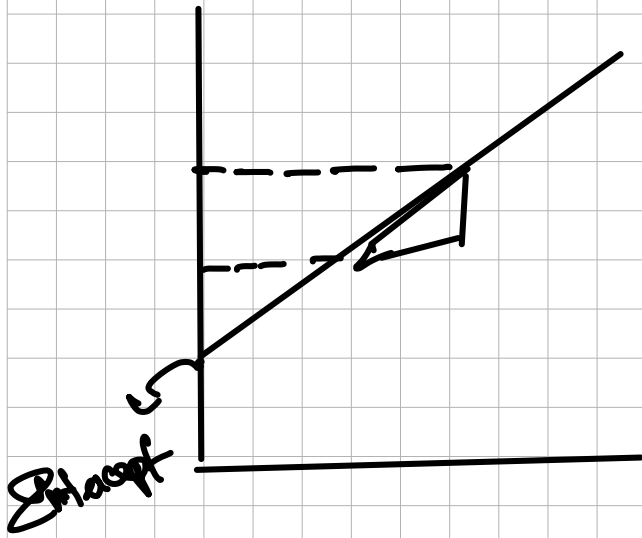


Equation of a straight line, 2D plane and perplane (n dimension)



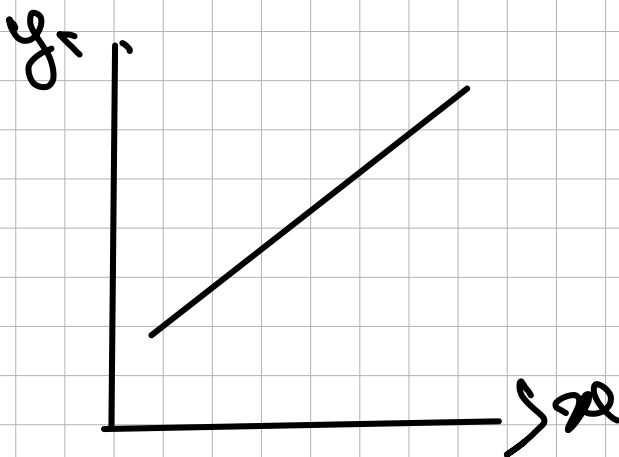
$$y = mx + c$$

$$y = \beta_0 + \beta_1 x$$

$$ax + by + c = 0$$

$m = \text{slope}$

$c = \text{Intercept}$

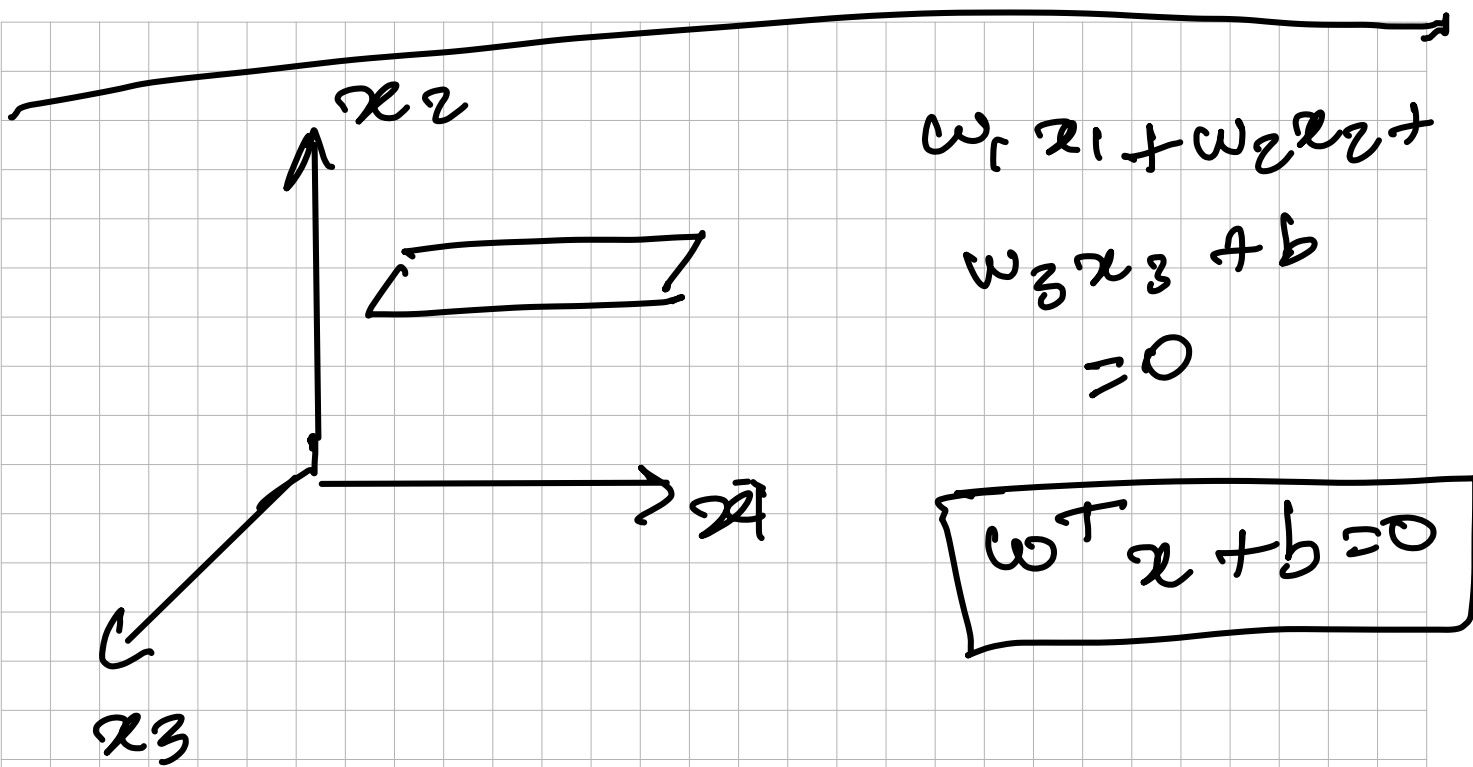


$w_1, w_2 = \text{coefficient}$

$$w_1 x_1 + w_2 x_2 + b = 0$$

$$\boxed{w^T x + b = 0}$$

\Rightarrow Equation of a straight line.

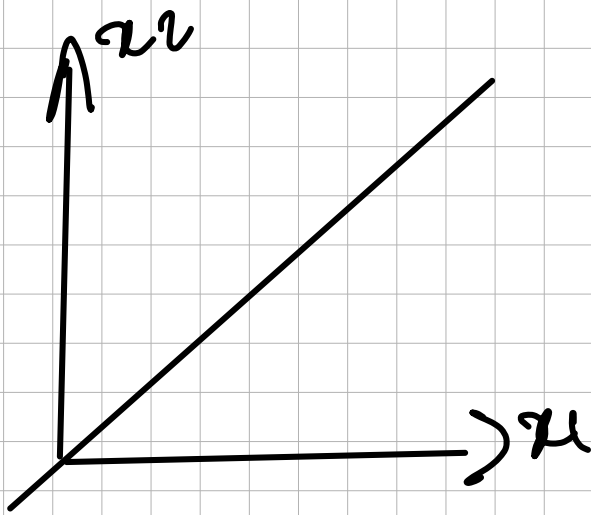


$$w = \begin{bmatrix} w_1 \\ w_2 \\ w_3 \end{bmatrix} \cdot x = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$$

N-Dimension Plane!

$$w_1 x_1 + w_2 x_2 + w_3 x_3 + \dots + w_n x_n + b = 0$$

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



$$w_1 x_1 + w_2 x_2 + b = 0$$

$$w_1 x_1 + w_2 x_2 = 0$$

$$w^T x = 0$$

Equation of a straight line
Passing through an origin

$$w^T x = 0$$

Equation of a plane = $\hat{u}_n : w^T x = 0$
