```
% fourier2.m
% Matlab script to illustrate the Fourier transform of a rectangular pulse
% EE160. Spring 2003. San Jose State University
% Robert Morelos-Zaragoza. 2/18/2003
%

clear all;

% Time axis: Sample period is 1 millisecond
t = -1.024:0.001:1.024;

% A rectangular pulse of width 50 milliseconds
y = rectpuls(t,0.05);

subplot(2,1,1);
plot(1000*t,y)
axis([-500 500 0 1.1])
title('Signal')
xlabel('time (milliseconds)')

% Discrete Fourier transform (via the Fast Fourier Transform)
Y = fft(y,2048);

% Compute the amplitude of the spectrum and center it
S = abs(fftshift(Y(1:2048)));
f = ((512:1536)-1023)/1024;

subplot(2,1,2);
plot(f,S(512:1536))
axis([-0.5 0.5 0 55])
title('Spectrum')
xlabel('frequency (Hz)')
```