PROGRAM: BSC MATHEMATICS

INDEX NUMBER: UE20005217

COURSE CODE: MATH 216

%------------------------------

%question 2c.

%------------------------------

clc,

clear

close all

B=[-1 10 -2;10 -1 0; 0 -2 10];

c=[9;7;6];

Bc=[B c];

%First we need to rearrange to obtain diagonally dominant matrix

As=[Bc(2,:); Bc(1,:); Bc(3,:)];

n=3; % where n is the number of columns or rows since the matrix is a square matrice.

x=zeros(n,1);

ress=zeros(n,1);

%% G-S Iterations

for iter=1:5

for k=1:n

xold=x(k);

num=As(k,end)-As(k,1:k-1)\*x(1:k-1)-As(k,k+1:n)\*x(k+1:n);

x(k)=num/As(k,k);

ress(k)=abs(x(k)-xold);

end

disp(['iter',num2str(iter),' x= ',num2str(x'),' ress=',num2str(max(ress))]);

end

COMMAND WINDOW

iter1 x= 0.7 0.97 0.794 ress=0.97

iter2 x= 0.797 1.1385 0.8277 ress=0.1685

iter3 x= 0.81385 1.1469 0.82938 ress=0.01685

iter4 x= 0.81469 1.1473 0.82947 ress=0.0008425

iter5 x= 0.81473 1.1474 0.82947 ress=4.2125e-05