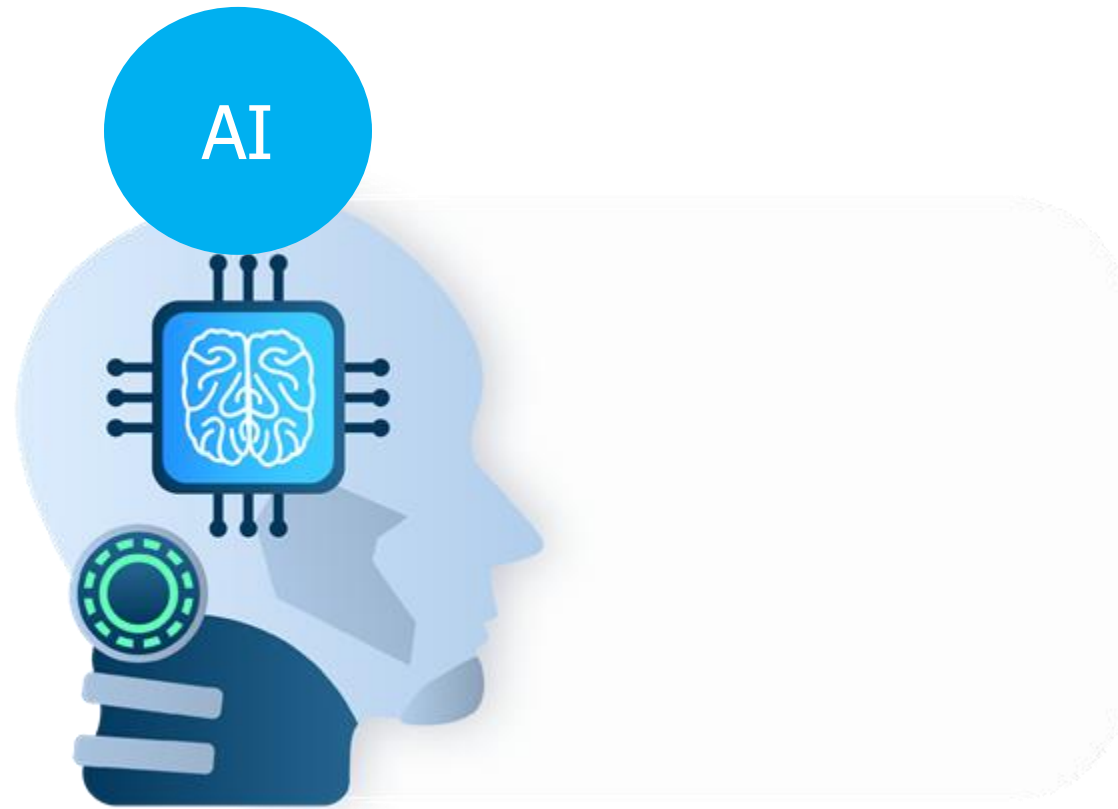


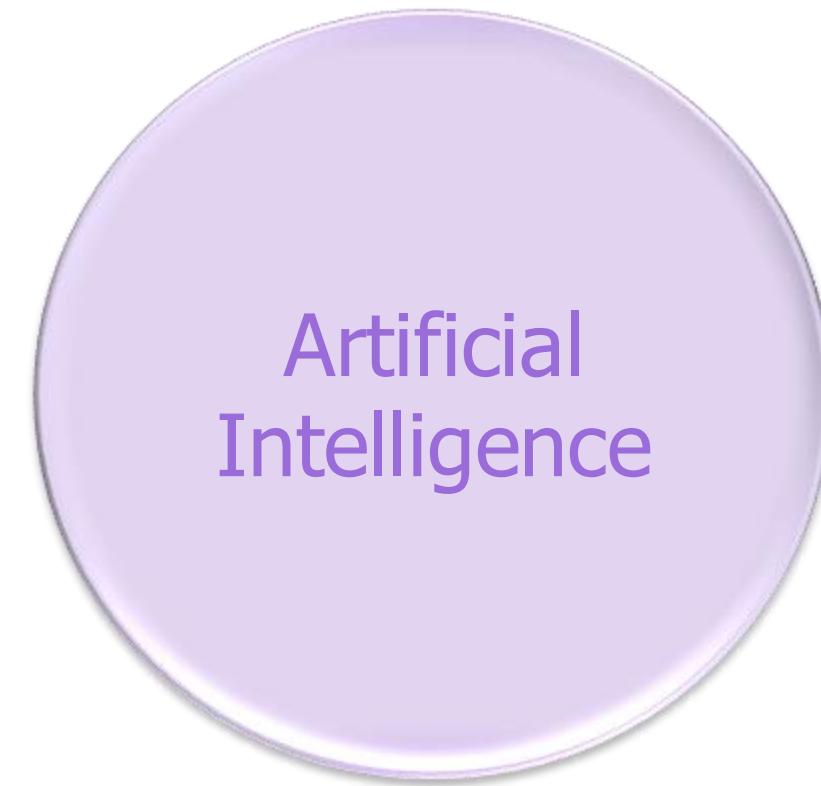
Machine Learning



What is Artificial Intelligence



Artificial Intelligence

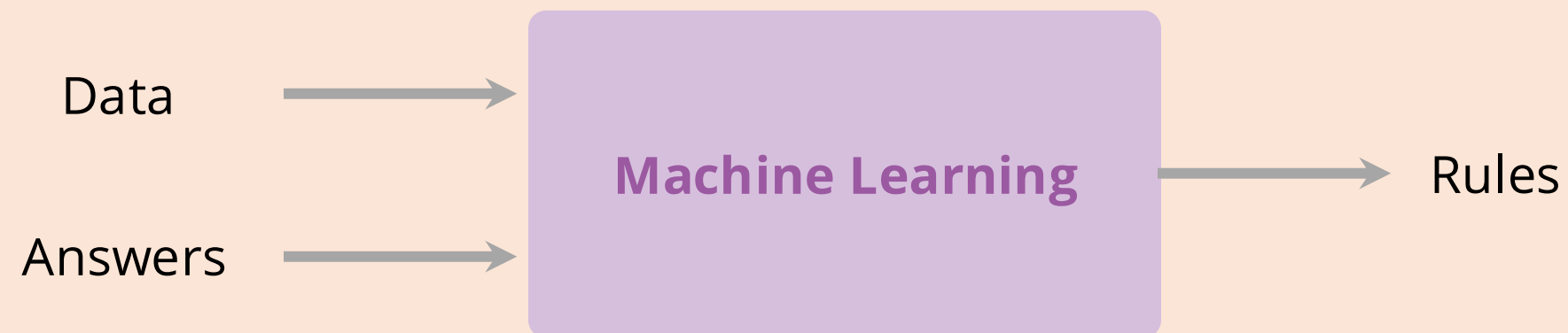


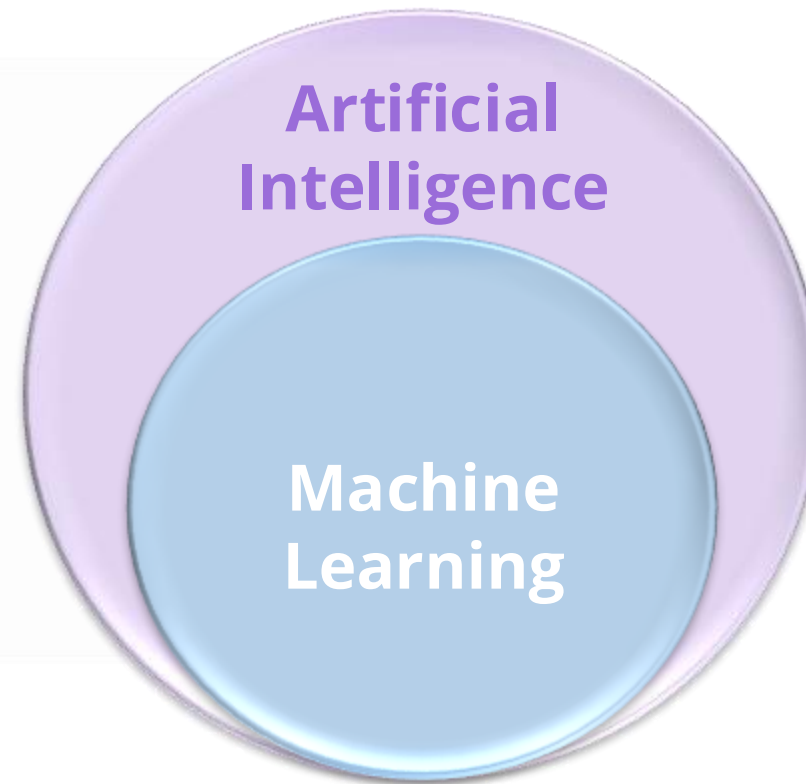
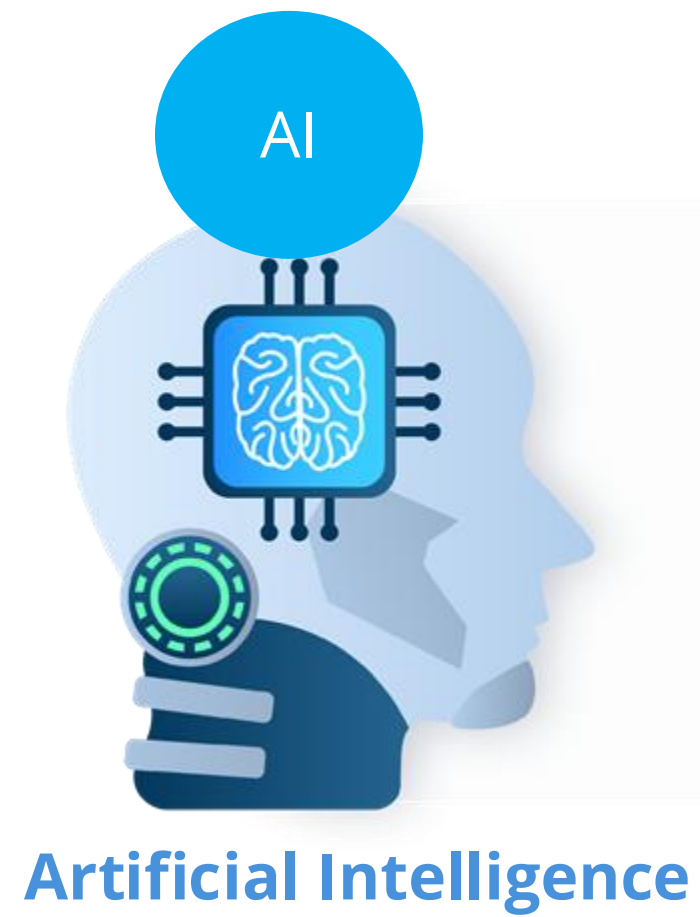
Machine Learning

"Hey computer, here are the rules for identifying a cat in a picture."



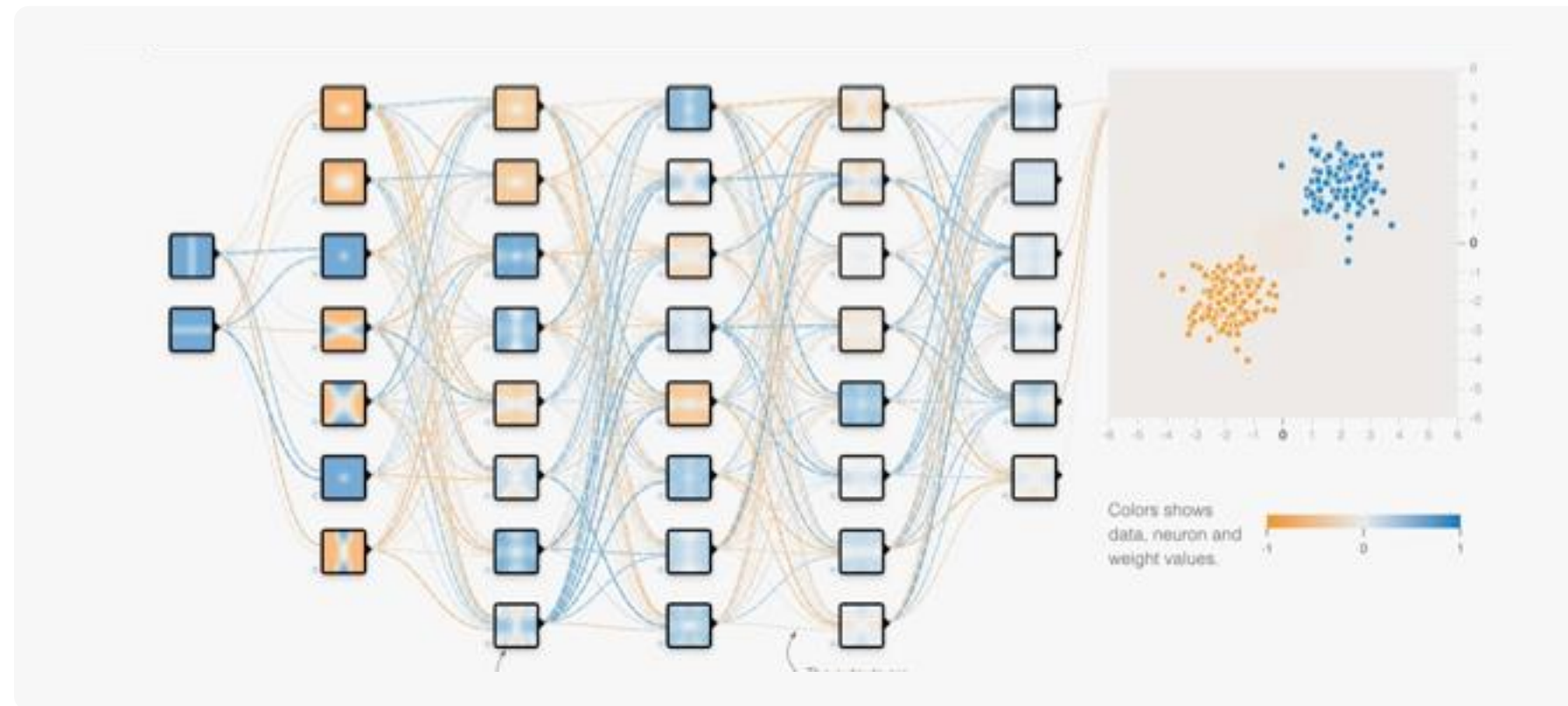
"Hey computer, here are 10,000 pictures of cats. Figure it out yourself!"



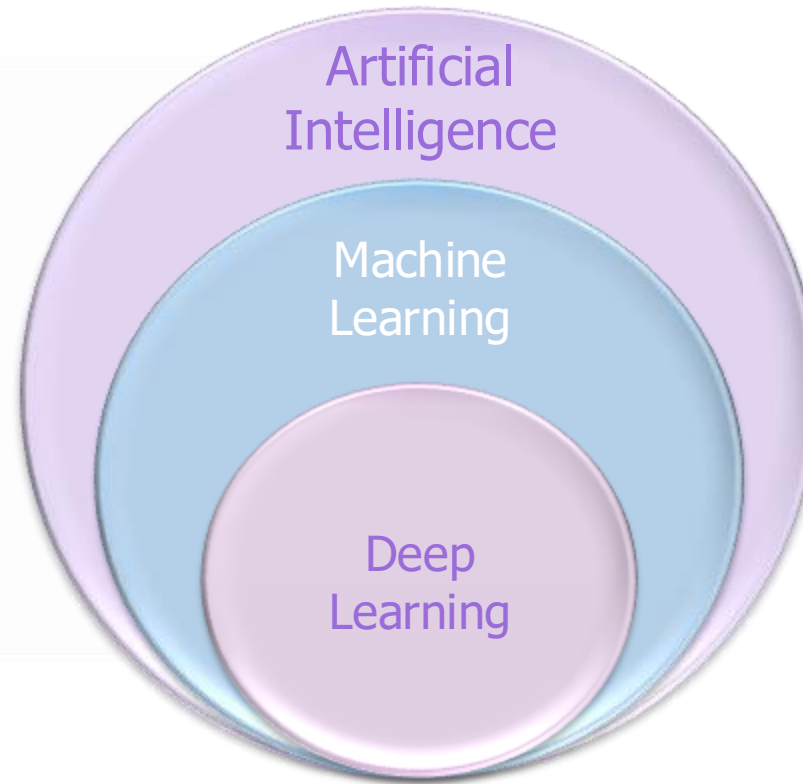
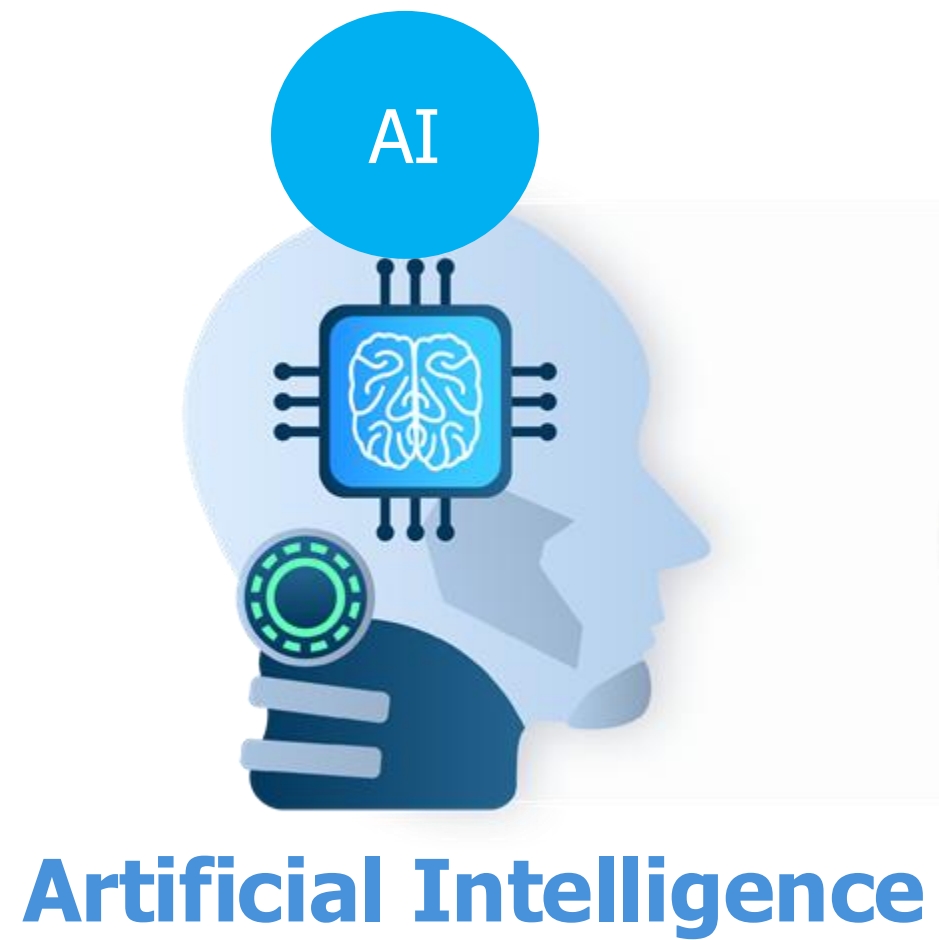


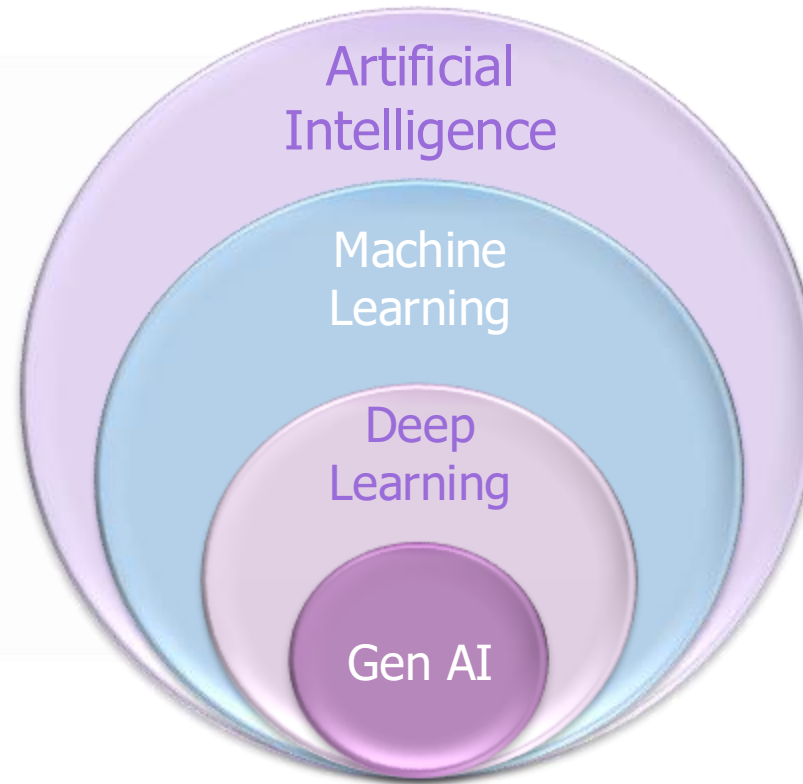
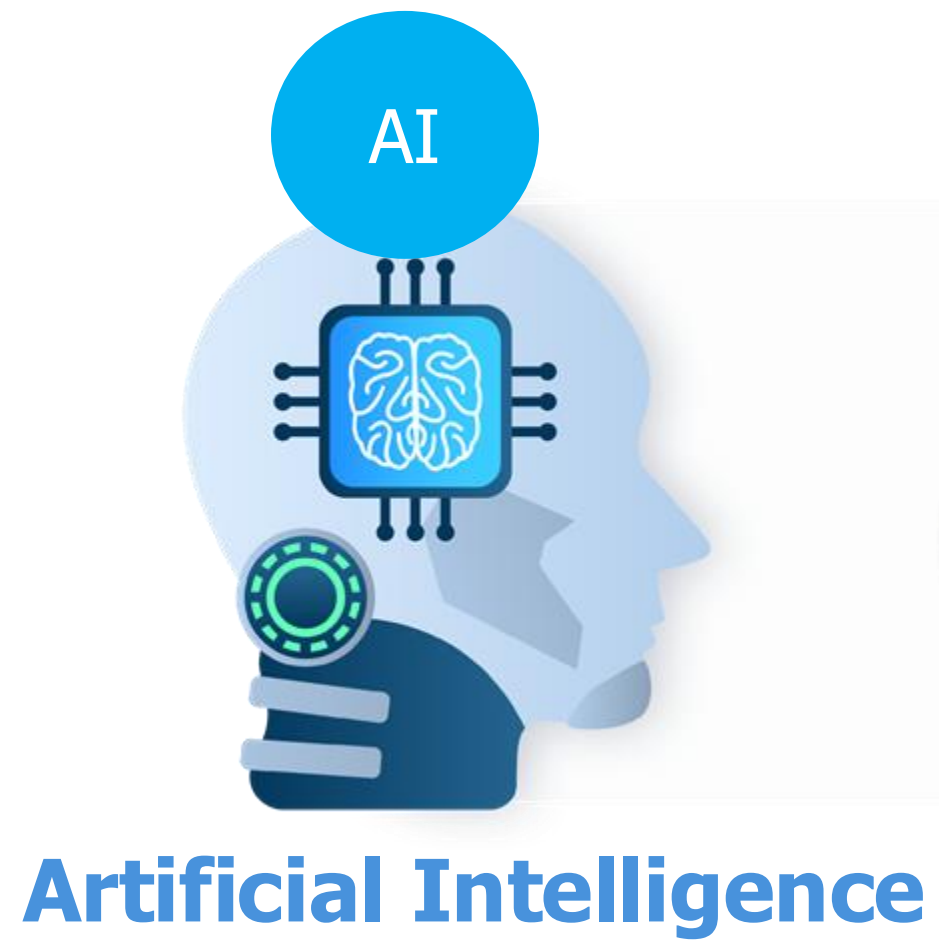
Deep Learning

Deep Learning utilizes **artificial neural networks** with multiple layers (hence "**deep**") to learn and represent complex patterns in data.



Deep learning has revolutionized fields like **computer vision**, **natural language processing**, and **speech recognition**.





Supervised
Learning



Unsupervised
Learning



Reinforcement
Learning



Types of Machine Learning

Machine learning



Let's start with..



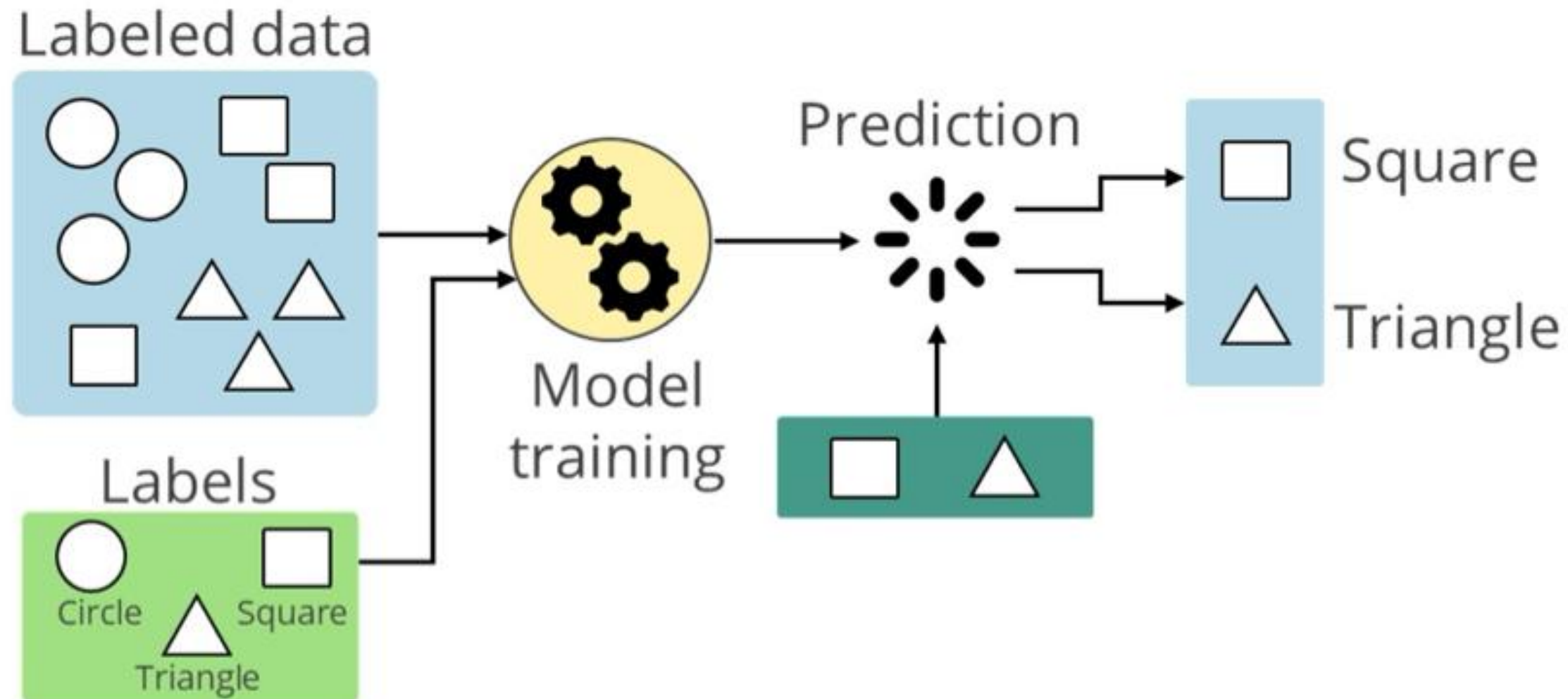
Supervised



Unsupervised

Supervised Machine Learning

A supervised learning method uses labeled data to predict outcomes guided by specific input-output pairs.

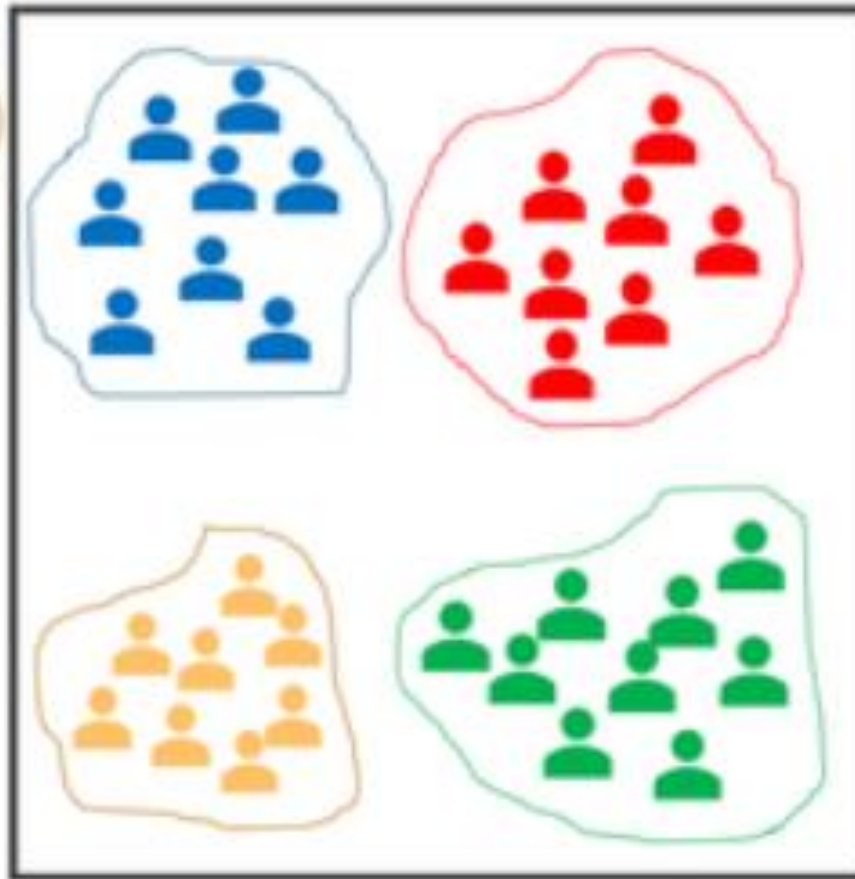


Here, both inputs and outputs are known.

Unsupervised Machine Learning



Trying to determine the appropriate audience for the product

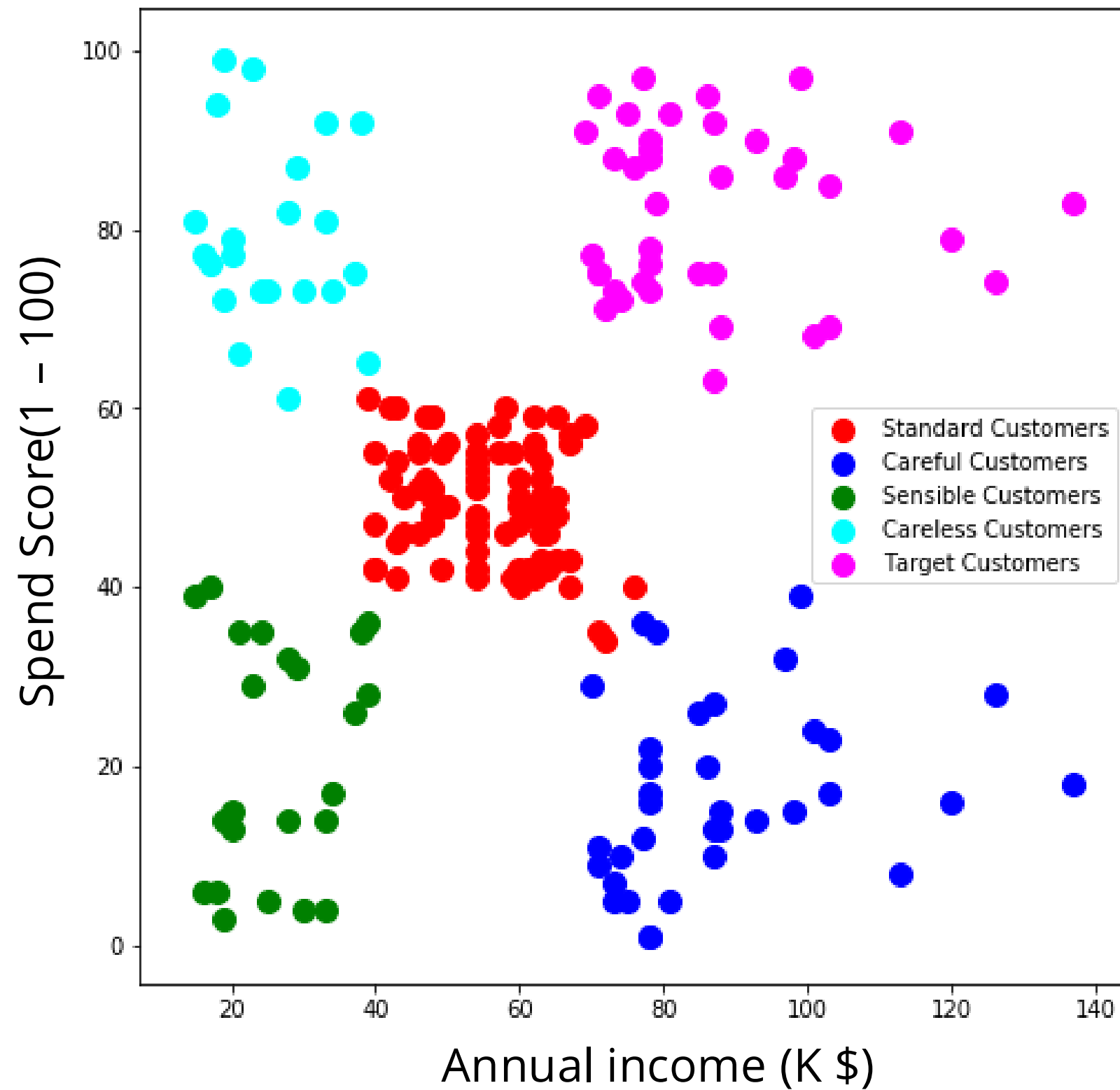


Using clustering algorithms on the customer base



Selling the product to the targeted audience

Unsupervised Machine Learning



What is an ML model?

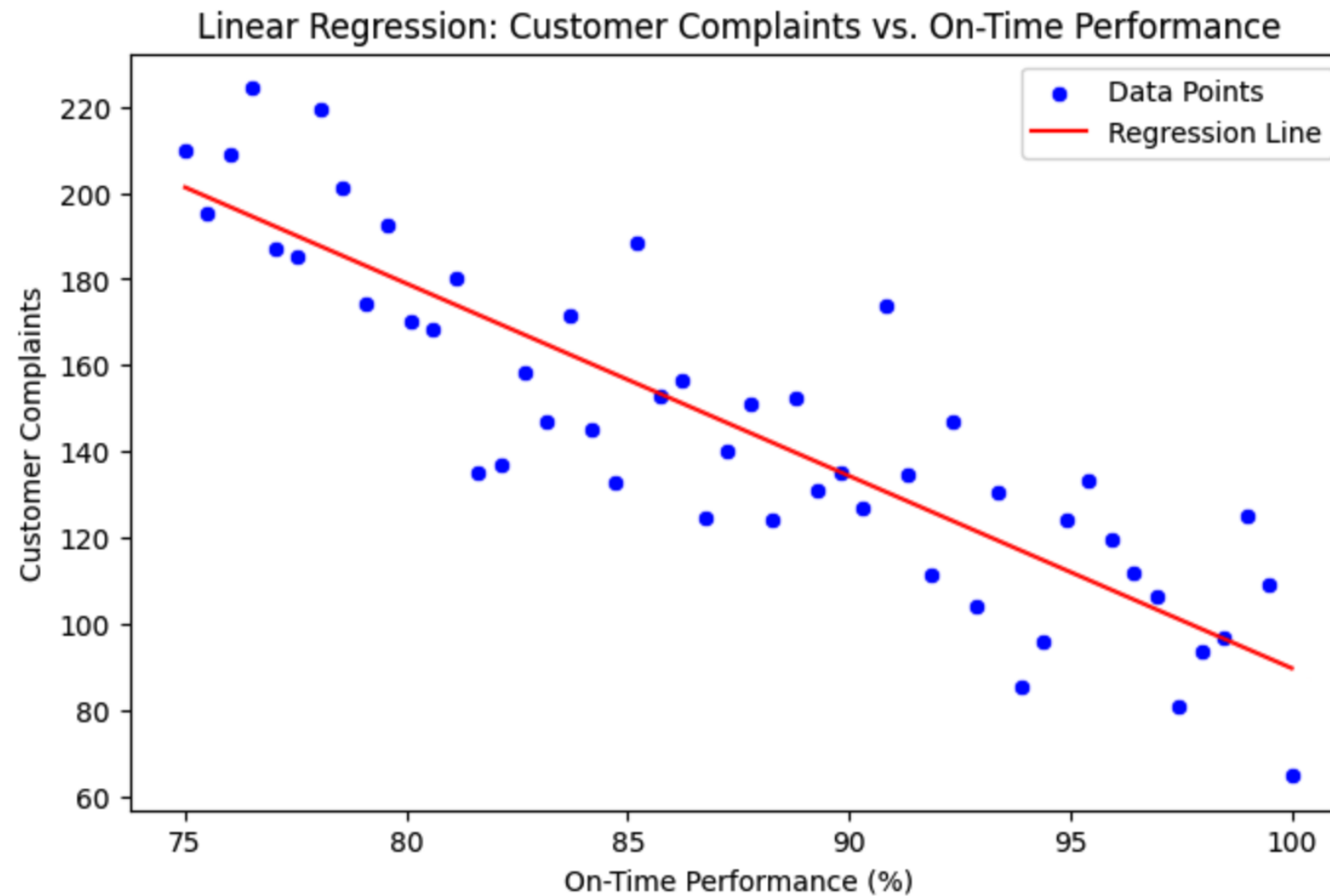
What is an ML model?

Objective: Predicting number of customer complaints based on % of on-time arrival based on a sample data.

	On-Time Performance (%)	Customer Complaints
0	75.0	210.0
1	76.0	195.0
2	76.0	209.0
3	77.0	224.0
4	77.0	187.0
5	78.0	185.0
6	78.0	219.0
7	79.0	201.0
8	79.0	174.0
9	80.0	192.0
10	80.0	170.0
11	81.0	168.0
12	81.0	180.0
13	82.0	135.0
14	82.0	137.0
15	83.0	158.0
16	83.0	147.0

What is an ML model?

Objective: Predicting number of customer complaints based on % of on-time arrival based on a sample data.



$$\text{Customer Complaints} = -4.46 * (\text{On-Time Performance}) + 536.08$$

What is an ML model?

Customer Complaints = $-4.46 * (\text{On-Time Performance}) + 536.08$

Is this a universal relationship?

Supervised ML - Types

Target Variable – Continuous - Regression

Example – How much delay in arrival?

Target Variable – Categorical - Classification

Example – Whether On-time(yes/no)?



Let's do some work in python.

Bias Variance Trade-off

