P.3.4.2

In outer product LU algorithm,

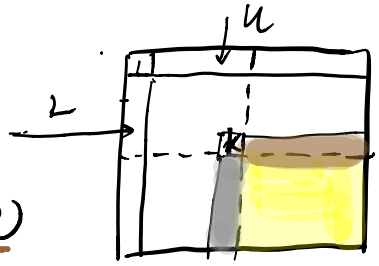
for $k = 1 : n-1$

$\rho = k+1 : n$

$A(\rho, k) = A(\rho, k) / A(k, k)$

$A(\rho, \rho) = A(\rho, \rho) - A(\rho, k) \cdot A(k, \rho)$

end



In Complete Pivoting, before updating $A(\rho, k)$ and $A(\rho, \rho)$ part, the algorithm will first search $|A(k:n, k:n)|$ and find the maximum a_{ij} and swap a_{ij} and a_{kk}. After the swap, the $A(k, k:n)$ will be the new computed $U(k, :)$. Thus $U(k,k) = a_{kk}$ is the largest element in the row.

In rook pivoting, it chooses an element of $|A(k:n),(k:n)|$ that is maximal in both its row and column. and does the swap again. Because we are switching the whole row, so it still will be the largest element in the new computed $U(k, :)$ row. Therefore, this is also true with rook pivoting.