

Q2-2: Are these statements true or false?

(A) The principal component with the largest eigenvalue maximizes the reconstruction error.

(B) The dimension of original data representation is always higher than the dimension of transformed representation of PCA.

1. True, True
2. True, False
3. False, True
4. False, False

Q2-2: Are these statements true or false?

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1. True, True

2. True, False

3. False, True

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(A) The principal component with the largest eigenvalue captures the maximum amount of variability which is equivalent to minimum reconstruction error.

(B) If the matrix XX^T is full-rank, they can be of the same dimension.

Q3-1: Are these statements true or false?

(A) Ignoring the components of small eigenvalues will not lose information.

(B) With better parameter tuning, we can get a better first principal component which maximizes the variability more precisely.

1. True, True
2. True, False
3. False, True
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3. False, True

4. False, False



(A) We may lose some information if we ignore the components of small eigenvalues because there is still some variability at those directions. But they are of little significance due to small variability.

(B) The computation of PCA usually only involves eigenvalue decomposition, which includes no parameter tuning.