

# ECE 759: Homework Example

## Subtitle is Excluded if Left Blank

Due on October 10, 2014

*Falkner 2:30*

Graduate Student

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## Problem 1

Listing 1 shows a MATLAB script that was used to generate Figure 1.

Listing 1: MATLAB Function Used to Generate Figure 1

```

function homework_example
%HOMWORK_EXAMPLE Example MATLAB function for LaTeX homework templates.
% This function produces a figure by using a number of MATLAB commands. It
% should help generate the power of the \matlabcscript macro for including
5 % MATLAB functions and scripts within code.
%
% The figure generated by this function will be used to demonstrate how to
% use \scalefig.
10 % Generate 100 random data points with a normal distribution
X = randn(1, 100);
% Generate a histogram in N at 100 centers specified at Xcenters
[N, Xcenters] = hist(X, length(X)/10);
15
% Plot the sample CDF of the data
clf;
subplot(211);
cdf_datafig = stairs(sort(X), linspace(0,1,length(X)) );
20
% Plot an expected CDF on top of it
hold on;
xlims = xlim;
expX = linspace(xlims(1), xlims(2), 1000);
25 cdf_expfig = plot( expX, normcdf(expX), 'r--' );
% Label the figure
legend( [cdf_datafig, cdf_expfig], 'Data Distribution', ...
        'Expected Distribution', 4 );
30 xlabel( 'x' );
ylabel( 'F(x) = P(X \leq x)' );
title( 'Normal Cummulative Distribution Function' );
35 %%% Notice the use of TeX in the above ylabel. In MATLAB 7.0, LaTeX can
%also be used if the interpreter on the text object is changed from
%â€œtex" to "latex" .
% Plot the sample pdf of the data
subplot(212);
35 pdf_datafig = bar( Xcenters, N/length(X)/(Xcenters(2)-Xcenters(1)) );
xlim( xlims );
% Plot an expected pdf on top of it
hold on;
45 pdf_expfig = plot( expX, normpdf(expX), 'r--' );
% Label the figure
legend( [pdf_datafig, pdf_expfig], 'Data Density', ...
        'Expected Density', 1 );
50 xlabel( 'x' );
ylabel( 'dF(x)/dx' );
45 title( 'Normal Probability Density Function' );

```



Figure 1: Figure Generated By Listing 1

## Problem 2

You were expecting *lorem ipsum* here, weren't you?

(a)

Still no Latin.

(b)

The *ipso facto* brown fox jumped over the lazy dog.