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fprintf('No2(d).\n\n');
% Test yoyr code from part (c)
clear all;
close all;

%dimensions
n1 = 100; n2 = 1000;

%solutions from the algorithm and using direct solver
[A1,xa1,f1] = algorithm(n1);
x1=A1\f1;

[A2,xa2,f2] = algorithm(n2);
x2=A2\f2;

%plotting
figure(1)
plot(x1,'--o')
hold on
plot(xa1,'*')
legend('exact soln','algorithm soln');
xlabel('n');ylabel('x');
title('Agraph of x against n for n=100')

figure(2)
%plotting
plot(x2,'--o')
hold on
plot(xa2,'*')
legend('exact soln','algorithm soln');
xlabel('n');ylabel('x');
title('Agraph of x against n for n=1000')

fprintf('As seen from the graphs above their is no difference between the exact solution from the solver \n and from the algorithm, hence it gives the

function [A,x,f] = algorithm(n)
    %coefficients
    i = [1:n]'; a = i;
    j = [1:n-1]'; b = -(j+1)/3; c = b;
    k = [1:n-2]'; d = -(k+2)/6; e = d;

    %RHS
    l = [3:n-2]'; fi(1-2) = 0;
    f = [1/2 1/6 fi 1/6 1/2]';

    [x] = pentadiagonal(a,b,c,d,e,f);

    %Coefficient matrix
    A = diag(d,-2) + diag(b,-1) + diag(a) + diag(c,1) + diag(e,2);
end

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No2(d).

As seen from the graphs above their is no difference between the exact solution from the solver and from the algorithm, hence it gives the correct answer.

