

$$d_{Mahal_class_k}(Y_{LDA}) = \sqrt{(Y_{LDA} - \bar{x}_k)^T S_{classN}^{-1} (Y_{LDA} - \bar{x}_k)}$$

$$d_{Mahal_class_k} = sum \left(\left(\begin{bmatrix} Y_{LDA_1} \\ \vdots \\ Y_{LDA_i} \end{bmatrix} - \begin{bmatrix} \bar{x}_k \\ \vdots \\ \bar{x}_k \end{bmatrix} \right) \cdot \begin{bmatrix} S_{11_class_k}^{-1} & \cdots & S_{n1_class_k}^{-1} \\ \vdots & \ddots & \vdots \\ S_{1n_class_k}^{-1} & \cdots & S_{nn_class_k}^{-1} \end{bmatrix} \cdot \left(\begin{bmatrix} Y_{LDA_1} \\ \vdots \\ Y_{LDA_i} \end{bmatrix} - \begin{bmatrix} \bar{x}_k \\ \vdots \\ \bar{x}_k \end{bmatrix} \right) \right)$$

