

WORKSHEET ON OPERATIONS IN LU DECOMPOSITION

David F. Gleich · CS 314 · Purdue University

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EXAMPLE OF 3 × 3 MATRIX

$$\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$$

Step 1 Compute l_{21}, l_{31} .

Total flops

Step 2 Update A

$a'_{22} =$

$a'_{23} =$

$a'_{32} =$

$a'_{33} =$

Total flops

EXAMPLE OF N × N MATRIX

$$\begin{bmatrix} a_{11} & \dots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{n1} & \dots & a_{nn} \end{bmatrix}$$

Step 1 Compute $l_{21}, l_{31}, \dots, l_{n1}$.

Total flops

Step 2 Update A

Update region

Number of updates

Flops per update

Total flops

EXAMPLE OF 3 × 3 MATRIX

(After the first column)

$$\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ 0 & a'_{22} & a'_{23} \\ 0 & a'_{32} & a'_{33} \end{bmatrix}$$

Step 1 Compute l_{32} .

Total flops

Step 2 Update A

$$a''_{33} =$$

Total flops

EXAMPLE OF N × N MATRIX

(Before the ith column)

Step 1 Compute $l_{i+1,i}, l_{i+2,i}, \dots, l_{n,i}$.

Total flops

Step 2 Update A

Update region

Number of updates

Flops per update

Total flops

NUMBER OF FLOPS IN GENERAL

Flops at each step

Overall formula

Result