

Gauss-Seidel, Example 2

Here is a different way to code the example, using loops instead of matrix multiplication (may be better for sparse matrices?)

```
function x=GaussSeidel2(A,b,x,NumIters)
% Runs the Gauss-Seidel method for solving Ax=b, starting with x and
% running a maximum of NumIters iterations.
%
% In this case, we run the method as a loop instead of in matrix form. We
% will also only output the last iteration.

n=length(x);

for m=1:NumIters
    for i=1:n
        temp1=0;
        for j=1:i-1
            temp1=temp1+A(i,j)*x(j);
        end
        temp2=0;
        for j=i+1:n
            temp2=temp2+A(i,j)*x(j);
        end
        x(i)=(-1/A(i,i))*(temp1+temp2-b(i));
    end
end
```

Here is the result of the same example:

```
>> A=[3,1,-1;2,4,1;-1,2,5]; b=[4;1;1];
>> x0=[0;0;0];
>> y=GaussSeidel2(A,b,x0,7)
y =
    1.9949
   -0.9960
    0.9974
```