对一个单位矩阵了的作修改:将第i行的欠信和到案了行上,论、 dii = k.

Remark: 初等矩阵左乘矩阵A: 初等行变换 初等矩阵左乘矩阵A:初等列变换

Ex 21.
$$\overrightarrow{Ax} = \overrightarrow{b}$$
 $\begin{bmatrix} 2 & 2 & 3 \end{bmatrix} \begin{bmatrix} x_1 \\ 1 & 1 & 0 \end{bmatrix} \begin{bmatrix} x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 4 \\ 2 \\ 1 \end{bmatrix}$.

以每到对角之素不为的元素为消充目标,将增产矩阵[A/B]化为 阶辆 形:

Column 1: $\frac{1}{1}$ $\frac{1}{1}$: $\frac{1}{1}$ $\frac{1$

$$= \begin{bmatrix} 2 & 3 & 4 \\ 0 & -2 & -\frac{3}{2} & 0 \end{bmatrix} = : \tilde{A} = \begin{bmatrix} a_{ij} \end{bmatrix}_{3\chi 4}.$$

将 $a_{31} = -1$ 化为零: $R_3 - \frac{a_{31}}{a_{11}}R_1 = R_3 + \left(-\frac{a_{31}}{a_{11}}\right)R_1 = R_3 + kR_1$

使用
$$E_{31;k}$$
 with $k=-\frac{a_{31}}{a_{11}}=-\frac{-1}{2}=\frac{1}{2}$

$$E_{31,k}\tilde{A} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ -\frac{1}{2} & 0 & 1 \end{bmatrix} \begin{bmatrix} 2 & 2 & 3 & 4 \\ 0 & -2 & -\frac{3}{2} & 0 \\ -1 & 2 & 1 & 1 \end{bmatrix}$$

使用
$$E_{31}$$
; k with $k = -\frac{a_{31}}{a_{11}} = -\frac{1}{2} = \frac{1}{2}$.

 E_{31} , $k\tilde{A} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ -\frac{1}{2} & 0 & 1 \end{bmatrix} \begin{bmatrix} 2 & 2 & 3 & 4 \\ 0 & -2 & -\frac{3}{2} & 0 \\ -1 & 2 & 1 & 1 \end{bmatrix}$

$$= \begin{bmatrix} 2 & 2 & 3 & 4 \\ 0 & -2 & -\frac{3}{2} & 0 \\ 0 & 3 & 1+\frac{3}{2} = \frac{3}{2} & 1+\frac{4}{2} = 3 \end{bmatrix} = : \tilde{A} = \begin{bmatrix} a_{ij} \end{bmatrix}_{3\times4}$$

继续处理第2列对角元素7方的非零元

Column 2. 将 $\Omega_{32} = 3$ 化为零元素: $R_3 - \frac{\Omega_{32}}{\alpha_{22}} R_2 = R_3 + \left(-\frac{\Omega_{32}}{\alpha_{22}}\right) R_2$.

使用 E₃₂; k with
$$k = -\frac{a_{32}}{a_{22}} = -\frac{3}{-2} = \frac{3}{2}$$
.

 E_{32} ; k $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & \frac{3}{2} & 1 \end{bmatrix} \begin{bmatrix} 2 & 2 & 3 & 4 \\ 0 & -2 & -\frac{3}{2} & 0 \\ 0 & \frac{3}{2} & 1 \end{bmatrix} \begin{bmatrix} 2 & 2 & 3 & 4 \\ 0 & 3 & \frac{5}{2} & 3 \end{bmatrix}$

$$= \begin{bmatrix} 2 & 2 & 3 & 4 \\ 0 & -2 & -\frac{3}{2} & 0 \\ 0 & 0 & -\frac{7}{4} + \frac{5}{2} = \frac{1}{4} & 3 \end{bmatrix} = A = \begin{bmatrix} a_{ij} \end{bmatrix}_{3 \times 4}.$$

此时A化为阶幅移矩阵,且A对应的阶辐数=(A=[AB]对后的阶辐数=毒知数的个数、所以这个线性与轻但存在唯一解.

新门了选择使用回代活成解上进伐短方经组,或继续使用倍乘

矩阵和信加矩阵化为行简化两幅形.

対荷似: 主元
$$\alpha_{11}=2$$
 (以为 1. 3)使用 $E_{11;k}$ with $k=\frac{1}{2}=\frac{1}{\alpha_{11}}$ $E_{11;k}$ $A=\frac{1}{2}$ $A=\frac$

 $E_{22}; k\widetilde{A} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & -\frac{1}{2} & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 1 & \frac{3}{2} & 2 \\ 0 & -2 & -\frac{3}{2} & 0 \\ 0 & 0 & \frac{1}{4} & 3 \end{bmatrix}$

$$= \begin{bmatrix} 1 & 1 & \frac{3}{2} & 2 \\ 0 & 1 & \frac{3}{4} & 0 \end{bmatrix} = : \tilde{A}$$

将主元 $a_{33} = \frac{1}{4}$ 化为1. 3使用 E_{33} k with $k = \frac{1}{a_{33}} = 4$

$$E_{33;k} \widehat{A} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 4 \end{bmatrix} \begin{bmatrix} 1 & 1 & \frac{3}{2} & 2 \\ 0 & 1 & \frac{3}{4} & 0 \\ 0 & 0 & \frac{1}{4} & \frac{3}{3} \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 1 & \frac{3}{2} & 2 \\ 0 & 1 & \frac{3}{4} & 0 \\ 0 & 0 & 1 & \frac{12}{2} \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 1 & \frac{3}{2} & 2 \\ 0 & 0 & 1 & \frac{3}{2} & 2 \\ 0 & 1 & -\frac{3}{4} & 0 \\ 0 & 0 & 1 & \frac{3}{2} & 2 \\ 0 & 1 & -\frac{3}{4} & 0 \\ 0 & 0 & 1 & \frac{3}{2} & 2 \\ 0 & 1 & \frac{3}{4} & 0 \\ 0 & 0 & 1 & \frac{3}{2} & 2 \\ 0 & 1 & \frac{3}{4} & 0 \\ 0 & 0 & 1 & \frac{3}{2} & 2 \\ 0 & 1 & \frac{3}{4} & 0 \\ 0 & 0 & 1 & \frac{3}{2} & 2 \\ 0 & 1 & \frac{3}{4} & 0 \\ 0 & 0 & 1 & \frac{3}{2} & 2 \\ 0 & 1 & \frac{3}{4} & 0 \\ 0 & 0 & 1 & \frac{3}{2} & 2 \\ 0 & 1 & \frac{3}{4} & 0 \\ 0 & 0 & 1 & \frac{3}{2} & 2 \\ 0 & 1 & \frac{3}{4} & 0 \\ 0 & 0 & 1 & \frac{3}{2} & 2 \\ 0 & 1 & \frac{3}{4} & 0 \\ 0 & 0 & 1 & \frac{3}{2} & 2 \\ 0 & 1 & 0 & -9 \\ 0 & 0 & 1 & 0 & -9 \\ 0 & 0 & 1 & 0 & -9 \\ 0 & 0 & 1 & 2 \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 1 & \frac{3}{2} & 2 \\ 0 & 1 & 0 & -\frac{3}{4} \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 12 \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 0 & 2-\frac{3}{2} \cdot 12 = 16 \\ 0 & 0 & 1 & 2 \\ 0 & 0 &$$

勝
$$a_{12} = 1$$
 化为零, 9 使用 E_{12} ; k with $k = -\frac{a_{12}}{a_{22}} = -\frac{1}{1} = -1$.

 E_{12} ; $kA = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 1 & 0 & -16 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 & -9 \\ 0 & 0 & 1 \end{bmatrix}$

$$= \begin{bmatrix} 1 & 0 & 0 & -7 \\ 0 & 1 & 0 & -9 \\ 0 & 0 & 1 \end{bmatrix}$$
行简化階稿形

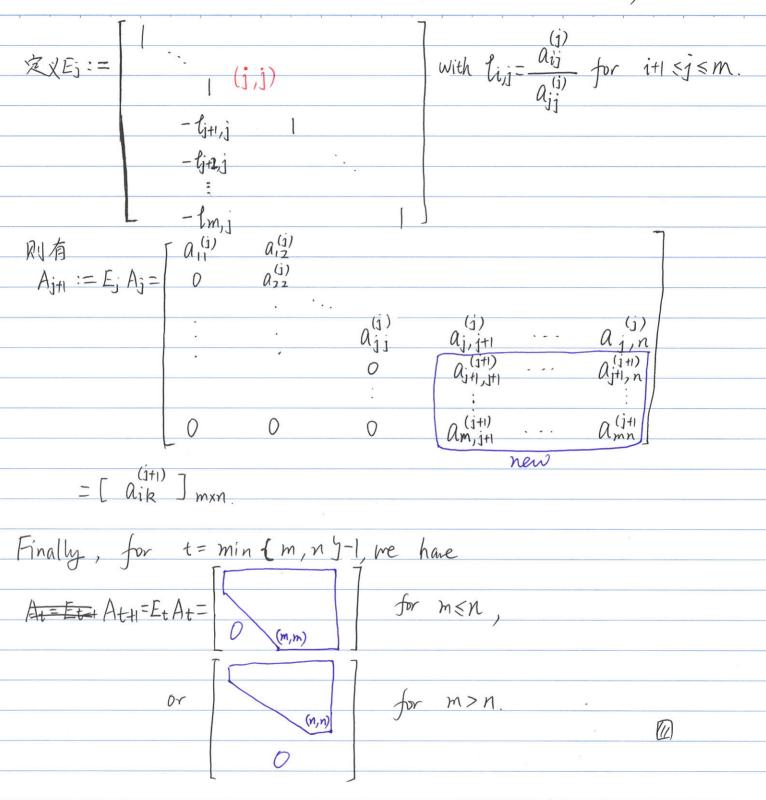
$$\Rightarrow \chi_1 = -7, \quad \chi_2 = -9, \quad \chi_3 = 12.$$

$$Verifi(ation: A\overline{z} = \begin{bmatrix} 2 & 2 & 3 \\ 1 & -1 & 0 \\ 1 & 2 & 1 \end{bmatrix} \begin{bmatrix} -7 & 2(-7) + 2(-9) + 3 \cdot 12 & = 4 \\ -9 & = & 1(-7) + (-1)(9) + 0 \cdot 12 & = 2 \\ 12 & (-1)(-1) + 2(-9) + 1 \cdot 12 & = 1 \end{bmatrix}$$

$$Remark: \overline{\Delta} - \overline{D} \text{ on } \overline{\text{keft}} \quad \overline{\mathcal{J}} \text{ the } \overline$$

$\begin{array}{c} \text{Or } \text{At} = \begin{bmatrix} a_{1}^{(+1)} & a_{12}^{(+1)} & a_{1,m-1}^{(+1)} & a_{1,m}^{(+1)} & a_{1,m}^{(+1)} \\ 0 & a_{2}^{(+1)} & a_{1,m-1}^{(+1)} & a_{1,m}^{(+1)} & a_{1,m}^{(+1)} \\ 0 & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} \\ 0 & 0 & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} \\ 0 & 0 & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} \\ 0 & 0 & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} \\ 0 & 0 & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} \\ 0 & 0 & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} \\ 0 & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} \\ 0 & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} \\ 0 & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} \\ 0 & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} \\ 0 & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} \\ 0 & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} \\ 0 & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} \\ 0 & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} \\ 0 & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} \\ 0 & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} & a_{2}^{(+1)} \\ 0 & a_{2}^{(+1$						22
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		[Q'(++1)	al2	(t+1)	$a_{l,n}^{(t+1)}$	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	or A1.=	0		V(, n-	- () / (C m > N
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	0, 1,74	V				Jor Mark.
$\begin{array}{c} 0 & a_{n,n}^{(+r)} \\ 0 & 0 \\ \vdots & \vdots \\ 0 & 0 \\ \end{array}$ $\begin{array}{c} T_0 \text{ Too simmarite, we have } A_{t} = A_{t} = E_{t-1} = E_{t-2} \cdots E_{t} E_{t-1} A_{t}. \\ \text{Step 1. } MSM : A_{t} = A = \begin{bmatrix} a_{1k}^{(0)} \\ a_{1k}^{(0)} \end{bmatrix}_{mm}. \\ \text{Step 2. } \{k \text{ Too simmarite, we have } A_{t} = A_{t} = \begin{bmatrix} a_{1k}^{(0)} \\ a_{1k}^{(0)} \end{bmatrix}_{mm}. \\ \text{Step 2. } \{k \text{ Too simmarite, we have } A_{t} = A_{t} = \begin{bmatrix} a_{1k}^{(0)} \\ a_{1l}^{(0)} \end{bmatrix}_{mm}. \\ \text{Step 2. } \{k \text{ Too simmarite, we have } A_{t} = E_{t} = A_{t} = \begin{bmatrix} a_{1k}^{(0)} \\ a_{1l}^{(0)} \end{bmatrix}_{mm}. \\ \text{With } \{k_{1l} = \frac{a_{1l}^{(0)}}{a_{1l}^{(0)}} \text{ for } 2 \leq i \leq M. \\ \text{Step 2. } \{k \text{ Too simmarite, we have } A_{t} = A_{t} = \begin{bmatrix} a_{1k}^{(0)} \end{bmatrix}_{mm}. \\ \text{Step 1. } \{k \text{ Too simmarite, we have } A_{t} = $			••	(t+1)		
To made summaratile, we have $A_{t+}=E_{t+1}=E_{t-2}\cdots E_s E_1A_1$. Step 1 初始化: $A_1=A=\begin{bmatrix}a_{1k}^{(0)}\\a_{1k}^{(0)}\end{bmatrix}_{mmn}$. Step 2 核次处理第 [为] 董策 t 列,其中 t = min [m,n]+, 3 构造成循环 处理第 [列: $-l_{21}$] with $l_{11}=\frac{a_{11}^{(0)}}{a_{11}^{(0)}}$ for $2 \le i \le m$. $\frac{-l_{m_1}}{2} = \frac{l_{m_2}^{(0)}}{l_{m_3}^{(0)}} = \frac{l_{m_3}^{(0)}}{l_{m_3}^{(0)}} = $				u_{n-1}, a_{n-1}	Un-1,71	
To massimmarite, we have $A + H = EE_{t-1} = Et-2 \cdots E_2 E_1 A_1$. Step 1 初始化 $A_1 = A = \begin{bmatrix} a_{1k}^{(0)} \\ a_{1k}^{(0)} \end{bmatrix}$ $M = A = \begin{bmatrix} a_{1k}^{(0)} \\ a_{1k}^{(0)} \end{bmatrix}$ $M = A = \begin{bmatrix} a_{1k}^{(0)} \\ a_{1k}^{(0)} \end{bmatrix}$ $M = A = \begin{bmatrix} a_{1k}^{(0)} \\ a_{1k}^{(0)} \end{bmatrix}$ with $f_{11} = \frac{a_{11}^{(0)}}{a_{11}^{(0)}}$ for $2 \le i \le M$. $\frac{1}{2} \times E_1 := \begin{bmatrix} a_{11}^{(0)} & a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{11}^{(0)} & a_{11}^{(0)} & \cdots & a_{2n}^{(0)} \\ \vdots & \vdots & \ddots & \vdots \\ a_{11}^{(0)} & a_{12}^{(0)} & \cdots & a_{2n}^{(0)} \end{bmatrix} = \begin{bmatrix} a_{1k}^{(0)} \end{bmatrix} M \times M$. $\frac{1}{2} \times E_2 := \begin{bmatrix} a_{11}^{(0)} & a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \end{bmatrix} = \begin{bmatrix} a_{12}^{(0)} & a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \end{bmatrix} = \begin{bmatrix} a_{12}^{(0)} & a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \end{bmatrix} = \begin{bmatrix} a_{12}^{(0)} & a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \end{bmatrix} = \begin{bmatrix} a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \end{bmatrix} = \begin{bmatrix} a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \end{bmatrix} = \begin{bmatrix} a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \end{bmatrix} = \begin{bmatrix} a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \end{bmatrix} = \begin{bmatrix} a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \end{bmatrix} = \begin{bmatrix} a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \end{bmatrix} = \begin{bmatrix} a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \end{bmatrix} = \begin{bmatrix} a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \end{bmatrix} = \begin{bmatrix} a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \end{bmatrix} = \begin{bmatrix} a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \end{bmatrix} = \begin{bmatrix} a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \end{bmatrix} = \begin{bmatrix} a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \\ a_{12}^{(0)} & \cdots & a_{1n}^{(0)} \end{bmatrix}$				0	an,n	
To massummarite, we have $A_{tH}=E_{t+1}=E_{t-2}\cdots E_2E_1A_1$. Step 1. 初始化: $A_1=A=\begin{bmatrix}a_{ik}^{(0)}\\a_{ik}^{(0)}\\a_{ik}^{(0)}\end{bmatrix}$ m/m. Step 2. 核次处理第 [3] 董策 t 列,其中 t = min [m,n]+, 3构设成循环. 处理第 [3]: $\begin{bmatrix}1\\-l_{21}\\\vdots\\a_{11}^{(0)}\end{bmatrix}$ with $l_{11}=\frac{a_{11}^{(0)}}{a_{11}^{(0)}}$ for $2\le i \le m$. $A_2:=E_1A_1=\begin{bmatrix}0\\0\\a_{12}^{(0)}\\\vdots\\0\\a_{m2}^{(0)}\\\vdots\\0\\a_{mm}\end{bmatrix}$ New $A_2:=E_1A_1=\begin{bmatrix}0\\0\\a_{11}^{(0)}\\a_{11}^{(0)}\\\vdots\\0\\0\\-l_{m2}^{(0)}\\\vdots\\0\\0\\-l_{m2}^{(0)}\end{bmatrix}$ with $l_{12}=\frac{a_{12}^{(0)}}{a_{12}^{(0)}}$ for $3\le i \le m$. $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B$				0	0	
To massummarite, we have $A_{tH}=E_{t+1}=E_{t-2}\cdots E_2E_1A_1$. Step 1. 初始化: $A_1=A=\begin{bmatrix}a_{ik}^{(0)}\\a_{ik}^{(0)}\\a_{ik}^{(0)}\end{bmatrix}$ m/m. Step 2. 核次处理第 [3] 董策 t 列,其中 t = min [m,n]+, 3构设成循环. 处理第 [3]: $\begin{bmatrix}1\\-l_{21}\\\vdots\\a_{11}^{(0)}\end{bmatrix}$ with $l_{11}=\frac{a_{11}^{(0)}}{a_{11}^{(0)}}$ for $2\le i \le m$. $A_2:=E_1A_1=\begin{bmatrix}0\\0\\a_{12}^{(0)}\\\vdots\\0\\a_{m2}^{(0)}\\\vdots\\0\\a_{mm}\end{bmatrix}$ New $A_2:=E_1A_1=\begin{bmatrix}0\\0\\a_{11}^{(0)}\\a_{11}^{(0)}\\\vdots\\0\\0\\-l_{m2}^{(0)}\\\vdots\\0\\0\\-l_{m2}^{(0)}\end{bmatrix}$ with $l_{12}=\frac{a_{12}^{(0)}}{a_{12}^{(0)}}$ for $3\le i \le m$. $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B_2$ $D_2=B_2$ $D_2=B_2$ $D_1=B_2$ $D_2=B_2$ $D_2=B$				•	;	
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Step 1. 初始化: $A_1 = A = \begin{bmatrix} a_{1k}^{(i)} \\ a_{1k}^{(i)} \end{bmatrix}_{mm}$ Step 2. 核次处理第 13] 董籍 t 到,其中 t = min $\begin{bmatrix} m, n \end{bmatrix}$ 为 我这就循环。 处理第 1 列: $\begin{bmatrix} 1 \\ -l_{21} \end{bmatrix}$ with $l_{11} = \frac{a_{11}^{(i)}}{a_{11}^{(i)}}$ for $2 \le i \le m$. $\begin{bmatrix} -l_{m_1} \\ -l_{m_1} \end{bmatrix}$ $\frac{1}{2} \times E_1 = \begin{bmatrix} a_{11}^{(i)} \\ a_{11}^{(i)} \end{bmatrix}$ $A_2 := E_1 A_1 = \begin{bmatrix} a_{12}^{(i)} \\ a_{12}^{(i)} \end{bmatrix}$ $\begin{bmatrix} a_{12}^{(i)} \\ a_{22}^{(i)} \end{bmatrix}$ $\begin{bmatrix} a_{12}^{(i)} \\ a_{12}^{(i)} \end{bmatrix}$ $\begin{bmatrix} a_{12}^{(i)} \\ a_{12}^{(i)} \end{bmatrix}$ $\begin{bmatrix} a_{11}^{(i)} \\ a_{12}^{(i)} \end{bmatrix}$ $\begin{bmatrix} a_{1$	To masu	mmarile	, we hav	e Att	-EtEt-1 Et	t-2 ··· E ₂ E ₁ A ₁ .
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注算分元 $A_{11}^{(i)}$ $A_{12}^{(i)}$ $A_{1n}^{(i)}$ $A_{2n}^{(i)}$		XX	= :		McM	Q ₁₁ - Jor Zerene.
注算分元 $A_{11}^{(i)}$ $A_{12}^{(i)}$ $A_{1n}^{(i)}$ $A_{2n}^{(i)}$			L-lmi			
$A_{2} := E_{1}A_{1} = \begin{bmatrix} 0 & a_{12}^{(2)} & \cdots & a_{2n}^{(2)} \\ \vdots & \vdots & \vdots \\ 0 & a_{m_{2}}^{(2)} & \cdots & a_{2n}^{(2)} \end{bmatrix} = \begin{bmatrix} a_{1k}^{(2)} \end{bmatrix}_{m\chi\eta}.$ \vdots $a_{m_{2}}^{(2)} & a_{mn}^{(2)} \end{bmatrix}$ $2\chi E_{2} := \begin{bmatrix} 0 & 1 & with & \ell_{12} = \frac{a_{12}^{(2)}}{a_{12}^{(2)}} & for & si \leq m.$ $0 & -\ell_{32} & 1 & with & \ell_{12} = \frac{a_{12}^{(2)}}{a_{12}^{(2)}} & for & si \leq m.$ $0 & -\ell_{m_{2}} & 1 & \cdots & \vdots \\ 0 & -\ell_{m_{2}} & 1 & \cdots & \vdots \\ 0 & -\ell_{m_{2}} & 1 & \cdots & \vdots \\ 0 & a_{11}^{(2)} & a_{12}^{(2)} & a_{13}^{(2)} & \cdots & a_{1n}^{(2)} \\ A_{3} := E_{-}A_{2} = \begin{bmatrix} 0 & a_{12}^{(2)} & a_{13}^{(2)} & \cdots & a_{2n}^{(3)} \\ 0 & 0 & a_{33}^{(3)} & \cdots & a_{3n}^{(3)} \\ \vdots & \vdots & \vdots & \vdots \end{bmatrix}$ $m\chi\eta$	3+1	資る知			(1)	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		·- Ε, Δ			(2)	- [n(2)]
加加 $A_{m_2}^{(2)}$ $A_{m_n}^{(2)}$ A_{m_n}	Γ)	2217)	1	:	W2n	- LUIR J MXN.
大程第2列:			•	Λ (2)	0 (2)	
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$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			TI	new	_	1
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	4					A ⁽²⁾
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		定义Ez	:= 0	-		with liz = diz for 38 5m.
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			0	-l ₃₂ 1		Q11
计算 $3 = E_2 A_2 = 0$ 0 0 0 0 0 0 0 0 0			<u>;</u>		··•	
$A_{3} = E_{2}A_{2} = \begin{bmatrix} 0 & a_{22}^{(2)} & a_{23}^{(2)} & a_{2n}^{(2)} & = [a_{1k}^{(3)}]_{m \times n} \\ 0 & 0 & a_{33}^{(3)} & a_{3n}^{(3)} \\ \vdots & \vdots & \vdots & \vdots \end{bmatrix}$			L 0	- lm2		
$A_{3} = E_{2}A_{2} = \begin{bmatrix} 0 & a_{22}^{(2)} & a_{23}^{(2)} & a_{2n}^{(2)} & = [a_{1k}^{(3)}]_{m \times n} \\ 0 & 0 & a_{33}^{(3)} & a_{3n}^{(3)} \\ \vdots & \vdots & \vdots & \vdots \end{bmatrix}$	计	算る知	$\int Q_{11}^{(2)}$	$a_{12}^{(2)}$	0(2)	$\alpha_{in}^{(2)}$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				Q22	-	$\begin{array}{c c} & & & \\ & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\$
	117	, , , , , , , , , , , , , , , , , , ,				- WI V 3/1
			:		:	
			0	n	0(3)	
War a			L V	V		

令j=1,2, , t-1, 麦部需处理的列指码,则有一般的,



To summarize, Et Et -: E, E, A, = A+1 =: R.