
```

function hw4_q2

tot_its = [5, 40, 80, 160, 320, 640, 1280];
num_experiments = length(tot_its);

%Generate Linear System
n = 200;
a = 200;
[A,b] = generate_SPD_mat_and_rhs_vec(n,a);

err_jacobi = zeros(num_experiments,1);
err_cg = zeros(num_experiments,1);
exp_num = 1;

for tot_it =tot_its

    %Compute Solutions

    %Jacobi
    x_jacobi = my_jacobi(A,b,tot_it);

    %CG
    x_cg = my_cg(A,b, tot_it);

    %"True" Solution
    x_t = A\b;

    %Errors
    err_jacobi(exp_num) = norm(x_t - x_jacobi)/norm(x_t);
    err_cg(exp_num) = norm(x_t - x_cg)/norm(x_t);

    exp_num = exp_num + 1;
end

format long;

T = table(tot_its',err_jacobi,err_cg);
T.Properties.VariableNames =
    {'Num_Iterations' 'Relative_Error_Jacobi' 'Relative_Error_CG'};
disp(T);

```

| <i>Num_Iterations</i> | <i>Relative_Error_Jacobi</i> | <i>Relative_Error_CG</i> |
|-----------------------|------------------------------|--------------------------|
| 5 | 0.857533939670785 | 0.768930515504903 |
| 40 | 0.591269930202062 | 0.0814919834393898 |
| 80 | 0.452837342488601 | 0.00547663590055746 |
| 160 | 0.298618765751155 | 1.69450576461347e-15 |
| 320 | 0.152570548932885 | 1.69450576461347e-15 |
| 640 | 0.0495076488680893 | 1.69450576461347e-15 |
| 1280 | 0.00703567385419505 | 1.69450576461347e-15 |