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function x = GaussPivot(A,b)
% GaussPivot: Gauss elimination pivoting
%   x = GaussPivot(A,b): Gauss elimination with pivoting.
% input:
%   A = coefficient matrix
%   b = right hand side vector
% output:
%   x = solution vector

[m,n]=size(A);
if m~=n, error('Matrix A must be square'); end
nb=n+1;
Aug=[A b];
% forward elimination
for k = 1:n-1
    % partial pivoting
    [big,i]=max(abs(Aug(k:n,k)));
    ipr=i+k-1;
    if ipr~=k
        Aug([k,ipr],:)=Aug([ipr,k],:);
    end
    for i = k+1:n
        factor=Aug(i,k)/Aug(k,k);
        Aug(i,k:nb)=Aug(i,k:nb)-factor*Aug(k,k:nb);
    end
end
% back substitution
x=zeros(n,1);
x(n)=Aug(n,nb)/Aug(n,n);
for i = n-1:-1:1
    x(i)=(Aug(i,nb)-Aug(i,i+1:n)*x(i+1:n))/Aug(i,i);
end

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