```
% Example for Problem 5.8
% Using Third Order Butterworth Low-Pass Filter
%

close all; % close all opened graphs
clear all; % clear all variables
figure;    % open new graph

% Normalized components from filter coefficient tables
Ln1 = 1.;  %  Normalized Inductance
Ln2 = 1.;  %  Normalized Inductance
Cn1 = 2.;  %  Normalized Capacitance
Rg = 1;    %  Normalized Source resistance
RL = 1;    %  Normalized Load Resistance

wc=1;  % Normalized Cutoff Frequency
w = 0;     %  Initialize frequency

for i=1:40;
       ZL1=j*w*Ln1;
       ZL2=j*w*Ln2;
       YC1= j*w*Cn1;
       GL=1./RL;
       % Define the ABCD matrices for each element of the filter
       A0=[1 Rg;0 1];
       A1=[1 ZL1;0 1];
       A2=[1 0;YC1 1];
       A3=[1 ZL2;0 1];
       A4=[1 0;GL 1];
       ABCD=A0*A1*A2*A3*A4;
       omega(i)=w;  %  Normalized frequency
       H=2.*1/(ABCD(1));
       IL(i)=-20*log10(abs(H)); % insertion loss
       w=w+0.1*wc;
end

plot(omega,IL);grid on;
axis([0 4 0 40]);
title('3rd Order Normalized Chebyshev Low-Pass Filter Insertion Loss');
xlabel('Frequency, Hz');
ylabel('Insertion Loss, dB');
hold on;
plot([0 1],[3 3],'b:',[1 1],[0 3],'b:');
text(0.15,4,'{\bf3dB}')·
```