

# LU Factorization Reference Note

Factor the matrix  $A$  to lower  $L$  and upper  $U$  triangle matrices

$$\begin{aligned}Ax &= b \\LUx &= b \\ \text{let } Ux &= y \\ \textcolor{red}{x} &= U^{-1}y \\ Ly &= b \\ y &= L^{-1}b \\ \textcolor{red}{x} &= U^{-1}y = U^{-1}L^{-1}b\end{aligned}\tag{1}$$