```
% fourier1.m
% Matlab script to illustrate the Fourier transform of a periodic signal
% EE160. Spring 2003. San Jose State University
% Robert Morelos-Zaragoza. 2/18/2003
%

clear all;

% Time axis : Sample period is 0.5 milliseconds
t = 0:0.0005:1.2;

% The sum of three sinusoidal signals at 100, 300 and 500 Hz
y = 0.5*sin(2*pi*100*t)+0.3*sin(2*pi*300*t)+0.5*cos(2*pi*500*t);

subplot(2,1,1);
plot(1000*t(1:100),y(1:100))
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 = 2000*((0:2047)-1023)/2048;

subplot(2,1,2);
plot(f,S)
title('Spectrum')
xlabel('frequency (Hz)')
```