# Assignment 1

Bookmark this page

## Q1

1.0/1.0 point (graded)

PCA is employed for

- ( ) Linear regression
- ( ) Dimensionality expansion
- (•) Dimensionality Reduction
- ( ) Clustering

✔

Submit

## Q2

1.0/1.0 point (graded)

The direction of the largest principal component is given as

- ( ) eigenvector corresponding to minimum eigenvalue of the data covariance matrix
- (•) eigenvector corresponding to maximum eigenvalue of the data covariance matrix
- ( ) any eigenvector corresponding to the covariance matrix
- ( ) any vector belonging to the null space of the data covariance matrix

✔

Submit

## Q3

1.0/1.0 point (graded)

Principal components of data can be found

- (•) Via projection of data along principal directions
- ( ) Via projection of data orthogonal to principal directions
- ( ) Same as the principal directions
- ( ) Orthogonal to the principal directions

✔

Submit

## Q4

1.0/1.0 point (graded)

Find the principal direction corresponding to

$$\begin{bmatrix}1 & 2\end{bmatrix}\begin{bmatrix}4 & 0\end{bmatrix}\begin{bmatrix}1 \\ 2\end{bmatrix}$$

$\kappa = \begin{bmatrix} 2 & -1 \end{bmatrix} \begin{bmatrix} 0 & 3 \end{bmatrix} \begin{bmatrix} 2 & -1 \end{bmatrix}$

- $\begin{bmatrix} \frac{2}{\sqrt{5}} \\ -\frac{1}{\sqrt{5}} \end{bmatrix}$
- $\begin{bmatrix} \frac{1}{\sqrt{2}} \\ -\frac{1}{\sqrt{2}} \end{bmatrix}$
- **(selected)** $\begin{bmatrix} \frac{1}{\sqrt{5}} \\ \frac{2}{\sqrt{5}} \end{bmatrix}$
- $\begin{bmatrix} \frac{1}{\sqrt{2}} \\ \frac{1}{\sqrt{2}} \end{bmatrix}$

✔

Submit

## Q5

1.0/1.0 point (graded)

The data matrix $\mathbf{X}$ in the lecture has been defined as

- $\frac{1}{\sqrt{N-1}} \begin{bmatrix} \bar{\mathbf{x}}_1 \\ \bar{\mathbf{x}}_2 \\ \vdots \\ \bar{\mathbf{x}}_N \end{bmatrix}$
- $\frac{1}{\sqrt{N-1}} [\bar{\mathbf{x}}_1^T \quad \bar{\mathbf{x}}_2^T \quad \dots \quad \bar{\mathbf{x}}_N^T]$
- **(selected)** $\frac{1}{\sqrt{N-1}} \begin{bmatrix} \bar{\mathbf{x}}_1^T \\ \bar{\mathbf{x}}_2^T \\ \vdots \\ \bar{\mathbf{x}}_N^T \end{bmatrix}$
- $\frac{1}{\sqrt{N-1}} [\bar{\mathbf{x}}_1 \quad \bar{\mathbf{x}}_2 \quad \dots \quad \bar{\mathbf{x}}_N]$

✔

Submit

## Q6

1.0/1.0 point (graded)

The principal directions can also be obtained as

- $p$ dominant left singular vectors of $X$
- **(selected)** $p$ dominant right singular vectors of $X$
- $p$ dominant right eigenvectors of $X$

- ○ $p$ dominant column space vectors of $X$

✔

Submit

## Q7

1.0/1.0 point (graded)

The PCA routine can be imported in PYTHON a

- ◉ from sklearn.decomposition import PCA
- ○ from sklearn import PCA
- ○ import PCA
- ○ from decomposition import PCA

✔

Submit

## Q8

1.0/1.0 point (graded)

Consider the datasets imported as from sklearn import datasets The Iris dataset can be loaded as

- ○ irisset = datasets.iris()
- ○ irisset = load_iris()
- ◉ irisset = datasets.load_iris()
- ○ irisset = iris()

✔

Submit

## Q9

1.0/1.0 point (graded)

Consider PCA routine called as pca = PCA(n_components=2); PCA can be applied and data X can be transformed in PYTHON as

- ◉ Xp = pca.fit(X).transform(X)
- ○ Xp = pca.fit_transform(X)
- ○ Xp = pca.fittransform(X)
- ○ Xp = pca(X)

✔

Submit

## Q10

1.0/1.0 point (graded)

Gaussian mixture can be loaded as

- (●) from sklearn.mixture import GaussianMixture
- ( ) from sklearn import GaussianMixture
- ( ) from mixture import GaussianMixture
- ( ) from numpy import GaussianMixture

✔

Submit

Previous Next >