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**CHEMICAL ENGINEERING**

**17/ENG01/008**

%Linearized

commandwindow

clearvars

clc

format short g

onlineas2 = xlsread('onlineas2');

t1 = onlineas2(:,1);

v = onlineas2(:,2);

v1=round(onlineas2(900,2),1)

t0 = ones(length(v),1);

t = [t0 t1]

y=log(v)

[mcoeff, mcoeffint, mresid, mresidint, manova] = regress(v,t);

mcoeff;

manova;

Kp=10^mcoeff(1)

rp= -Kp/ mcoeff(2)

rd= (mcoeff(2)\*rp/-Kp)

figure(1)

plot(t,v(:,1),'r-o','markerindices',[1:40:length(t)])

xlabel('Time(min)')

ylabel('Volume (m^3)')

legend('Experimental','Nonlinear')

grid on

grid minor

axis tight

%non-linear

commandwindow

clearvars

clc

format short g

syms kp rd rp t

v=kp\*(1-exp(t-(rd/rp)));

onlineas2 = xlsread('onlineas2');

v = onlineas2(:,2);

t1 = onlineas2(:,1);

t0 = ones(length(v),1);

t=[t0 t1]

beta=[kp rd rp ]

modelfun= @(beta,t)(beta(1)\*(1-exp(t-(beta(2)/beta(3)))));

rng('default')

opts=statset('nlinfit');

opts.RobustWgtFun='bisquare';

initials=[0.1,0.1, 0.1];

%new1=nlinfit(t,v,modelfun,initials)

%new2=modelfun(new1,t);

plot(t,v)

%comparing

figure(3)

plot(t1,v)

hold on

plot(t1,)

hold on

plot(t1,modelfun)

grid minor

grid on

xlabel('Time(min)')

ylabel('Volume(m^3)')

legend('Experimental','Linearlized','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)

