

Unit 8: Quiz

Due Apr 7 at 11:59pm **Points** 8 **Questions** 8
Available until Apr 8 at 2:59am **Time Limit** 45 Minutes

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

Attempt History

	Attempt	Time	Score
LATEST	<u>Attempt 1</u>	5 minutes	8 out of 8

Score for this quiz: **8** out of 8

Submitted Apr 7 at 6:39pm

This attempt took 5 minutes.

Question 1

1 / 1 pts

Which of the following statements is incorrect for the PCA?



The principal components identify the direction where the spread of the data is maximized.



The PCA algorithm finds all principal components simultaneously through matrix multiplication.



The PCA algorithm is based on iterative gradient search.

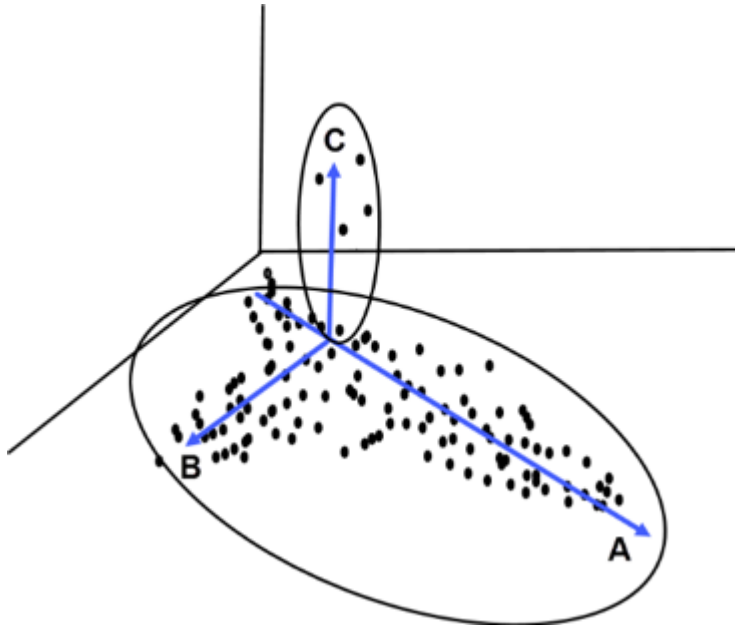


The principal components are the linear projection of the original inputs.

Correct!

Question 2**1 / 1 pts**

In the following figure, which vector is the best candidate for the third principal component?

**Correct!**

- ☒ Vector C
- ☐ Vector A
- ☐ Vector B

Question 3**1 / 1 pts**

The most interpretable principal components are those that have the smallest eigenvalues.

- ☐ True
- ☒ False

Correct!

Question 4**1 / 1 pts**

Which of the following is NOT true for dimensionality reduction?

Correct!

☐ Dimensionality reduction is useful for data visualization.

☒ Dimensionality reduction slows down the training of the machine learning systems.

☐ Dimensionality reduction mitigates the curse of dimensionality.

☐ Reducing dimensionality does lose some information so it may make machine learning perform slightly worse.

Question 5**1 / 1 pts**

The first principal component for a dataset is found to be on the direction given by vector $U = (4, 2)$. Which of the following might be the direction of the second principal component? (Select all that apply.)

Correct!

☒ $V = (-3, 6)$

Correct!

☒ $V = (-2, 4)$

☐ $V = (-3, 1.5)$

☐ $V = (1.5, 3)$

The principal components are orthogonal to each other.

Question 6**1 / 1 pts**

Which of the following is WRONG for the PCA?

☐ The PCA reduces the dimension of feature space.

☒

The length of the first principal component vector is larger than that of the second principal vector.

☐ The length of each principal component vector is equal to 1.

☐ Any two principal components are orthogonal to each other.

Correct!**Question 7****1 / 1 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.

☒ The measure of the reconstruction error.

☐ The length of the principal component vectors.

Correct!

Question 8**1 / 1 pts**

Which of the following is an advantage of dimensionality reduction?
(Select all that apply.)

Correct!☒ Saving storage space**Correct!**

Visualizing the data and gaining insights on the most important features.

Correct!☒ Improve model accuracy by removing redundant features and noise.**Correct!**☒ Less training time for a learning algorithm using the features.**Quiz Score: 8 out of 8**