```
clear all;
clc

% Finding the inverse of matrix A using LU Decomposition

% A= [9 -4 1 0 0 0 0 0 0 0 0 0 0 0
%    -4 6 -4 1 0 0 0 0 0 0 0 0 0 0
%    1 -4 6 -4 1 0 0 0 0 0 0 0 0 0
%    0 1 -4 6 -4 1 0 0 0 0 0 0 0 0
%    0 0 1 -4 6 -4 1 0 0 0 0 0 0 0
%    0 0 0 1 -4 6 -4 1 0 0 0 0 0 0
%    0 0 0 0 1 -4 6 -4 1 0 0 0 0 0
%    0 0 0 0 0 1 -4 6 -4 1 0 0 0 0
%    0 0 0 0 0 0 1 -4 6 -4 1 0 0 0
%    0 0 0 0 0 0 0 1 -4 6 -4 1 0 0
%    0 0 0 0 0 0 0 0 1 -4 6 -4 1 0
%    0 0 0 0 0 0 0 0 0 1 -4 6 -4 1
%    0 0 0 0 0 0 0 0 0 0 1 -4 5 -2
%    0 0 0 0 0 0 0 0 0 0 0 1 -2 1 ]

A= load("A.txt");
rows= size(A,1);

for i=1:rows
    A(i,i)= A(i,i) +9;
end

[L,U, counter1] = LU_calc(A); % Calling LU_calc fn for finding L and U
 matrix for A
X= zeros (rows, rows);
counter2=0;
for i=1: rows
    B= zeros(rows,1);
    B(i)=1;
    [X(:,i),count]= inverse_calc(L,U,B); % Calling inverse_calc fn for
 getting vector x(i)
    counter2= counter2+count;
end
disp("Inverse of matrix A is: ");
disp(X);
fprintf('Number of operation = %i\n', counter1+counter2);
```

```
Inverse of matrix A is:
  Columns 1 through 7

    0.0591    0.0158   -0.0000   -0.0011   -0.0003    0.0000    0.0000
    0.0158    0.0760    0.0192   -0.0003   -0.0015   -0.0004    0.0000
   -0.0000    0.0192    0.0770    0.0192   -0.0004   -0.0015   -0.0004
   -0.0011   -0.0003    0.0192    0.0770    0.0192   -0.0004   -0.0015
   -0.0003   -0.0015   -0.0004    0.0192    0.0770    0.0192   -0.0004
    0.0000   -0.0004   -0.0015   -0.0004    0.0192    0.0770    0.0192
```

```
    0.0000    0.0000   -0.0004   -0.0015   -0.0004    0.0192    0.0770
    0.0000    0.0000    0.0000   -0.0004   -0.0015   -0.0004    0.0192
   -0.0000    0.0000    0.0000    0.0000   -0.0004   -0.0015   -0.0004
   -0.0000   -0.0000    0.0000    0.0000    0.0000   -0.0004   -0.0015
   -0.0000   -0.0000   -0.0000    0.0000    0.0000    0.0000   -0.0004
    0.0000   -0.0000   -0.0000   -0.0000    0.0000    0.0000    0.0000
    0.0000    0.0000   -0.0000   -0.0000   -0.0000    0.0000    0.0000
    0.0000    0.0000    0.0000   -0.0000   -0.0000   -0.0000    0.0000
   -0.0000    0.0000    0.0000    0.0000   -0.0000   -0.0000   -0.0000

  Columns 8 through 14

    0.0000   -0.0000   -0.0000   -0.0000    0.0000    0.0000    0.0000
    0.0000    0.0000   -0.0000   -0.0000   -0.0000    0.0000    0.0000
    0.0000    0.0000    0.0000   -0.0000   -0.0000   -0.0000    0.0000
   -0.0004    0.0000    0.0000    0.0000   -0.0000   -0.0000   -0.0000
   -0.0015   -0.0004    0.0000    0.0000    0.0000   -0.0000   -0.0000
   -0.0004   -0.0015   -0.0004    0.0000    0.0000    0.0000   -0.0000
    0.0192   -0.0004   -0.0015   -0.0004    0.0000    0.0000    0.0000
    0.0770    0.0192   -0.0004   -0.0015   -0.0004    0.0000    0.0000
    0.0192    0.0770    0.0192   -0.0004   -0.0015   -0.0004    0.0000
   -0.0004    0.0192    0.0770    0.0192   -0.0004   -0.0015   -0.0004
   -0.0015   -0.0004    0.0192    0.0770    0.0192   -0.0004   -0.0015
   -0.0004   -0.0015   -0.0004    0.0192    0.0770    0.0193   -0.0003
    0.0000   -0.0004   -0.0015   -0.0004    0.0193    0.0775    0.0202
    0.0000    0.0000   -0.0004   -0.0015   -0.0003    0.0202    0.0792
    0.0000    0.0000    0.0001   -0.0003   -0.0020   -0.0037    0.0138

  Column 15

   -0.0000
    0.0000
    0.0000
    0.0000
   -0.0000
   -0.0000
   -0.0000
    0.0000
    0.0000
    0.0001
   -0.0003
   -0.0020
   -0.0037
    0.0138
    0.1031

Number of operation = 8870
```

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