
Linear Algebra

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Further Study

$$\det A^{-\lambda I} = 0 \rightarrow \lambda \text{ 가 } 5 \text{ 개}$$

$$\textcircled{5\text{차식}} \rightarrow \begin{matrix} 1\text{차 } 5\text{개} & \text{or} & 1\text{차 } 3\text{개} + 2\text{차 } 1\text{개} \\ & & \text{or } 1\text{차 } 1\text{개} + 2\text{차 } 2\text{개} \end{matrix} \quad \left. \vphantom{\begin{matrix} 1\text{차 } 5\text{개} \\ 1\text{차 } 3\text{개} + 2\text{차 } 1\text{개} \\ 1\text{차 } 1\text{개} + 2\text{차 } 2\text{개} \end{matrix}} \right\} \text{분해}$$

$$(\lambda^2 - 2\lambda + 5) \quad \text{실근은 } 1 \text{ or } 3 \text{ or } 5\text{개}$$

$$\text{중근 있을 때: } (\lambda - 2)^2(\lambda - 3) = 0$$

$$\lambda = 2 \rightarrow (A - 2I)x = 0$$

$$\lambda = 3 \rightarrow \begin{matrix} \textcircled{1} \text{ or } \textcircled{2} \rightarrow \begin{bmatrix} 1 \\ 1 \end{bmatrix}, \begin{bmatrix} 2 \\ 1 \end{bmatrix} \\ \textcircled{1+1=2} \quad \textcircled{2+1=3} \end{matrix} \rightarrow \text{c} \cdot \begin{bmatrix} 1 \\ 1 \end{bmatrix} \quad \left. \vphantom{\begin{bmatrix} 1 \\ 1 \end{bmatrix}} \right\} \text{앞은 +}$$

- Determining whether a matrix $A \in \mathbb{R}^{n \times n}$ diagonalizable.
 - Geometric multiplicity should be equal to algebraic multiplicity.
 - As a special case, A has n distinct eigenvalues, A is diagonalizable.
 - Lay Ch5.3

중근없이 n 개의 eigenvalue

$$(\lambda - 1)(\lambda - 3)(\lambda - 2)(\lambda + 5)(\lambda + 2) \rightarrow 5\text{개의 independent vector 얻을 수 있음}$$

- Solving $(A - \lambda I)x = 0$ for a given eigenvalue λ
 - Lay Ch1.5

* 중근이 있을 때 eigenspace 차원이 더 낮으면 diagonalize 하지 않는다!!