

CHAPTER 10

LU Decomposition

This chapter deals with a class of elimination methods called *LU* decomposition techniques. The primary appeal of *LU* decomposition is that the time-consuming elimination step can be formulated so that it involves only operations on the matrix of coefficients, $[A]$. Thus, it is well suited for those situations where many right-hand-side vectors $\{B\}$ must be evaluated for a single value of $[A]$. Although there are a variety of ways in which this is done, we will focus on showing how the Gauss elimination method can be implemented as an *LU* decomposition.

One motive for introducing *LU* decomposition is that it provides an efficient means to compute the matrix inverse. The inverse has a number of valuable applications in engineering practice. It also provides a means for evaluating system condition.

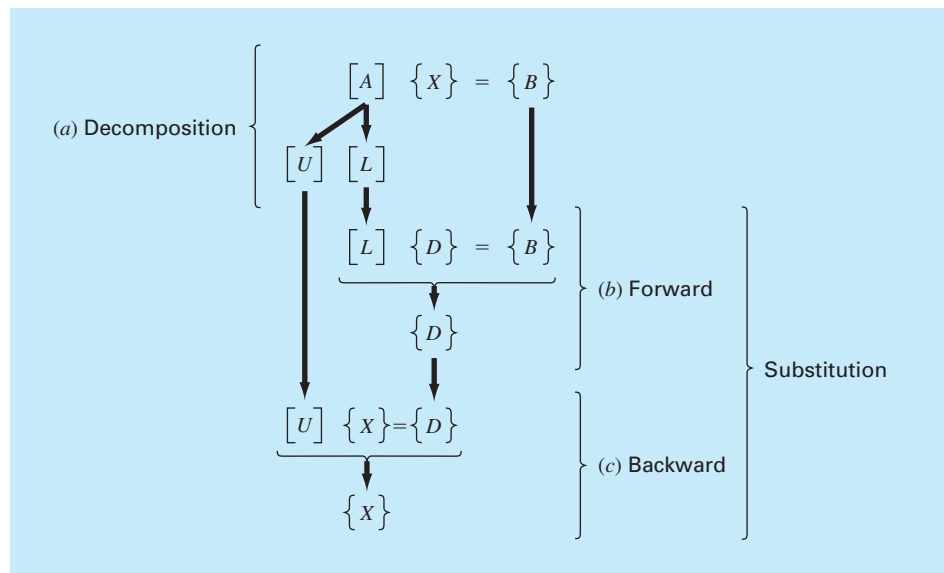


FIGURE 10.1
The steps in *LU* decomposition.