

Gauss – Seidal Method

```
clear all;
% Gauss-Seidel Method
A = [1 1 1;1 2 2;2 3 5];
b = [-8; 4; 13];
dim = size(A,2); %getting rows

res = rand(dim,1);
res_follow = res;
disp('initial random result vector');
res
k = 0;
d = 6; %stability digit
convergence = 0;
for k=1:100000
    for i=1: dim
        tot=0;
        for j=1: dim
            if(i ~= j)
                tot = tot + A(i,j) * res_follow(j);
            end
        end
        res_follow(i) = (1/A(i,i))*(b(i) - tot);
    end
    for m=1:dim
        if ((abs(res_follow(m) - res(m))) <= (10^(-d) * abs(res_follow(m))))
            convergence = 1;
        else
            convergence = 0;
            break;
        end
    end
    end
    if(convergence ~= 0)
        break;
    end
    res = res_follow;
end
disp('Iteration count');
k
disp('Result vector');
res
disp('should be like');
inv(A)*b
```

Initial random result vector

res =

0.7948
0.9568
0.5226

Iteration count

k =

32

Result vector

res =

-20.0000
3.5000
8.5000

Should be like

ans =

-20.0000
3.5000
8.5000

Reference for convergence:

<http://www.math.gatech.edu/academic/courses/core/math2601/pdf/jac.pdf>