

### Exercises on factorization into $A = LU$

**Problem 4.1:** What matrix  $E$  puts  $A$  into triangular form  $EA = U$ ? Multiply by  $E^{-1} = L$  to factor  $A$  into  $LU$ .

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

**Problem 4.2:** (2.6 #13. *Introduction to Linear Algebra*: Strang) Compute  $L$  and  $U$  for the symmetric matrix

$$\mathbf{A} = \begin{bmatrix} a & a & a & a \\ a & b & b & b \\ a & b & c & c \\ a & b & c & d \end{bmatrix}.$$

Find four conditions on  $a, b, c, d$  to get  $A = LU$  with four pivots.