Practice Quiz, 3 questions

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Congratulations! You passed!

Next Item



4/4 points

1.

For a vector
$$\mathbf{x} = \begin{bmatrix} 6 \\ 0 \\ 0 \end{bmatrix}$$
 and the subspace U spanned by the basis vectors $\mathbf{b}_1 = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$ and $\mathbf{b}_2 = \begin{bmatrix} 0 \\ 1 \\ 2 \end{bmatrix}$, which

of the following statements are true?

You can use the formula slide that comes with the corresponding lecture.

The coordinates of the projected point with respect to $\mathbf{b}_1, \mathbf{b}_2$ are $\begin{bmatrix} 0 \\ 0 \end{bmatrix}$.

Un-selected is correct

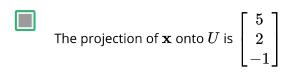
The projection matrix is
$$\begin{bmatrix} 0 & 0 & 0 \\ 0 & 1 & 2 \\ 0 & 2 & 4 \end{bmatrix}$$

Un-selected is correct

The projection of
$${f x}$$
 onto U is $\left[egin{array}{c} 0 \\ 0 \\ 0 \end{array}
ight]$

. . .

Un-selected is correct



Correct

6/6 points (100%)

Project 3D data onto a 2D subspace

Practice Quiz, 3 questions

The projection matrix is not symmetric.





The rank of the projection matrix is 1.

Un-selected is correct



The projection matrix is symmetric.



Correct

Projection matrices are always symmetric.



The projection matrix is $\frac{1}{6}\begin{bmatrix}5&2&-1\\2&2&2\\-1&2&5\end{bmatrix}$



Correct

Well done!



The coordinates of the projected point with respect to ${f b}_1, {f b}_2$ are $\begin{bmatrix} 5 \\ -3 \end{bmatrix}$.



Correct

Excellent job!



point

Project
$$\begin{bmatrix} 3 \\ 2 \\ 2 \end{bmatrix}$$
 onto the subspace spanned by $\begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$ and $\begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$.

You can use the formula slide that comes with the corresponding lecture.



Project 3D1data onto a 2D subspace Practice Quiz, 3 questions

- $\begin{bmatrix} 2 \\ 1 \\ 1 \end{bmatrix}$
- $\begin{bmatrix} 6 \\ 4 \\ 4 \end{bmatrix}$

Correct

Absolutely! The original vector is already in the subspace, so the projection has no effect.



1/1 point

3.

- 1. Project $egin{bmatrix} 12 \ 0 \ 0 \end{bmatrix}$ onto the subspace U_1 spanned by $egin{bmatrix} 1 \ 1 \ 1 \end{bmatrix}, egin{bmatrix} 0 \ 1 \ 2 \end{bmatrix}.$
- 2. Project the result from 1. onto the subspace spanned by $\begin{bmatrix} -10\sqrt{6} \\ -4\sqrt{6} \\ 2\sqrt{6} \end{bmatrix}$. What is the final projection?

Hint: For step 2. you do not necessarily need to compute anything.

You can use the formula slide that comes with the corresponding lecture.

- $\begin{bmatrix} 5 \\ 2\sqrt{6} \\ -1\sqrt{6} \end{bmatrix}$
- $\begin{bmatrix} 5 \\ 2\sqrt{6}+1 \\ -\sqrt{6}+2 \end{bmatrix}$
- $\begin{bmatrix} 10 \\ 4 \\ -2 \end{bmatrix}$

