⇒ Machine Learning (what do you remember?)

Let's start with that

⇒ Artificial Intelligence.

(i) Preprocessing → PCA
→ Scalar Machine
→ NMF

(ii) Supervised Learning | Learning

(iii) Un Supervised

(iv) Re-inforce ——

→ 3 Algos

(i) Regression (ii) classification.

images

$\Rightarrow$ machine Learning:

AI — Symbolic
        AI
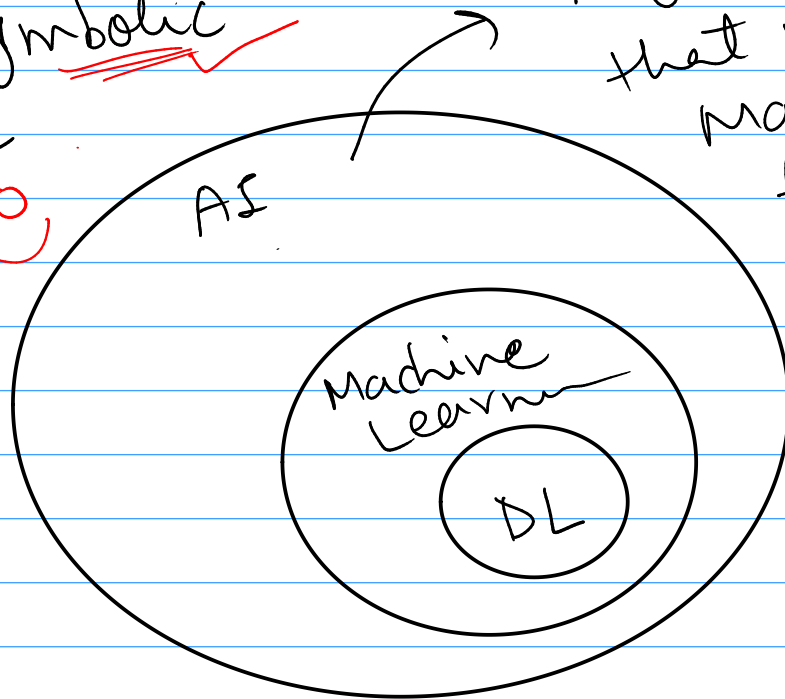
Anything that makes machine think like human

1950s   old $\geq$ 90

AI

Machine Learning

DL

chess

•
•

Pawn

Charles Babbage $\longrightarrow$ Ada Lovelace

1880s   Analytical Machine (computer)

1950s   Alan Turing (The Imitation Games)
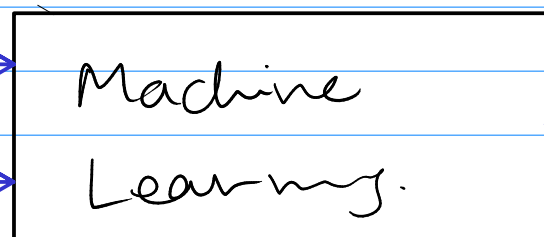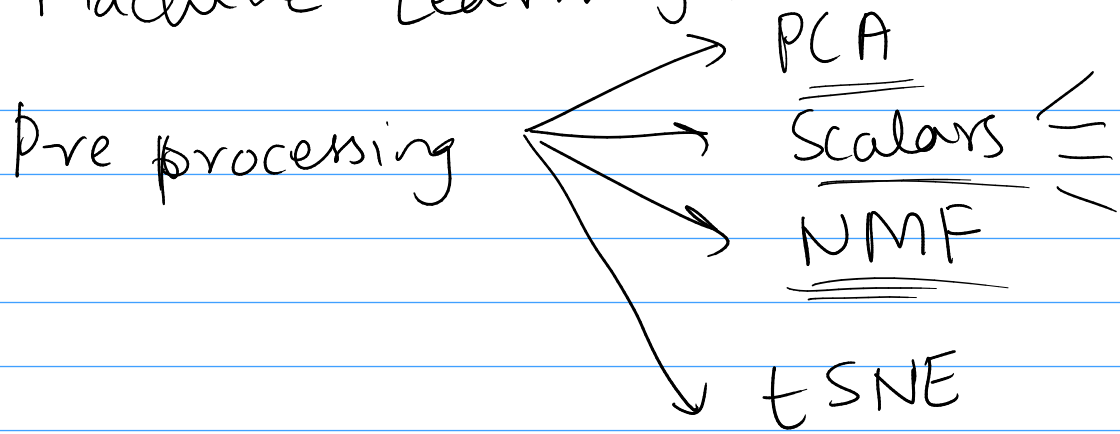
Turing Test

Classical Programming
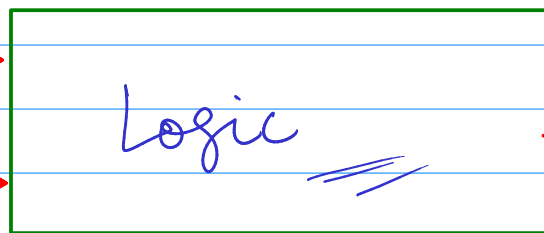
Data $\longrightarrow$
Rules $\longrightarrow$ Logic $\longrightarrow$ Ans

Train
Test   90%

Data $\longrightarrow$
Ans $\longrightarrow$ Machine Learning. $\longrightarrow$ Rules

labels

⇒ Machine Learning:

Pre processing → PCA
→ Scalars
→ NMF
→ tSNE

⇒ Scalars: (i) Standard Scalar
(ii) Robust Scalar.
(iii) MinMax Scalar.

Machine Learning
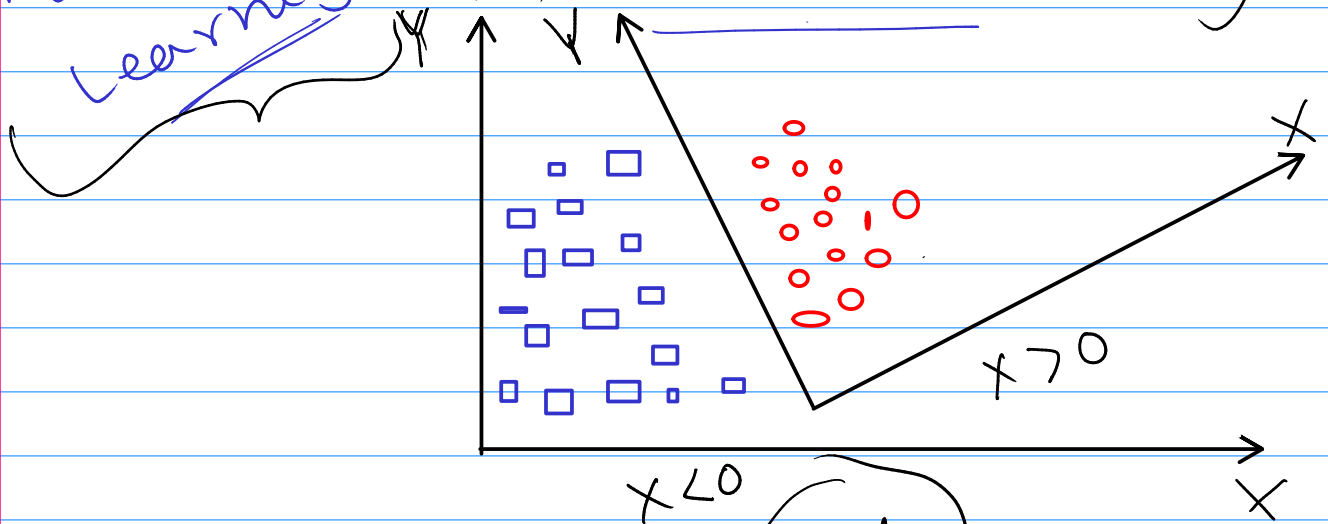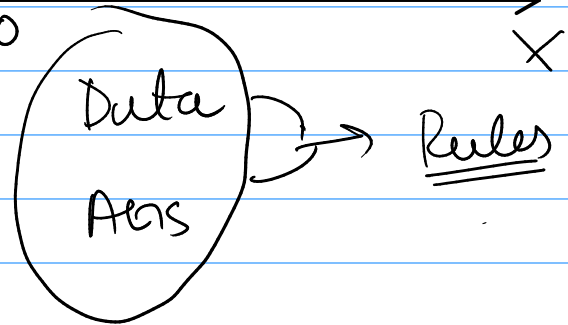
$x < 0$ $x > 0$

⇒ Deep Learning:

Data Algs → Rules

Machine Lear → Deep Learning
Patterns

Patterns

Data 2D plane

→ Any

$x_0 = 1$

$x_0 = = \ ?$

x_1

W_1

W_0

bias

W_2

x_2

$\sum \ \big| \ f(y)$

$(\ Activation \ )$

1

x_2

$x_1 \ \big\} \ Feature$

x_2
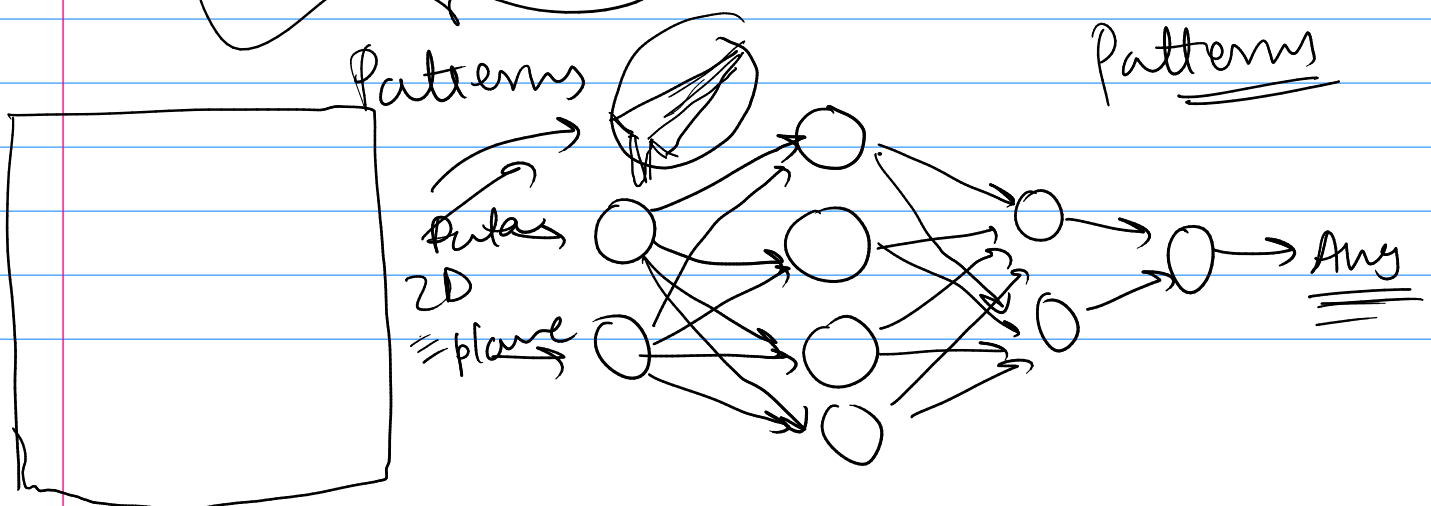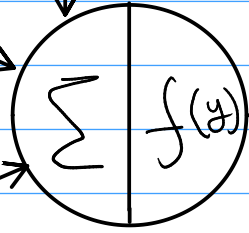
$y = W_1 x_1 + W_2 x_2 + W_0 x_0$

Feature Space

$y = mx + c$

hyper plane

W_2

x_1

Weight Space $\leftarrow$

$W_1, W_2, W_0 \ \big\} \ Weight$

W_1

$$y = x_1 W_1 + x_2 W_2 + W_0 \quad \bigg| \quad \underline{y = 0}$$

$y \quad x_2 \uparrow$

$$0 = x_1 W_1 + x_2 W_2 + W_0$$

$x \rightarrow x_1$
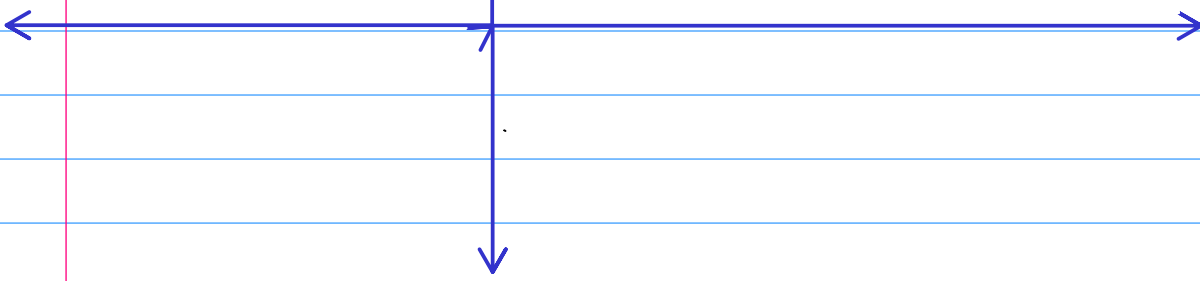
$$\Rightarrow \quad x_2 W_2 = -x_1 W_1 - W_0$$

$$x_2 = \left(\frac{-W_1}{W_2}\right) x_1 - \left(\frac{W_0}{W_2}\right)$$

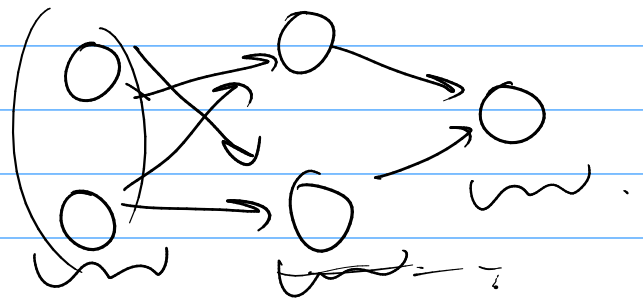$$\left| \quad m = \frac{-W_1}{W_2} \quad , \quad c = \frac{-W_0}{W_2} \right.$$

AND, OR, NAND, NOR

$\underline{(XOR)}$ — $\times$ Single Neuron

$\overline{A}B + A\overline{B}$

x_2

1	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0

2D plane

Linearly Separable

Tensor flow → Keras.

(i) Number of dimension was increased

(ii) No. of layers