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CS21M037

LARP Quiz 2

1) $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

2)

3) Solution to $\lambda^3 - 3\lambda^2 + \left(1 - \frac{1}{\sqrt{6}}\right) = 0$

5) (-0.16)

6) $\begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$

8) Eigenvalue = 0
Eigenvector = dominant eigenvector of A

9) Not possible as one of eigen vale is 0.

10) 30240

5) we subtract (-0.16).

So the first row .

4) without loss of generality, let a_1 be the standard basis vector.

By Gram - Schmidth process, let $\hat{a}_1 = a_1$

we get the other vectors as,

$$\hat{a}_2 = a_2 - \frac{\hat{a}_1^T a_2}{\hat{a}_1^T \hat{a}_1} \hat{a}_1$$

as $\hat{a}_1$ is a standard basis vec, it has all 0s except one location with 1.

$\therefore \hat{a}_1^T \hat{a}_1 = 1$ $\quad$ $\hat{a}_1^T a_2$ will be the i^{th} value of a_2 where i is location of the 1 in $\hat{a}_1$.

$\therefore \frac{\hat{a}_1^T a_2}{\hat{a}_1^T \hat{a}_1} \hat{a}_1$ will be vector with all 0s except at i^{th} position where it will have the i^{th} value of a_2.

Since we subtract from a_2,

In $\hat{a}_2$ all values are <u>unaffected</u> except the i^{th} position which becomes 0.

Hence if a_2 had non-zero values in other locations, $\hat{a}_2$ will NOT be a standard basis vector.

FALSE

$= 8! - 2 \times$

$= \frac{3}{4} \times 403$

Hence row 1 = row 4 and so determinant = 0.

7) $x^T S x \geq 0 \Rightarrow$ positive def matrix

$\therefore$ cant have -ve eigen values.

$\therefore$ $-3, -2$ CANT be eigen values.