Mini-Assignment: Dimensionality Reduction

Due Apr 7 at 11:59pm **Points** 8 **Questions** 4
Available until Apr 8 at 2:59am **Time Limit** 30 Minutes
Allowed Attempts 2

This quiz was locked Apr 8 at 2:59am.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	less than 1 minute	8 out of 8

Score for this attempt: **8** out of 8
Submitted Apr 7 at 6:48pm
This attempt took less than 1 minute.

Question 1

2 / 2 pts

Suppose that we are given a data set of 20 points (with zero mean) in 2d space. When the first principal component of the data set is computed, the result is as follows:

$u = (\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}})$

If we add one data point to the data set at (2,2), how would this first principle component change?

- It would rotate toward the y axis.
- Correct! It would not.
- It would rotate toward the x axis.

- It would extend in the same direction.

Question 2

2 / 2 pts

Suppose that we are given a data set of 20 points (with zero mean and the norm of each point is smaller than 1) in 2d space. When the first principal component of the data set is computed, the result is as follows:

$u = (\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}})$

If we add an extremely large number of data points to the data set at (0, -5), how would this change the principle component?

- It would towards (1, 0)
- It would towards (-1, 0)

Correct!

- It would towards (0, -1)

The direction will towards (0,-5)

Question 3

2 / 2 pts

Which of the following is one way to find out whether the dimensionality reduction algorithm performs well?

- The dimension of the data matrix
- The number of principal components.

Correct!

- (●) The measure of the reconstruction error.
- ( ) The length of the principal component vectors

Question 4

2 / 2 pts

The PCA makes which of the following assumptions about the data?

- ( ) The data has a zero standard deviation.

Correct!

- (●) The data has a zero mean
- ( ) The data has a square data matrix.
- ( ) The data as a uniform distribution.

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Unit 8: Graded Assignmen

Quiz Score: **8** out of 8