
Introduction to Machine Learning

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Welcome!

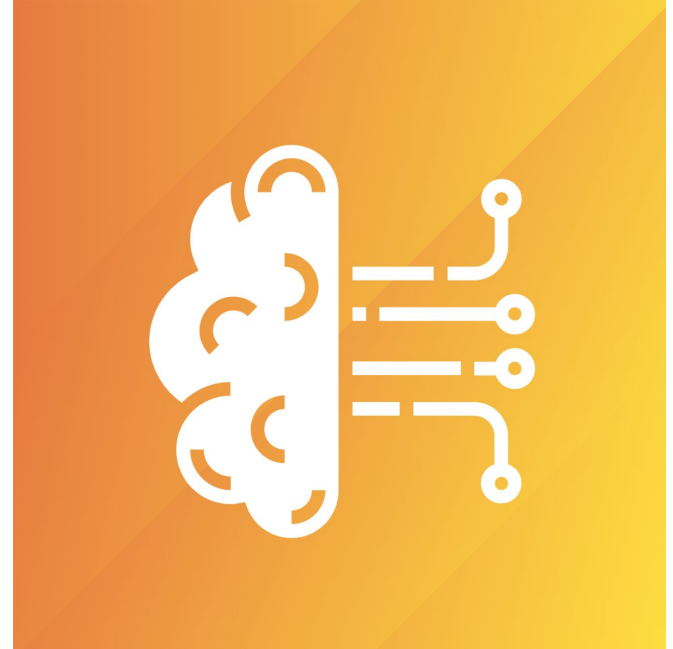
To the world of Data Science!

Topics we will cover today:

1. Python Basics
2. Numpy
3. Matplotlib
4. Linear Regression & Gradient Descent

Machine Learning

Providing machines ability to learn & improve from experience!



But how?

Machine learn some functions that map input X to some desired output Y.

Math Quiz #1 - Teacher's Answer Key

$$1) \ 2 \ 4 \ 5 \ = \ 3$$

$$2) \ 5 \ 2 \ 8 \ = \ 2$$

$$3) \ 2 \ 2 \ 1 \ = \ 3$$

$$4) \ 4 \ 2 \ 2 \ = \ 6$$

$$5) \ 6 \ 2 \ 2 \ = \ 10$$

$$6) \ 3 \ 1 \ 1 \ = \ 2$$

$$7) \ 5 \ 3 \ 4 \ = \ 11$$

$$8) \ 1 \ 8 \ 1 \ = \ 7$$

Student Marks Prediction

You are given some input like

assignment submitted

hours of study

bunked lectures

MARKS = ASSIGNMENTS*HOURS STUDY - BUNKED LECTURES

This list of inputs in Machine Learning are called **features**.

Autonomous Vehicles | Self Driven Cars



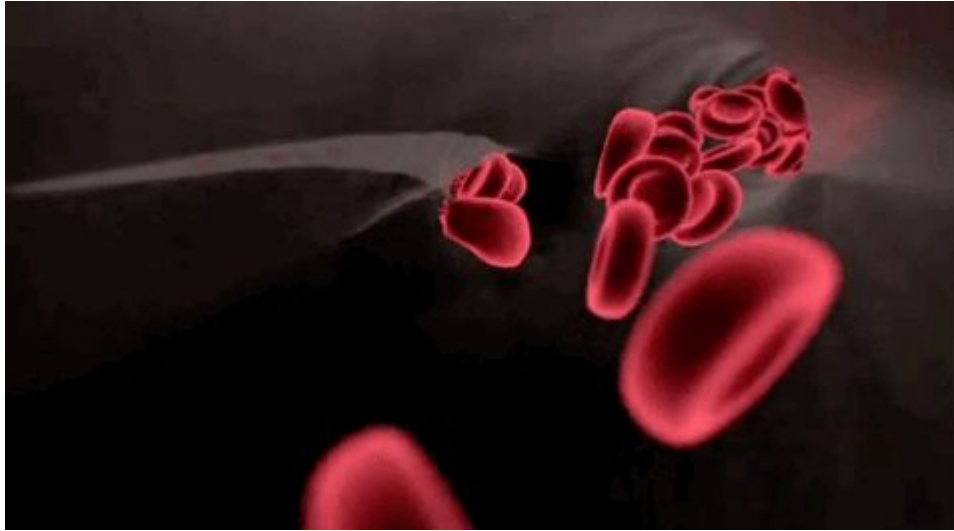
Input - ?

Output - ?



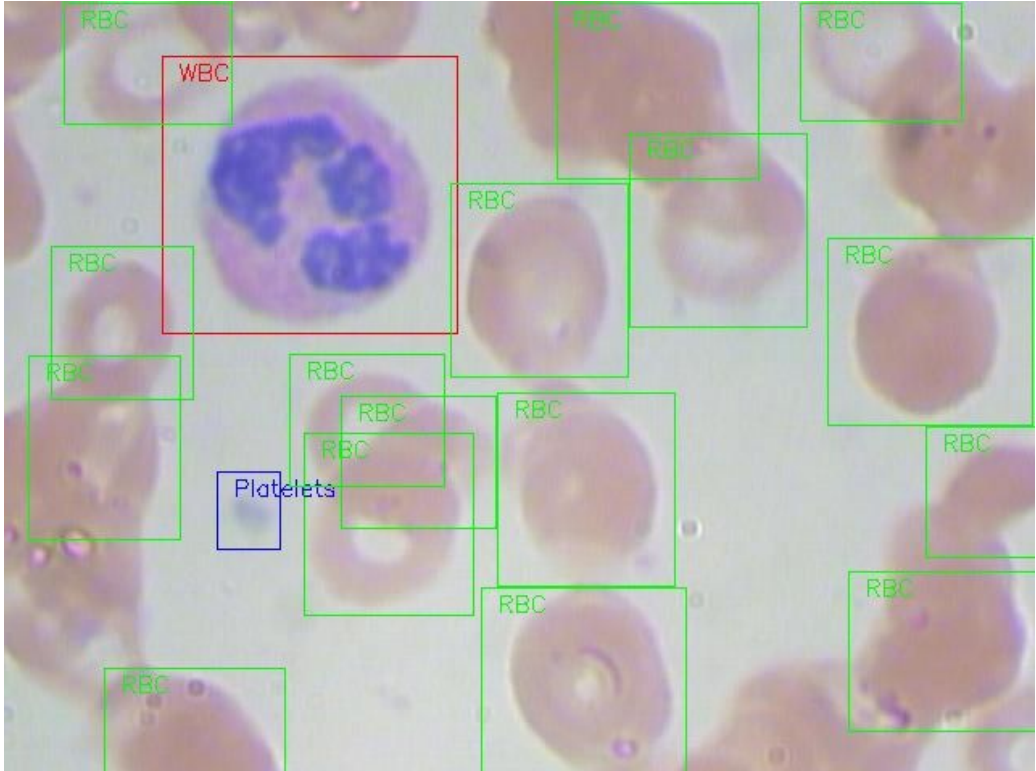
Health & Medicine

Blood Cells Detection



Input - ?

Output - ?



Landmark Detection

Snapchat



Why it is challenging?



				165	187	209	58	7
	14	125	233	201	98			159
253	144	120	251	41	147			204
67	100	32	241	23	165			30
209	118	124	27	59	201			79
210	236	105	169	19	219			156
35	178	199	197	4	14			218
115	104	34	111	19	196			
32	69	231	203	74				

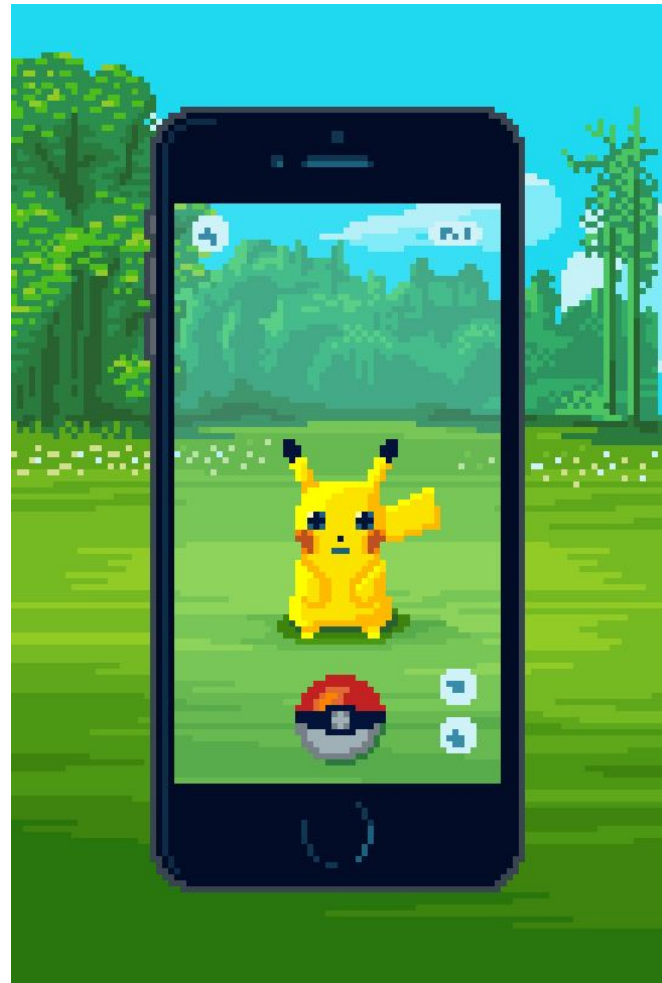
Neural Art Transfer

PRISMA



Machine Learning is everywhere!

- Email Filtering
- Amazon Recommendations
- Search Engines
- Fraud Detection
- Generating Art
- Story Generation
- Disease Diagnosis



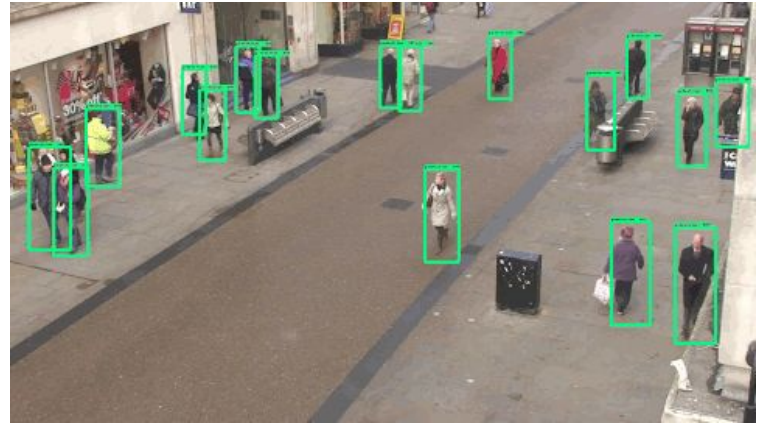
Machine Learning is everywhere!

Computer Vision

- Autonomous Systems
- Videos Surveillance for Crimes
- Smart Cameras

Natural Language Processing

- Personal Assistants like Google Allo
- Text Generation/Autocomplete
- Smart Speakers like Google Home



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Some useful Libraries

Numpy

Pandas

OpenCV

Matplotlib

Types of Machine Learning

1. Supervised Learning
 - a. Regression
 - b. Classification
2. Unsupervised Learning
3. Reinforcement Learning

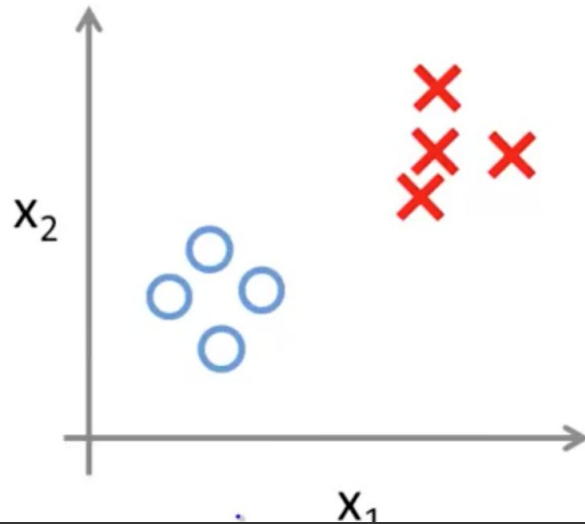
Let's Build Some Projects!

Regression Technique

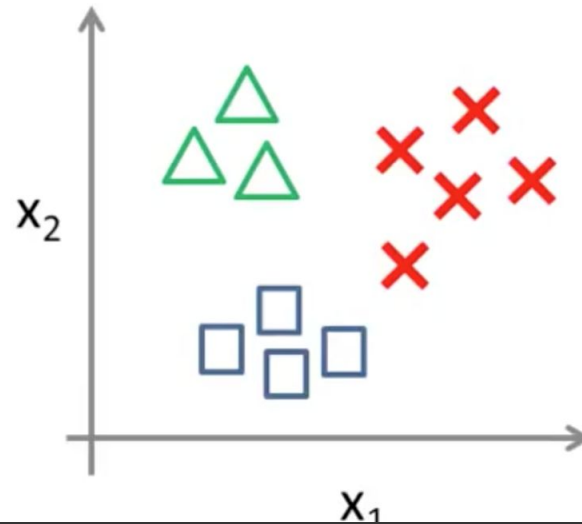
Bedrooms	Sq. feet	Neighborhood	Sale price
3	2000	Normaltown	\$250,000
2	800	Hipsterton	\$300,000
2	850	Normaltown	\$150,000
1	550	Normaltown	\$78,000
4	2000	Skid Row	\$150,000

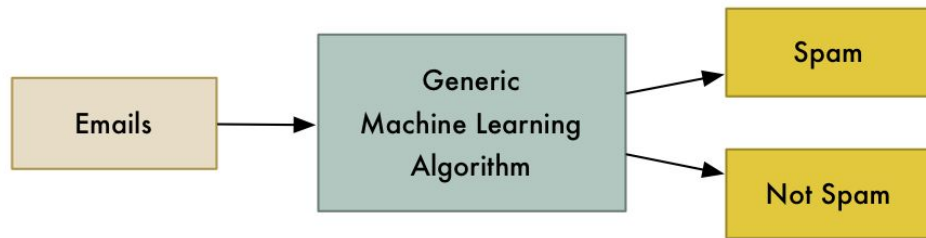
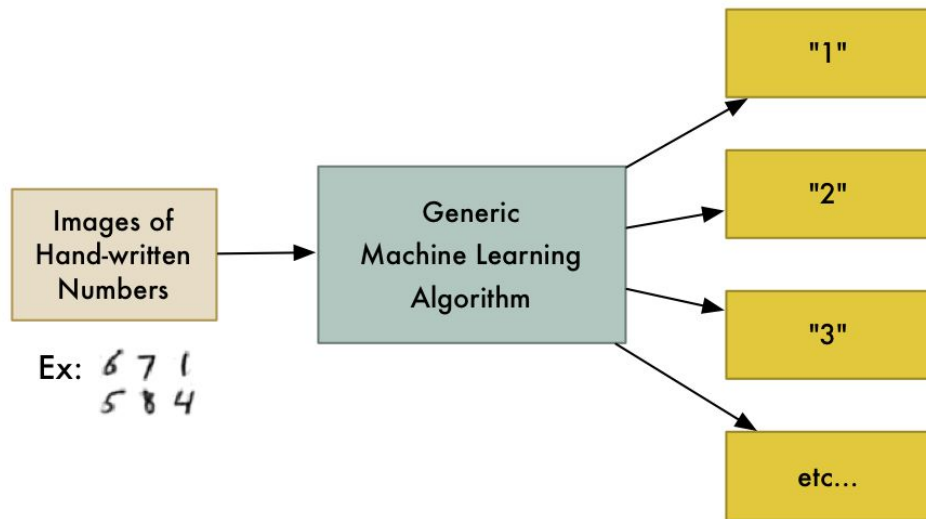
Classification Algorithm

Binary classification:



Multi-class classification:





Thank You...!!