

Online Value Added Course on Machine Learning, Deep Learning and Neural Networks

Day 3

Conducted by

Mr. Anupam Borthakur

Prime Minister's Research Fellows (PMRF)



Centre of Excellence in Artificial Intelligence
Indian Institute Of Technology, Kharagpur



Assam down town University, Guwahati, Assam



#iitKLIV
Kharagpur Learning, Imaging and
Visualization Research Group
www.iitkliv.github.io



Agenda

1. Recap
2. Difference between Supervised and Unsupervised Learning
3. Difference between Classification and Regression
4. One simple algorithm for Unsupervised Learning

Applications of Machine Learning in our day to day life



Google Maps

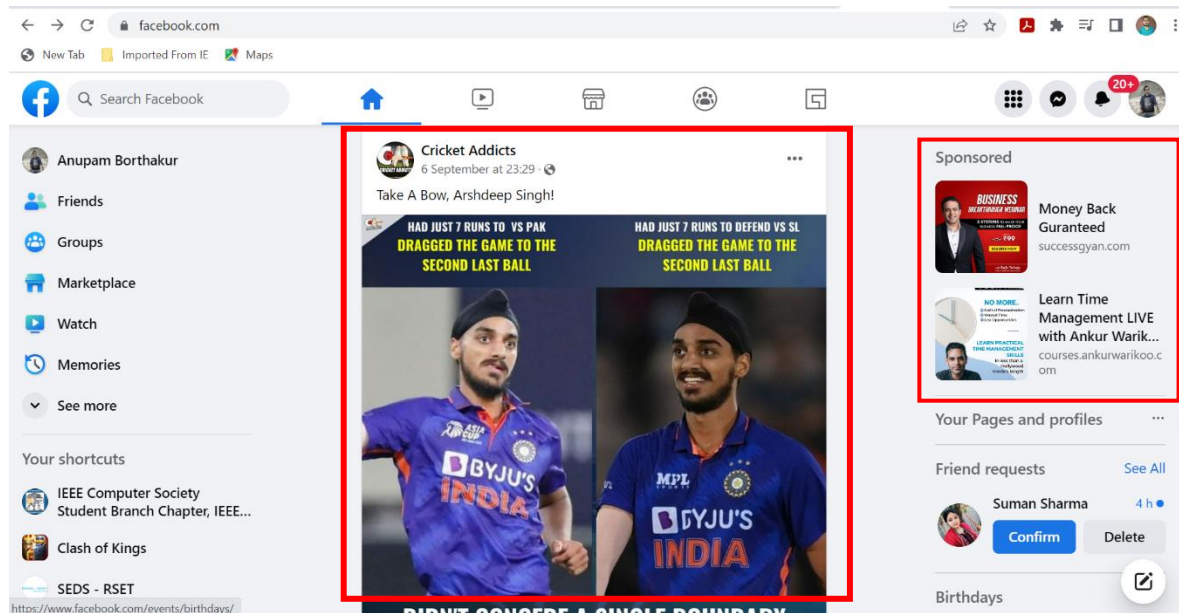


Voice Recognition

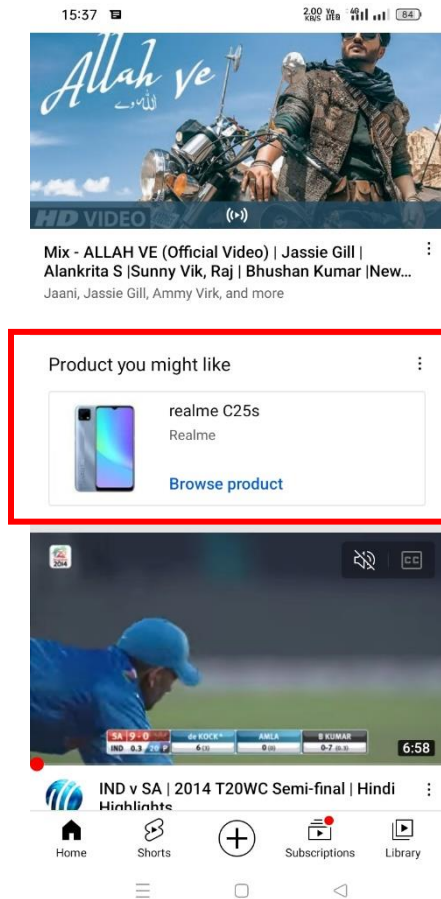


Finger Print Recognition

Importance of Data



Facebook



YouTube

Why its important to study ML now

- ✓ Abundant amount of data
- ✓ High Computational Resources
- ✓ Growing progress in the available platforms and algorithms
- ✓ Increase support from industry
 - ✓ Facebook: 10 Million Photos uploaded per hour
 - ✓ YouTube: 1 hour of video uploaded every minute
 - ✓ Google: 24 Peta bytes of data per day
 - ✓ Twitter 400 Million tweets per day

Types of Machine Learning

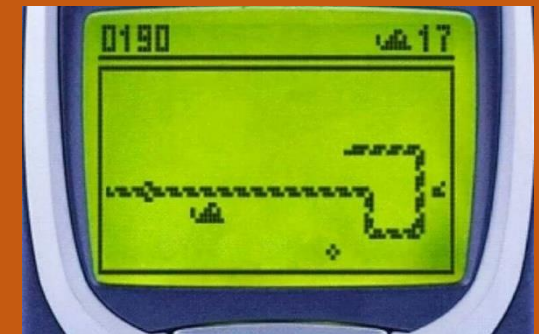
Supervised Learning



Un-supervised Learning



Reinforcement Learning



Supervised vs Unsupervised Learning

Supervised

Age	Class
14	T
24	A
17	T
30	A

Teenager (T)
Adult (A)

Unsupervised

Age
14
24
17
30

Find patterns

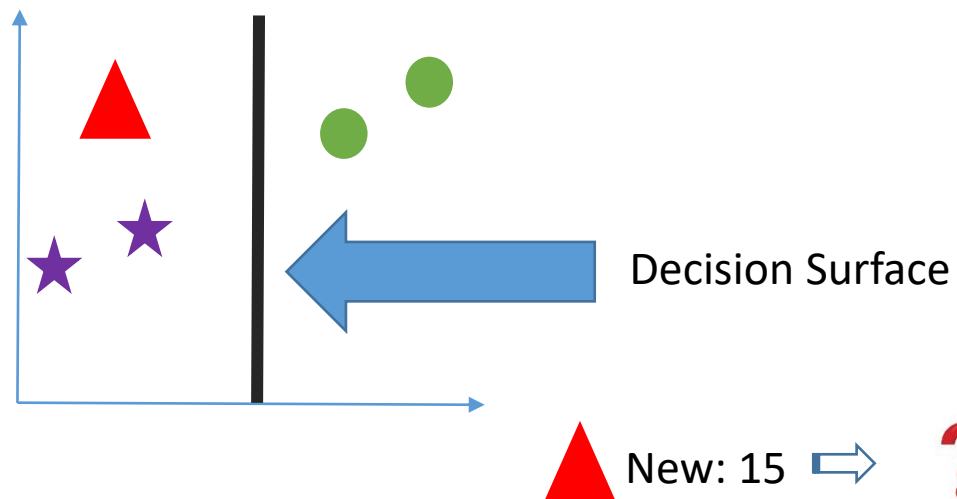
New: 15



Supervised

	Age	Class
★	14	T
●	24	A
★	17	T
●	30	A

Teenager (T)
Adult (A)



Unsupervised

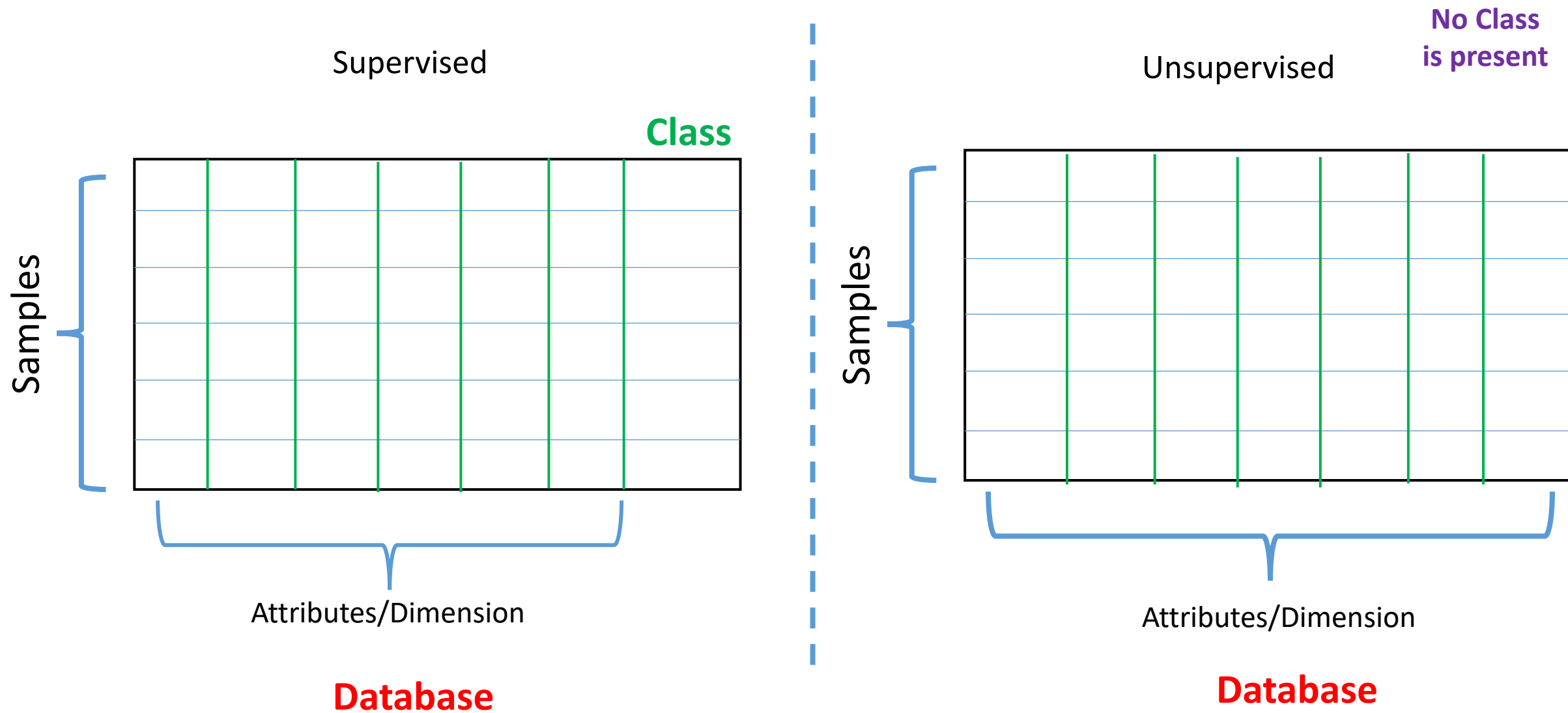
Age
14
24
17
30

Find patterns

- Groups
- Clusters

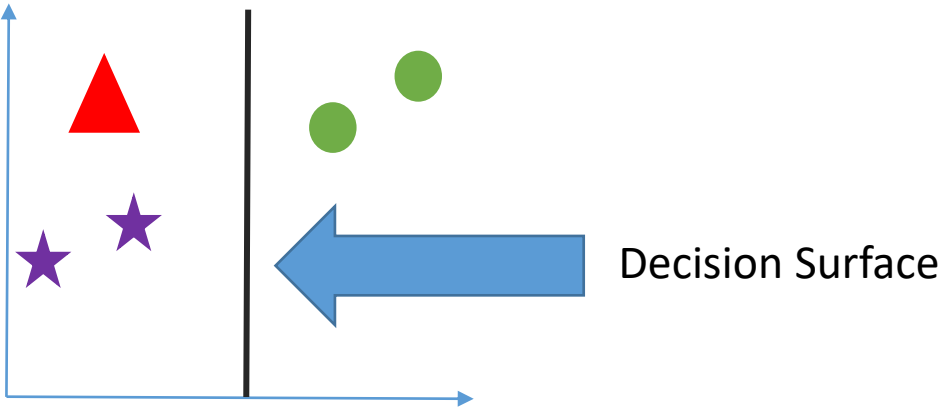


Simple Structure of a Database

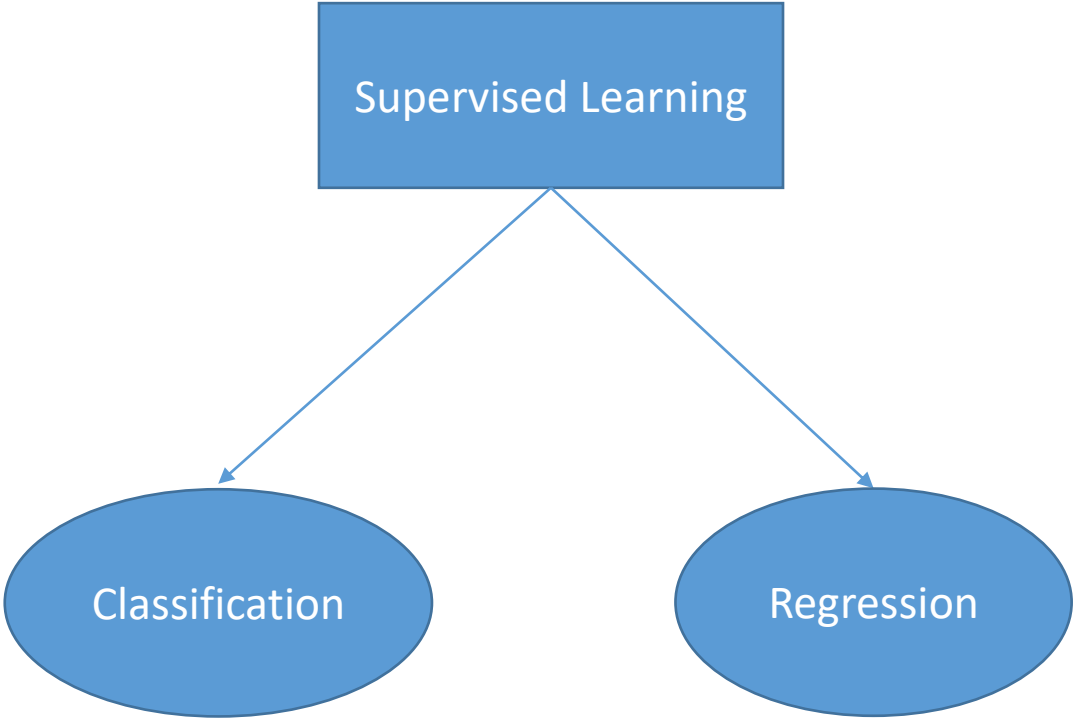


Supervised

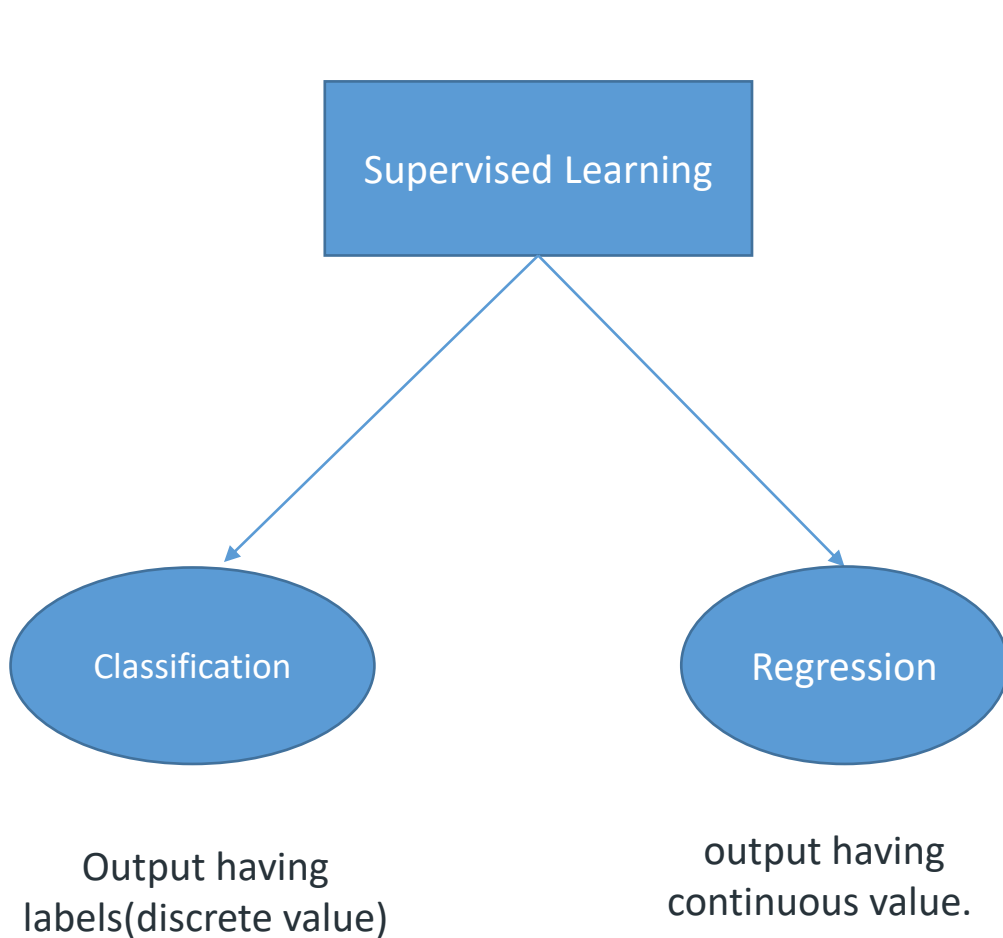
	Age	Class
★	14	T
●	24	A
★	17	T
●	30	A



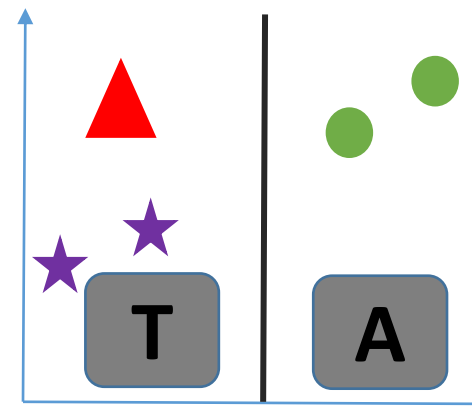
Types of Supervised Learning



Types of Supervised Learning



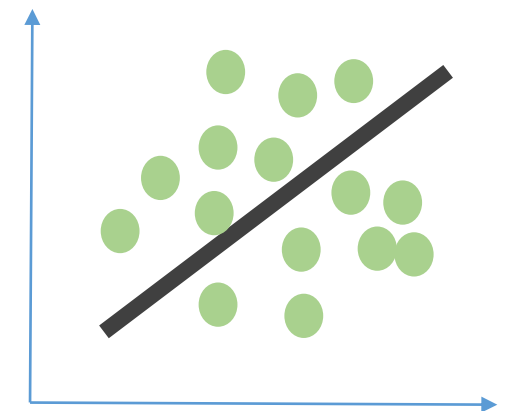
Age	Class
14	T
24	A
17	T
30	A



Classification

Floor	Bedroom	Years	Price
2	3	15	40 lakh
1	2	7	24 lakh
3	3	12	60 lakh
2	2	8	30 lakh
1	1	10	15 lakh

Price of a house?



Regression

Classification vs Regression



Who will win?

Classification



Regression

Predict weather for next 1 week?



Predict the stock price?

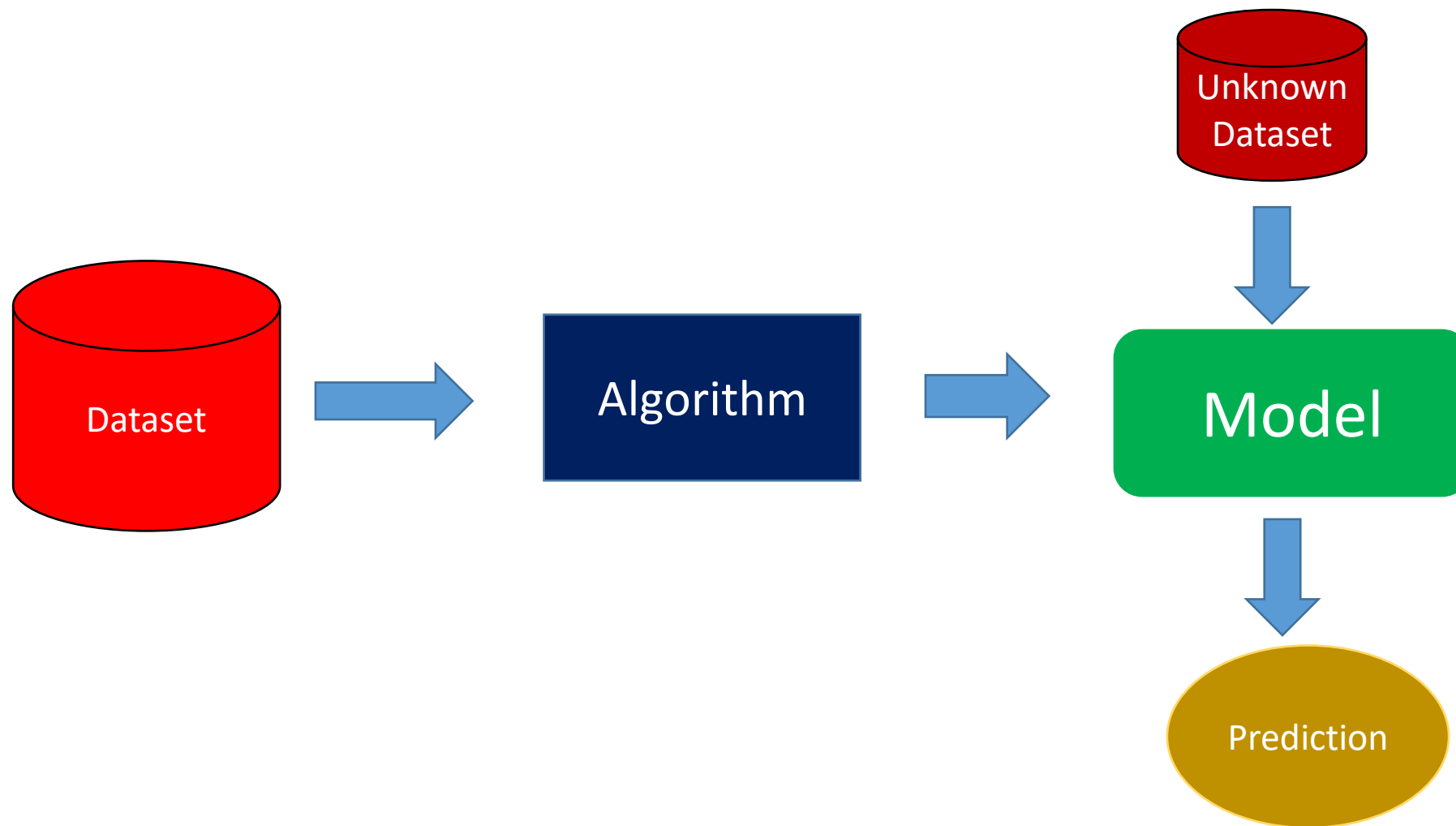
Regression



Classification

Will Modi win in 2024 election?

Simple Training Pipeline of Machine Learning

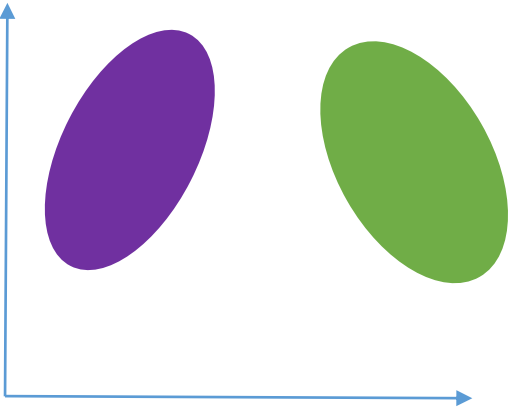


Unsupervised Learning

Input/Database

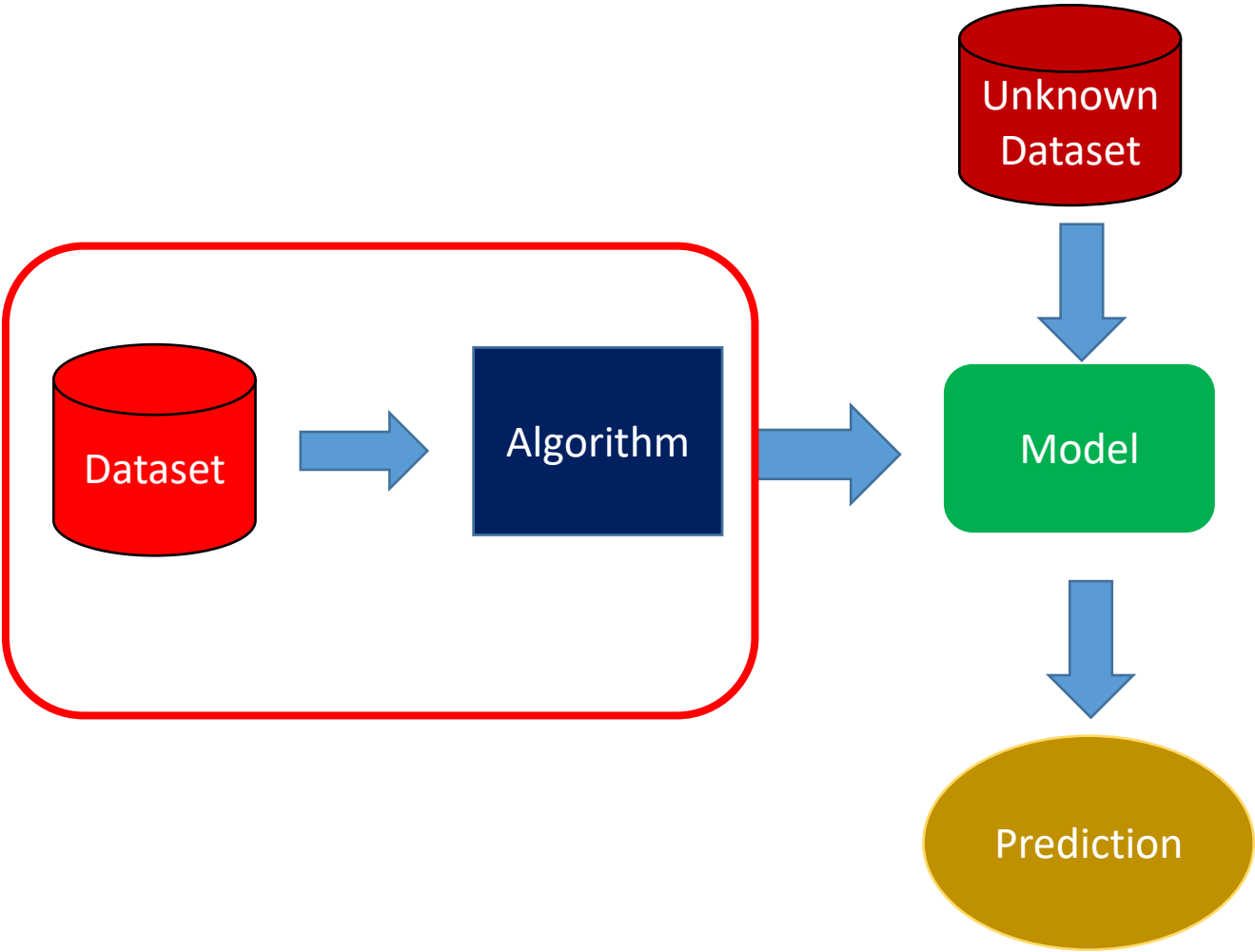
Age
14
24
17
30

Find patterns



Output/Model

Simple Training Pipeline of Machine Learning

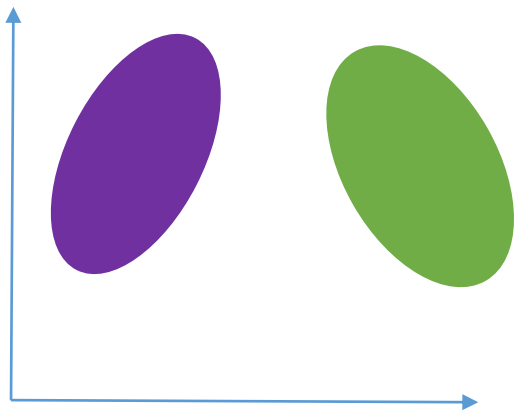


Unsupervised Learning

Data

Age
14
24
17
30

Find patterns

**Model****Data**

Age
14
24
17
30

Step 1: Choose a centroid (random)

Step 2: Find the distance for each of the points to that centroid

Step 3: Assign each point to the closet centroid

Data

Age	
14	← Centroid
24	
17	
30	← Centroid

Step 1: Choose a centroid (random)

Centroid

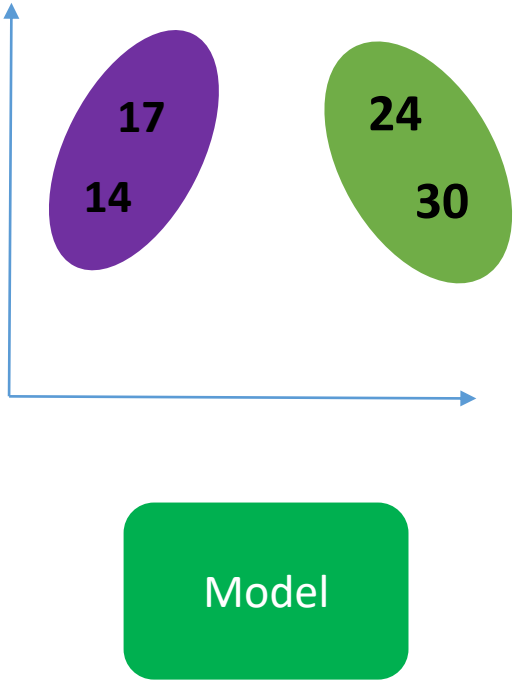
14 30

24 → $|24 - 14| = 10$
 $|24 - 30| = 6$

17 → $|17 - 14| = 3$
 $|17 - 30| = 13$

Algorithm

Step 2: Find the distance for each of the points to that centroid



Step 3: Assign each point to the closet centroid

Identify which one is **Supervised** and which one is **Unsupervised**



?



?

Thank You

For your Attention!

Any Questions?

