JOHNS HOPKINS
WHITING SCHOOL
of ENGINEERING

Applied and Computational Mathematics

Data Mining
625.740
Module 3 Example Problems

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Classes ω_1 and ω_2 are normally distributed $p(\mathbf{x}|\omega_j) \sim \mathcal{N}(\mu_j, \Sigma_j)$. Find the Bayes decision boundary.

1. $$\mu_1 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}, \quad \Sigma_1 = \begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix}$$
$$\mu_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}, \quad \Sigma_2 = \begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix}$$

2. $$\mu_1 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}, \quad \Sigma_1 = \begin{pmatrix} 5 & 3 \\ 3 & 5 \end{pmatrix}$$
$$\mu_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}, \quad \Sigma_2 = \begin{pmatrix} 5 & 3 \\ 3 & 5 \end{pmatrix}$$

3. $$\mu_1 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}, \quad \Sigma_1 = \begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix}$$
$$\mu_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}, \quad \Sigma_2 = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

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