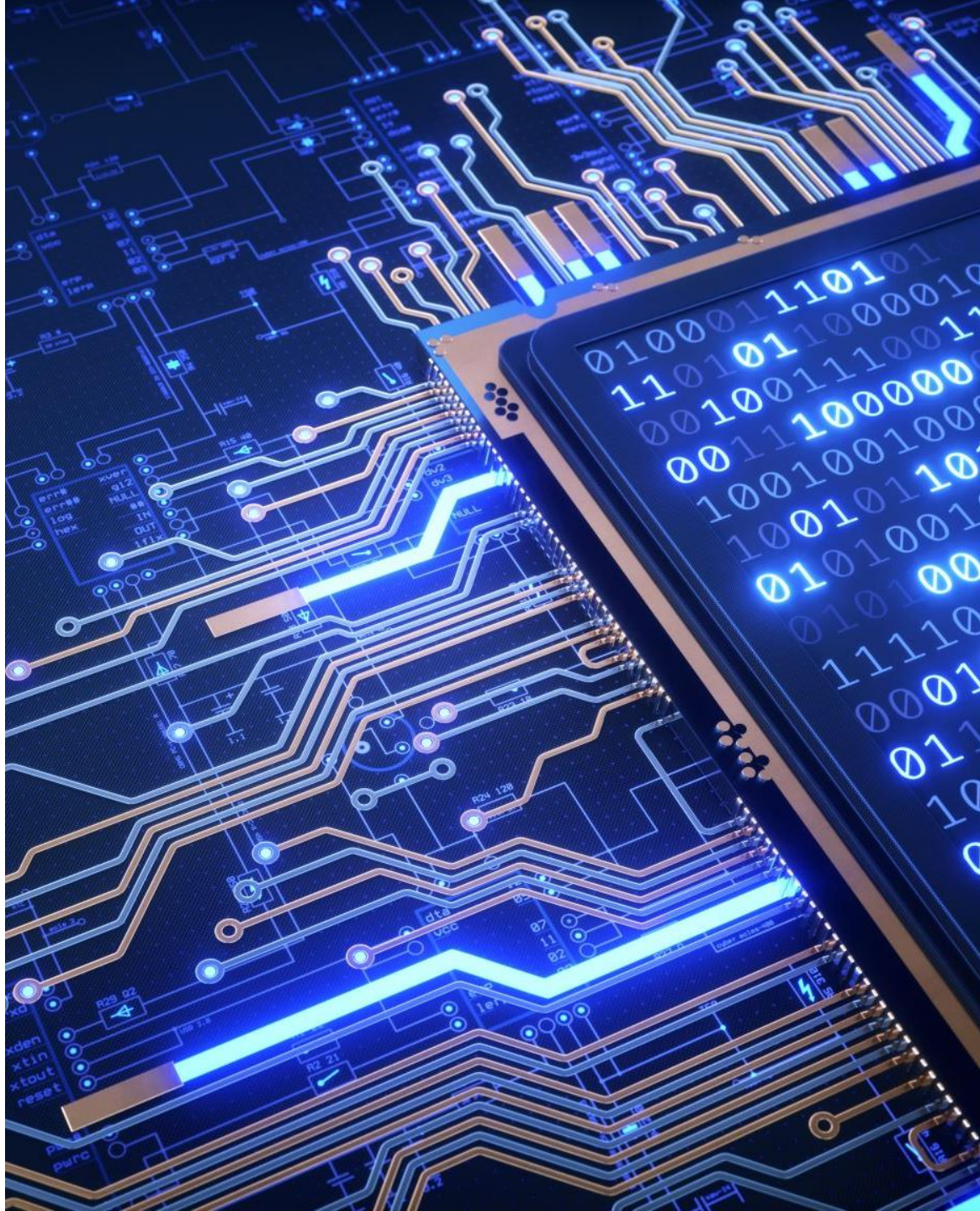
WELCOME
TO
MACHINE LEARNING
BOOTCAMP



MEET YOUR MENTORS

Atharva Khedkar
Imagine Cup India Champion
Beta Microsoft Learn Student Ambassador
@AtharvaKhedkar

Aditya Bobde
Deep Learning Expert,
Alpha Microsoft Learn Student Ambassador
@Adityabobde2

QUICK QUESTIONNAIRE

- How many people have heard about Machine Learning ?
- How many people know about Machine Learning ?
- How many people have used Machine Learning ?

Syllabus for
Machine Learning Bootcamp

Week 1

- Introduction to Machine Learning.
- Getting Started with Python
- Linear Algebra

Week 2

- Linear Regression
- Logistic Regression
- **Project : House Price Prediction, Heart attack Possibility**

Week 3

- KNN
- Git and GitHub
- **Project : Character Recognition**

Week 4

- SVM
- OpenCV
- **Project : Face Recognition**

Week 5

- Naïve Bayes
- Model Deployment
- **Project : SMS Spam Classifier**

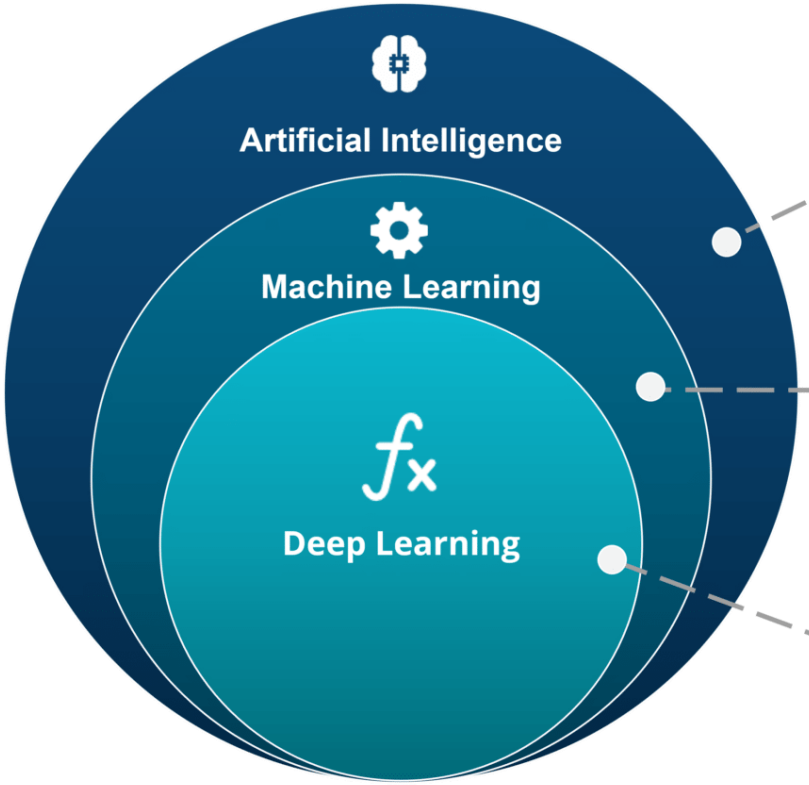
Week 6

- Principal Component Analysis
- Kmeans and recommendation system

Highlights

- Kahoot quizes every week

AI DOMAIN

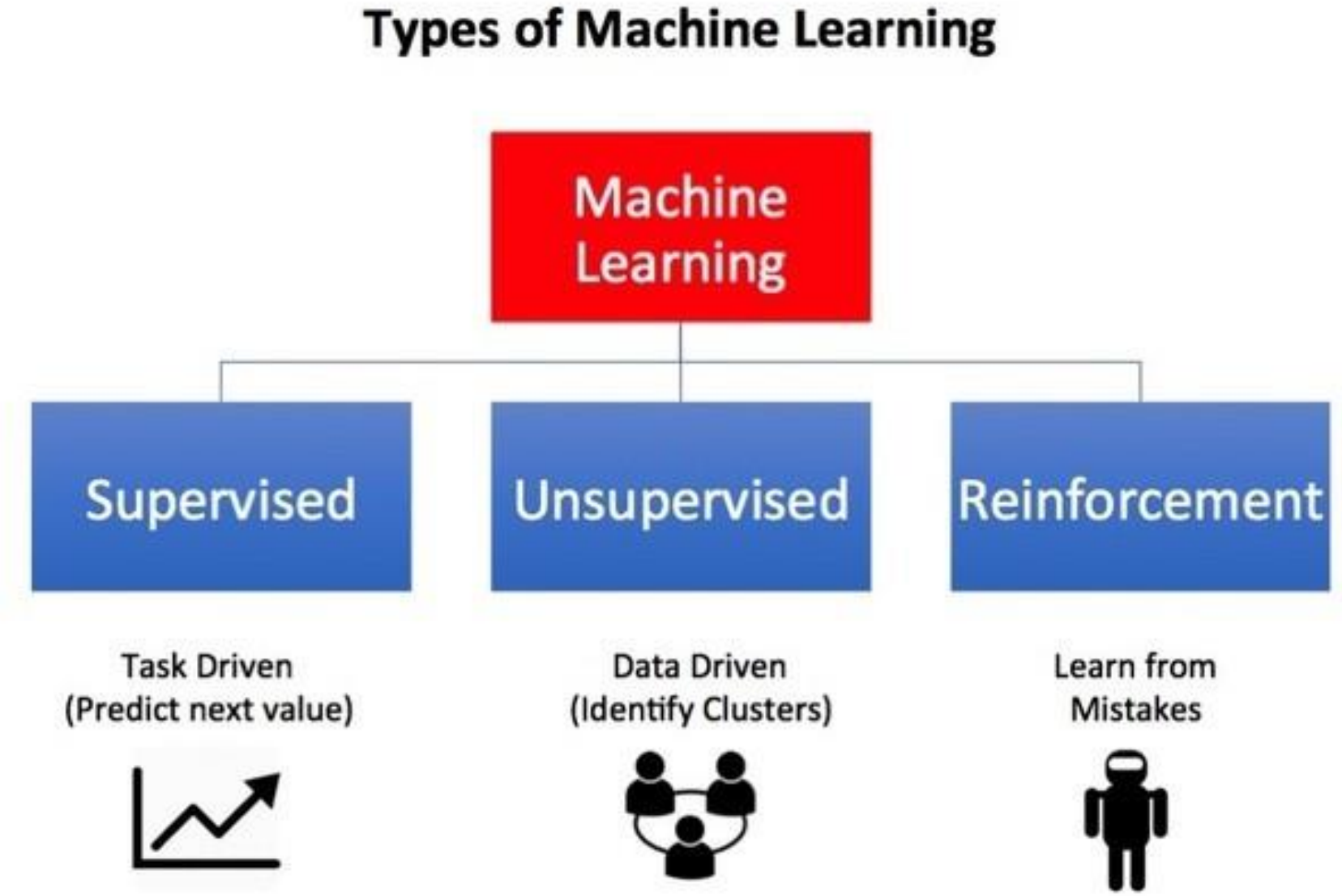


ARTIFICIAL INTELLIGENCE
A technique which enables machines to mimic human behaviour

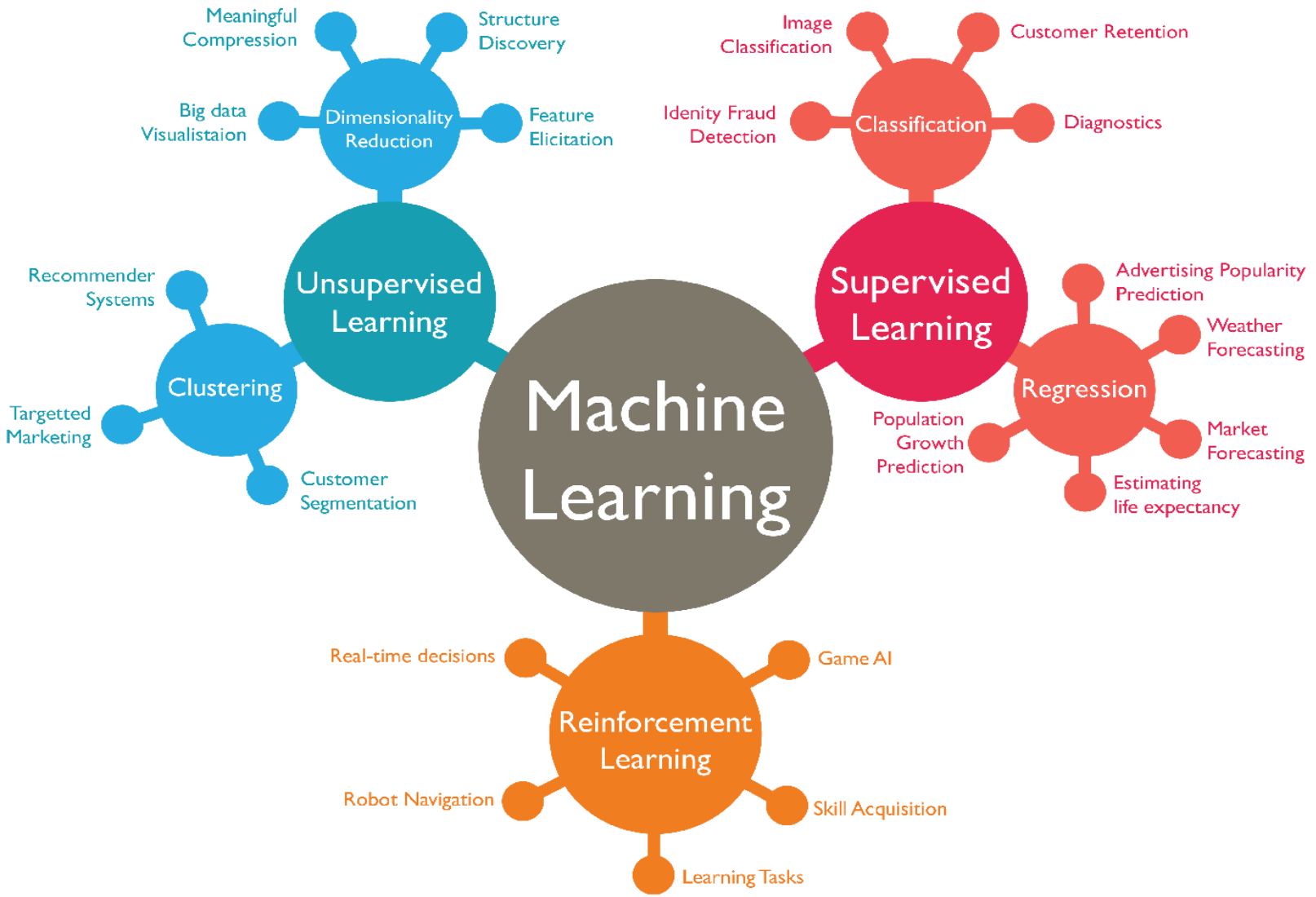
MACHINE LEARNING
Subset of AI technique which use statistical methods to enable machines to improve with experience

DEEP LEARNING
Subset of ML which make the computation of multi-layer neural network feasible

TYPES OF MACHINE LEARNING



TYPES OF MACHINE LEARNING



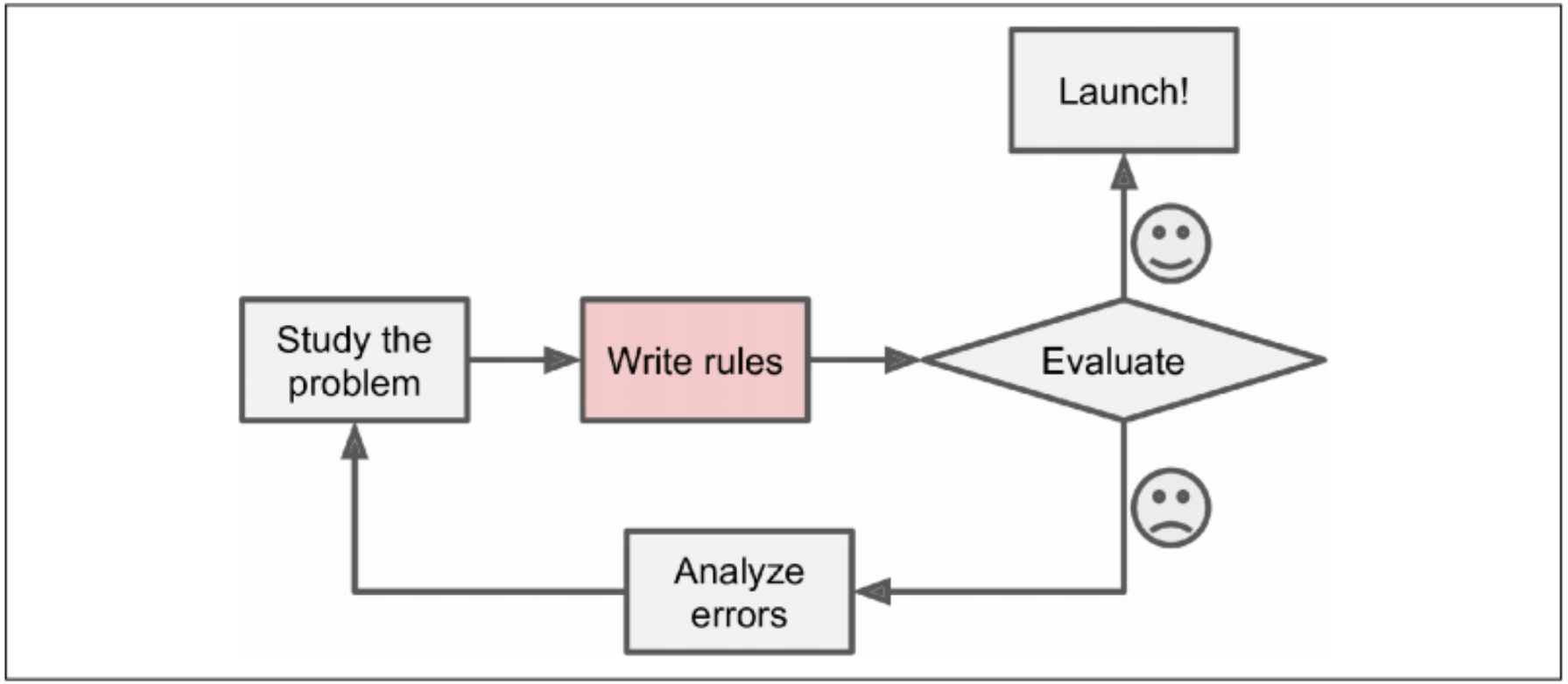
What is Machine learning?

Using Data for **answering questions**.

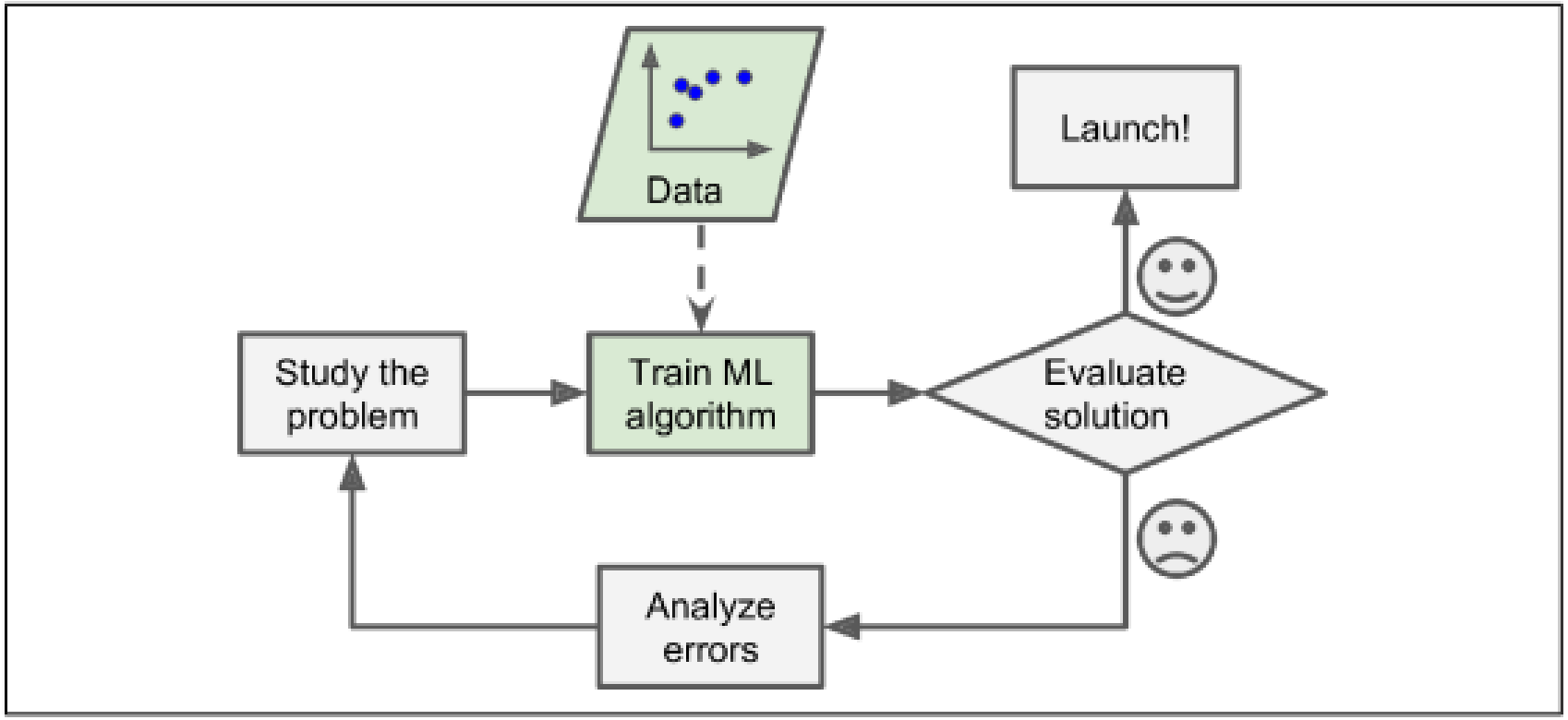
Trainin
g

Predicting

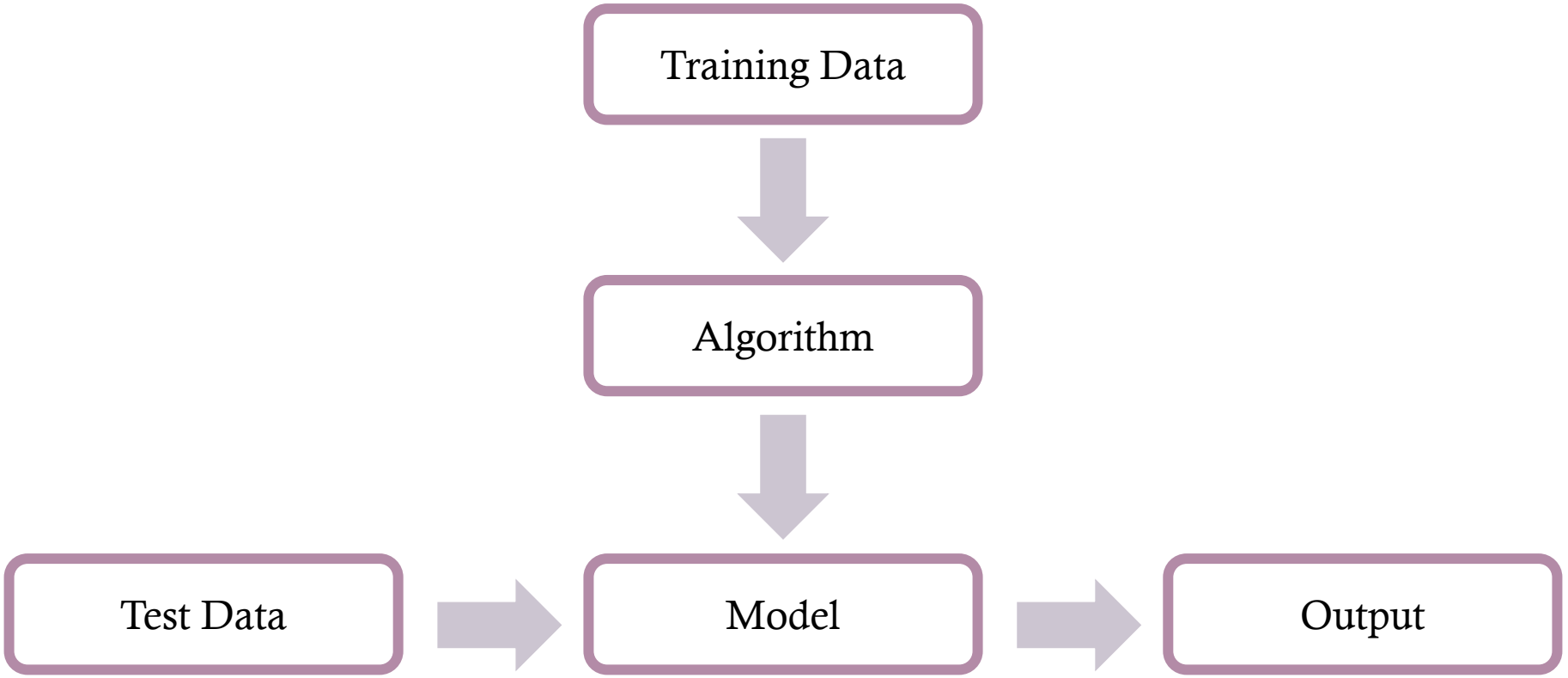
THE TRADITIONAL APPROACH



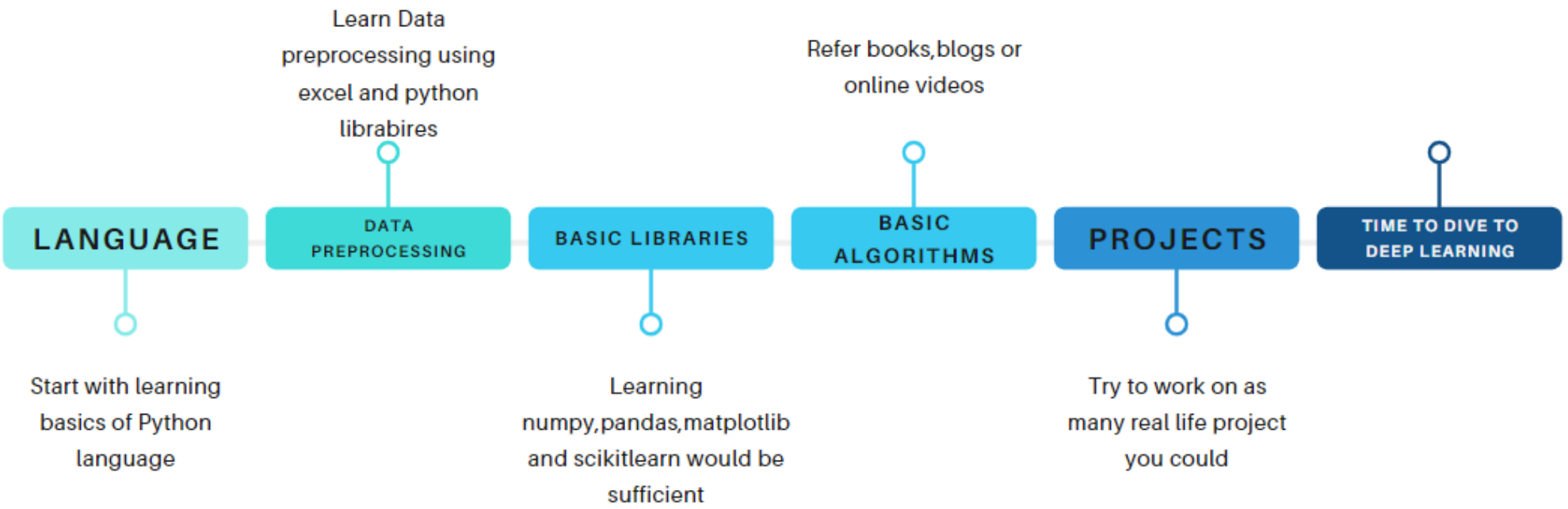
THE MACHINE LEARNING APPROACH



Workflow of Machine Learning



Learning Approach



SUPERVISED MACHINE LEARNING

Explicit learning, data contains input & output.

Output can be continuous (regression) or discrete (classification).

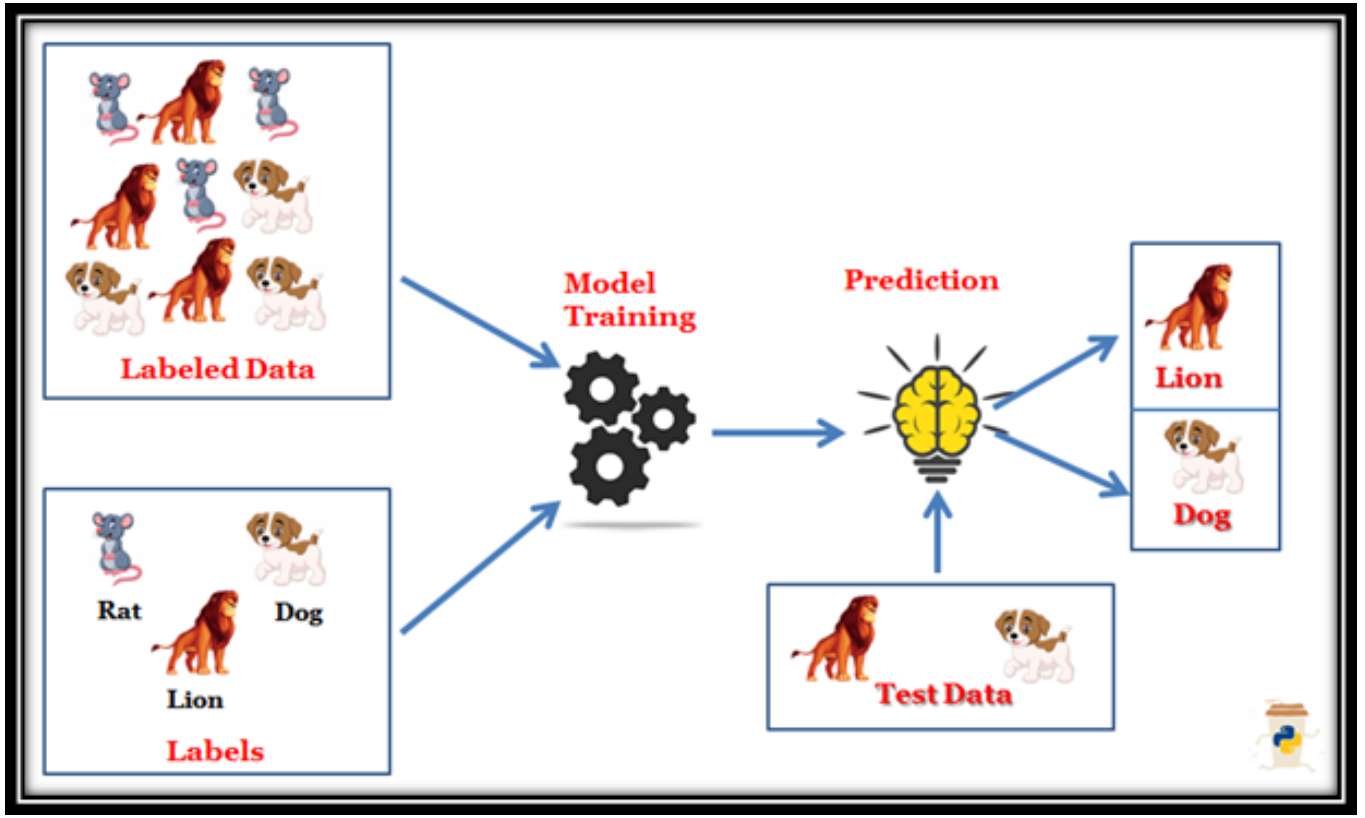
Learning algorithms tries to find pattern between input & output during training phase.

Once the pattern is learned, this can be used for predicting output for given input

TYPES OF SUPERVISED ALGORITHMS

1. Linear Regression
2. Logistic Regression
3. Decision Tree
4. SVM
5. Naive Bayes
6. KNN
7. K-Means
8. Random Forest

SUPERVISED LEARNING

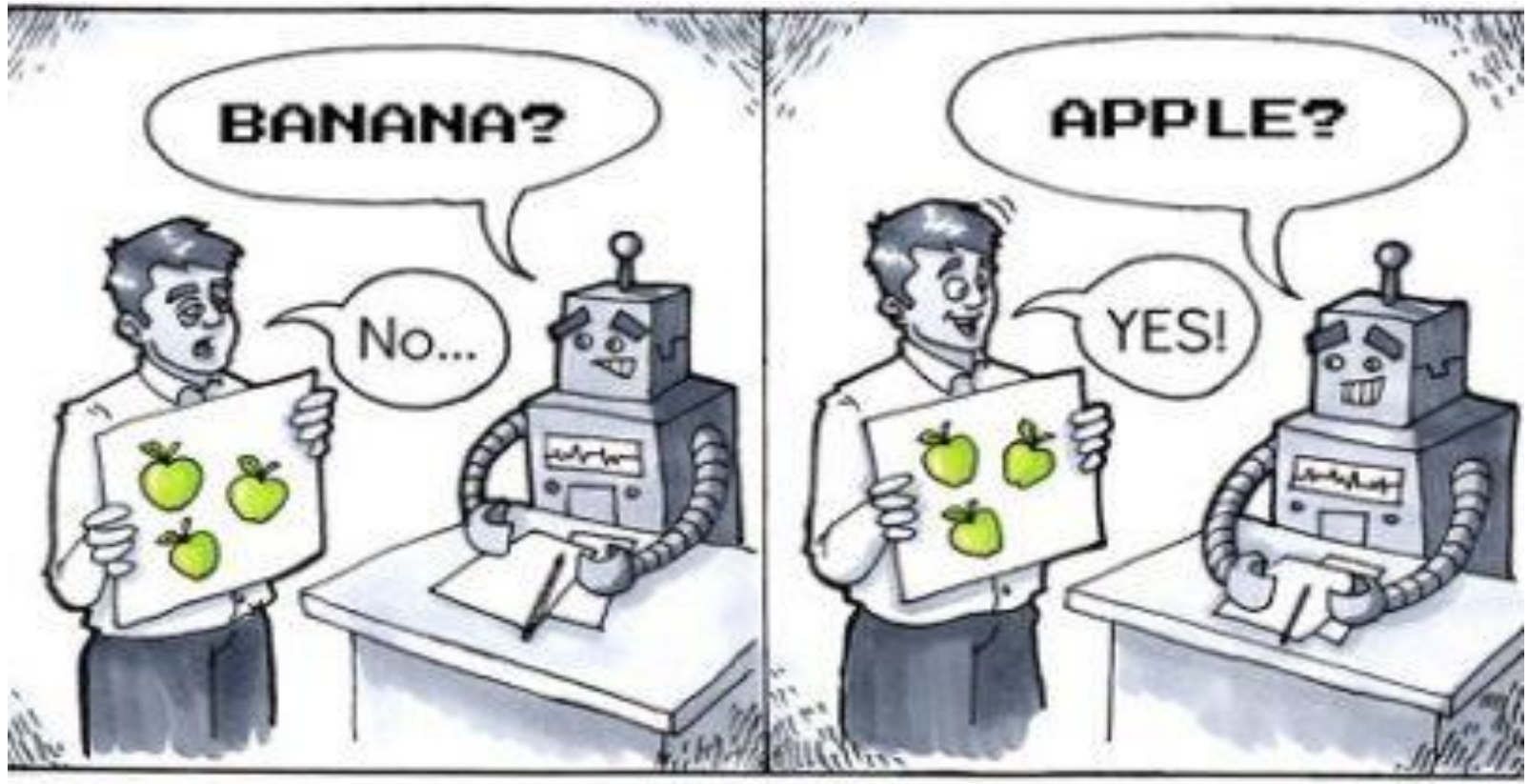


SPAM MAIL DETECTION

- Input: Mail
- Output: Spam or Ham
- Supervised ML Algorithm
- Binary Classification problem

PREDICTING STONKS

- Input : Previous Data
- Output: Future Stock Price
- Supervised Regression Problem



Supervised Learning

UNSUPERVISED MACHINE LEARNING

Finding Pattern in input data

Not output associated

No correct answer or supervision provided

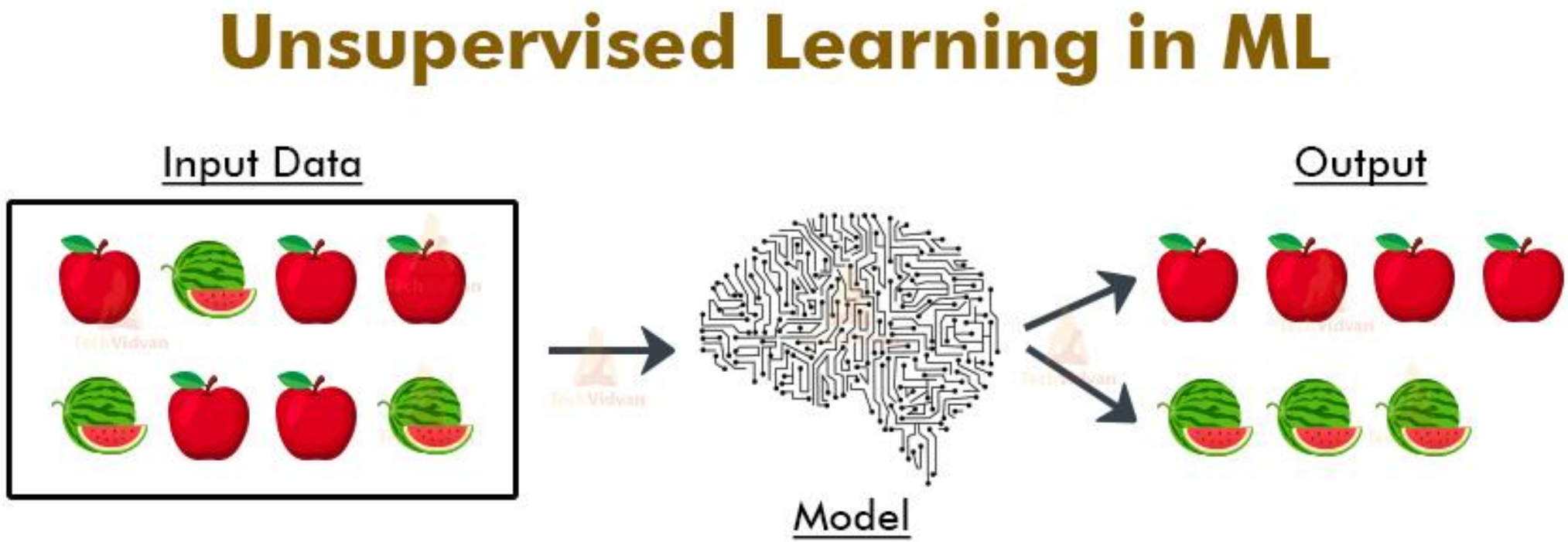
Grouping of data (clustering)

Learning association rule (people who bought X also bought Y)

TYPES OF UNSUPERVISED ALGORITHMS

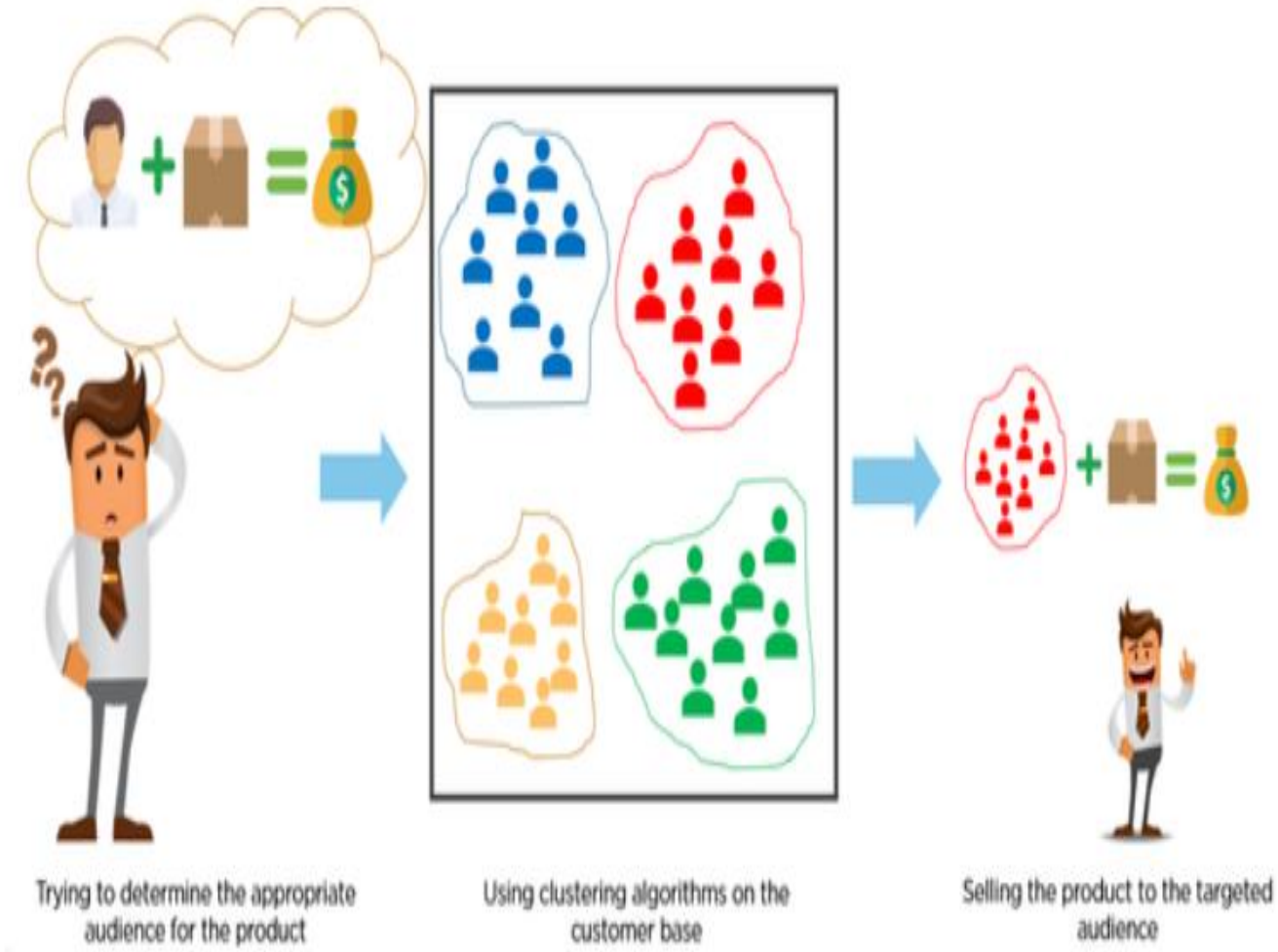
- K-means clustering
- Hierarchal clustering
- Anomaly detection
- Principle Component Analysis
- Independent Component Analysis

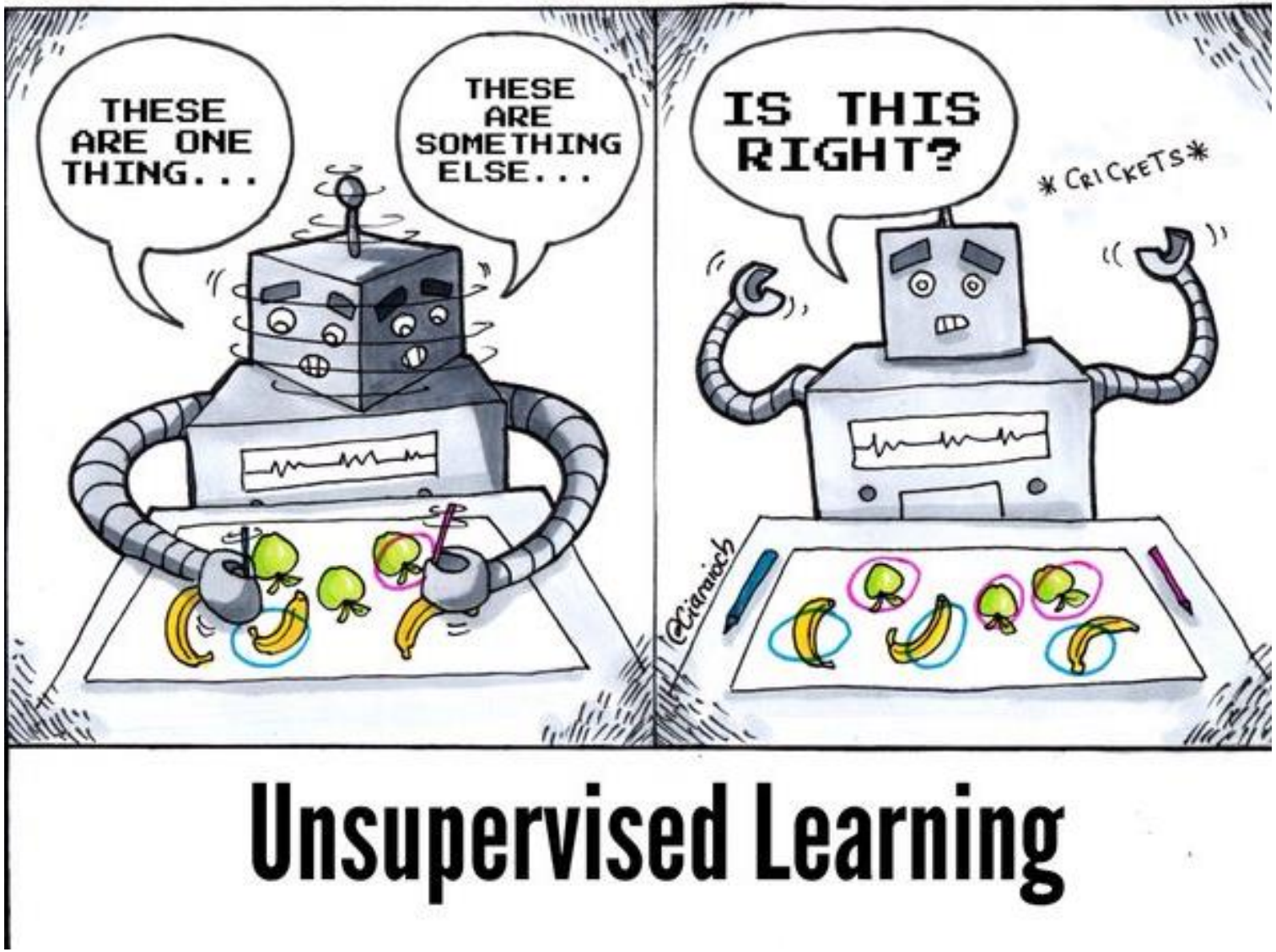
UNSUPERVISED LEARNING



MARKET SEGMENTATION

- Input: Customer details
- Output: clusters
- Unsupervised, Clustering problem




THESE ARE ONE THING...
THESE ARE SOMETHING ELSE...
IS THIS RIGHT?
CRICKETS
@ciamaoch
Unsupervised Learning

REINFORCEMENT LEARNING

The learning system, called an agent observe the environment, select and perform actions, and get rewards in return

It must then learn by itself what is the best strategy to get the most reward over time.

A strategy defines what action the agent should choose when it is in a given situation.

DeepMind's AlphaGo program is also a good example of Reinforcement Learning

REINFORCEMENT LEARNING

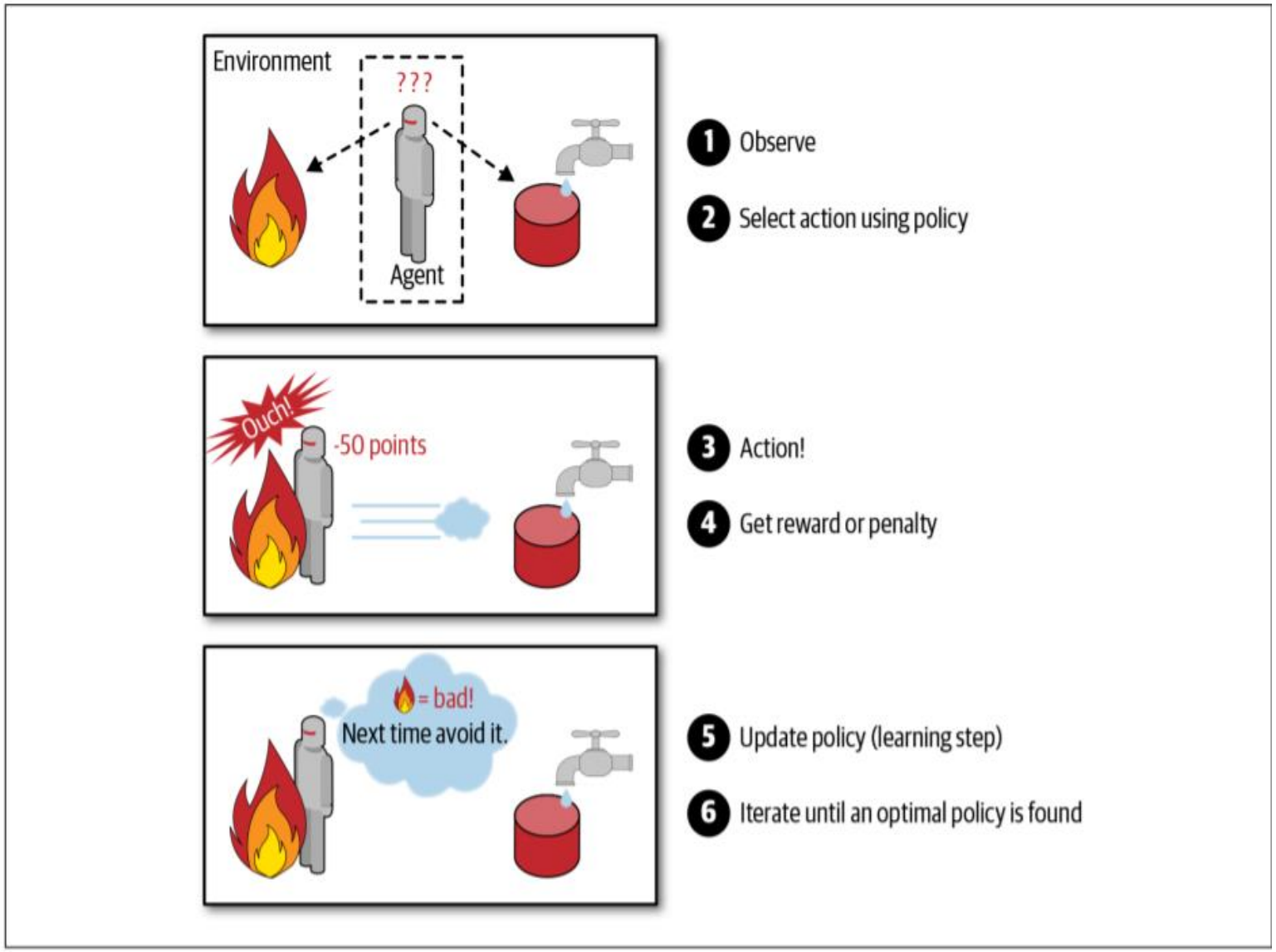
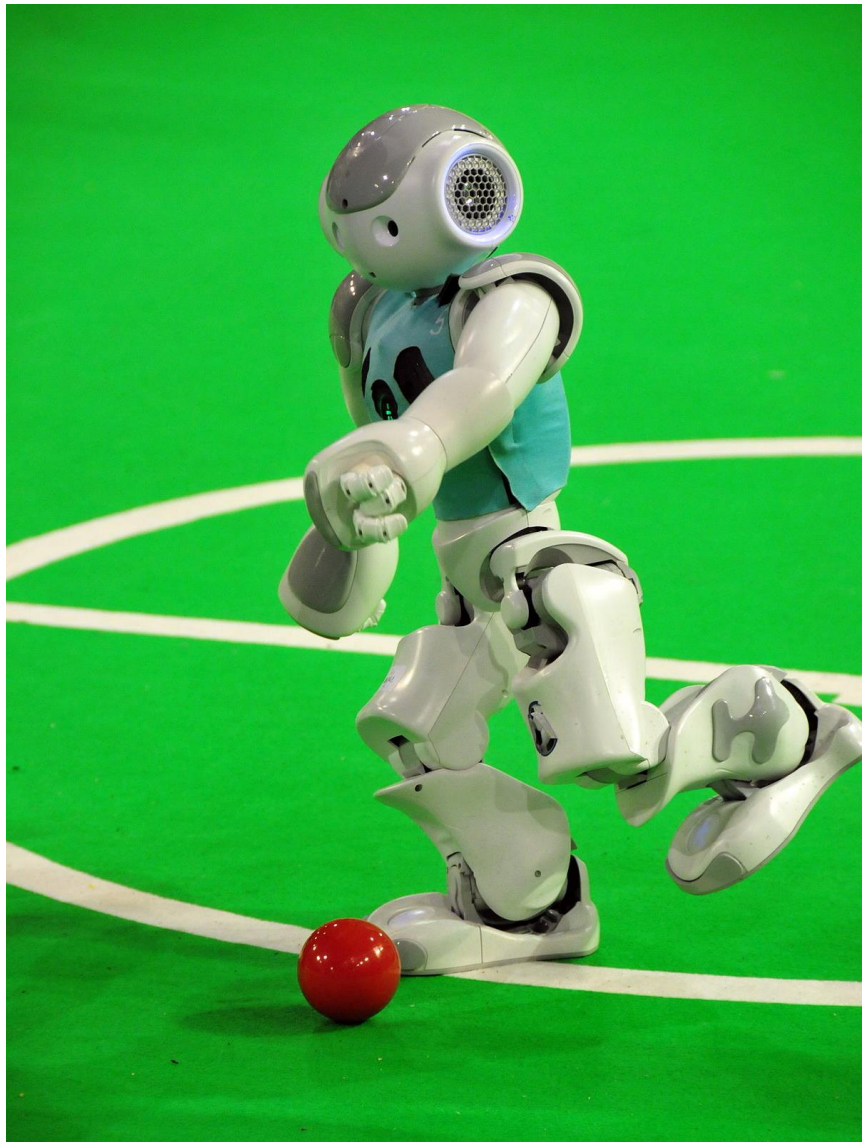


Figure 1-12. Reinforcement Learning

ROBOT PLAYING FOOTBALL

- Input : Other player information, rewards
- Output: Action to score
- Reinforcement learning



MAIN CHALLENGES OF MACHINE LEARNING

- Insufficient training Data
- Poor Quality Data
- Irrelevant Features
- Underfitting/Overfitting data

THANK YOU