

Swetha D S

**Department of Science and Humanities** 

# PES UNIVERSITY ONLINE

# CLASS-11

# **Supplementary Problems**

## **Gram-Schmidt Orthogonalization**



$$||q_1|| = \sqrt{|^2 + o + |^2} = \sqrt{2}$$

$$Q_1 = \begin{pmatrix} \frac{1}{\sqrt{2}}, & 0, \\ \sqrt{\sqrt{2}} \end{pmatrix}$$

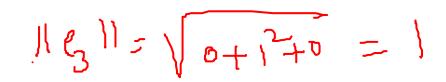
$$e_{1} = (b) - (a_{1}^{T} a_{2}) q_{1}$$

$$= \begin{bmatrix} 1 \\ 0 \end{bmatrix} - \begin{bmatrix} 1 \\ 1 \end{bmatrix} \begin{bmatrix} 1 \\ 0 \end{bmatrix}$$



$$||C_2|| = \sqrt{(\lambda)^2 + 0 + (-\lambda)^2}$$

$$= \sqrt{2}$$



$$q_3 = \frac{e_3}{11^{e_31}} = (0,1,0)$$

$$(\alpha)_{0}(C) \rightarrow (9, 9_{2}, 9_{3})$$





$$q_{1} = \begin{pmatrix} \chi_{2} \\ 0 \\ \chi_{2} \end{pmatrix}$$

$$q_{2} = \begin{pmatrix} \chi_{2} \\ -\chi_{2} \\ 0 \\ -\chi_{2} \end{pmatrix}$$

$$q_{3} = \begin{pmatrix} \chi_{2} \\ 0 \\ -\chi_{2} \\ 0 \\ 0 \end{pmatrix}$$

0 + 1000 + 1000 = 0 0 + 1000 = 0 0 + 1000 = 0 0 + 1000 = 0 0 + 1000 = 0 0 + 1000 = 0 0 + 1000 =



(a, b, c) -> (9, , 92, 93)

(Saw-Schwidt Osthogorchiz tion

# Symmetric matrices



1) Check the mathix are orthogonal diagonalizable It of then orthogonaly diagonalize it an A=SN5 = UND = BN 07

while of is as orthogonal matrix.

Solvi. 
$$A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix} = \begin{bmatrix} A - \lambda I \end{bmatrix} = 0$$

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$$\begin{vmatrix} A - \lambda$$

$$\lambda^{2} - 3\lambda^{2} = 0$$

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Considu [A->]x=0 CI->)x+4+2=0; x+(1->)y+3=0; x+y+(1->)3=0

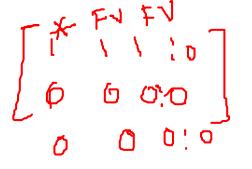


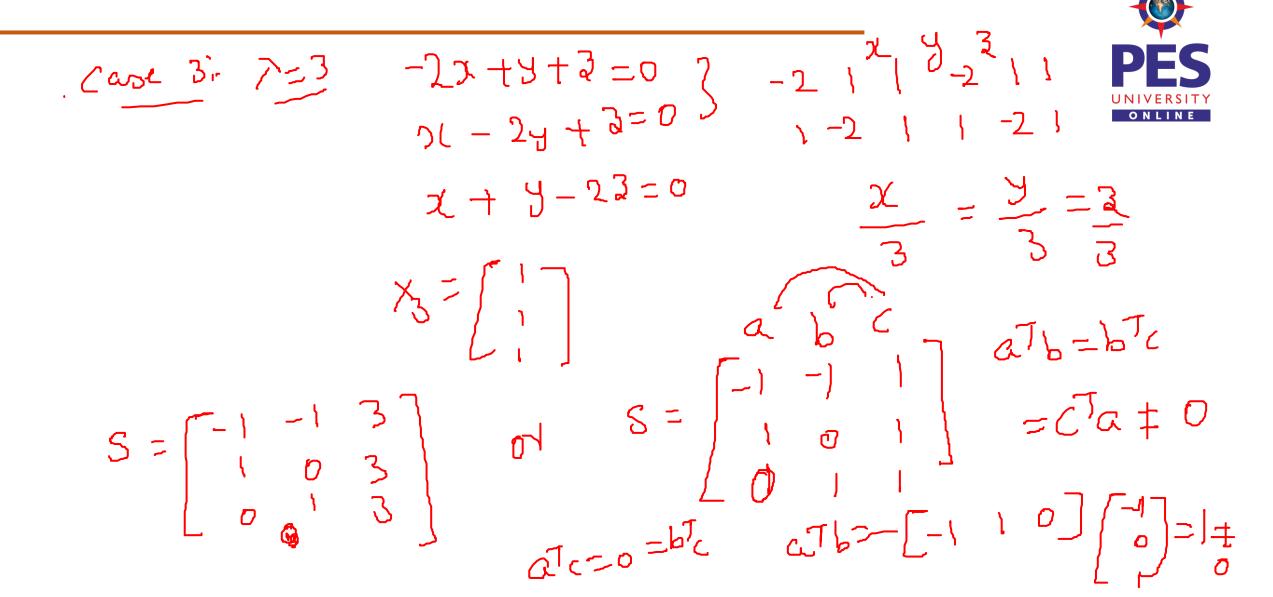
· Case 11. 7=0=> 7+4+3=0] JL+4 +2=0

バナイナタニロ

 $\gamma = 0, \chi = \begin{bmatrix} -1 \\ 0 \end{bmatrix} \begin{bmatrix} k_1 = 1, k_2 = 0 \\ 0 \end{bmatrix}$ 

$$K_1 = 0, \quad \chi_2 = 1$$



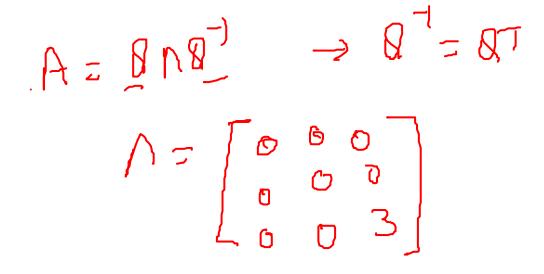




$$q_{2} = \frac{c_{2}}{|le_{2}|} e_{1} = b - (q_{1}^{T}a)q_{1}$$
  $q_{2} = (-\frac{1}{46})^{2} - \frac{1}{46}$ 

$$= e_3 = (\sqrt{3})^3 / \sqrt{3}$$
 $8 = (-1/3)^2 - (\sqrt{3})^3 / \sqrt{3}$ 
 $\sqrt{3}$ 
 $\sqrt{3}$ 

$$9^{7}_{1}9_{2} = 0$$
 $9^{7}_{2}9_{1} = 0$ 
 $9^{7}_{1}9_{2} = 0$ 







# **THANK YOU**

## **SWETHA D S**

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