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**Matric No: 17/ENG04/026**

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**EEE 382 ASSIGNMENT**

```
commandwindow
clearvars
clc
close all
format short g
syms t Kp Td Tp x

%Linearized
v= Kp*(1-exp(-(t-Td)/Tp))
femmy=xlsread('1587203818odevbesdata','data1');
t1=femmy(:,1);
v=femmy(:,2);
V=round(mdata(900,2),1);
t0=ones(length(v),1);
t=[t0 t1];
[mcoeff, mcoeffint, mrseid, mresidint, manova]=regress(v,t1);
mcoeff
manova
Kp=V
Td=-mcoeff(1)
Tp=mcoeff(2)

figure(1)
plot(t1,v)
hold on
plot(t1,V)
grid on
grid minor
xlabel('Time (min)')
ylabel('Volume (m^3)')
legend('Experimental','Linearized')

%non-linear
ig=[0.1,0.1,0.1,0.1];
modelfun=@(v,t) ig(1)*(1-exp(-((ig(2)-ig(3))/ig*4))));
femi=nlinfit(t1,v,ig,modelfun)
figure(2)
plot(t1,v)
hold on
plot(t1,femi)
grid on
grid minor
xlabel('Time (min)')
ylabel('Volume (m^3)')
legend('Experimental','Nonlinear')

%comparing
figure(3)
plot(t1,v)
```

```
hold on
plot(t1,)
hold on
plot(t1,femi)
grid minor
grid on
xlabel('Time (min)')
ylabel('Volume (m^3)')
legend('Experimental','Linearized','Nonlinear')
```

```
%SAE
[v,t1]=simplefit_data1;
net=fitnet(10,'trainscg');
net.performFcn= 'sae';
net= train(net,x,t)
y=net(x)
e=t1-y
perf= sae(net,t,y)
```

```
%MAE
y=net(v)
e=t-y
perf= mae(e)
```

```
%SSE
[v,t1]=simplefit_data1;
net= fitnet(10);
net.performFcn= 'sse';
net= train(net,x,t)
y=net(x)
e=t1-y
perf= sse(net,t,y)
```

```

commandwindow
clearvars
clc
format short g

syms t kp td tp
v = kp*(1-exp(-((t-td)/tp)))
mdata = xlsread('1587203818odevbesdata', 'data1');
t1 = mdata(:,1);
v = mdata(:,2);
V1 = round(mdata(900,2),1)
t0 = ones(length(v),1)
t = [t0 t1]
[mcoeff, mcoeffint, mresid, mresidint, manova] = regress (v,t);
%mcoeff
%rsquaredvalue = mcoeff(1)
mcoeff
manova
kp = V1
td = -mcoeff(1)
tp = mcoeff(2)
plot(t,v(:,1));
grid on
grid minor

Beta = nlinfit(V,t,vf,beta0)

```

Beta0 = [t0 t1 ]

Plot(t,Beta)

