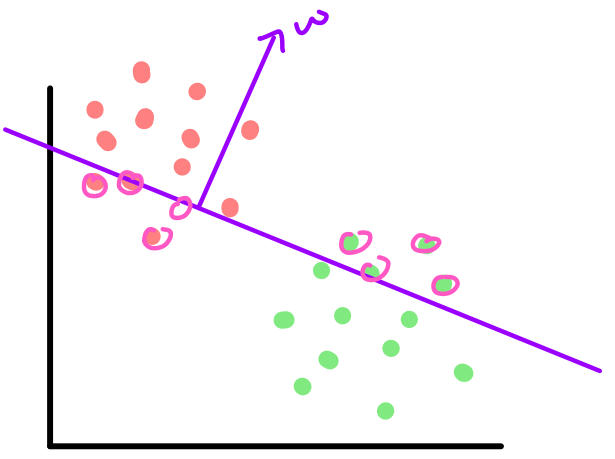
Problem - Solving

Perceptron learning Algorithm

Goal: find Best line $[w, w_0]$



Step1: Initialize a random w, w_0

close ~ & incorrect classification [misclassified Points]

Step2: Iterate until (convergence) : → till you have atleast 1 misclassified.

↳ update w & w_0 using: → actual label

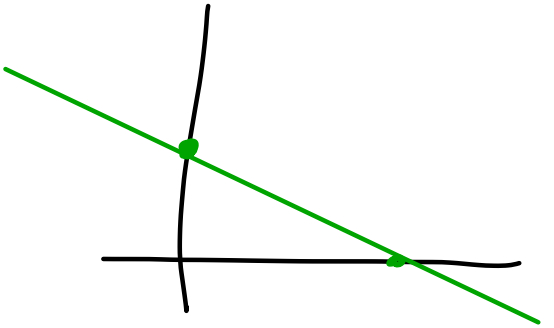
$$w_{new} = w_{old} + y^{(i)} \cdot x^{(i)}$$

$$w_0 = w_0 + y^{(i)}$$

} only do this for misclassified Points.

$2x + 3y - 4 = 0$

x	0	2
y	4/3	0
	p_1	p_2



$$y = \frac{-2x + 4}{3}$$

$$w_1 x_1 + w_2 x_2 + w_0 = 0$$

$$x_2 = \frac{-w_0 - w_1 x_1}{w_2}$$

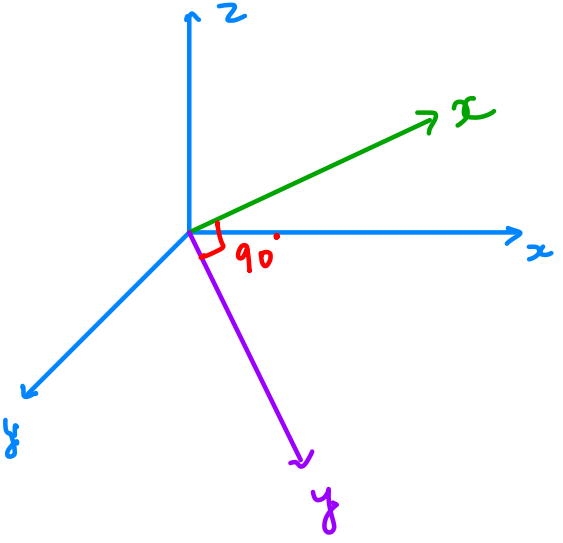
$$x = \begin{bmatrix} 2 \\ 1 \\ -3 \end{bmatrix}$$

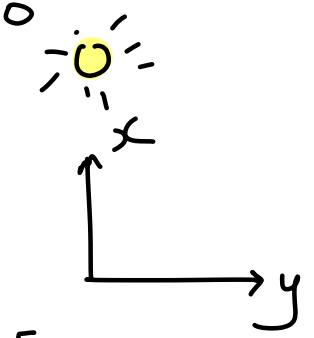
$$y = \begin{bmatrix} 5 \\ 8 \\ 6 \end{bmatrix}$$

$$\text{Proj}_y x = x^T \hat{y}$$

$$= \frac{x^T \vec{y}}{\|y\|} = \frac{10 + 8 - 18}{\|y\|}$$

$$= 0$$





[Shadow = 0]

If vector a=[3,4] and vector b=[5,0], what is the cos inverse of the angle between a and b?

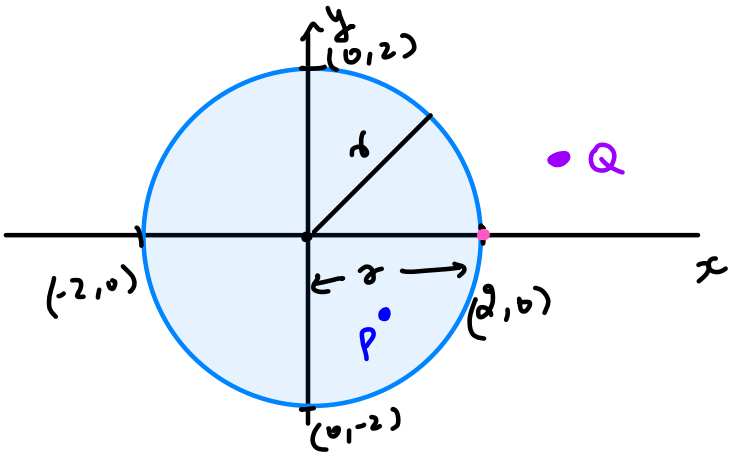
21 users have participated

	A	cos inverse of 4 by 5	5%
✓	B	cos inverse of 3 by 5	62%
	C	cos inverse of 2 by 5	19%
	D	cos inverse of 1 by 5	14%

End Quiz Now

$$\cos\theta = \frac{a \cdot b}{\|a\| \|b\|} = \frac{15}{5 \cdot 5} = \frac{3}{5}$$

Circle



$$x^2 + y^2 = r^2$$

$\boxed{r = 2}$

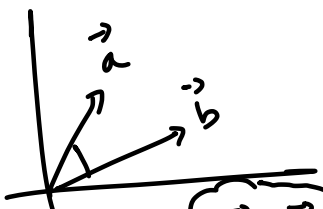
$P(1,-1)$

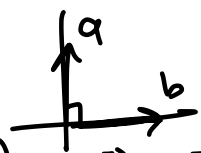
$Q(3,1)$

$R(2,0) \rightarrow$ on the circle.

$\downarrow$ if centre at (a,b)

$$(x-a)^2 + (y-b)^2 = r^2$$





linear similarity $\vec{a} \cdot \vec{b} = \|\vec{a}\| \, \|\vec{b}\| \cos\theta = 0$

$\Rightarrow$ -ve

king → queen

man → _____

boy → _____

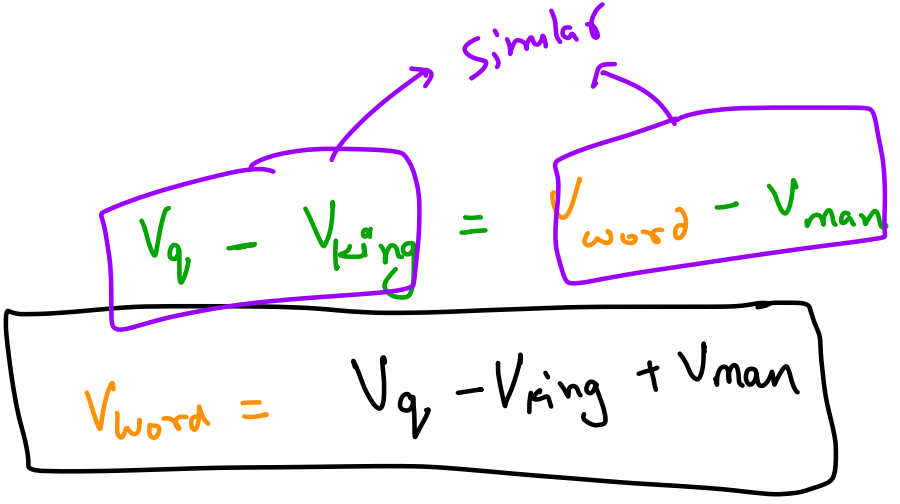
india → Delhi

japan → _____

MCQ

1. Book
2. apple
3. woman
4. lion

Similar

$$V_q - V_{king} = V_{word} - V_{man}$$

$$V_{word} = V_q - V_{king} + V_{man}$$