One Shinhan

→ eigenvector x is given by

$$x = \begin{pmatrix} x_1 = 0 \\ x_2 = 0 \\ x_3 \end{pmatrix} = x_3 \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix}$$

⇒ any real number with $x_3 \neq 0$ → eigenvectors of C with eigenvalue $= 2$

R_1
R_2
R_3

• $\boxed{\lambda = 3 + 2\sqrt{2}}$

+ current matrix $C - \lambda I$

R_1 $+R_2]$

$$\Leftrightarrow \begin{pmatrix} 1 & -2 & 0 \\ -2 & 5 & 0 \\ 0 & 0 & 2 \end{pmatrix} - \begin{pmatrix} 3+2\sqrt{2} & 0 & 0 \\ 0 & 3+2\sqrt{2} & 0 \\ 0 & 0 & 3+2\sqrt{2} \end{pmatrix}$$

$2/7$)

$$\Leftrightarrow \begin{pmatrix} -2-2\sqrt{2} & -2 & 0 \\ -2 & 2-2\sqrt{2} & 0 \\ 0 & 0 & -1-2\sqrt{2} \end{pmatrix} \left| \begin{matrix} 0 \to R_1 \\ 0 \to R_2 \\ 0 - R_3 \end{matrix} \right.$$

$+ \ 2R_2]$

$\downarrow$ $[R_1 \to \cancel{R_1} (-2-2\sqrt{2})/R_1$

$$\begin{pmatrix} 1 & 1+\sqrt{2} & 0 \\ -2 & 2-2\sqrt{2} & 0 \\ 0 & 0 & -1-2\sqrt{2} \end{pmatrix}$$

$\downarrow$ $[R_2 \to R_2 - (-2R_1)$

$$\begin{pmatrix} 1 & 1+\sqrt{2} & 0 \\ 0 & 4 & 0 \\ 0 & 0 & -1-2\sqrt{2} \end{pmatrix}$$

$\downarrow$ $[R_3 \to R_3 / (-1-2\sqrt{2})$

$$\begin{pmatrix} 1 & 1+\sqrt{2} & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 1 \end{pmatrix} \cancel{R_3 \to R_3 \ 4} \ \cancel{\begin{pmatrix} 1 & 1+\sqrt{2} & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 0 \end{pmatrix}}$$

⟺