2a. For $n=1$, $A=(\alpha_{11})$, $\check{L}=(1)$, $\check{U}=(\alpha_{11})$. This does not take any computations, so $|\Delta A| \le \gamma_1 |\check{L}||\check{U}|$.

b. Assume for $A_{00} \in \mathbb{R}^{n\times n}$ the algorithm computes $\check{L}_{00}$ and $\check{U}_{00}$ where $A_{00}+\Delta A_{00} = \check{L}_{00}\check{U}_{00}$ and $|\Delta A_{00}| \le \gamma_n |\check{L}_{00}||\check{U}_{00}|$

Now let $A \in \mathbb{R}^{n+1 \times n+1}$ with $A = \left(\begin{array}{c|c} A_{00} & a_{01} \\ \hline a_{10}^T & \alpha_{11} \end{array}\right)$

let $\left(\begin{array}{c|c} A_{00} & a_{01} \\ \hline a_{10}^T & \alpha_{11} \end{array}\right) + \left(\begin{array}{c|c} \Delta A_{00} & \delta a_{01} \\ \hline \delta a_{10}^T & \delta \alpha_{11} \end{array}\right) = \left(\begin{array}{c|c} \check{L}_{00} & 0 \\ \hline \check{l}_{10}^T & 1 \end{array}\right)\left(\begin{array}{c|c} \check{U}_{00} & \check{u}_{01} \\ \hline 0 & \check{v}_{11} \end{array}\right)$

be the result of the algorithm.

Note that $|\Delta A_{00}| \le \gamma_n |\check{L}_{00}||\check{U}_{00}|$ by the IH.

a_{01} is computed from the solution to $\check{L}_{00}\check{u}_{01} = a_{01}$ and the error from triangle solve is bounded: $|\delta a_{01}| \le \max(\gamma_2, \gamma_{n-1}) |\check{L}_{00}||\check{u}_{01}|$

Similarly, a_{10}^T is computed from the solution to $\check{l}_{10}^T \check{U}_{00} = a_{10}^T$ which is equivalent to solving the lower triangular system: $\check{U}_{00}^T \check{l}_{10} = a_{10}$ and the error is bounded: $|\delta a_{10}^T| \le \max(\gamma_2, \gamma_{n-1}) |\check{l}_{10}^T||\check{U}_{00}|$.

α_{11} is computed from $\alpha_{11} := \upsilon_{11} = \alpha_{11} - a_{10}^T a_{01}$

The error from the dot product $\check{\kappa} := a_{10}^T a_{01}$ is bounded: $|\delta \kappa| \le \gamma_n |\check{a}_{10}^T||\check{a}_{01}|$ so the error from the subtraction is bounded: $|\delta \alpha_{11}| \le \gamma_{n+1} |\check{a}_{10}^T \check{a}_{01} + \check{v}_{11}|$

So $|\Delta A| \le \left(\begin{array}{c|c} \gamma_n |\check{L}_{00}||\check{U}_{00}| & \max(\gamma_2, \gamma_{n-1}) |\check{L}_{00}||\check{u}_{01}| \\ \hline \max(\gamma_2, \gamma_{n-1}) |\check{l}_{10}^T||\check{U}_{00}| & \gamma_{n+1} |\check{a}_{10}^T \check{a}_{01} + \check{v}_{11}| \end{array}\right)$

$\le \gamma_{n+1} \left(\begin{array}{c|c} |\check{L}_{00}\check{U}_{00}| & |\check{L}_{00}\check{u}_{01}| \\ \hline |\check{l}_{10}^T \check{U}_{00}| & |\check{a}_{10}^T a_{01} + \check{v}_{11}| \end{array}\right) \le \gamma_{n+1} |\check{L}||\check{U}|$