

MC Hw#1

Subject:
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Day:

11.11.2021 تاریخ

Time:

$$\alpha = \left\{ \begin{pmatrix} x \\ 0 \\ 2 \end{pmatrix}, \begin{pmatrix} 2x \\ 2y^2 \\ 1 \end{pmatrix}, \begin{pmatrix} 0 \\ y \\ 2y \end{pmatrix} \right\} \quad (1)$$

$$\Rightarrow \begin{vmatrix} x & 2x & 0 \\ 0 & 2y^2 & y \\ 2 & 1 & 2y \end{vmatrix} = \alpha$$

$$|\alpha| \rightarrow 2(2y^2 \times 2y - y) - 2x(0 \times 2y - 2y) + x \cdot 0$$

$$\Rightarrow 2(2x^2y^3 - y) - 2x(-2y) + 0$$

$$\Rightarrow 2x^2y^3 - xy + 4xy =$$

$| \alpha | = 0$ \rightarrow $x = 0$

$$|\alpha| = \rightarrow 2x^2y^3 - xy + 4xy =$$

$$\rightarrow 2x^2y^3 + 3xy =$$

$$\rightarrow 2y(2x^2y^2 + 3) = 0 \rightarrow \begin{cases} x = 0 \\ y = 0 \\ 2x^2y^2 + 3 = 0 \end{cases}$$

$x, y \neq 0$, $2x^2y^2 + 3 \neq 0$ \rightarrow $2x^2y^2 + 3 = 0$ \rightarrow $x^2y^2 = -\frac{3}{2}$ \rightarrow $x^2 = -\frac{3}{2}y^2$

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(→ 1)

$$xy^2 \neq -\frac{3}{2}, x, y \neq 0$$

$$\alpha = \left\{ \begin{pmatrix} x \\ 0 \\ 2 \end{pmatrix}, \begin{pmatrix} 2x \\ 2y^2 \\ 1 \end{pmatrix}, \begin{pmatrix} 0 \\ y \\ xy \end{pmatrix} \right\}$$

$$\text{if } \rightarrow x=1, y=1$$

$$\Rightarrow \alpha = \left\{ \begin{pmatrix} 1 \\ 0 \\ 2 \end{pmatrix}, \begin{pmatrix} 2 \\ 2 \\ 1 \end{pmatrix}, \begin{pmatrix} 0 \\ 1 \\ 1 \end{pmatrix} \right\}$$

$$\beta = \{e_1, e_2, e_3\}$$

$\therefore \alpha \sim \beta \text{ if } P^{-1} = \frac{1}{3} \begin{pmatrix} 1 & 0 & 2 \\ 2 & 2 & 1 \\ 0 & 1 & 1 \end{pmatrix}$

$$v_1 = e_1 + 0e_2 + 2e_3$$

$$v_2 = 2e_1 + 2e_2 + e_3 \Rightarrow [v_1 \ v_2 \ v_3] = [e_1 \ e_2 \ e_3] \begin{pmatrix} 1 & 0 & 2 \\ 2 & 2 & 1 \\ 0 & 1 & 1 \end{pmatrix}$$

$$v_3 = 0e_1 + e_2 + e_3$$

$$\rightarrow [e_1 \ e_2 \ e_3] = [v_1 \ v_2 \ v_3] \begin{pmatrix} 1 & 0 & 2 \\ 2 & 2 & 1 \\ 0 & 1 & 1 \end{pmatrix}^{-1}$$

$\therefore P = \frac{1}{3} \begin{pmatrix} 1 & 0 & 2 \\ 2 & 2 & 1 \\ 0 & 1 & 1 \end{pmatrix}$

$$\therefore P = \frac{1}{3} \begin{bmatrix} \frac{1}{5} & \frac{2}{5} & \frac{4}{5} \\ -\frac{2}{5} & \frac{1}{5} & \frac{3}{5} \\ \frac{2}{5} & -\frac{1}{5} & \frac{2}{5} \end{bmatrix}$$

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f2

(1)

km
5

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f2

$$\left\{ \begin{array}{l} x_1 - 3x_2 + 2x_4 + 5x_5 = 4 \\ 3x_1 - 6x_2 + 2x_3 + x_4 - 2x_5 = -3 \end{array} \right. \quad (1)$$

$$5x_1 - 12x_2 + 2x_3 + 5x_4 + 8x_5 = 7$$

$$A = \begin{pmatrix} 1 & -3 & 0 & 2 & 5 \\ 3 & -6 & 2 & 1 & -2 \\ 5 & -12 & 2 & 5 & 8 \end{pmatrix} \quad y = \begin{pmatrix} 4 \\ -3 \\ 7 \end{pmatrix} \quad 3 \times 1$$

$$\text{Rank}(A) = ? \quad \begin{matrix} n+m \\ \downarrow 5 \end{matrix} \rightarrow m < n = 5$$

$$\begin{pmatrix} 1 & 0 & 2 \\ 3 & 2 & 1 \\ 5 & 2 & 5 \end{pmatrix}$$

$$1(1+2) - 2(6+1) = -11 \neq 0, \text{ hence } X$$

$$\text{Rank}(A) = 2, m = 3 \rightarrow \text{Rank}(A) < m$$

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$$12y^2 \neq -3$$

$$\alpha = \begin{pmatrix} 1 \\ 2 \\ \vdots \\ 2 \end{pmatrix}$$

$$if \rightarrow z = 1$$

$$\Rightarrow \alpha = \begin{pmatrix} 1 \\ 1 \\ \vdots \\ 1 \end{pmatrix}$$

$$\beta = \{ e_1, e_2 \}$$

$$v_1 = e_1 + 0$$

$$v_2 = 2e_1 + 0$$

$$v_3 = 0e_1 + 1$$

$$\rightarrow [e_1, e_2]$$

$$\Rightarrow P$$

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(2-2)

$$\begin{cases} x_1 - 2x_2 + 3x_3 = 1 \\ 2x_1 - 3x_2 + 5x_3 = 0 \\ -x_1 + 4x_2 - x_3 = -1 \end{cases}$$

$$A = \begin{bmatrix} 1 & -2 & 3 \\ 2 & -3 & 5 \\ -1 & 4 & -1 \end{bmatrix}, \quad y = \begin{bmatrix} 1 \\ 0 \\ -1 \end{bmatrix}$$

3×3 $\rightarrow m=n=3$

$$\text{Rank}(A) = ?$$

$$1(-3) + 1(-5) + 2(2+1) + 3(8-3) = \cancel{-2} \cancel{3} \cancel{5} + \cancel{6} \cancel{15} \cancel{25} = 21$$

$$\text{Rank}(f) = 3 \quad \left\{ \begin{array}{l} 4 \neq 0 \\ m=3 \end{array} \right. \quad : \text{if } f \neq 0$$

$$\text{Rank}(A) = m = 3$$

$$\therefore \text{Rank}(A) = m = 3$$

$$x = A^{-1}y$$

$$x_1 = -4$$

$$x_2 = -1 \rightarrow x = \begin{pmatrix} -4 \\ -1 \\ 1 \end{pmatrix}$$

$$x_3 = 1$$

3. by substitution

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2x1

1
2x3

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(3)

$$\text{Rank}(AB) \leq \min(\text{Rank}(A), \text{Rank}(B))$$

✓

$$\text{Rank}(A^2) \leq \min(\text{Rank}(A), \text{Rank}(A))$$

Rank(A)

$$\text{Rank}(A^3) \leq \min(\text{Rank}(A^2), \text{Rank}(A))$$

:

$$\begin{aligned} \text{Rank}(A^K) &\leq \text{Rank}(A^{K-1}) \leq \text{Rank}(A^{K-2}) \leq \dots \\ &\leq \text{Rank}(A^2) \leq \text{Rank}(A) \end{aligned}$$

$$\Rightarrow \text{Rank}(A^K) \leq \text{Rank}(A)$$

✓

$A \in \mathbb{R}^{n \times n}$

الف

$$K \text{Rank}(A) - (K-1)n \leq \text{Rank}(A^K)$$

$$\text{Rank}(A)(K-1) \leq (K-1)n$$

$$\text{if } K \geq 1 \rightarrow \text{Rank}(A) \leq n$$

$$\text{if } K = 1 \rightarrow \text{Rank}(A) \leq n$$

$$\text{if } K < 1 \text{ then } \text{Rank}(A) \leq n$$

($K \neq 1$) \rightarrow if K is an integer

$$\Rightarrow K \geq 1 \Rightarrow \text{Rank}(A) \leq n$$

✓

تم

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$$N(b) \leftarrow \rightarrow n - \text{Rank}(b) \Rightarrow \text{Rank}(A) = n$$

12
X

$$\text{Rank}(AB) \leq \min(\text{Rank}(A), \text{Rank}(B))$$

$$A = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}_{3 \times 3} \rightarrow \text{Rank}(A) = \frac{3}{3} = 3 : \text{since } J^3$$

$$, n = 3 \rightarrow N(A) = 0$$

$$B = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}_{3 \times 1} \rightarrow \text{Rank}(AB) \leq \min(\text{Rank}(A), \text{Rank}(B))$$

$$\text{Rank}(B) = 1$$

$$\text{Rank}(AB) \leq \min(3, 1) = 1$$

$\frac{1}{3}$

بلطفه

$$u, y \in \mathbb{R}^{n \times 1} \rightarrow \text{Rank}(uy^T) = 1$$

(0) 13
✓

$$\text{Rank}(u) = \text{Rank}(y) = 1$$

$$\text{Rank}(uy^T) \leq \min(\text{Rank}(u), \text{Rank}(y^T))$$

1

$$\rightarrow \text{Rank}(uy^T) = \frac{1}{3}$$

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$$Ax = 0 \rightarrow \text{أرجو عرضي}$$

(3)

(✓)

$$Ay = b, b \neq 0 \in \text{range}(A)$$

: ممكنا نجده في $\text{range}(A^T)$ \setminus A ارجو عرضي

$$x^T y = 0$$

: b' ينتمي إلى $\text{range}(A^T)$ \setminus A ارجو عرضي

$$Ay = b \rightarrow y = A^T B b'$$

$$x^T y = 0 \rightarrow x^T A^T B b' = 0$$

$$\rightarrow (B^T A x)^T b' = 0$$

أرجو عرضي

يمكننا العثور على

يمكننا العثور على $\text{range}(A^T) \setminus A$ ارجو عرضي

A هي ماتريكس مقلوب

(✓)

$$Q^T A Q = \text{ماتريكس} = ?$$

$$Q^T Q^{-1} = I \rightarrow Q^{-1} A Q = \text{ماتريكس} \rightarrow Q^{-1} A Q = ?$$

عنصر

$$Q^T A Q = ?$$

عنصر

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$N(b) =$

$\text{Rank}(AB) =$

$$A = \begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$$

$$B = \begin{pmatrix} 1 \\ 0 \end{pmatrix}_3$$

$\text{Rank}(AB) = 1$

$\text{Rank}(A) = 2$

"3"

$\text{Range}(A)$

$\text{Rank}(A)$

$\text{Rank}(A)$

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 $f=1\text{Hz}$ $x \in \mathbb{R}^n$ $D \in \mathbb{R}^{n-1 \times n}$

?

(F)

$$Dx = x_i^{(1)} = \frac{x_{i+1} - x_i}{\Delta t}, \quad i=1, \dots, n-1$$

for $n=3$

$$D = \begin{bmatrix} \alpha_1 & \alpha_2 & \alpha_3 \\ \alpha'_1 & \alpha'_2 & \alpha'_3 \end{bmatrix}_{n-1 \times n} \quad x = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}_{3 \times 1}$$

$\xrightarrow{2 \times 3} \quad x_{i+1} - x_i$

$$Dx = x_i^{(1)}, \quad x_i^{(1)} = \frac{x_{i+1} - x_i}{\Delta t}, \quad \xrightarrow{\Delta t = 1}$$

$$\Rightarrow x_i^{(1)} = \begin{pmatrix} x_2 - x_1 \\ x_3 - x_2 \end{pmatrix}$$

$$\Rightarrow \begin{pmatrix} \alpha_1 & \alpha_2 & \alpha_3 \\ \alpha'_1 & \alpha'_2 & \alpha'_3 \end{pmatrix}_{2 \times 3} \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix}_{3 \times 1} = \begin{pmatrix} x_2 - x_1 \\ x_3 - x_2 \end{pmatrix}_{2 \times 1}$$

$$\left\{ \begin{array}{l} \alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 = x_2 - x_1 \\ \alpha'_1 x_1 + \alpha'_2 x_2 + \alpha'_3 x_3 = x_3 - x_2 \end{array} \right.$$

$$\left\{ \begin{array}{l} \alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 = x_2 - x_1 \\ \alpha'_1 x_1 + \alpha'_2 x_2 + \alpha'_3 x_3 = x_3 - x_2 \end{array} \right.$$

$$\left\{ \begin{array}{l} D = \begin{pmatrix} -1 & 1 & 0 \\ 0 & -1 & 1 \end{pmatrix} \\ \text{if } n=3 \end{array} \right.$$

$$\left\{ \begin{array}{l} \text{rank}(D)=2 \\ D^{-1} = \left\{ \begin{pmatrix} -1 \\ 1 \end{pmatrix}, \begin{pmatrix} 1 \\ -1 \end{pmatrix} \right\} \end{array} \right.$$

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(ن)

+42 -12
(2,3) \times (4,3)

+22 -4h

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if $n=4$

(4 "اول)

$$D = \begin{pmatrix} \alpha_1 & \alpha_2 & \alpha_3 & \alpha_4 \\ \alpha'_1 & \alpha'_2 & \alpha'_3 & \alpha'_4 \\ \alpha''_1 & \alpha''_2 & \alpha''_3 & \alpha''_4 \end{pmatrix}_{3 \times 4}, \quad X = \begin{pmatrix} u_1 \\ u_2 \\ u_3 \\ u_4 \end{pmatrix}_{4 \times 1}$$

$$u_i^{(1)} = \begin{pmatrix} u_2 - u_1 \\ u_3 - u_2 \\ u_4 - u_3 \end{pmatrix}_{3 \times 1}$$

\rightarrow $\omega_1 = u_3 - u_2, \omega_2 = u_2 - u_1$ و ...
او $\omega_1, \omega_2, \omega_3, \omega_4$ با این ترتیب است؛ if $n=3$

$$\omega_4 - \omega_3 = \underbrace{\alpha''_1}_{\vdots} u_1 + \underbrace{\alpha''_2}_{\vdots} u_2 + \underbrace{\alpha''_3}_{\vdots} u_3 + \underbrace{\alpha''_4}_{\vdots} u_4$$

$$\rightarrow D = \begin{pmatrix} -1 & 1 & 0 & 0 \\ 0 & -1 & 1 & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

پس نتیجه می شود

$$\text{Rank}(D) = n-1$$

بردازه مجموع $n-1$ مقدار $n-1$ است

D عکس 12

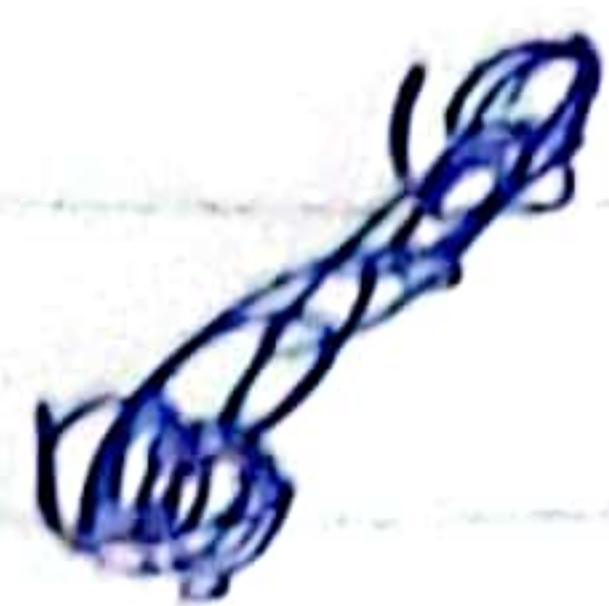
راستایی را داشت

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(الف)

$$A = \begin{bmatrix} -2 & 1 \\ -5 & 3-a \\ -4 & -2-1 \end{bmatrix}$$

$$\lambda = ? \quad \lambda \in \{-3, 3, 0\}$$

$$\det(\lambda I - A) = \rightarrow \begin{vmatrix} \lambda+2 & 0 & -1 \\ +5 & \lambda-3 & -a \\ -4 & +2 & \lambda+1 \end{vmatrix}$$

$$\lambda = \rightarrow \begin{vmatrix} 2 & 0 & -1 \\ +5 & -3 & -a \\ -4 & +2 & 1 \end{vmatrix}$$

$$2(-3 + 2a) - (1 \cdot \underbrace{-12}) \rightarrow 4a = 4 \rightarrow a = 1$$

$$\lambda = 3 \rightarrow \begin{vmatrix} 5 & -0 & -1 \\ 5 & 0 & -a \\ -4 & 2 & 4 \end{vmatrix}$$

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$$5(1+2a) - (1.) = .$$

(in 5 sub)

$$1. a=1 \rightarrow a=1$$

$$\left| \begin{array}{ccc} -1 & 0 & -1 \\ 5 & -6 & -a \\ -4 & +2 & -2 \end{array} \right|$$

$$-(12+2a) - (10 \overset{-14}{\cancel{+2}} 4) = .$$

$$12+2a + \frac{14}{2} = . \rightarrow 2a=2 \rightarrow a=1$$

$\Rightarrow a \in \{-3, 3, 1\}$ $\leftarrow a=1 \text{ L. ou } \cancel{a=1}$

$$A_{3 \times 3}, \quad v = \begin{pmatrix} 1 \\ 2 \\ -1 \end{pmatrix}, \quad w = \begin{pmatrix} 2 \\ -1 \\ 3 \end{pmatrix}$$

$\frac{1}{3} \rightarrow 15$

$$Av = v, \quad Aw = 2w$$

$$b = A^5 \begin{pmatrix} -1 \\ 8 \\ -9 \end{pmatrix} \rightsquigarrow b = \underbrace{\begin{pmatrix} ? \\ ? \\ ? \end{pmatrix}}_{3v - 2w}$$

$$3v - 2w$$

$$b = -3 \begin{pmatrix} 1 \\ 2 \\ -1 \end{pmatrix} - 48 \begin{pmatrix} 2 \\ -1 \\ 3 \end{pmatrix}$$

$$\rightarrow 3AvA^4 - 2AwA^4$$

$$-3Avb^3 - 4AwA^3 + 3Av - 24bw$$

$$+ 3Avb^2 - 6bwA^2 \quad \left. \begin{array}{l} \uparrow \\ -3v - 48w \end{array} \right.$$

$$-3Avb - 12bw$$

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(15)

$$A = \left[\begin{array}{cccccc} 1.0.1 & 3 & 5 & 7 & 9 & 11 \\ 1 & 1.0.3 & 5 & 7 & 9 & 11 \\ 1 & 3 & 1.0.5 & 7 & 9 & 11 \\ 1 & 3 & 5 & 1.0.7 & 9 & 11 \\ 1 & 3 & 5 & 7 & 1.0.9 & 11 \\ 1 & 3 & 5 & 7 & 9 & 1.0.11 \end{array} \right]$$

? $\xrightarrow{3}$ $\xrightarrow{3}$ $\xrightarrow{3}$

$$\rightarrow A - 1 \dots 7 = A' = \left[\begin{array}{cccccc} 1 & 3 & 5 & 7 & 9 & 11 \\ 1 & 3 & 5 & 7 & 9 & 11 \\ 1 & 3 & 5 & 7 & 9 & 11 \\ 1 & 3 & 5 & 7 & 9 & 11 \\ 1 & 3 & 5 & 7 & 9 & 11 \\ 1 & 3 & 5 & 7 & 9 & 11 \end{array} \right]$$

$$|A| - |A'| \rightarrow \left[\begin{array}{cccccc} 2-1 & -3 & -5 & -7 & -9 & -11 \\ -1 & 2-3 & -5 & -7 & -9 & -11 \\ -1 & -3 & 2-5 & -7 & -9 & -11 \\ -1 & -3 & -5 & 2-7 & -9 & -11 \\ -1 & -3 & -5 & -7 & 2-9 & -11 \\ -1 & -3 & -5 & -7 & -9 & 2-11 \end{array} \right]$$

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(2-5 مارس)

الخطوات التي تتم في حل المسألة

ما هي الخطوات التي تتم في حل المسألة

برهان (برهان)

$$\rightarrow |2\lambda - \lambda'| = \begin{vmatrix} 2' & 0 & 0 & 0 & 0 & 0 \\ 0 & \lambda' & 0 & 0 & 0 & 0 \\ 0 & 0 & 2' & 0 & 0 & 0 \\ 0 & 0 & 0 & \lambda' & 0 & 0 \\ 0 & 0 & 0 & 0 & \lambda' & 0 \\ -1 & -3 & -5 & -7 & -9 & \lambda' - 36 \end{vmatrix}$$

$$\det(2\lambda - \lambda')$$

$$\rightarrow (2')^4 \left| \begin{array}{cc} \lambda' & 0 \\ -9 & \lambda' - 36 \end{array} \right|$$

$$\rightarrow (2')^4 (2'(\lambda' - 36) - 0)$$

$$\rightarrow (2')^5 (\lambda' - 36) =$$

$$\left\{ \begin{array}{l} 2' = \dots \rightarrow \sqrt[4]{5} \\ \lambda' = 36 \end{array} \right.$$

$$A = 1 \dots 7 + \lambda' \rightarrow \left\{ \begin{array}{l} \lambda = 1 \dots \rightarrow \sqrt[4]{5} \\ \lambda = 1 \cdot 36 \end{array} \right.$$

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(7)

$$B = \begin{bmatrix} -7 & 4 & -4 \\ -5 & 1 & -2 \\ 0 & 0 & -1 \end{bmatrix}$$

(الف)

? جدول ملخص

$$B_m = B^{1..0}$$

$$\begin{bmatrix} -7 & 4 & -4 \\ -5 & 1 & -2 \\ 0 & 0 & -1 \end{bmatrix}^{1..0}$$

$$\rightarrow B = Q J Q^{-1} \rightarrow B \times B = Q J \underbrace{Q^{-1}}_I Q J \underbrace{Q^{-1}}_I$$

$$\rightarrow B^2 = Q J^2 Q^{-1} \rightarrow B^n = Q J^n Q^{-1}$$

$$\rightarrow B^{1..0} = Q J^{1..0} Q^{-1} \rightarrow \left\{ \begin{array}{l} J^{1..0} ? \\ Q, Q^{-1} ? \end{array} \right.$$

$$\det(IJ - B) = \begin{vmatrix} 2+7 & -4+4 \\ +5 & 2-1+2 \\ 0 & 0 & 2+1 \end{vmatrix} = .$$

$$\rightarrow \{ \lambda = -1, \lambda = -3 \pm 2j \}$$

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(1, 2, 3, 7 "m/s)

$$(A - \lambda I) V = . \rightarrow$$

$$\lambda = -1 \quad \left[\begin{array}{ccc|c} 6 & -4 & -4 & V_1 \\ 5 & -2 & 2 & V_2 \\ 0 & 0 & 0 & V_3 \end{array} \right] = .$$

$$6V_1 - 4V_2 + 4V_3 = .$$

$$5V_1 - 2V_2 + 2V_3 = . \times 2 \rightarrow 4V_1 = . \rightarrow V_1 = .$$

$$-4V_2 = -4V_3 \rightarrow V_2 = V_3 = 1$$

$$\Rightarrow \left[\begin{array}{c} 0 \\ 1 \\ 1 \end{array} \right] = V$$

$$(A - \lambda I) V' = . \rightarrow$$

$$\lambda = -3+2j \quad \left[\begin{array}{ccc|c} 4+2j & -4 & -4 & V'_1 \\ 5 & -4+2j & 2 & V'_2 \\ 0 & 0 & -2+2j & V'_3 \end{array} \right] = .$$

$$(4+2j)V'_1 - 4V'_2 + 4V'_3 = .$$

$$5V'_1 - (-4+2j)V'_2 + 2V'_3 = .$$

$$(-2+2j)V'_3 = . \rightarrow V'_3 = .$$

Subject: $4U_1 + 27U_2$

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$$\begin{cases} (4+27)U_1 - 4U_2 = \\ 5U_1 - 4U_2 + 27U_2 = \end{cases}$$

1.01.7 mbl

$$\rightarrow U_2' = (1 + \frac{1}{2})U_1'$$

$$\underline{U_1'} = 1 \quad \underline{U_2'} = (1 + \frac{1}{2})\underline{U_1'}$$

$$J' = \begin{bmatrix} 1 \\ 1 + \frac{1}{2} \\ \vdots \end{bmatrix}$$

$$Q = \begin{bmatrix} 0 & 1 \\ 1 & 1 & \frac{1}{2} \\ 1 & 6 & \cdot \end{bmatrix}$$

$$Q^{-1} = \begin{bmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ -2 & 2 & 2 \end{bmatrix}$$

$$J = \begin{bmatrix} -1 & 0 & 0 \\ 0 & -3 & 2 \\ 0 & -2 & -3 \end{bmatrix}$$

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$$(12-B)U = \dots$$

$\lambda = -1$

$$6U_1 - 4U_2 + 4U_3 =$$

$$5U_1 - 2U_2 + 2U_3 =$$

$\downarrow \downarrow$

$$-4U_2 = -4U_3$$

$$\Rightarrow \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$$

$$(12-B)U' = \dots$$

$\lambda = -3$

$$(4+27)U'_1 - 4U'_2$$

$$5U'_1 (-4+27) + (-2+27)$$

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(i) \mathcal{F} \sim b

$$\mathbf{J}^{1..} = \begin{bmatrix} 1 & \dots \\ \vdots & \mathbf{J}' \\ \ddots & \end{bmatrix} \quad \mathbf{J}' = \begin{bmatrix} -3 & +2 \\ -2 & -3 \end{bmatrix}^{1..}$$

$$\mathbf{B}_m = \mathbf{B}^{1..} = Q \mathbf{J}^{1..} Q^{-1}$$

$$X^K = X, \quad \mathbf{L}^K \quad R^{2x2}$$

$$X = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \rightarrow X^2 = X$$

$$\begin{bmatrix} a^2+bc & ab+bd \\ ac+de & d^2+bc \end{bmatrix} = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$$

$$\left\{ \begin{array}{l} a^2+bc = a \\ a+d = 1 \end{array} \right. , \quad \frac{a+d=1}{d}$$

$$\left\{ \begin{array}{l} a+d = 1 \\ d^2+bc = d \end{array} \right.$$

$$1-4bc \geq 0 \rightarrow bc \leq \frac{1}{4}$$

$\sqrt{a^2-4bc} \leq \sqrt{b^2}$

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(\rightarrow , 7) تابع

$$bc \leq \frac{1}{4} \quad (1 \text{ ب}, \text{م})$$

$$a, b = \frac{1 \pm \sqrt{1-4bc}}{2} \quad (2 \text{ ب}, \text{م})$$

$$a + b = 1 \quad (3 \text{ ب}, \text{م})$$

لما زادت قيمة a و b في التكامل، نتج عنه ذلك

$$\left\{ \begin{array}{l} x^k = x \\ \xrightarrow{\quad} - \xrightarrow{\quad} \end{array} \right. \text{ به الاتجاه}$$

$$\underbrace{A}_{\text{---}} \quad (4)$$

$$y = \begin{bmatrix} u_1 \\ u_2 \\ u_3 \end{bmatrix} \begin{bmatrix} 2 & -1 & b \\ -1 & a-1 & \\ b & -1 & \end{bmatrix} \begin{bmatrix} u_1 \\ u_2 \\ u_3 \end{bmatrix} \quad (\text{الف})$$

تحليل $y \leftarrow$ تحليل y

تحليل $y \leftarrow$ تحليل y إلى

27. J

$$2a-1 > 0 \rightarrow a > \frac{1}{2}$$

$$-ab^2 + 2b + (a-1) > 0 \rightarrow 2 < b < \frac{-2a+2}{a}$$

ROHAM

$A \leftarrow$ صفاتان

\rightarrow

$B = 2I + A$

بعض صفات B

ما زالت صفاتان اس پر صفات دیگر آن صفتیں ای

ایکی صفات دیگر نہیں ای

کافی دوچار کریں ایکی صفات دیگر I ای

B ایکی صفات دیگر ای

کافی دیگر ای

لیکن ایکی صفات دیگر ای