Matlab Program for Gauss method

Write a matlab program, which can be used to find the solution of the following system by using Gauss method with back ward substitutions

$$\begin{aligned} 4x_1 - 9x_2 + 2x_3 &= 5 \\ 2x_1 - 4x_2 + 6x_3 &= 3 \\ x_1 - x_2 + 3x_3 &= 4 \end{aligned}$$

```
A=[4,-9,2;2,-4,6;1,-1,3];
b=[5;3;4];
n=3;
for k=1:n-1;
    for i=k+1:n

        m(i,k)=A(i,k)/A(k,k);

        for j=k:n
            A(i,j)=A(i,j)-m(i,k)*A(k,j);
        End

        b(i)=b(i)-m(i,k)*b(k);
    end

end
x(n)=b(n)/A(n,n);

for i=n-1:-1:1
    s=0;
    for j=i+1:n
        s=s+A(i,j)*x(j);
    end
    x(i)=(b(i)-s)/A(i,i);
end

    disp(x);


        6.9500    2.5000   -0.1500
```

Matlab Program

Write a matlab program, which can be used to find the approximate solution of the following system by using

1- Jacobi Method

2-Gauss-Sidel

$$\begin{aligned} 9x_1 - 4x_2 + 2x_3 &= 5 \\ 2x_1 - 4x_2 + x_3 &= 3 \\ x_1 - x_2 + 3x_3 &= 4 \end{aligned}$$

Where $X^0 = (0,0,0)$

Jacobi

```
A=[9,-4,2;2,-4,1;1,-1,3];
b=[5;3;4];
n=3;
x0=[0;0;0];
r=norm(b-A*x0);
k=0;
while r> 0.01
    k=k+1;

    for i=1:n
        s=0;
        for j=1:n

      if i≠j

            s=s+A(i,j)*x0(j);
        end
        end

      x(i)=(b(i)-s)/A(i,i);
    end
    x0=x' ;
    r=norm(b-A*x0);
end
disp(x);
```

```
disp(k);
```

```
0.1205   -0.4005    1.1605      k=19
```

```
    Gass-Sidel

    A=[9,-4,2;2,-4,1;1,-1,3];
b=[5;3;4];
n=3;
x0=[0;0;0]; x=x0';
r=norm(b-A*x0);
k=0;
while r> 0.01
    k=k+1;
    for i=1:n
        s=0;
        for j=1:n

      if i≠j
     if i<j
            s=s+A(i,j)*x0(j);
     else
            s=s+A(i,j)*x(j);
        end
    end
end
       x(i)=(b(i)-s)/A(i,i);
    end
    x0=x' ;
    r=norm(b-A*x0);
end
disp(x);
disp(k);
```

```
 0.1188   -0.4004    1.1603     k=5
```