Computing Assignment 1: Solving for N*

w02w_GEerr.m -- Testing diffrent values of Nex

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```matlab
clear;

NexVect = 200: 200: 10000;
ticTocArr = [];
eResArr = [];

for index=1:length(NexVect)
    disp("Exp with Nex = " + NexVect(index));

    tic
    %  N = matrix size;  Nex = # of experiments
    N = 1*128;
    Nex = 1*NexVect(index);

    %  solution of all ones
    x0 = ones(N,1);

    %  data vector of errors
    res_err = zeros(Nex,1);
    sol_err = zeros(Nex,1);

    for kk = 1:Nex
        %  make random matrix & b-vector
        A = eye(N,N) + randn(N,N)/sqrt(N);
        b = A*x0;

        %  GE via backslash
        x1 = A \ b;

        %  rms residual error
        res_err(kk) = rms(A*x1-b);

        % rms solution error
        sol_err(kk) = rms(x1-x0);
    end

    disp("");
    ticTocArr(index) = toc;
    eResArr(index) = mean(log10(res_err));

end

figure;
hold on;
xlabel("Number of Experiments")
ylabel("Time Of Experiment")
plot(NexVect, ticTocArr, 'r-o');
```
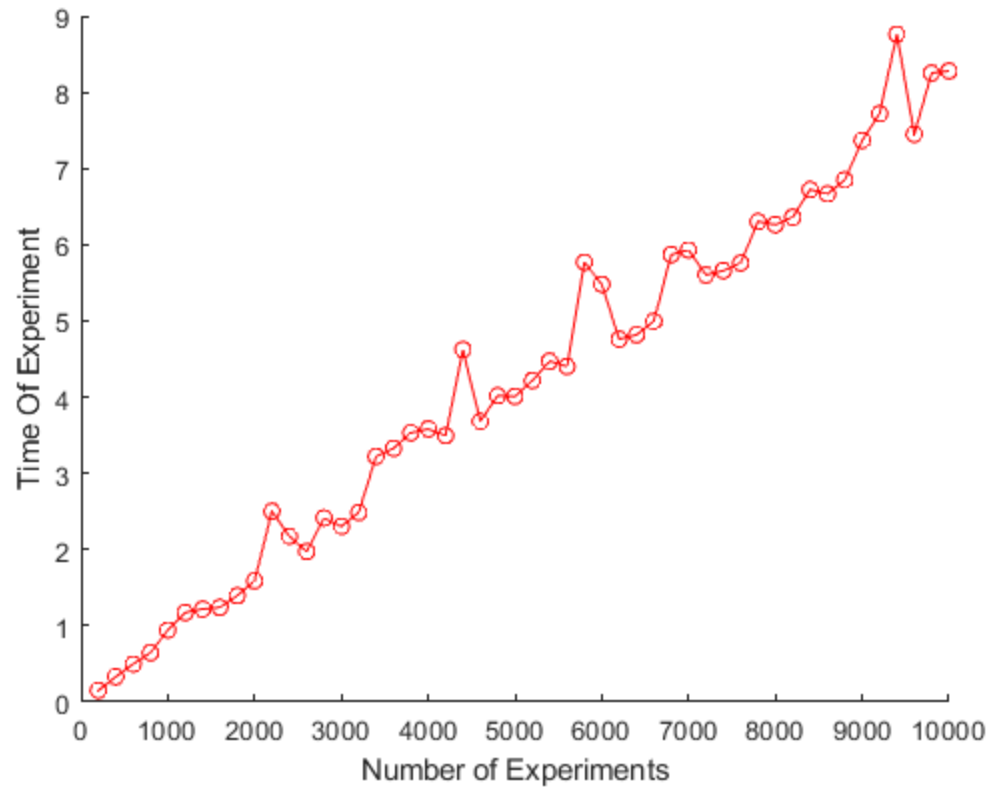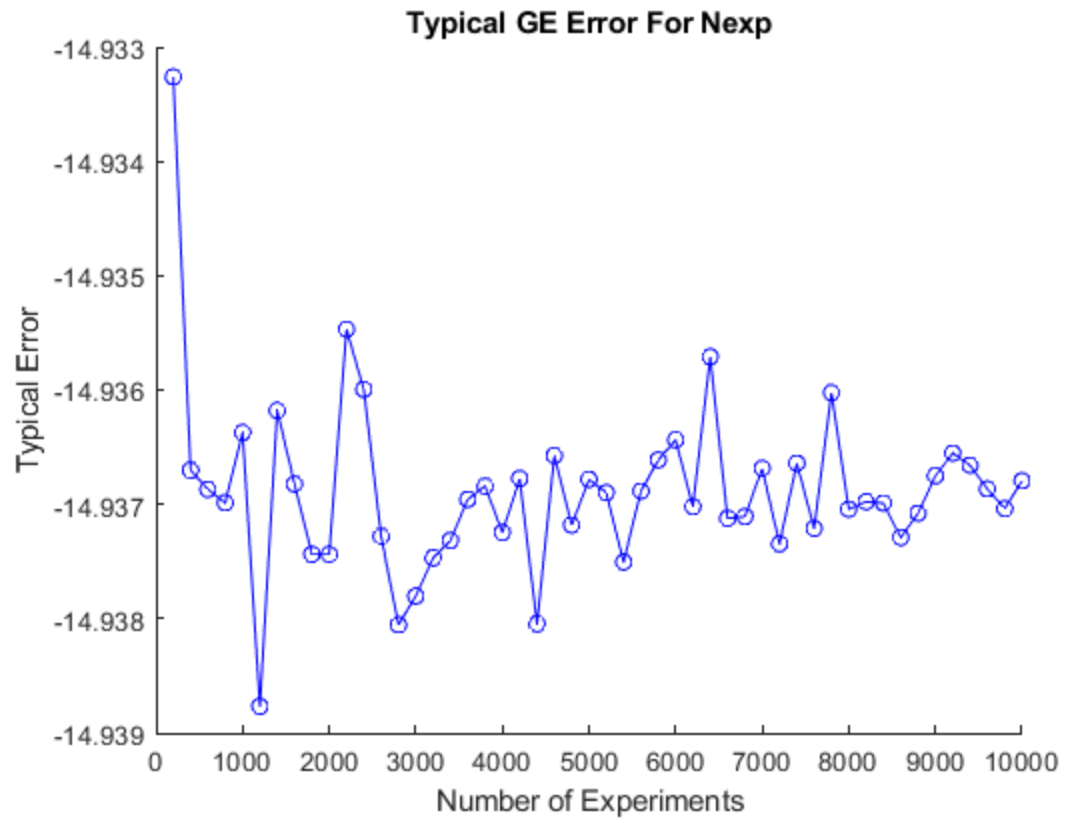
```
hold off;

figure;
hold on;
title('Typical GE Error For Nexp')
xlabel("Number of Experiments")
ylabel("Typical Error")
plot(NexVect, eResArr, 'b-o');
hold off;
```

Exp with Nex = 200
Exp with Nex = 400
Exp with Nex = 600
Exp with Nex = 800
Exp with Nex = 1000
Exp with Nex = 1200
Exp with Nex = 1400
Exp with Nex = 1600
Exp with Nex = 1800
Exp with Nex = 2000
Exp with Nex = 2200
Exp with Nex = 2400
Exp with Nex = 2600
Exp with Nex = 2800
Exp with Nex = 3000
Exp with Nex = 3200
Exp with Nex = 3400
Exp with Nex = 3600
Exp with Nex = 3800
Exp with Nex = 4000
Exp with Nex = 4200
Exp with Nex = 4400
Exp with Nex = 4600
Exp with Nex = 4800
Exp with Nex = 5000
Exp with Nex = 5200
Exp with Nex = 5400
Exp with Nex = 5600
Exp with Nex = 5800
Exp with Nex = 6000
Exp with Nex = 6200
Exp with Nex = 6400
Exp with Nex = 6600
Exp with Nex = 6800
Exp with Nex = 7000
Exp with Nex = 7200
Exp with Nex = 7400
Exp with Nex = 7600
Exp with Nex = 7800
Exp with Nex = 8000
Exp with Nex = 8200
Exp with Nex = 8400
Exp with Nex = 8600
Exp with Nex = 8800

```
Exp with Nex = 9000
Exp with Nex = 9200
Exp with Nex = 9400
Exp with Nex = 9600
Exp with Nex = 9800
Exp with Nex = 10000
```

Typical GE Error For Nexp

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