```matlab
clear all; clc;

% system of linear equations

% 4x - y + z = 7
% 4x -8y + z = -21
% -2x + y + 5z = 15
% AX = B

% A matrix should be strictly diagonally dominant

A = [4 -1 1
     4 -8 1
     -2 1 5];

B = [7;-21;15];
N = length(B);

maxI = 100;
delta = 1e-6;

P0 = [1;2;2];
P = P0;
X = zeros(N,maxI);
for k=1:maxI % until it converges
    for j = 1:N % number of variables
        if j == 1
            X(j,k) = (B(j) - A(j,j+1:N)*P([j+1:N]))/A(j,j);
        elseif j == N
            X(j,k) = (B(j) - A(j,1:j-1)*X(1:j-1,k))/A(j,j);
        else
            X(j,k) = (B(j) - A(j,1:j-1)*X(1:j-1,k) - A(j,j+1:N)*P(j+1:N))/
A(j,j);
        end
    end
    err = norm(X(:,k)-P);
    relerr = err/(norm(X(:,k) + delta));
    P = X(:,k);
    if (err < delta) &&  (relerr < delta)
        break
    end
end

k = (0:1:k)';
x_k = [P0(1) X(1,1:k(end))]';
y_k = [P0(2) X(2,1:k(end))]';
z_k = [P0(3) X(3,1:k(end))]';

Data = [k,x_k,y_k,z_k]


Data =
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```
     0     1.0000     2.0000     2.0000
1.0000     1.7500     3.7500     2.9500
2.0000     1.9500     3.9688     2.9863
3.0000     1.9956     3.9961     2.9990
4.0000     1.9993     3.9995     2.9998
5.0000     1.9999     3.9999     3.0000
6.0000     2.0000     4.0000     3.0000
7.0000     2.0000     4.0000     3.0000
8.0000     2.0000     4.0000     3.0000
9.0000     2.0000     4.0000     3.0000
```

Published with MATLAB® R2021b