```matlab
%Random Variables Exercise
clear all;
m = 1000;
mu = 0;
sigma = 1;
data = normrnd(mu,sigma,m,1);
meanx = mean(data);
stdx = std(data);

subplot(2,2,1);
plot(data,'.');
title(['Random Data with µ = ',num2str(mu),' and # =
 ',num2str(sigma)]);
ylabel('Number');
xlabel('Number of points');
```
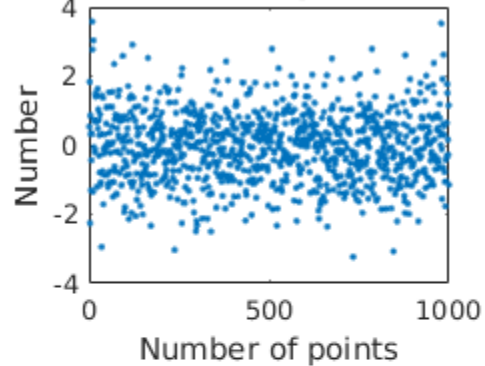


```matlab
subplot(2,2,2);
histogram(data);
title('Random numbers');
fprintf('The calculated mean value is %f\n',sum(data)/m);
fprintf('The matlab mean value is %f\n',meanx);
fprintf('The calculated std value is %f\n',sqrt(sum((data-meanx).^2)/
(m-1)));
fprintf('The matlab std value is %f\n',stdx);
```

The calculated mean value is -0.032632

The matlab mean value is -0.032632
The calculated std value is 0.998965
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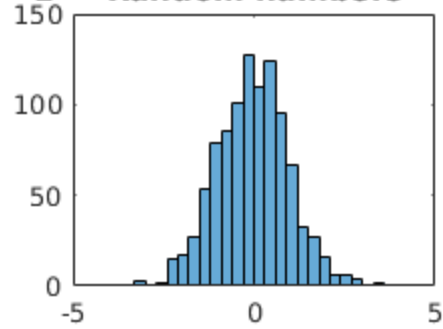
Random Data with μ = 0 and σ = 1   Random numbers
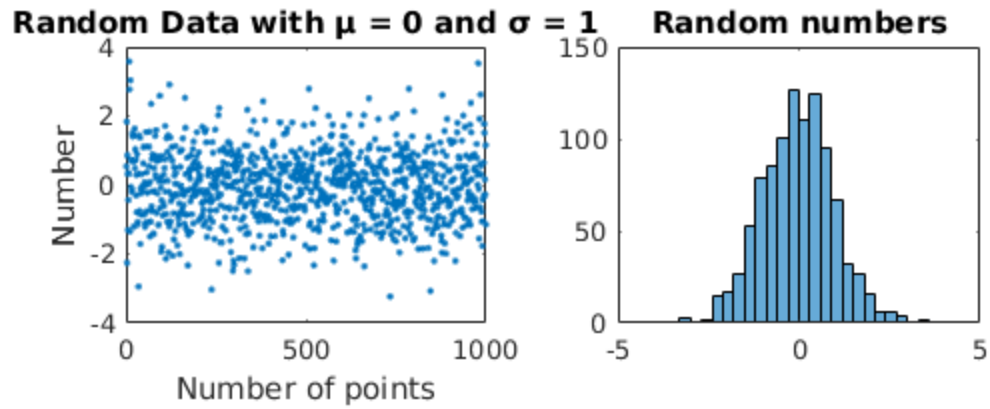
```
data2 = zeros(m,1);
for i=1:m
data2(i) = mean(normrnd(mu,sigma,i,1));
end
subplot(2,2,3);
plot(data2,'.');
title('Mean values of N variables');
xlabel('N points');
ylabel('Mean value of N datapoints');
```
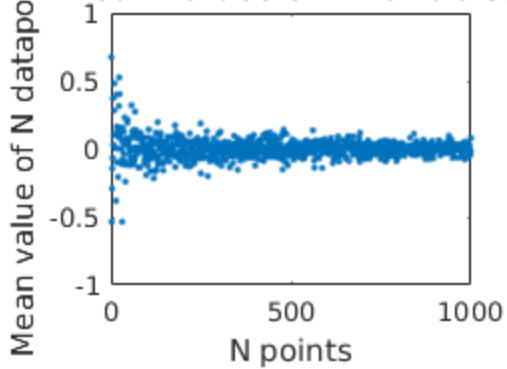
**Random Data with μ = 0 and σ = 1**
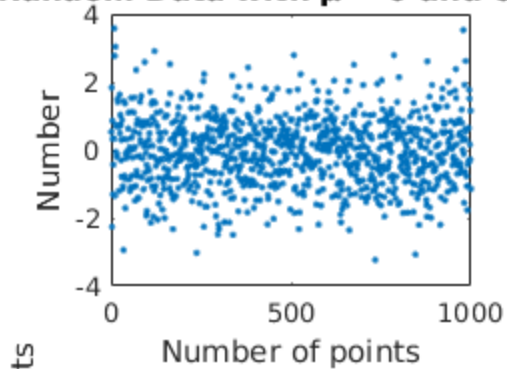
Random numbers
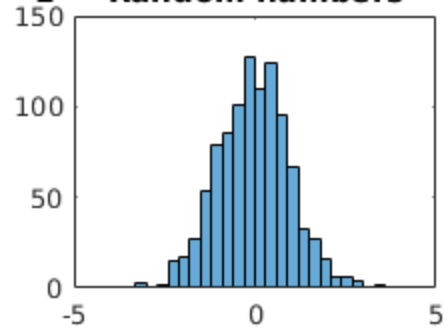
Mean values of N variables

```
meanxM = mean(data2);
stdxM = std(data2);
fprintf('The mean value for %d mean values is %f\n',m,meanx/sqrt(m));
fprintf('The std value for %d mean values is %f\n',m,stdxM);
fprintf('The std value for the mean value is %f\n',stdxM/sqrt(m));
subplot(2,2,4);
plot(data,'.');
hold on;
plot(data2,'.');
```

The mean value for 1000 mean values is -0.001032
The std value for 1000 mean values is 0.076006
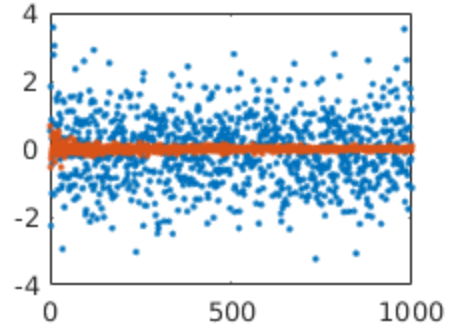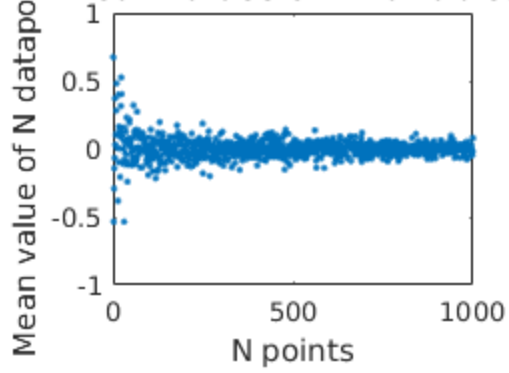*The std value for the mean value is 0.002404*

Random Data with μ = 0 and σ = 1
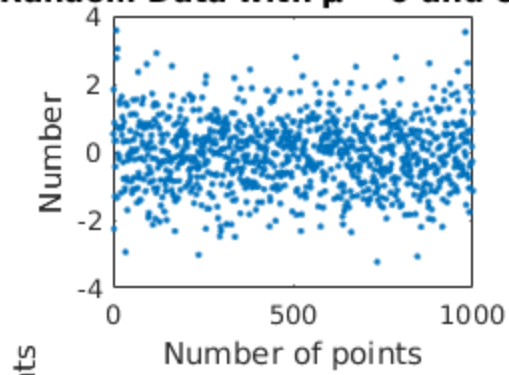
Random numbers

Mean values of N variables

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