

Experiment no 7

AIM - Solution of linear system of equations using Gauss-Seidel method

Apparatus - Scilab Software

Program Code -

```
clc;
clear;

disp("Ankit Krish")
disp("13551")
disp("B.Sc (Hons) Electronics")
disp("AIM : Solution of linear system of equations using Gauss Jacobi
method ")

n = input("Enter the number of rows : ")
A = zeros(n,n+1)

for i = 1:n
    for j = 1:n+1
        A(i,j) = input("Enter the value of element A(" +string(i) +
", " + string(j) + ") : ");
    end
end

disp(A)

x = zeros(n,1);
X = zeros(n,1);
error = input("Enter the value of tolerance : ");

isDiagonalDominant = %F;
temp = 0;

for i = 1:n
    for j = 1:n
        if i~=j
            temp = temp + A(i,j);
            disp(temp);
        end
    end
    if (A(i,i) > temp)
        isDiagonalDominant = isDiagonalDominant | %T;
        disp(isDiagonalDominant);
    end
    temp = 0;
end
```

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if (isDiagonalDominant == %F) then
    disp("Diagonal Dominance condition not satisfied.");
end

count = 0;
while (isDiagonalDominant)
    count = count + 1;
    for i = 1:n
        sum = 0;
        for j = 1:n
            if i ~= j
                sum = sum + A(i,j) * x(j,1);
            end
        end
        X(i,1) = (A(i,n+1) - sum) / A(i,i);
    end;
    diff1 = zeros(n,1)
    for i = 1:n
        diff1 =abs(X(i,1) - x(i,1))
        disp("The difference between current value and previous
value is ",diff1)

    end;
    if max(diff1) == %inf || (diff2 == %inf) | (diff3 == %inf)
        disp("The equation have no solution");
        break;
    end;

    if min(abs(X(i,1) - x(i,1))) < error /* && (abs(X(2,1) - x(2,1))
< error) && (abs(X(3,1) - x(3,1)) < error)*/
        disp("The solution of the equation is",X)
        break;
    else
        x = X;
    end;
    disp("Total no. of iteration is : ",count);
end;

```

```

"Ankit Krish"
"13551"
"B.Sc (Hons) Electronics"
"AIM : Solution of linear system of equations using Gauss Jacobi method "
Enter the number of rows : 3

Enter the value of element A(1,1) : 1

Enter the value of element A(1,2) : 2

Enter the value of element A(1,3) : 3

Enter the value of element A(1,4) : 4

Enter the value of element A(2,1) : 5

Enter the value of element A(2,2) : 6

Enter the value of element A(2,3) : 7

Enter the value of element A(2,4) : 8

Enter the value of element A(3,1) : 9

Enter the value of element A(3,2) : 2

Enter the value of element A(3,3) : 4

Enter the value of element A(3,4) : 6

    1.   2.   3.   4.
    5.   6.   7.   8.
    9.   2.   4.   6.
Enter the value of tolerance : 0.005

    2.
    5.
    5.
    12.
    9.
    11.
    11.
"Diagonal Dominance condition not satisfied."

```