Gauss Seidel Method

%Gauss Seidel

clear all

clc

n=3;

A=[4.63 -1.21 3.22;-3.07 5.48 2.11;1.26 3.11 4.57];

b=[2.22 -3.17 5.11];

%x0=[0 0 0 0];

tol=0.0001;

N=100;

x0=[0 0 0];

x=[0 0 0];

k=1;

i=1;

count=0;

for k=1:N %no of iterations

for i=1:n %for n variable equations

p=0;

q=0;

for j=1:i-1

p=p+(A(i,j)\*x(j));

end

for j=i+1:n

q=q+(A(i,j)\*x0(j));

end

x(i)=(b(i)-p-q)/A(i,i);

end

% if((x-x0)<tol || (x0-x)<tol)

% disp(x);

if(max(abs(x-x0))<=tol)

disp(x);

count=count+1;

break;

end

x0=x;

end

if(count==0)

disp("Increase number of Iterations");

end

%Answers

%Q3 i 1.0001 1.0000 1.0000 1.0000

%Q3 ii -0.7534 0.0411 -0.2808 0.6918

%Q4 -8.9886 -9.4837 10.0503

SOR Method

%SOR

clear all

clc

n=4;

A=[4 1 -1 1;1 4 -1 -1;-1 -1 5 1;1 -1 1 3];

b=[-2 -1 0 1];

%x0=[0 0 0 0];

tol=0.0001;

N=50;

x0=[0 0 0 0];

x=[0 0 0 0];

k=1;

i=1;

w=0.9

for k=1:N %no of iterations

for i=1:n %for n variable equations

p=0;

q=0;

for j=1:i-1

p=p+(A(i,j)\*x(j));

end

for j=i+1:n

q=q+(A(i,j)\*x0(j));

end

x(i)=((1-w)\*x0(i)+w\*(b(i)-p-q)\*1/A(i,i));

end

% if((x-x0)<tol || (x0-x)<tol)

% disp(x);

if(max(abs(x-x0))<=tol)

disp(x);

break;

end

x0=x;

end

%Answer

%Q3 i 1.0001 1.0000 1.0000 1.0000

%Q3 ii -0.7534 0.0411 -0.2808 0.6918