```
clear all;
close all;

%rng('default')
B = rand(4,4);
A = B'*B; %To make A symmetrically positive definite
b = rand(4,1);
tol = 10^(-8);   %relative residual
kmax = 10^5;


u = Gauss(A,b,tol,kmax)

%Eigen values of A
lambda = eig(A)

fprintf("Since the eigen vlaues of A are all positive hence A is symmetric positive definite,\n hence given any vector x , x'Ax > 0.\n")

function x = Gauss(A,b,tol,kmax)

n = size(A,1);

% Intial guesss
xk = zeros(n,1);

%compute an intial residual
rk = b - A*xk;

D = diag(diag(A));
L = tril(A) -D;
M = D + L;

zk = M\rk; %intial approx

for k = 1:kmax

    xkp1 = xk +zk;
    rkp1 = b - A*xkp1;
    zkp1 = M\rkp1;

    if norm(zkp1) < tol
        break;
    end
    xk = xkp1;
    zk = zkp1;

end
fprintf('The number of iterations k = %3d\n', k);
x = xkp1;

end
```

```
The number of iterations k = 298

u =

   -0.4800
    1.0048
   -6.5607
   11.4476


lambda =

    0.0197
    0.0700
    0.3937
    4.1868

Since the eigen vlaues of A are all positive hence A is symmetric positive definite,
 hence given any vector x , x'Ax > 0.
```

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