```
n = 10000;

X1 = normrnd(3, sqrt(2), [1, n]);
X2 = normrnd(1, 1, [1, n]);

A = [1/2 3;
     1   1];

Y = A * [X1; X2];

Y1 = Y(1, :);
Y2 = Y(2, :);

%b)
disp("Mean of X1")
disp(mean(X1));
disp("Mean of X2")
disp(mean(X2));

samplecov = cov(X1,X2);
samplecorr = corrcoef(X1,X2);
disp("Cov of X1 and X2");
disp(samplecov(1,2));
disp("Corr of X1 and X2");
disp(samplecorr(1,2));

%c)
figure(1)
plot(X1,X2,'.')

%d)
disp("Mean of Y1")
disp(mean(Y1));
disp("Mean of Y2")
disp(mean(Y2));

samplecov = cov(Y1,Y2);
samplecorr = corrcoef(Y1,Y2);
disp("Cov of Y1 and Y2");
disp(samplecov(1,2));
disp("Corr of Y1 and Y2");
disp(samplecorr(1,2));

figure(2)
plot(Y1,Y2,'.')

%g)
filtered_Y2 = Y2(Y1 > 5);
prob_empirical = mean(filtered_Y2 > 2 & filtered_Y2 < 3);

disp("Answer for g")
```

```
disp(prob_empirical)
```