

2024 - 鯨, #3

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2024 年 10 月 18 日

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£°ĭ¼ ½³ blueHx = b£¬ H In½ blueHilbert ¾ £¬¼´

blueH = (h\_{ij})\_{n \times n} \quad h\_{ij} = \frac{1}{i + j - 1}, i, j = 1, 2, \cdots, n

„ µIj ¹ blue¶½ £¨ xµ I1£©, bµĭ „³ „J½ µ  
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- (1) • Doolittle LU • ° Cholesky • µ ° (red²»µ ÷ ° )£»
- (2) ½ n=6£¬• LU • ģ Cholesky • IJ• ¾½blueHx = b£»• ±¨, ġ ½ (blue ½ µ ) °  
• ¶ µĭ ĭ£
- (3) «£(2)´ ¬¾ n=10° 19£ 燐•¨ blue±¨, ½ (red ½ 1-•¶ µĭ ) °blue¼
- (4) ¶ LU • n=6° 10 µ LU • ķ £¬¼´blue,³ µ ½Œ L° U.
- (5) ±µ 燐•¨ ó ô½ £®

## 2 1/2

– 1/2 □

- bluen=6:

$\frac{3}{4} \llcorner \frac{1}{2} \text{ blue} x$	磺 (1,1,1,1,1,1)	$\P \frac{3}{4} (\text{blue} \ x_{num} - x\ _1)$
LU 1/2		
Cholesky 1/2	blue	

表 1: n=6

- bluen=10:

$\frac{3}{4} \llcorner \frac{1}{2} \text{ blue} x$	磺 (1,1,1,1,1,1,1,1,1,1)	$\frac{3}{4} \P (\text{blue} \ x_{num} - x\ _1)$
LU 1/2		
Cholesky 1/2		

表 2: n=10

- bluen=19:

$\frac{3}{4} \llcorner \frac{1}{2} \text{ blue} x$	blue 磺 (1,...,1)	$\frac{3}{4} \P (\text{blue} \ x_{num} - x\ _1)$
LU 1/2		
Cholesky 1/2		

表 3: n=19

– LU 1/2

- bluen=6:  $L = \begin{bmatrix} a & b & a & a & a & a \\ a & b & a & a & a & a \\ a & b & a & a & a & a \\ a & b & a & a & a & a \\ a & b & a & a & a & a \\ a & b & a & a & a & a \end{bmatrix} \quad U = \begin{bmatrix} a & b & a & a & a & a \\ a & b & a & a & a & a \\ a & b & a & a & a & a \\ a & b & a & a & a & a \\ a & b & a & a & a & a \\ a & b & a & a & a & a \end{bmatrix}$

- bluen=10:  $L = \begin{bmatrix} a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \end{bmatrix}$

$U = \begin{bmatrix} a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \\ a & b & a & a & a & a & a & a & a & a \end{bmatrix}$

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