Solve with Us (Week 4)

Machine Learning Foundations

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Question No. 1

For what value of x, the matrix,

$$A = \begin{bmatrix} 8 & x & 0 \\ 4 & 0 & 2 \\ 12 & 6 & 0 \end{bmatrix}$$

becomes singular?

Question no. 2

The eigenvectors of the matrix, $\begin{bmatrix} 1 & 2 \\ 0 & 2 \end{bmatrix}$, are written in the form

$\begin{bmatrix} 1 \\ a \end{bmatrix}$ and $\begin{bmatrix} 1 \\ b \end{bmatrix}$. what is a+b?

Question no. 3

If the matrix $\begin{bmatrix} \frac{3}{5} & \frac{4}{5} \\ x & \frac{3}{5} \end{bmatrix}$ is orthogonal then the value of x is?

Question no. 4

For the matrix, $A = \begin{bmatrix} 2 & 3 \\ x & y \end{bmatrix}$ the eigenvalues are 4 and 8.

Calculate x+y.

Question no. 5

Let A be the 2X2 matrix with elements $a_{11} = a_{12} = a_{21} = 1$

and $a_{22} = -1$, then the of eigenvalues of A^{18} are?

Question no. 6

The value of p such that the vector $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ is an eigenvector of the matrix

$\begin{bmatrix} 4 & 1 & 2 \\ p & 2 & 1 \\ 14 & -4 & 10 \end{bmatrix}$ is ?

Question no. 7

The maximum value of 'a' such that the matrix, $\begin{bmatrix} -3 & 0 & -2 \\ 1 & -1 & 0 \\ 0 & a & -2 \end{bmatrix}$

has three linearly independent real eigenvectors is

Question no. 8

In the matrix equation Px=q, which of the following is a necessary condition for the existence of at least one solution for the unknown vector x.

A) Augmented matrix [Pq] must have the same rank as matrix P.
B) Vector q must have only non zero elements.
C) Matrix P must be singular.
D) Matrix P must be square.

Question no. 9

Consider the following system of equations in three variables x,y and z

$2x-y+3z=1$

$3x-2y+5z=2$

$-x-4y+z=3$

The system of equations has

Question no. 10

For the matrix $\begin{bmatrix} 4 & 2 \\ 2 & 4 \end{bmatrix}$ the eigenvalue corresponding to the eigenvector

$\begin{bmatrix} 101 \\ 101 \end{bmatrix}$ is

Question no. 11

Cayley-Hamilton theorem states that a square matrix satisfies its own characteristic equation. Consider a matrix

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

A satisfies the relation

Question no. 12

The eigenvalues of the following matrix are

$$\begin{bmatrix} -1 & 3 & 5 \\ -3 & -1 & 6 \\ 0 & 0 & 3 \end{bmatrix}$$

How was the session?

Students, write your response!

THANK YOU!!!!