

2021-02-03 - Problema 1

	1	2	3	4	5
x_1	1	1	1	1	1
x_2	3	4	2	5	1
c	-1	+1	+1	-1	+1
α_i^*	$\boxed{10}$ >0	$\boxed{10}$ >0	$\boxed{3.56}$ $>0, < C$	$\boxed{3.56}$ $>0, < C$	0

FDL:

$$\Theta^* = c_1 \alpha_1^* x_1 + c_2 \alpha_2^* x_2 + c_3 \alpha_3^* x_3 + c_4 \alpha_4^* x_4$$

$$= (-1 \cdot 10 + 1 \cdot 10 + 1 \cdot 3.56 + -1 \cdot 3.56),$$

$$(-1 \cdot 10 \cdot 3 + 1 \cdot 10 \cdot 4 + 1 \cdot 3.56 \cdot 2 + -1 \cdot 3.56 \cdot 5)$$

$$= (0, -0.68)$$

~~3~~ primer vector es)

vector soporte x_4 : $\alpha_4^* < C + 1 \cdot \alpha_4^* > 0$

$$\Theta_0^* = c_4 - \Theta^* x_4 = -1 - (0 + -0.68 \cdot 5) = 2.4$$

Ecuación frontera (hiperplano separador): $-0.68x_2 + 2.4 = 0$

Ecuación Margenes $\rightarrow -0.68x_2 + 2.4 = -1$

$$\text{Margen} \Rightarrow \frac{2}{\|\Theta\|}$$

$$\frac{1}{\|\Theta\|} = \frac{1}{\sqrt{0.68^2 + 2.4^2}} = \frac{1}{\sqrt{0.4624 + 5.76}} = \frac{1}{\sqrt{6.2224}} = \frac{1}{2.4944} \approx 0.4$$

Vectores soporte: $\mathcal{V} = \{(1, 3)^T, (1, 4)^T, (1, 2)^T, (1, 5)^T\}$

$$\frac{\square}{\square} = 1 + 2x + 3y + 4z = 0$$

$$\frac{\square}{\square}$$

$$\square$$

$$\frac{\square}{\square} = \frac{(1, 2)^T (1, 3)^T + (1, 4)^T (1, 5)^T}{(1, 2)^T (1, 3)^T + (1, 4)^T (1, 5)^T} = 0$$

clasificación de $(1, 3, 5)^T$

$$(-0,68 \cdot 3, 5) + 2, 4 = 0,055 \rightarrow > 0$$

Pertenece a la clase +1

$$2, 1 = (1 + 2 \cdot 0, 0 + 3 \cdot 0, 0) \cdot 1 - 1 = 0$$

$$5, 1 = (1 + 5 \cdot 0, 0 + 5 \cdot 0, 0) \cdot 1 - 1 = 0$$

$$0 = 0$$

$$0 = 0$$

$$0 = 0$$

$$0 = 0$$

1 (0, 0) de normalizado

$$1 - 0,055 = 0,945 = 1 - (0, 0, 0 + 0, 0, 0)$$