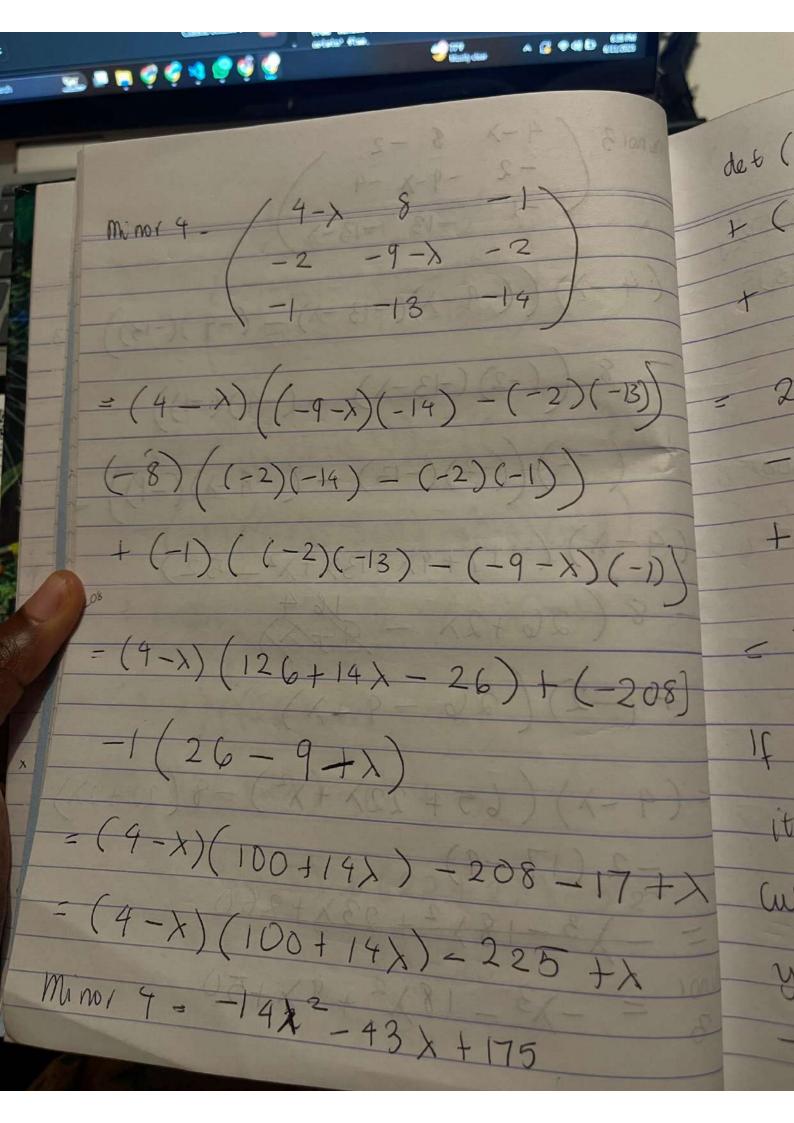


minol 3 $\begin{pmatrix} 4-x & 8-2 \\ -2 & -9-x & -4 \\ \hline -1 & -13 & -13-x \end{pmatrix}$ (4-x) ((-9-x)(-13-x) - (-4)(-13)) -8 ((-2)(-13-x) - (-4)(-1)) $+(-2)(-13)-(-9-\lambda)(-1)$ $=(4-x)(117+9x+13x+x^2-52)$ -8(26+2x - 9+x) +(-2)(26-9+1) $=(4-1)(65+221+1^2)-8(22+21)$ -2 (17-9) $=-\frac{3-18}{2}+\frac{23}{2}+260$ $\frac{1000}{3} = -\lambda^3 - 18\lambda^2 + 9x + 50$



$$det(A-NI) = -10(-2x^{2}+40x-150)$$

$$+(5-x)(-x^{3}-18x^{2}+9x+50)$$

$$+(6(-14x^{2}-43)+175)$$

$$\frac{-430 \times + 1750 - 5 \times^{3} - 90 \times^{2} + 45 \times}{+250 + \times^{4} + 18 \times^{3} + 9 \times^{2} + 50 \times}$$

$$= \frac{34+13}{3} - 219 + \frac{2}{3} - 835 + 3500$$

Cubic resolvent equation

$$y^3 - a_2y^2 + (a_1a_3 - 4a_4)y + (4a_2q - (a_3)^2 - a_1^2a_4) = 0$$

 $y^3 - (-219)y^2 + (13)(-835) - 4(3500)$ $+(4(-219)(3500)-(-835)^2-(13)^2$ (3500) 7 = 0 y3+21942+(-10,835-14,000)y+ We (-3,066,000-697,225-591,500)=72 y3 + 219y2 - 24, 855y -4, 354, 725=0 To find the cubic equation root, we did some listing to fing y which is the root 3, = 147.998 to find the quartic root we use Z2+1/2 (a,+)(a,)2-4 a2+4y Z+ $\frac{1}{2}(y_1 + \sqrt{(y_1)^2 - 4(a_4)} = 0$

Z2+1/2 (13+ J(13)2-(4(-219))+4(147,948))2 + 1/3 (147.948 +) (147.948) 2-4 (3500) Z2+1/2 (13 ± 40.45) Z + 1/2 (147.948 +888) We have 2 equations 22+1/2 (13+40.45)z+1/2 (147.948 0)=1 $z^2 + \frac{1}{2} (13 - 40.45) z + \frac{1}{2} (147.948)$ -88.86) Z2+26,732+118,40 22-13.732+29.54 45ing Z = - b + | b2 - 4ac 20

For equation 1 Z= -26.73 ± 5 (26.73) 2-4 (1) (118-40 50 $Z = -26.73 + \int 240.83$ - 26.73 + 15.51 - -26.73+15.51 or -26.73-15.5 --5.61 or -21.12 For equation 2: 72-13.73z+29.54 Z = -b + 1 b2 -4ac $Z = -(13.73) + \int (-13.73)^2 - 4(1)$ Z = 13, 13 + \\ \tag{70.43}

rested to real the "besistorage" project

18-40

-15.51

(29.54)

$$Z = \frac{13.73 + 8.39}{2}$$
 or $\frac{13.73 - 8.39}{2}$

Finding Eigen vector
$$\lambda_1 = -21.12$$

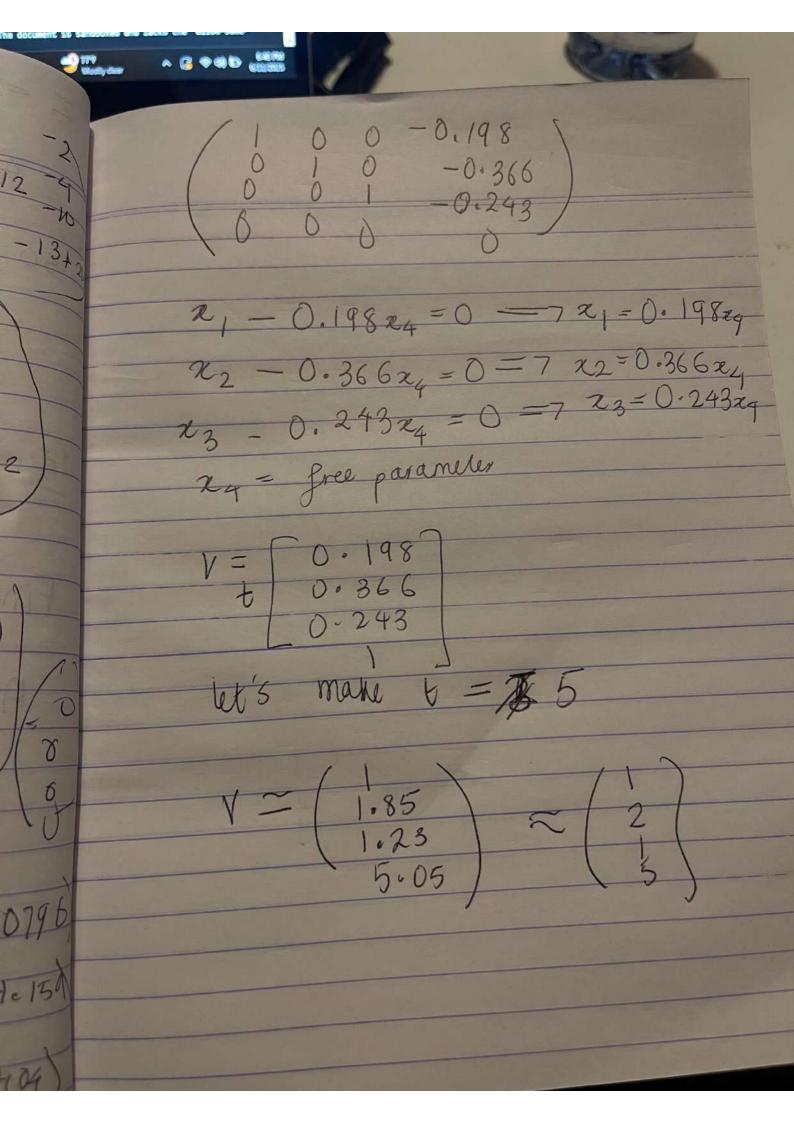
$$A = \begin{bmatrix} 4 & 8 & -1 & -2 \\ -2 & -9 & -2 & -4 \\ 0 & 10 & 5 & -10 \end{bmatrix}, \lambda = -21.12$$

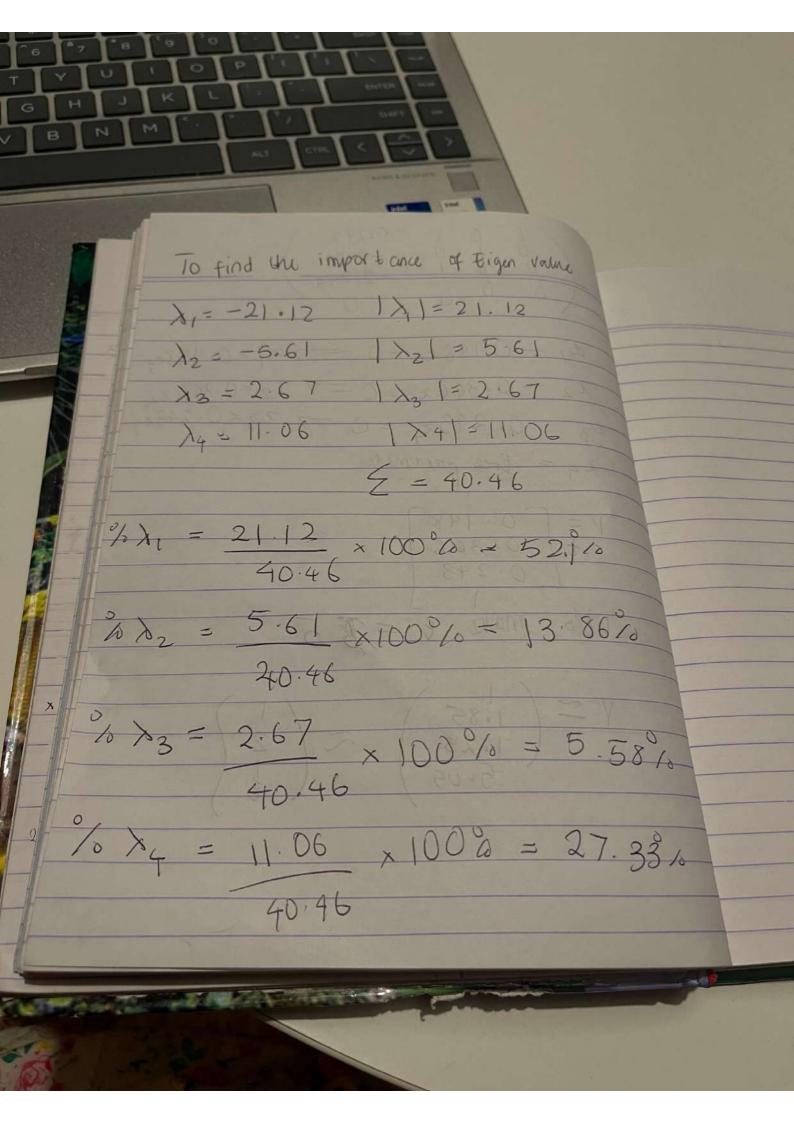
To find the eigen voctors

$$(A - \lambda 1)y = 0$$

$$\lambda = -21.12$$
, we compute $A - (-21.12)1 = 19$
+ 21.121

A+21.121 = /4+21.12 8 -1 26.12 -10 1-14 R1: 25.12 (1,0.318, -0.0398, -0.079) L2= L2 + 2R, (0, 12.756, -2.0796, -4.15) R4=R4+R, (0,-12.682,-14.0398,8.0404)





$$V_1 = V_2 = V_3 = V_3 = 0$$

Thus $\lambda_1 = -5.604$ leads to a zero eigenvector, it may not be an exact eigenvalue.