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Active Learning

Q Use PCA to transform pattern (2, 1)

→ Steps involved in PCA algo are.

1) Get data
2) Compute the mean vector (μ)
3) Subtract mean from the given data
4) Calculate the covariance matrix
5) Calculate the eigan vectors and eigen values of the covariance matrix
6) Choosing components and forming a feature vector
7) Deriving the new data set.

⇒ Given Feature vector is $\begin{bmatrix} 2 \\ 1 \end{bmatrix}$

The mean vector (μ) is $\begin{bmatrix} 4.5 \\ 5 \end{bmatrix}$

The Eigen vector is $\begin{bmatrix} 2.55 \\ 3.67 \end{bmatrix}$

∴ The feature vector gets transformed to :

= Transpose of Eigen vector × (Feature vector - Mean vector)

$$= \begin{bmatrix} 2.55 \\ 3.67 \end{bmatrix}^T \times \left(\begin{bmatrix} 2 \\ 1 \end{bmatrix} - \begin{bmatrix} 4.5 \\ 5 \end{bmatrix} \right)$$

$$= \begin{bmatrix} 2.55 & 3.67 \end{bmatrix} \times \begin{bmatrix} -2.5 \\ -4 \end{bmatrix}$$

$$= (-6.37) + (-14.68)$$

$$= -21.05$$