$$A = \begin{pmatrix} -2 & -4 & 2 \\ -2 & 1 & 2 \\ 4 & 2 & 5 \end{pmatrix}$$
This is a  $3 \times 3$  matrix

Charaltonistic Equation (polynomial: |A->I[=0]
Eigenvalue

$$\begin{pmatrix}
-2 & -4 & 2 \\
-2 & (2) & - & 0 & \lambda & 0 \\
4 & 2 & 5 & - & 6 & \lambda
\end{pmatrix}$$

$$\begin{vmatrix} -2 - \lambda & -4 & 2 \\ -2 & 1 - \lambda & 2 \\ 4 & 2 & 5 - \lambda \end{vmatrix} = 0$$

$$(-2-1)(1-1)(5-1)-4]+4[-2(5-1)-8]+2[-4-4(1-1)=0$$

$$-\frac{3}{12} + 4^{12} + 277 - 90 = 0$$

$$\frac{\lambda^{3}-4\lambda^{2}-27\lambda}{-}$$

$$(\lambda - 3)(\lambda^2 - \lambda - 30) = 0$$

$$(\lambda - 3)(\lambda + 5)(\lambda - 6) = 0$$

$$\begin{array}{c} (\lambda + 5)(\lambda - 5) \\ \lambda_1 = 3 \\ \lambda_2 = -5 \\ \lambda_3 = 6 \end{array}$$

$$\begin{array}{c} (\lambda + 5)(\lambda - 5) \\ \lambda_4 = -5 \\ \lambda_3 = 6 \end{array}$$

$$\begin{array}{c} (\lambda + 5)(\lambda - 5) \\ \lambda_5 = -5 \\ \lambda_6 = -5 \\ \lambda_6 = -5 \end{array}$$

$$\begin{array}{c} (\lambda + 5)(\lambda - 5) \\ \lambda_6 = -5 \\ \lambda_7 = -5 \\ \lambda_8 = -5 \\ \lambda_8 = 6 \end{array}$$

$$\begin{array}{c} (\lambda + 5)(\lambda - 5) \\ \lambda_1 = 30 \\ \lambda_2 = -5 \\ \lambda_3 = 6 \end{array}$$

$$\begin{array}{c} (\lambda + 5)(\lambda - 5) \\ \lambda_1 = 30 \\ \lambda_2 = -5 \\ \lambda_3 = 6 \end{array}$$

Eigen Vadons: 
$$(A - \lambda I)(\chi) = (0)$$

$$\chi = 3$$

$$\begin{pmatrix}
-5 & -4 & 2 \\
-2 & -2 & 2 \\
2 & 2 & 2
\end{pmatrix}
\begin{pmatrix}
\chi_1 \\
\chi_2 \\
\chi_3 \\
0
\end{pmatrix}$$

$$\begin{pmatrix}
0 \\
0 \\
0
\end{pmatrix}$$

$$|^3 - 4 - 27 + 90 \neq 0$$

$$\begin{cases} \chi = 0 \end{cases}$$

$$-5x_{1} - 4x_{2} + 2x_{3} = 0$$

$$-2x_{1} - 2x_{2} + 2x_{3} = 0$$

$$-2x_{1} + 2x_{2} + 2x_{3} = 0$$

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$$2x_{1} + 2x_{2} + 2x_{3} = 0$$

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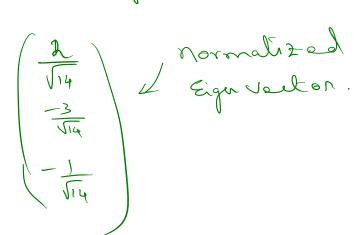
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=  $\sqrt{\frac{14}{4}} = \sqrt{\frac{14}{4}} = \frac{\sqrt{14}}{2} \sqrt{\frac{14}{14}}$ 

Normalized Eigen vector for  $\lambda = 3$  ?



$$\chi = -5$$
 $\chi_{1} = \frac{1}{2}, \chi_{2} = \frac{1}{2}, \chi_{3} = -\frac{1}{2}$ 

$$\mathcal{N} = \sqrt{\frac{3}{2}}$$

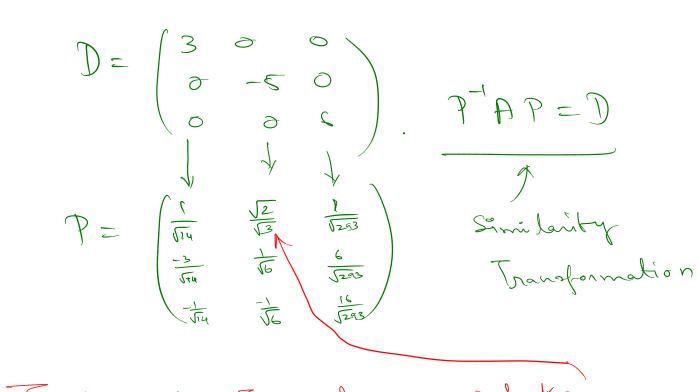
$$\chi_1 = \frac{\sqrt{2}}{3}$$
;  $\chi_2 = \frac{1}{\sqrt{6}}$ ;  $\chi_3 = -\frac{1}{\sqrt{6}}$ 

$$x_1=1$$
  $x_2=6$   $x_3=16$ 

$$\chi_1 = \frac{1}{\sqrt{293}}$$
;  $\chi_2 = \frac{6}{\sqrt{293}}$ 

Diagonalized matrix D:

$$D = \begin{pmatrix} \lambda_1 & 0 & 0 \\ 0 & \lambda_2 & 0 \\ 0 & 0 & \lambda_3 \end{pmatrix}$$



In the video I made a mintake

Indead of 13 I get 3 there.

It should be 13/1.