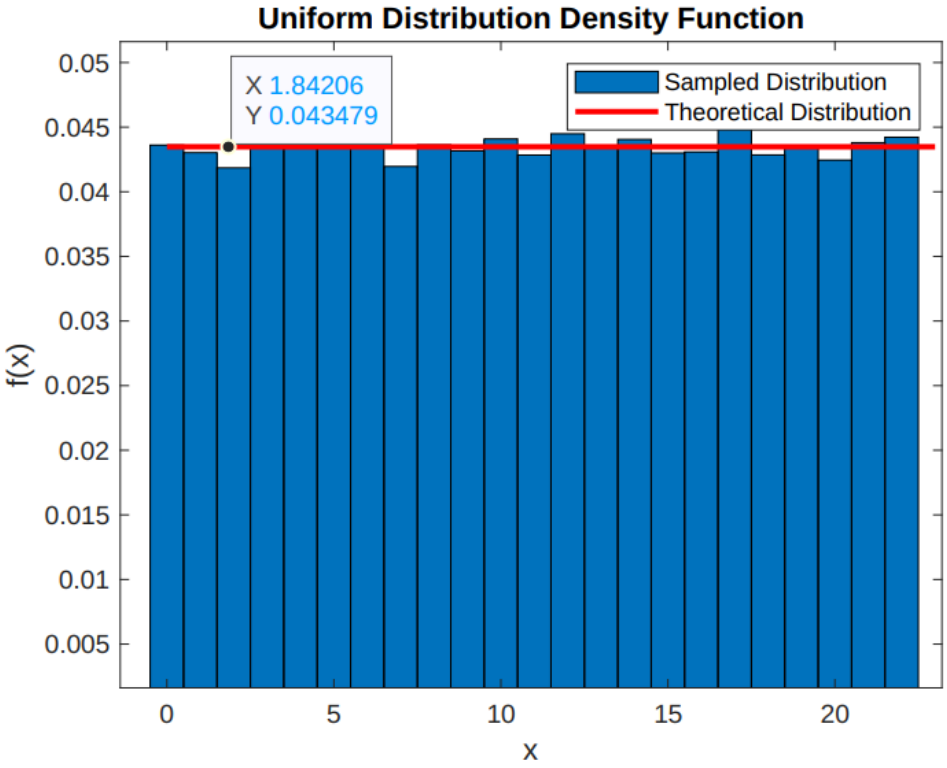
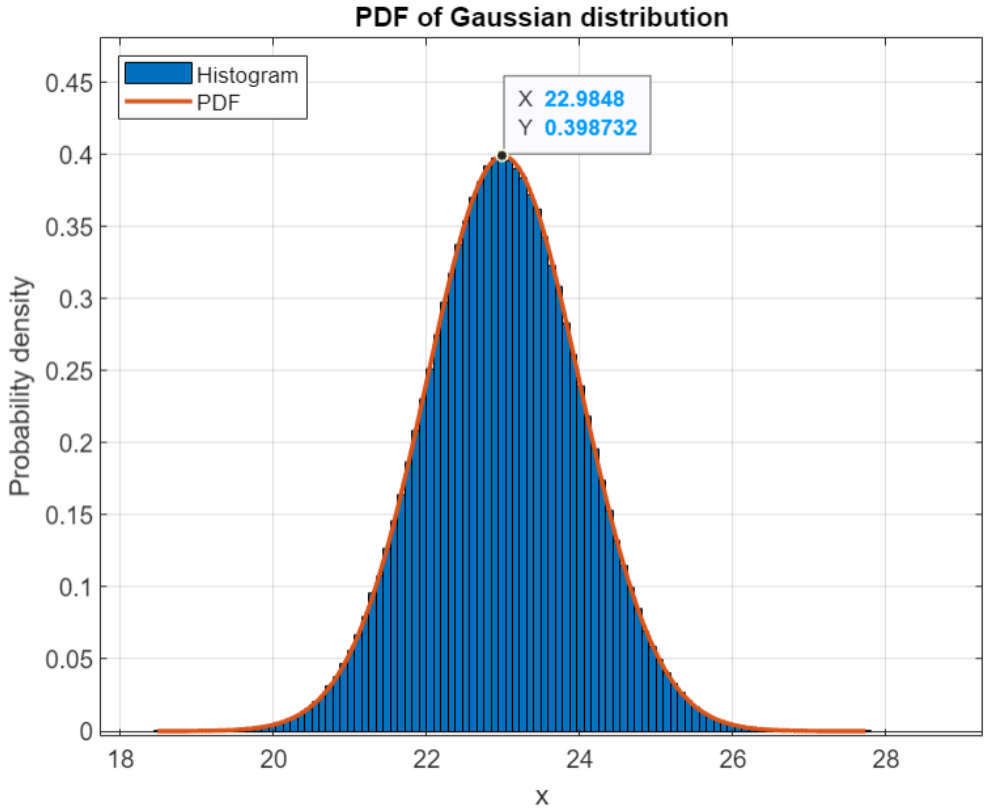
OUTPUT



Command Window

```
Theoritical Mean: 11.4999
calculated Mean: 11.5027
Theoritical Variance: 44.0819
Calculated Variance: 44.1044
>>
```

Output

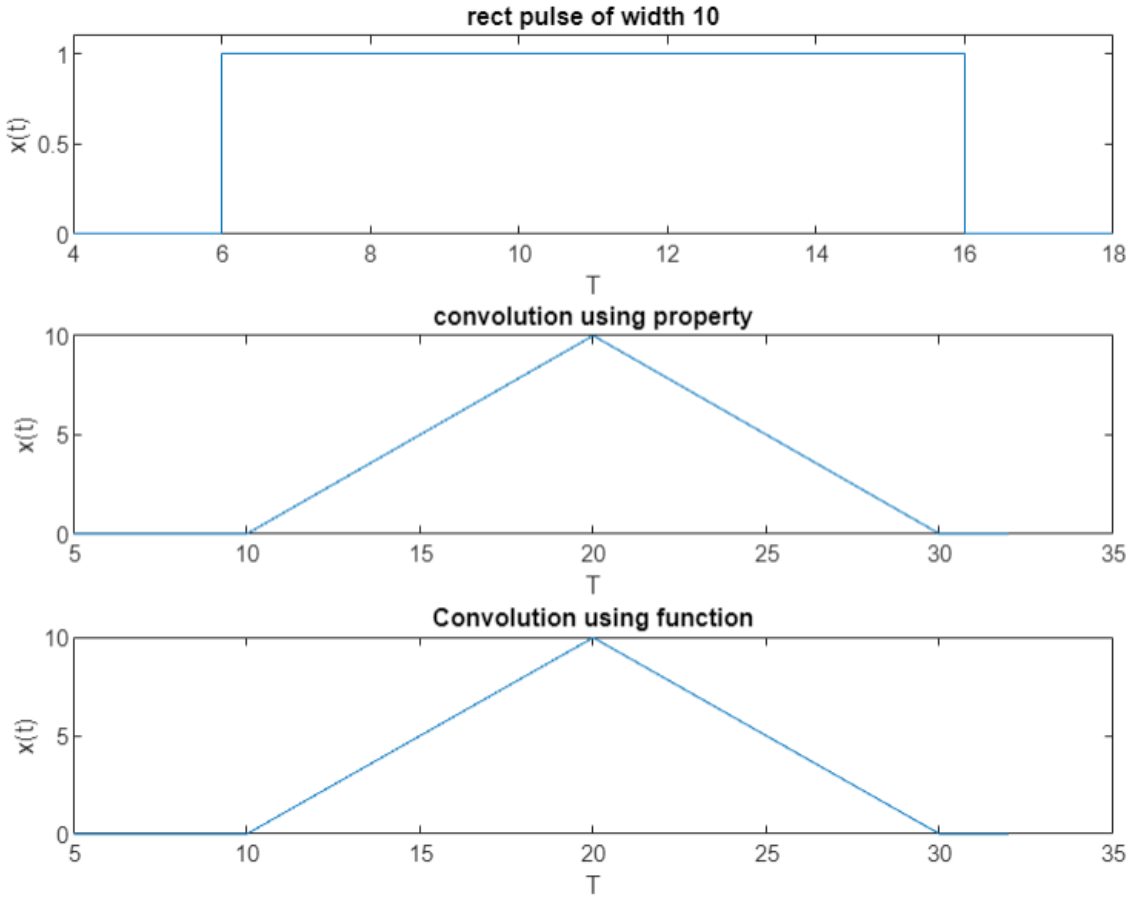



```
>> lab4
Mean: 23.0009
Variance: 1.0008
```

INPUT

```
% Plot the rectangular pulses
N = 10; % Width of the pulse
K = 5; % Number of zeros before and after the pulse
X1 = [zeros(1, K) ones(1, N) zeros(1, K)];
X2 = [zeros(1, K) ones(1, N) zeros(1, K)];
subplot(3,1,1)
stairs(X1);
xlabel('T');
ylabel('x(t)');
title('rect pulse of width 10');
axis([4,18,0,1.1]);
% Calculate fourier transform of both signals and multiply them
P = 32; % P is the smallest power of 2 greater than 2*N
DFTX1 = fft(X1, P);
DFTX2 = fft(X1, P);
DFTY = DFTX1 .* DFTX2;
% Compute the Inverse Fourier transform of DFTY
Y1 = ifft(DFTY);
% Convolve X1 and X2 and compare with Y1
Y2 = conv(X1, X2);
Y2 = Y2(1:length(Y1));
error = norm(Y1 - Y2);
% Plot Y1
t = 1:length(Y1);
subplot(3,1,2);
plot(t, Y1);
xlabel('T');
ylabel('x(t)');
title('convolution using property');
axis([5,35,0,10]);
% Plot Y2
t = 1:length(Y2);
subplot(3,1,3);
plot(t, Y2);
xlabel('T');
ylabel('x(t)');
title('Convolution using function');
axis([5,35,0,10]);
```

OUTPUT


rect pulse of width 10
x(t)
T
convolution using property
x(t)
T
Convolution using function
x(t)
T