#2.)

$$A = \begin{bmatrix} b_1 & c_1 & & & \\ a_2 & b_2 & c_2 & & \\ & \ddots & \ddots & \ddots & \\ & & a_{N-1} & b_{N-1} & c_{N-1} \\ & & & a_N & b_N \end{bmatrix} = L \cdot U$$

$$L = \begin{bmatrix} 1 & & & & \\ \beta_2 & 1 & & & \\ & \ddots & \ddots & & \\ & & \beta_{N-1} & 1 & \\ & & & \beta_N & 1 \end{bmatrix}; U = \begin{bmatrix} \alpha_1 & c_1 & & & \\ & \alpha_2 & c_2 & & \\ & & \ddots & \ddots & \\ & & & \alpha_{N-1} & c_{N-1} \\ & & & & \alpha_N \end{bmatrix}$$

$$\alpha_1 = b_1$$
$$\beta_i = a_i / b_{i-1}; \quad \alpha_i = b_i - \beta_i c_{i-1} \qquad i = 2, \ldots, N$$

$$A \cdot x = L \cdot U \cdot x = b$$
$$L \cdot y = b \text{ solve for y}$$
$$U \cdot x = y \text{ solve for x}$$