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```
clear;clc;close all
```

Problem 3

```
for i = 1 : 3
    A = 3 + 3*randn(1000,1);
    B = 5 + 5*randn(1000,1);
    C = A + B;
    D = 3*A + 4*B;
    E = 3*A - 4*B;

    DATA = [A B C D E];

    % Part A - Find Mean and Variance for A, B, C, D, and E

    meanA(i) = mean(A);
    meanB(i) = mean(B);
    meanC(i) = mean(C);
    meanD(i) = mean(D);
    meanE(i) = mean(E);

    varA(i) = var(A);
    varB(i) = var(B);
    varC(i) = var(C);
    varD(i) = var(D);
    varE(i) = var(E);

    meanDATA(i,:) = mean(DATA);

    covDATA(:, :, i) = cov(DATA);

    fprintf("\nSequence %g\n", i)
    fprintf("-----\n")
    fprintf("Mean A = %.4f\n", meanA(i))
    fprintf("Mean B = %.4f\n", meanB(i))
    fprintf("Mean C = %.4f\n", meanC(i))
    fprintf("Mean D = %.4f\n", meanD(i))
    fprintf("Mean E = %.4f\n\n", meanE(i))

    fprintf("Var A = %.4f\n", varA(i))
    fprintf("Var B = %.4f\n", varB(i))
    fprintf("Var C = %.4f\n", varC(i))
    fprintf("Var D = %.4f\n", varD(i))
    fprintf("Var E = %.4f\n\n", varE(i))
```

```

fprintf("Mean DATA = \n")
fprintf("%.4f %.4f %.4f %.4f %.4f\n\n",meanDATA(i,:))

fprintf("Cov DATA = \n")
fprintf("%10.4f %10.4f %10.4f %10.4f %10.4f\n",covDATA(:, :, i))

end

subplot(2,1,1)
hold on
grid on
plot(meanA, '. ')
plot(meanB, '. ')
plot(meanC, '. ')
plot(meanD, '. ')
plot(meanE, '. ')
title("Mean for Each Sequence")
xlabel("Sequence Number")
xlim([0,4])
ylabel("Mean")
legend('A', 'B', 'C', 'D', 'E')
subplot(2,1,2)
hold on
grid on
plot(varA, '. ')
plot(varB, '. ')
plot(varC, '. ')
plot(varD, '. ')
plot(varE, '. ')
title("Variance for Each Sequence")
xlabel("Sequence Number")
xlim([0,4])
ylabel("Variance")
legend('A', 'B', 'C', 'D', 'E')

Sequence 1
-----
Mean A = 3.0529
Mean B = 5.1156
Mean C = 8.1684
Mean D = 29.6209
Mean E = -11.3037

Var A = 9.9585
Var B = 26.6646
Var C = 36.6322
Var D = 516.3690
Var E = 516.1506

Mean DATA =
3.0529 5.1156 8.1684 29.6209 -11.3037

Cov DATA =

```

9.9585	0.0046	9.9630	29.8937	29.8573
0.0046	26.6646	26.6691	106.6720	-106.6447
9.9630	26.6691	36.6322	136.5657	-76.7874
29.8937	106.6720	136.5657	516.3690	-337.0069
29.8573	-106.6447	-76.7874	-337.0069	516.1506

Sequence 2

Mean A = 2.9580
Mean B = 4.7314
Mean C = 7.6894
Mean D = 27.7998
Mean E = -10.0518

Var A = 9.9086
Var B = 24.7105
Var C = 34.2906
Var D = 480.6038
Var E = 488.4877

Mean DATA =
2.9580 4.7314 7.6894 27.7998 -10.0518

Cov DATA =

9.9086	-0.1642	9.7443	29.0687	30.3827
-0.1642	24.7105	24.5463	98.3494	-99.3349
9.7443	24.5463	34.2906	127.4181	-68.9523
29.0687	98.3494	127.4181	480.6038	-306.1918
30.3827	-99.3349	-68.9523	-306.1918	488.4877

Sequence 3

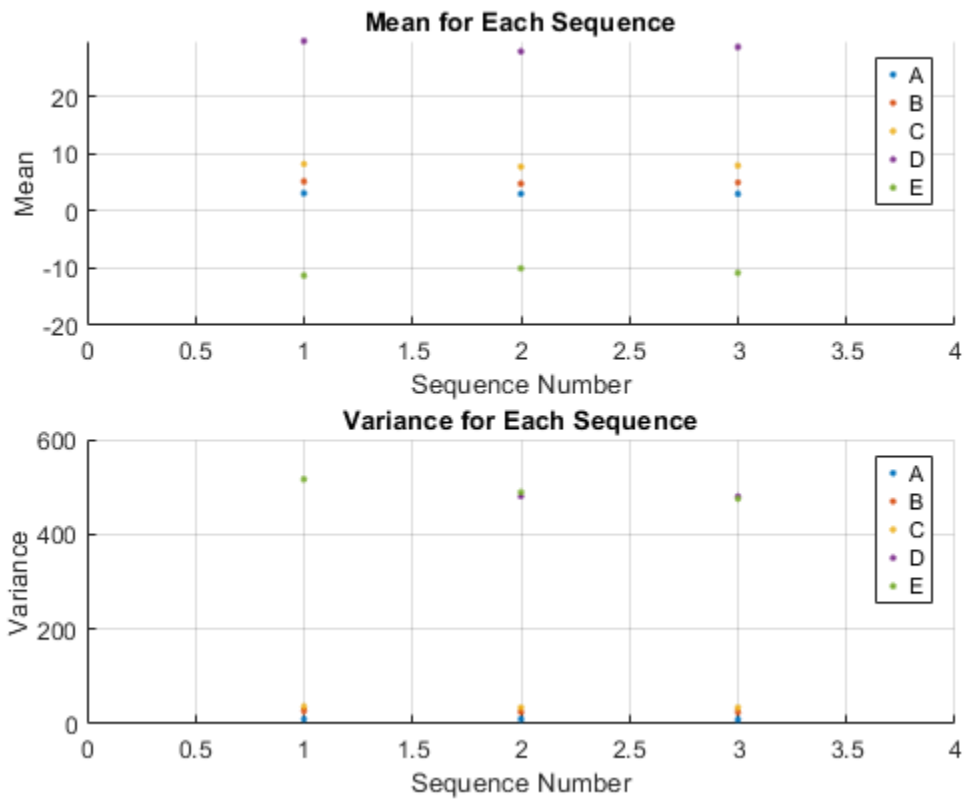
Mean A = 2.9557
Mean B = 4.9266
Mean C = 7.8823
Mean D = 28.5734
Mean E = -10.8392

Var A = 8.9781
Var B = 24.7809
Var C = 33.9651
Var D = 479.7701
Var E = 474.8234

Mean DATA =
2.9557 4.9266 7.8823 28.5734 -10.8392

Cov DATA =

8.9781	0.1031	9.0811	27.3464	26.5219
0.1031	24.7809	24.8839	99.4327	-98.8144
9.0811	24.8839	33.9651	126.7791	-72.2924
27.3464	99.4327	126.7791	479.7701	-315.6917
26.5219	-98.8144	-72.2924	-315.6917	474.8234



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