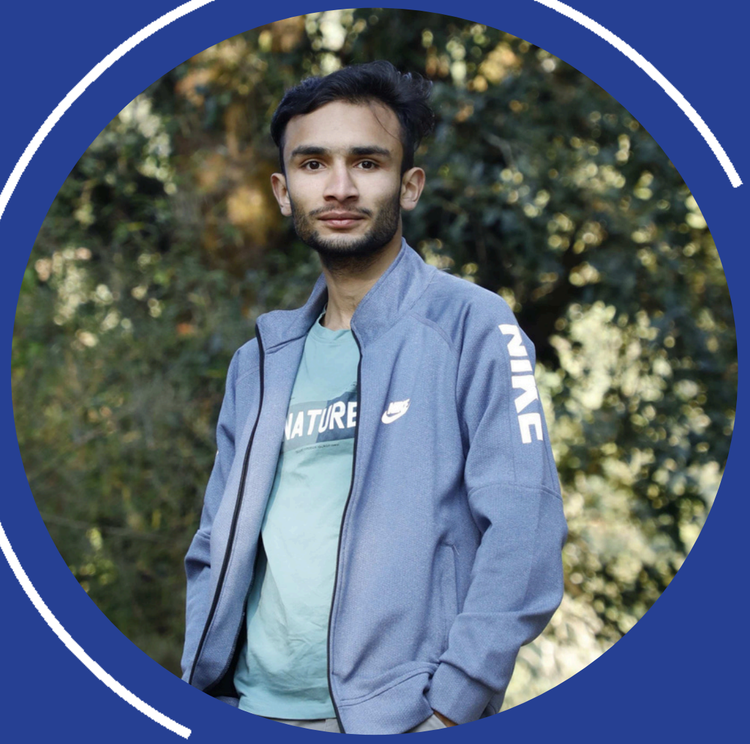
```
1
2   Python with 'AI Foundations':
3
4
5           print(['4_Days_Workshop'])
6
7
8   #By
9   #Trainer- Bibek Thapa
10  #Special Thanks to
11  #Mentor - Anuj Nanda Gorkhali
12  #Host - Roshan Bohara
13
14
```

John McCarthy is considered as the father of Artificial Intelligence. The term "artificial intelligence" was coined by him.

# ROSHAN BOHARA

## HOST

# Vice-Project Lead Speech




## Ujjwal Timalsina

**CFC Kathmandu 23.24,**
**Vice-Project Lead**

<Code> FOR {CHANGE}
Let code lead the change

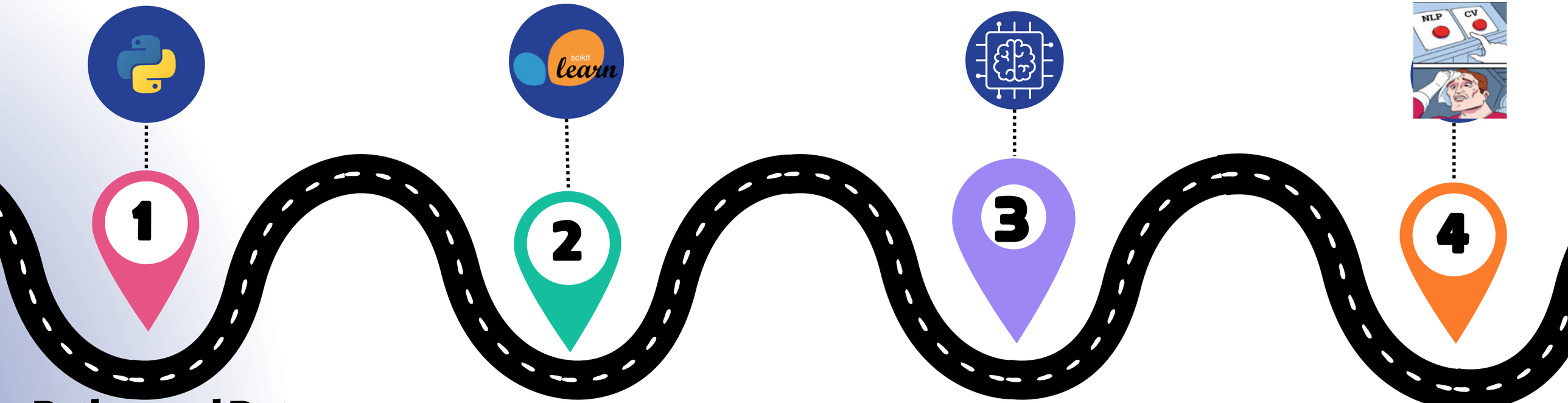
# Workshop Walkthrough

- Introduction to AI,ML,DL
- Introduction to Python
- Anaconda, Jupyter Notebook and Google colab setup
- Python Data Structure
- Python Foundation
- Data Manipulation with NUMPY & PANDAS

- Liner Regression
- Logistic Regression
- Decision Tree
- Ensemble Methods
- Support Vector Machine
- Hyperparamter tuning with GridSearchCV
- Model Deployment

- Artificial Neural Network
- Hyperparameters
- CNN
- Transfer Learning
- Transition to Computer Vision

- Object Detection(Intro to YOLO)
- Introduction to NLP
- Minor Project with Computer Vision(OCR) and NLP
- Deploy using Flask




**Python and Data Manipulation**

**Machine Learning**

**Deep Learning**

**CV and NLP**

# Mentor

## MR .BIBEK THAPA

**AI/ML ENGINEER**
**ICEBRKR, A VIRTLY COMPANY**

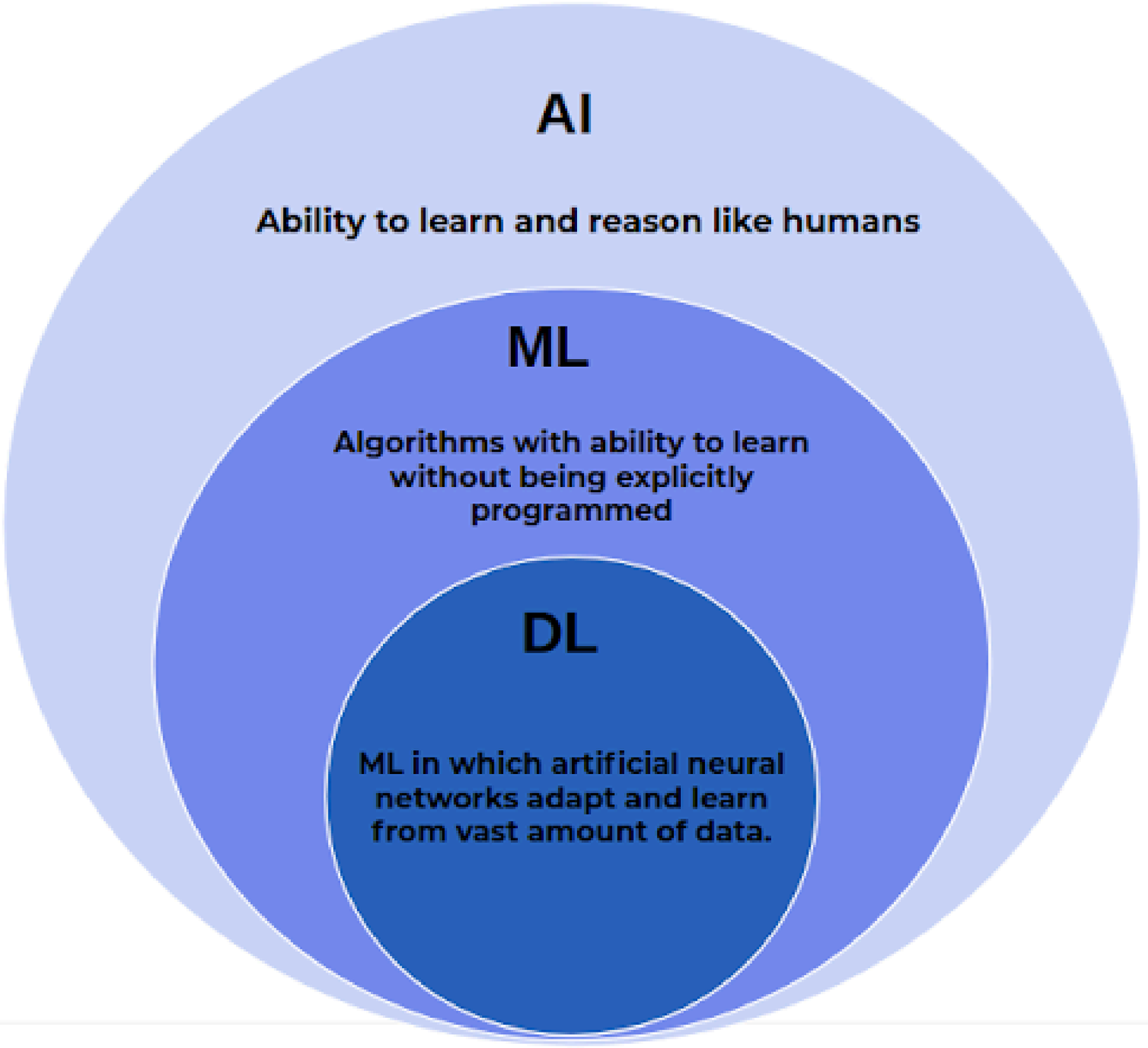
# DAY 1: Python and Data Manipulation

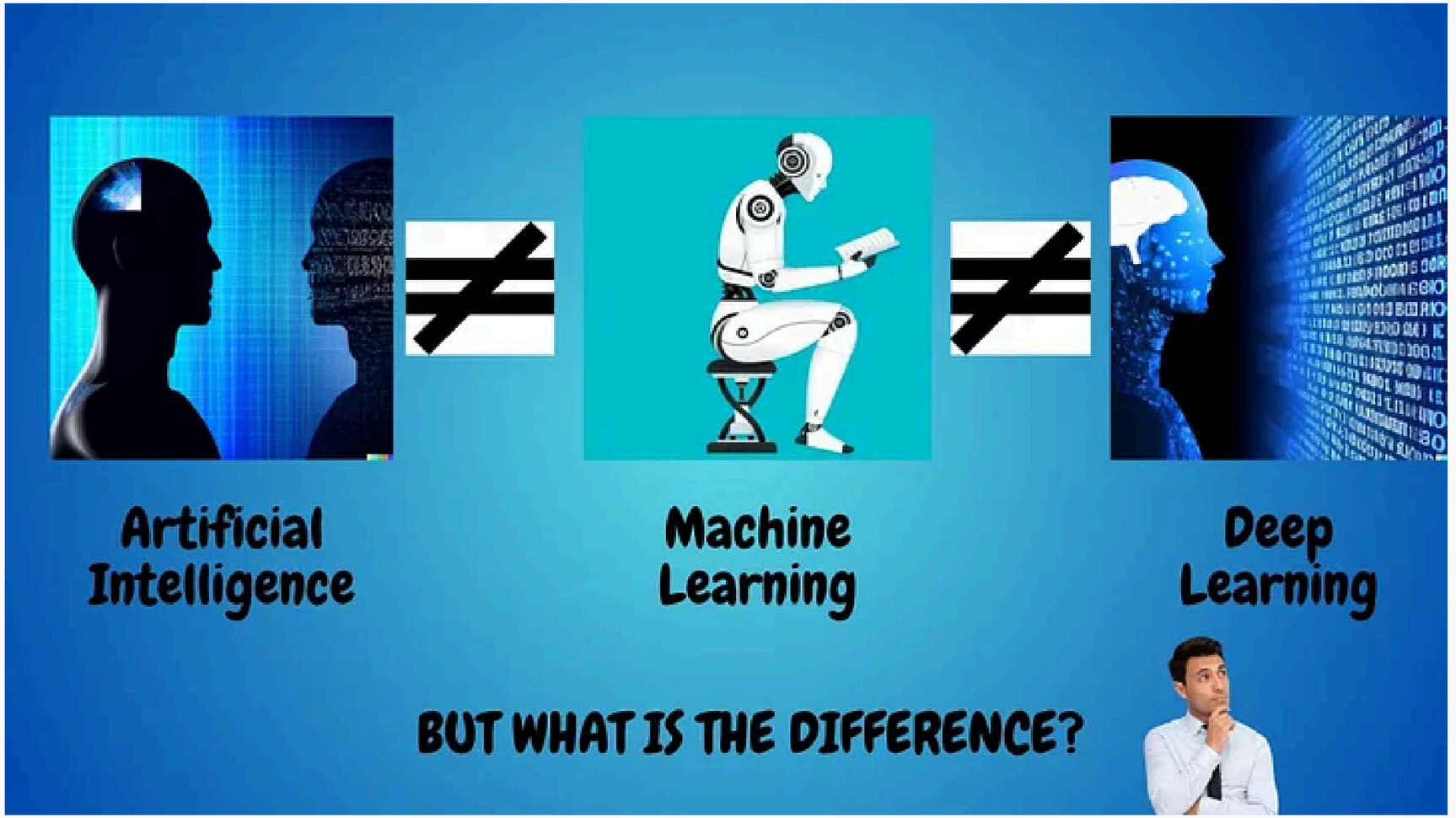
- Introduction to AI,ML,DL
- Introduction to Python
- Anaconda, Jupyter Notebook and Google colab setyp
- Python Data Structure
- Python Foundation
- Data Preparation with NUMPY & PANDAS

# INTRODUCTION TO AI,ML,DL

# AI vs ML vs DL

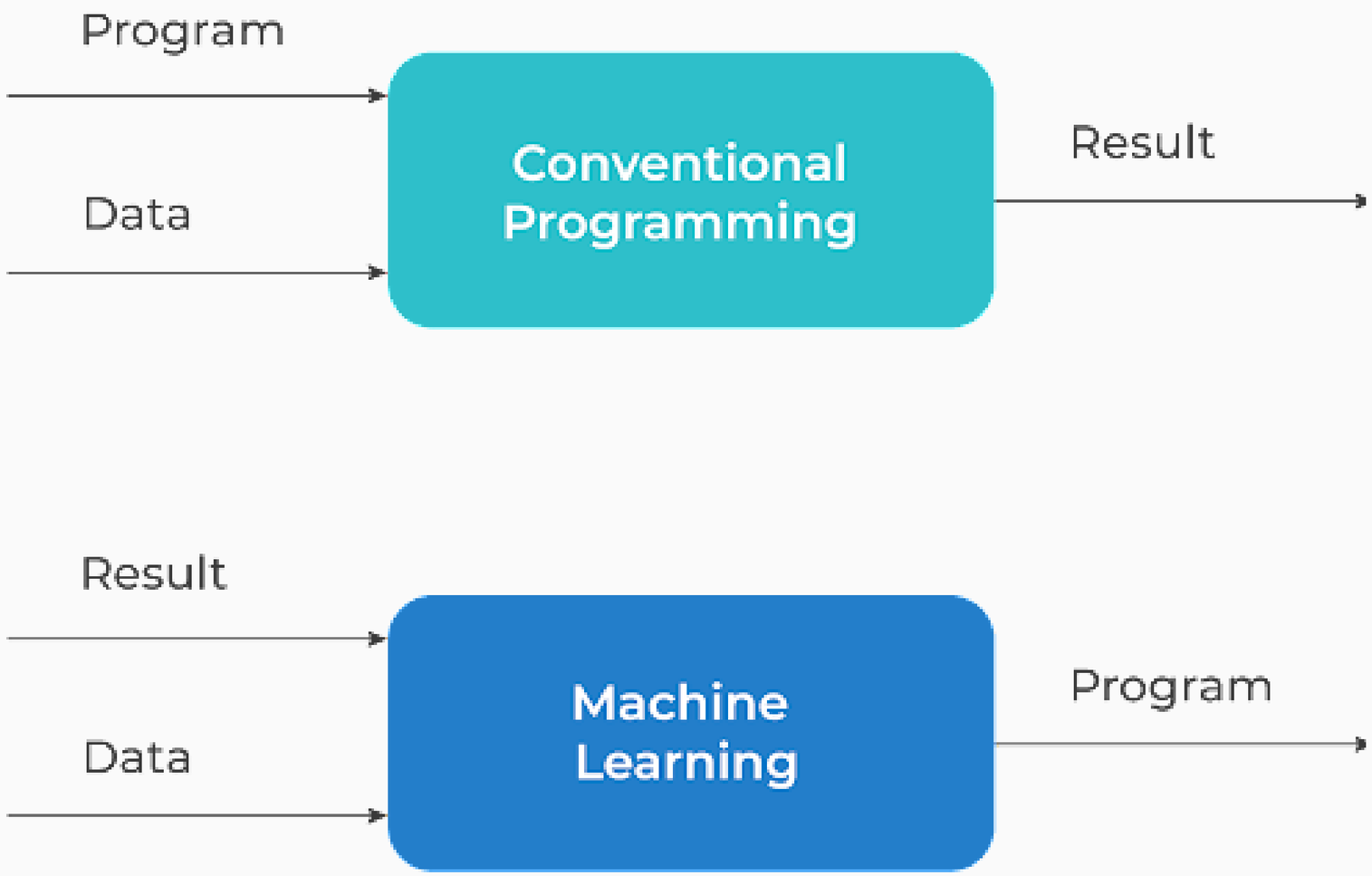
- **Artificial Intelligence (AI)**: Developing machines to mimic human intelligence and behaviour.
- **Machine Learning (ML)**: Algorithms that learn from structured data to predict outputs and discover patterns in that data.
- **Deep Learning (DL)**: Algorithms based on highly complex neural networks that mimic the way a human brain works to detect patterns in large unstructured data sets.


AI
Ability to learn and reason like humans
ML
Algorithms with ability to learn without being explicitly programmed
DL
ML in which artificial neural networks adapt and learn from vast amount of data.


Artificial Intelligence
Machine Learning
Deep Learning
BUT WHAT IS THE DIFFERENCE?

# Machine learning

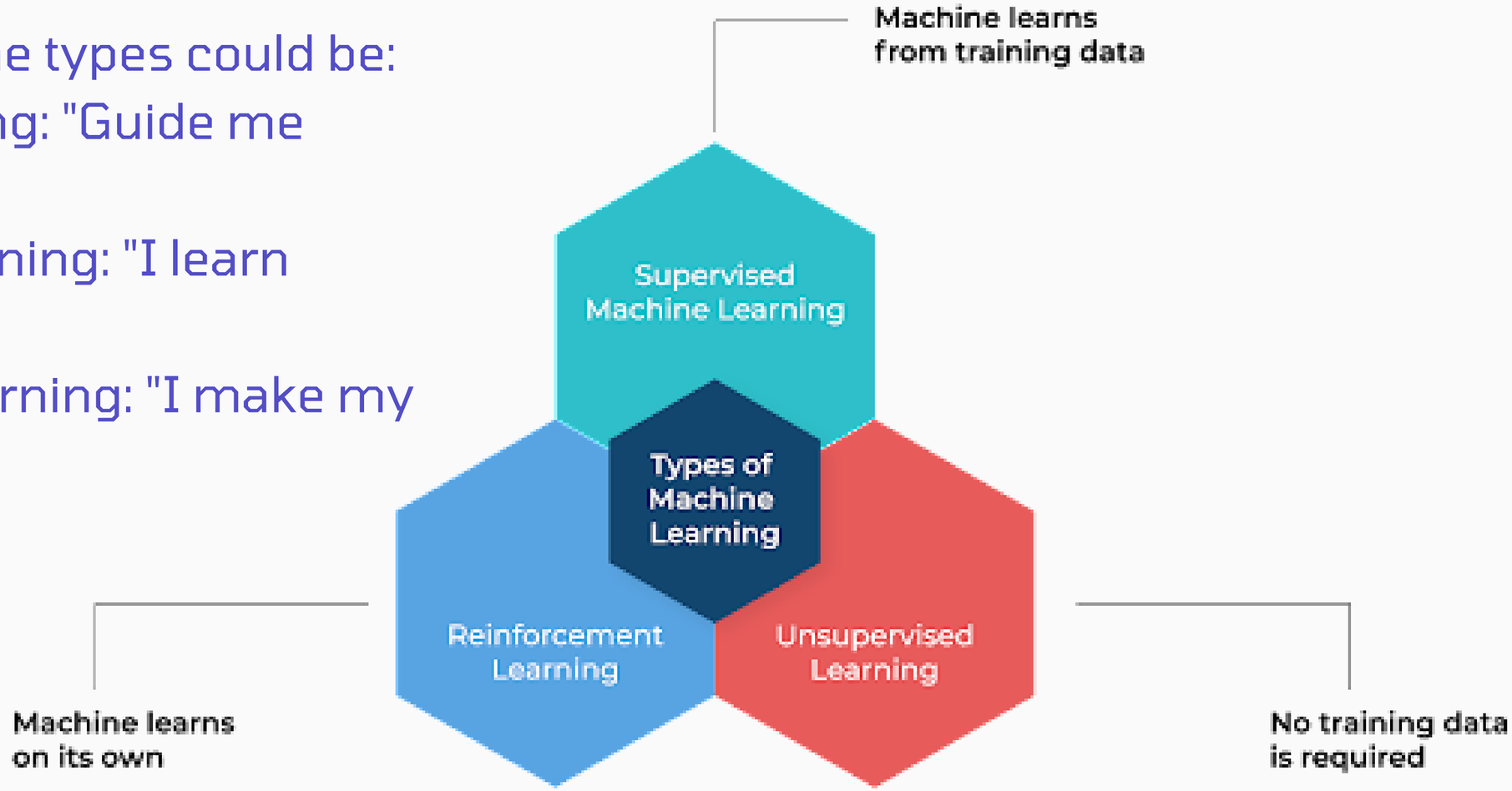
- How does machine learning differ from other traditional programming ideas?
- What makes machine learning so special? We will discuss it now.


Program
Data
Conventional Programming
Result
Result
Data
Machine Learning
Program

# Types of Machine Learning

A very short intro for the types could be:

- Supervised Learning: "Guide me through training!"
- Unsupervised Learning: "I learn independently!"
- Reinforcement Learning: "I make my own choices!"



# Machine learning Lifecycle

- Problem Definition
- Data Collection
- Data Preprocessing
- Feature Engineering
- Model Selection and Training
- Model Evaluation and Fine Tuning
- Model Deployment
- Monitoring and Maintenance

I tried to explain the concept of 'clean data' to my LLM. It responded with, 'I prefer my data like my room: messy and full of surprises.

CHATGPT

# ANACONDAS, Jupyter Notebook and Google COLAB SETUP

## Why virtual environments?

- helps to keep dependencies required by different projects separate by creating isolated python virtual environments for them.

## Preferred ways

- Virtual env
- Anaconda

# Python

- **Python** is a versatile and widely-used programming language with a vast ecosystem.
- Python can be treated in a procedural way, an object-oriented way or a functional way
- Here are some areas where Python is commonly used
  - **Web Development**
  - **Data Science and Machine Learning**
  - **Artificial Intelligence and Natural Language Processing**
  - **mathematics**
  - **Scripting**

# Python Syntax

- **Python** was designed for readability, and has some similarities to the English language with influence from mathematics.
- **Python** uses new lines to complete a command, as opposed to other programming languages which often use semicolons or parentheses.
- **Python** relies on indentation, using whitespace, to define scope; such as the scope of loops, functions and classes. Other programming languages often use curly-brackets for this purpose

```
def greet(name):
    """This function greets the user."""
    if name:
        print(f"Hello, {name}!")
    else:
        print("Hello there!")

# Example usage:
greet("Alice")
greet("Bob")
greet("")
```

# Modular Programming

- **Modular programming** is a software design technique to split your code into separate parts. These parts are called modules.
- The focus for this separation should be to have modules with no or just few dependencies upon other modules.
- Minimization of dependencies is the goal.

```
#ex1
from math import sin, pi


#ex2
from math import *
from numpy import *
print(sin(3))
```

# DATA STRUCTURE IN PYTHON

- List and list operation
- Tuple
- Set
- Dictionary and its operation
- Zip
- Enumerate

# PYTHON ESSENTIALS

- Lambda Function
- List Comprehension
- Slicing
- Exception Handling
- File Handling
- Object oriented

# DATA MANIPULATION WITH NUMPY AND PANDAS

- Numpy
- Pandas

# ASSIGNMENTS

## Dictionary Counting Problem:

- You are given a list of words. Write a function **count_words** that takes this string as input and returns a dictionary where the keys are the unique words in the list, and the values are the counts of each word.

## Fibonacci series:

- Write a function in Python to determine whether a given number is a Fibonacci number or not. If the number is a Fibonacci number, the function should return True; otherwise, it should return False.

## Lamba with zip with map with list comprehension

- Suppose you have two lists, numbers and squares, where numbers contains some integers and squares contains their corresponding squares. Your task is to create a new list result containing tuples of each number and its square.

## Solve using following two Approach:

- Using lambda with zip and map
- Using list comprehension with zip

# CLOSING

# SEE YOU TOMMOROW

<Code> FOR {CHANGE}

Let code lead the change

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# Connect with the Mentor