Lab-10

Implement Dimensionality reduction using principal component analysis (PCA) method.

To write:

	EX1	EX2	EX3	EX4
x_1	4	8	13	7
x_2	11	4	5	14

Step 1: Mean center the data

$\mu_{x_1} = 8.0$

$\mu_{x_2} = 8.5$

mean centered data:

	EX1	EX2	EX3	EX4
$x_1 - \mu$	-4	0	5	-1
$x_2 - \mu$	2.5	-4.5	-3.5	5.5

Step 2: project onto first principal component.

First eigen vector $e_1 = \begin{bmatrix} 0.5574 \\ -0.8303 \end{bmatrix}$

$$z_1 = (x_1 - \mu_1) \cdot 0.5574 + (x_2 - \mu_2) \cdot (-0.8303)$$

Final value

EX1 : -4.3054

EX2 : 3.7364

EX3 : 5.6930

EX4 : -5.1241

Solutions

1. On "heart.csv" dataset

Report the accuracy score before and after applying PCA.

Before applying:

Accuracy Score:

Logistic regression : 0.8533
Random forest : 0.8814
SVM : 0.8804

After PCA:

Logistic regression : 0.8582
Random forest : 0.8315
SVM : 0.8478

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