Contents


```
clc
clear all
```

General

```
A = [1,1,3;5,1,4;4,5,2];

b = [1;5;3];

I = [1,0,0;0,1,0;0,0,1];
```

No pivoting

```
Un = A;
Ln = I;


for i = 1:size(A,2)-1 %Column
   for j = i+1:size(A,1) %Row

       Ln(j,i) = Un(j,i)/Un(i,i);
       Un(j,i:size(A,2)) = Un(j,i:size(A,2)) - Ln(j,i)*Un(i,i:size(A,2));

   end
end




% Solve Ax = b

y = Ln\b ;

x1 = Un\y ;


r1 = sum(abs(A*x1 - b));
```

Pivoting

```
U = A;
L = I;
P = I;

i = 0;

n = size(A,1);
m = size(A,2);

for k = 1:size(A,2)-1 %Column

    for a = 2:size(A,1)

        if U(a,k) > U(a-1,k)
            i = a;
        end

    end

    if i > 0

        u(k,k:m) = U(k,k:m);
        U(k,k:m) = U(i,k:m);
        U(i,k:m) = u(k,k:m);

        l(k,1:k-1) = L(k,1:k-1);
        L(k,1:k-1) = L(i,1:k-1);
        L(i,1:k-1) = L(k,1:k-1);

        p(k,:) = P(k,:);
        P(k,:) = P(i,:);
        P(i,:) = P(k,:);


    end

   for j = k+1:size(A,1) %Row

       L(j,k) = U(j,k)/U(k,k);
       U(j,k:size(A,2)) = U(j,k:size(A,2)) - L(j,k)*U(k,k:size(A,2));

   end
   i=0;
end



% Solve Ax = b

y = Ln\b ;

x2 = Un\y ;

r2 = sum(abs(A*x2 - b));
```

Report

```
% No Pivot

Un
Ln
x1
r1


% Pivot

U
L
P
x2
r2
```

```
Un =

    1.0000    1.0000    3.0000
         0   -4.0000  -11.0000
         0         0  -12.7500


Ln =

    1.0000         0         0
    5.0000    1.0000         0
    4.0000   -0.2500    1.0000


x1 =

    0.9804
   -0.2157
    0.0784


r1 =

   1.3323e-15
```

```
U =

    5.0000    1.0000    4.0000
         0    4.2000   -1.2000
         0         0    2.4286


L =

    1.0000         0         0
    0.8000    1.0000         0
    0.8000    0.1905    1.0000


P =

     0     1     0
     0     0     1
     0     0     1


x2 =

    0.9804
   -0.2157
    0.0784


r2 =

   1.3323e-15
```

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