

Problem 4-3

PROB4_3.M

```
% Listing in Fig 4-11b
clc, clg, clear
% Input Data
Vd=8; L=5e-6; C=100e-6; rL=1e-3; R=1.0; fs=100e3; Vcontrol=0.75;
Ts=1/fs; tmax=50*Ts; deltat=Ts/50;
%
time=0:deltat:tmax;
vst=time/Ts - fix(time/Ts);
voi=Vd*(Vcontrol > vst);
%
A=[-rL/L -1/L; 1/C -1/(C*R)];
b=[1/L 0]';
MN=inv(eye(2) - deltat/2 * A);
M=MN*(eye(2)+deltat/2 * A);
N=MN*deltat/2*b;
%
iL(1)=4.0; vC(1)=5.5;
timelength=length(time);
%
for k = 2:timelength
x=M*[iL(k-1) vC(k-1)]' + N*(voi(k) + voi(k-1));
iL(k)=x(1); vC(k)=x(2);
end
%
plot(time, iL, time, vC)
```

