

# LU Factorization

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**Algorithm 1** LU Factorization

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1: procedure LU FACTORIZATION
2:   for  $k=1,\dots,n-1$  do
3:     for  $i=k+1:n$  do
4:        $a(i, k) = a(i, k)/a(k, k)$ 
5:       for  $j=k+1:n$  do
6:          $a(i, j) = a(i, j) - a(i, k) \cdot a(k, j)$ 
7:       end for
8:     end for
9:   end for
10:   $x(1) = b(1)$ 
11:  for  $i=2:n$  do
12:     $s=0$ 
13:    for  $j=1:i-1$  do
14:       $s = s + a(i, j) \cdot x(j)$ 
15:    end for
16:     $x(i) = b(i) - s$ 
17:  end for
18: end procedure
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