Ecuación tridiagonal $Ax = b$, donde

$$A = \begin{pmatrix} d_0 & d_0^{(s)} & 0 & \cdots & 0 & 0 & 0 \\ d_1^{(f)} & d_1 & d_1^{(s)} & 0 & \cdots & 0 & 0 \\ 0 & d_2^{(f)} & d_2 & d_2^{(s)} & 0 & \cdots & 0 \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ 0 & \cdots & 0 & 0 & d_{n-2}^{(f)} & d_{n-2} & d_{n-2}^{(s)} \\ 0 & \cdots & 0 & 0 & 0 & d_{n-1}^{(f)} & d_{n-1} \end{pmatrix}$$

and

$$b = \begin{pmatrix} b_0 \\ b_2 \\ \vdots \\ b_{n-2} \\ b_{n-1} \end{pmatrix}$$

Descomposición LU :

$$A = LU = \begin{pmatrix} 1 & 0 & 0 & \cdots & 0 & 0 & 0 \\ \delta_1^{(f)} & 1 & 0 & 0 & \cdots & 0 & 0 \\ 0 & \delta_2^{(f)} & 1 & 0 & 0 & \cdots & 0 \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ 0 & \cdots & 0 & 0 & \delta_{n-2}^{(f)} & 1 & 0 \\ 0 & \cdots & 0 & 0 & 0 & \delta_{n-1}^{(f)} & 1 \end{pmatrix} \begin{pmatrix} \delta_0 & d_0^{(s)} & 0 & \cdots & 0 & 0 & 0 \\ 0 & \delta_1 & d_1^{(s)} & 0 & \cdots & 0 & 0 \\ 0 & 0 & \delta_2 & d_2^{(s)} & 0 & \cdots & 0 \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ 0 & \cdots & 0 & 0 & 0 & \delta_{n-2} & d_{n-2}^{(s)} \\ 0 & \cdots & 0 & 0 & 0 & 0 & \delta_{n-1} \end{pmatrix}$$

donde:

$$\delta_0 = d_0 \quad ; \quad \delta_i^{(f)} = \frac{d_i^{(f)}}{\delta_{i-1}} \quad ; \quad \delta_i = d_i - \delta_i^{(f)} d_{i-1}^{(s)} \quad ; \quad i = 1, \ldots, n-1$$

La solución se expresa como:

$$Lz = b \;\Rightarrow\; z_0 = b_0 \quad ; \quad z_i = b_i - \delta_i^{(f)} z_{i-1} \quad ; \quad i = 1, \ldots, n-1$$

$$Ux = z \;\Rightarrow\; x_{n-1} = \tfrac{z_{n-1}}{\delta_{n-1}} \quad ; \quad x_i = (z_i - d_i^{(s)} x_{i+1})/\delta_i \quad ; \quad i = n-2, \ldots, 0$$