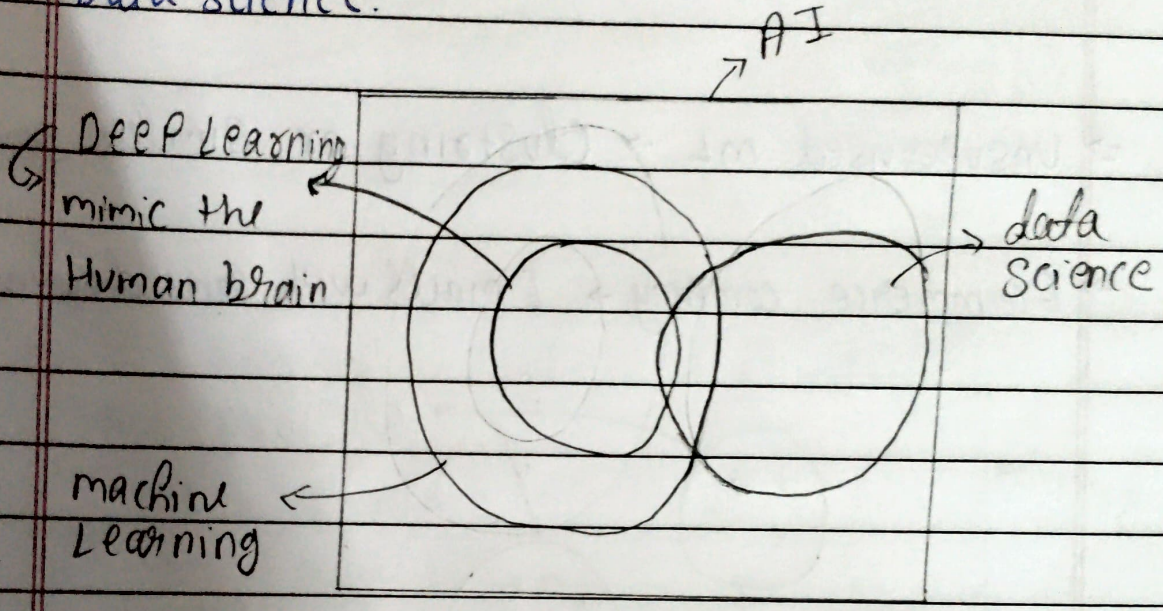
Introduction To Machine Learning.

(i) Artificial Intelligence.
(ii) Machine Learning.
(iii) Deep Learning.
(iv) Data Science.



AI → To create an application which can perform it's own task without any Human-Intervention.

Ex ⇒ Netflix recommendation system.
(ii) Self driving car.

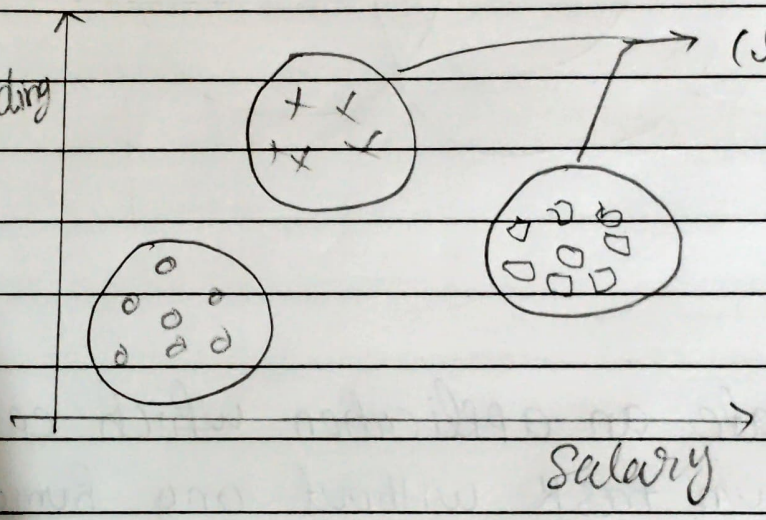
ML - It provides stats tools to analyse vizvalise, Prediction, forcast the data.

Type of ML

(i) Supervised ML → Dependent feature
                  → Independent feature
(ii) Unsupervised ML → Clustering
(iii) Reinforcement Learning. → Learning based on Rewards.

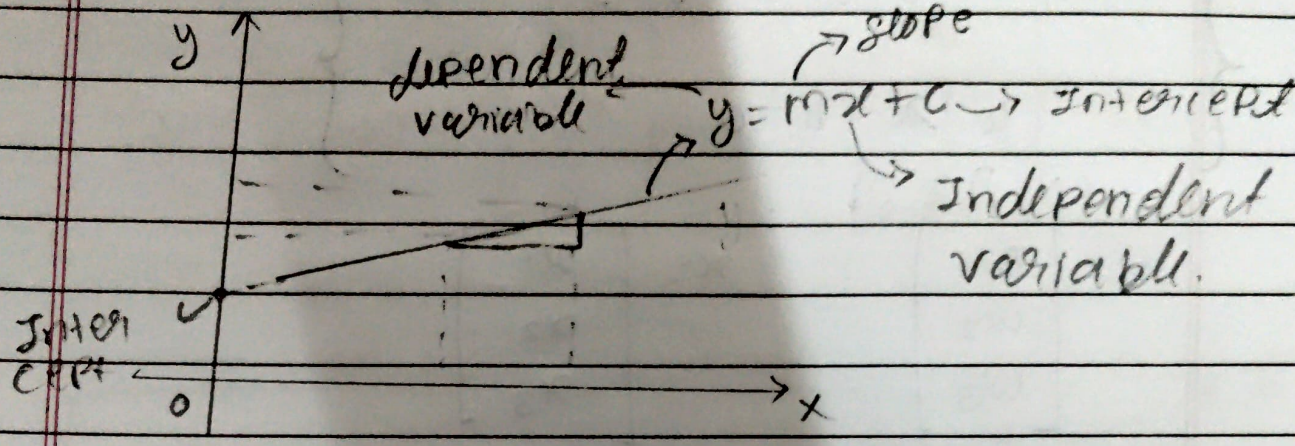
⇒ Unsupervised ML → Clustring or similer groups.

→ Ecommerce company → Emails with some discount



2

Equation of Line, 3D, and Hyperplan (n-dimens



$$ax + by = c$$

$$ax + by - c = 0$$

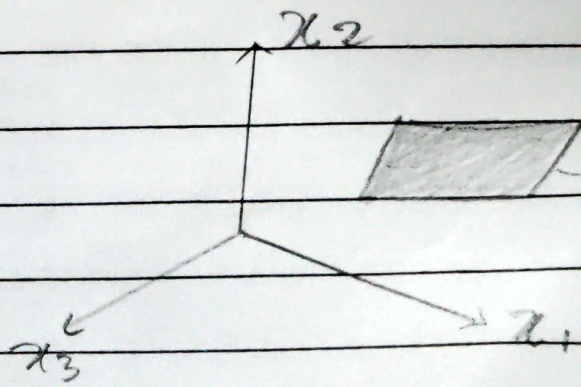
$$by = c - ax$$

$$y = -\frac{a}{b}x + \frac{c}{b}$$

$$\Rightarrow m = \left(-\frac{a}{b}\right), \quad c = \left(\frac{c}{b}\right)$$

$$w_1 x_1 + w_2 x_2 + b = 0 \rightarrow \text{equation of line.}$$

$$w^T x + b = 0$$



⇒ **Equation of 3-D:**

$$w_1x_1 + w_2x_2 + w_3x_3 + b = 0$$

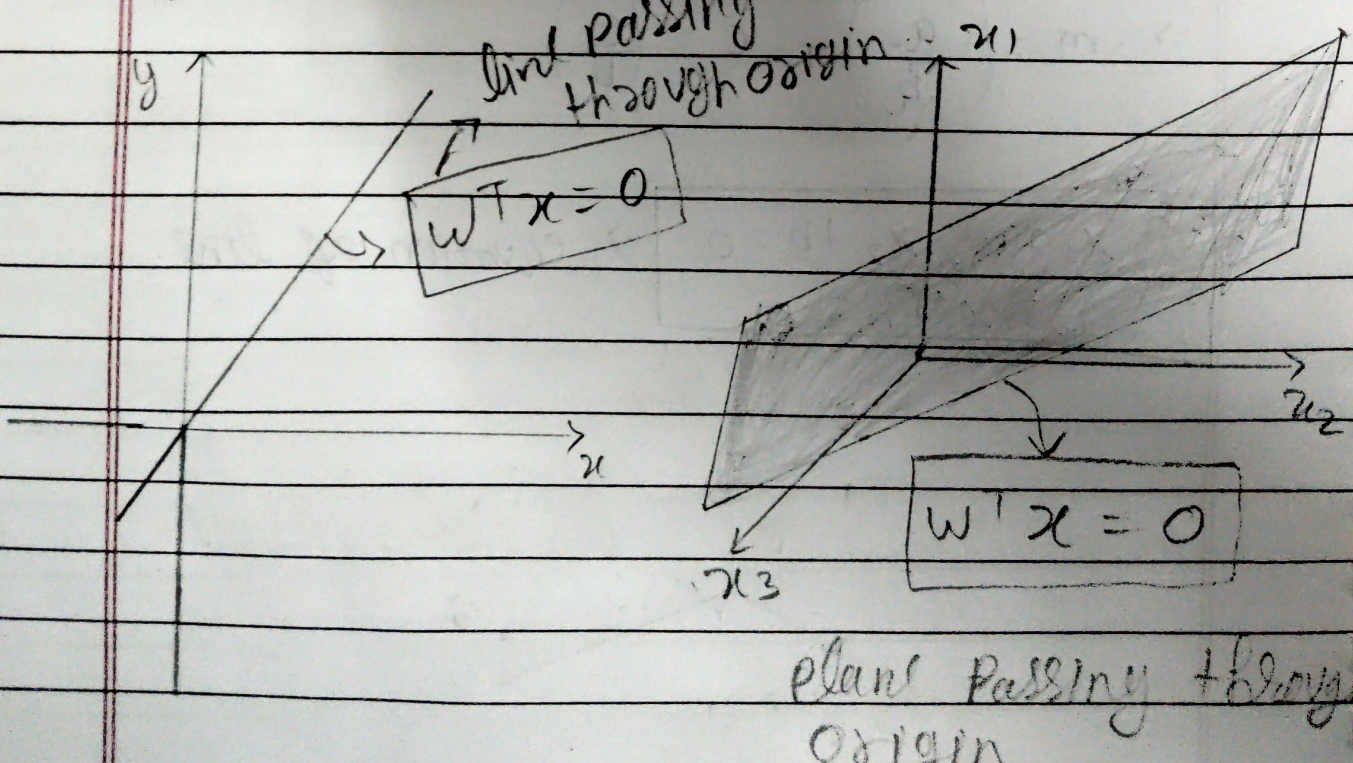
$$w^T x + b = 0$$

$$w = \begin{bmatrix} w_1 \\ w_2 \\ w_3 \end{bmatrix} \qquad x = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$$

⇒ **n- dimention**

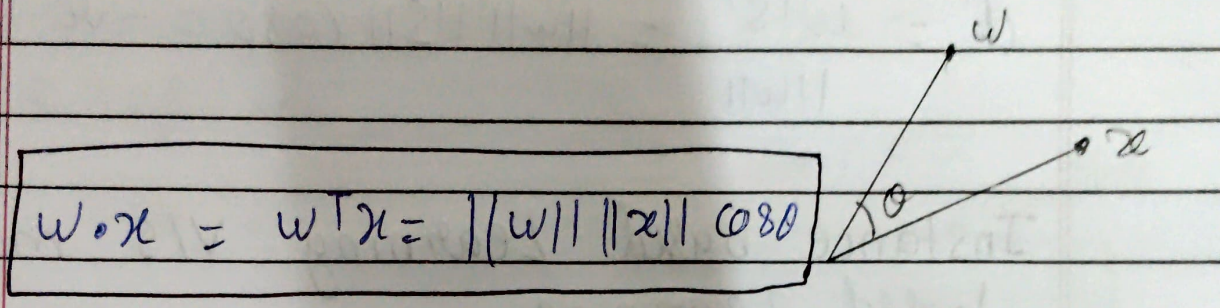
$$w_1x_1 + w_2x_2 + \cdots + w_nx_n + b = 0$$

$$w^T x + b = 0$$

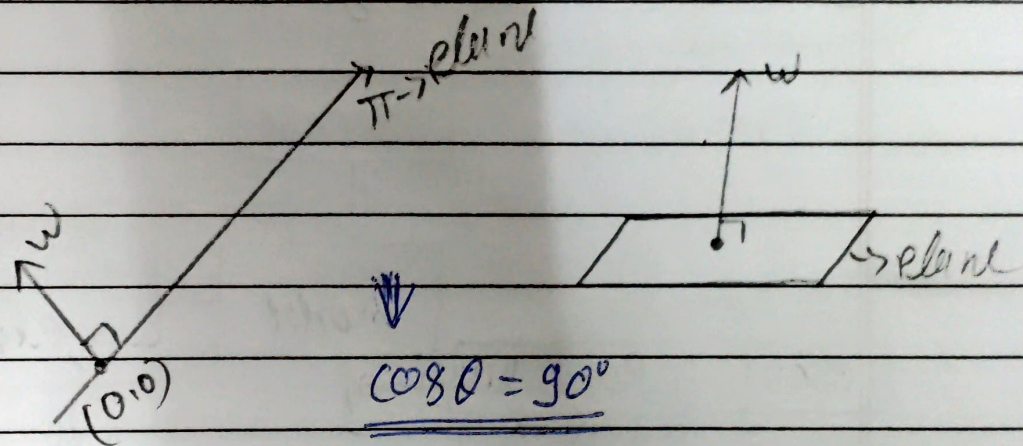


Equation of a plane = $\Pi_n : w^T x = 0$

$$w = \begin{bmatrix} w_1 \\ w_2 \\ \vdots \\ w_n \end{bmatrix} \qquad x = \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_n \end{bmatrix}$$

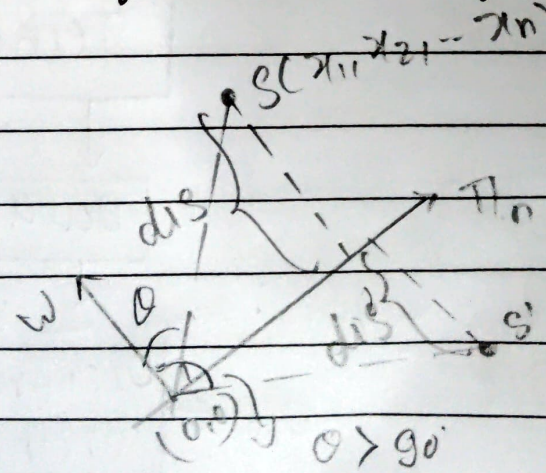


$$w \cdot x = w^T x = \|w\| \|x\| \cos\theta$$



$\cos\theta = 90°$

Distance of a point from plane:



$w^T x = 0$

↓

plane

$$\text{distance} = \frac{w^T s}{\|w\|}$$ → magnitude

$0 < \theta < 90$

$w^T s = \|w\| \|s\| \cos\theta = +ve$

$d' = \frac{w^T s'}{\|w\|} = \|w\| \|s\| \cos\theta = -ve$

$90 < \theta < 180$

Instance based Learning V/S model based Learning.