Regiones de decision

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Tags: Reconocimiento de Patrones, Clasificación, funciones discriminantes y superficies de decision

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$$P(x|w_i) \approx N(\mu_i, \Sigma_i) \qquad (2.3.15)$$
$$P(x|w_1) \approx N(0, I) \rightarrow Lubina$$
$$P(x|w_2) \approx N(\binom{1}{1}, I)$$

- $P(x|w_1) \approx N(0, I)$
- $P(x|w_2) \approx N(\binom{1}{1}, I)$

Paso 1:

$$x = \begin{pmatrix} x_1 \\ x_2 \end{pmatrix}$$

$$g_1(x) = (-1/2)[\begin{pmatrix} x_1 \\ x_2 \end{pmatrix} - \begin{pmatrix} 0 \\ 0 \end{pmatrix}]^t \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} (\begin{pmatrix} x_1 \\ x_2 \end{pmatrix} - \begin{pmatrix} 0 \\ 0 \end{pmatrix}) - (1/2)Ln(1) + Ln(1/2)$$

$$g_1(x) = (-1/2)[\begin{pmatrix} x_1 \\ x_2 \end{pmatrix}^t \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} (\begin{pmatrix} x_1 \\ x_2 \end{pmatrix}) + Ln(1/2)$$

$$g_1(x) = (-1/2)[x_1^2 + x_2^2] + Ln(1/2)$$

$$g_1(x) = -1/2x_1^2 - 1/2x_2^2 + Ln(1/2)$$

$$g_2(x) = (-1/2)[\begin{pmatrix} x_1 \\ x_2 \end{pmatrix} - \begin{pmatrix} 1 \\ 1 \end{pmatrix}]^t \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} (\begin{pmatrix} x_1 \\ x_2 \end{pmatrix} - \begin{pmatrix} 1 \\ 1 \end{pmatrix}) - (1/2)Ln(1) + Ln(1/2)$$

$$g_2(x) = (-1/2)[\begin{pmatrix} x_1 - 1 \\ x_2 - 1 \end{pmatrix}^t \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} (\begin{pmatrix} x_1 - 1 \\ x_2 - 1 \end{pmatrix}) + Ln(1/2)$$

$$g_2(x) = (-1/2)[x_1^2 - 2x_1 + 1 + x_2^2 - 2x_2 + 1] + Ln(1/2)$$

$$g_2(x) = -1/2x_1^2 + x_1 - 1 - 1/2x_2^2 + x_2 + Ln(1/2)$$

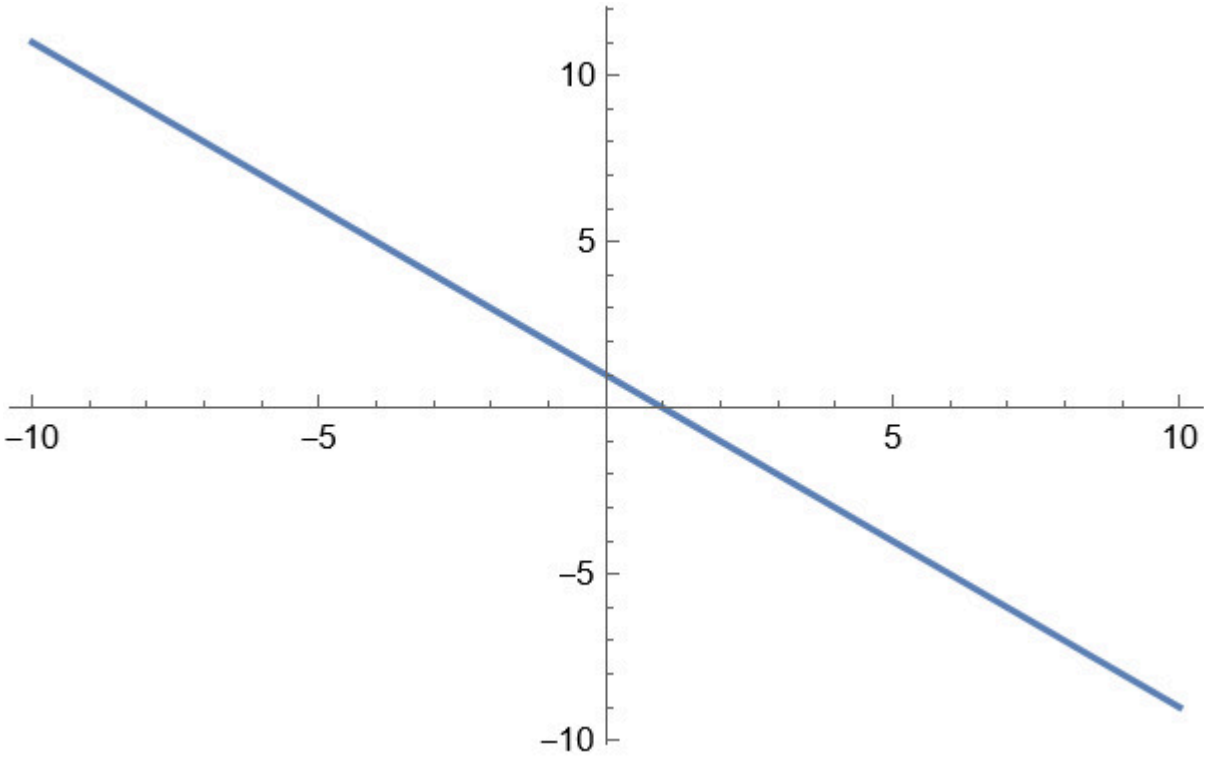
Paso 2: Igualar ecuaciones

$g_1(x) = g_j(x)$ para toda $i \neq j$

$$-1/2x_1^2 - 1/2x_2^2 + Ln(1/2) = -1/2x_1^2 + x_1 - 1 - 1/2x_2^2 + x_2 + Ln(1/2)$$

$$0 = x_1 - 1 + x_2$$

$$x_1 = 1 - x_2$$



References

Tarea 4 - RDC