Gauss Jordan Algorithm Class

1st. ***General Steps of Gauss Jordan from the Book:***

Read this steps before copy the program from the note.

2nd. ***% Gauss Jordan Used for Numarical Method***

```
% Gauss Jordan Used for Numarical Method
% note make sure the all line in his position because the sequances of
% order in the opraition
clc
clear
% the following step is to enter the size of the equation or number of
% unkown
fprintf(1,'input the number of equation - an integer .\n');
n= input(' ');
m=n+n;
% The next steps is for clean the matrix
a=zeros(n,n);
% you have to enter the value as matrix as [1,1,,...(1)] and make sure that
% the last number is present the right side of the equation
for i=1:n
    a(i,1:n) = input('Enter the matrix row by row \n');
end;
a=[a eye(n)];
% the first three step is arranging only
% step 1
for i=1:n,
% step 2
```

```
    flag=0;
    for p=i:n,
        if a(p,i) ~=0,
            flag=1;
            break;
        end;
    end;
    if flag==0, error ('No unique solution '); end;
    % step 3 to check
   if p~=i,
       for k=1:m,
           tmp=a(i,k);
           a(i,k)=a(p,k);
           a(p,k)=tmp;
       end;
   end;
   % Step 4 from here the Gauss Jordan method start
   aii=a(i,i);
   for k=1:m
       a(i,k)=a(i,k)/aii;
   end
   for j=1:n
       if j~=i
           % step 5
           mji=a(j,i);
           % step 6
           for k=1:m
               a(j,k)=a(j,k)-mji*a(i,k);
           end;
       end;
   end;
end;
% setp 7
fprintf('The new matrix is \n \n')
for i=1:n
    fprintf (1, ' %f\t',a(i,1:m))
    fprintf (1,'\n \n')
end
fprintf('The inverse Matrix is \n \n ')
for i=1:n
    fprintf(1,'%f\t',a(i,n+1:m))
    fprintf (1,'\n \n')
end
```

Result will be as the Following Matrix

```
input the number of equation - an integer .
 2
Enter the matrix row by row
[ 2 4]
```

Enter the matrix row by row
[2 6]

The new matrix is

1.000000	0.000000	1.500000	-1.000000
0.000000	1.000000	-0.500000	0.500000

The inverse Matrix is

1.500000	-1.000000
-0.500000	0.500000

We can see the same result if we inverse the matrix as the following way and get the same result

```
z=[ 2 4;2 6]

z =

     2     4
     2     6

>> z^-1

ans =

    1.5000   -1.0000
   -0.5000    0.5000
```