**clear, close all**

**clc**

**load('C:\Users\Azlinda\Desktop\model1.mat');**

**rand('twister',1);**

**noHidden = 10;**

**a = allData';**

**a = a';**

**y = a(:,1);**

**x1 = a(:,2);**

**x2 = a(:,3);**

**x3 = a(:,4);**

**x4 = a(:,5);**

**x5 = a(:,6);**

**x6 = a(:,7);**

**x7 = a(:,8);**

**x8 = a(:,9);**

**x9 = a(:,10);**

**x10 = a(:,11);**

**x11 = a(:,12);**

**yt = y(4:398);**

**yt1 = y(3:397);**

**yt2 = y(2:396);**

**yt3 = y(1:395);**

**x1t1 = x1(3:397);**

**x1t2 = x1(2:396);**

**x1t3 = x1(1:395);**

**x2t1 = x2(3:397);**

**x2t2 = x2(2:396);**

**x2t3 = x2(1:395);**

**x3t1 = x3(3:397);**

**x3t2 = x3(2:396);**

**x3t3 = x3(1:395);**

**x4t1 = x4(3:397);**

**x4t2 = x4(2:396);**

**x4t3 = x4(1:395);**

**x5t1 = x5(3:397);**

**x5t2 = x5(2:396);**

**x5t3 = x5(1:395);**

**x6t1 = x6(3:397);**

**x6t2 = x6(2:396);**

**x6t3 = x6(1:395);**

**x7t1 = x7(3:397);**

**x7t2 = x7(2:396);**

**x7t3 = x7(1:395);**

**x8t1 = x8(3:397);**

**x8t2 = x8(2:396);**

**x8t3 = x8(1:395);**

**x9t1 = x9(3:397);**

**x9t2 = x9(2:396);**

**x9t3 = x9(1:395);**

**x10t1 = x10(3:397);**

**x10t2 = x10(2:396);**

**x10t3 = x10(1:395);**

**x11t1 = x11(3:397);**

**x11t2 = x11(2:396);**

**x11t3 = x11(1:395);**

**psi = [yt1, yt2, yt3, x1t1, x1t2, x1t3, x2t1, x2t2, x2t3, x3t1, x3t2, x3t3, x4t1, ....**

**x4t2, x4t3, x5t1, x5t2, x5t3, x6t1, x6t2, x6t3, x7t1, x7t2, x7t3, ...**

**x8t1, x8t2, x8t3, x9t1, x9t2, x9t3, x10t1, x10t2, x10t3, x11t1, ...**

**x11t2, x11t3];**

**psi = psi';**

**yt = yt';**

**[psi, ps] = mapminmax(psi);**

**[yt, ys] = mapminmax(yt);**

**net = feedforwardnet(noHidden);**

**[net, tr] = train(net,psi,yt);**

**yhat = net(psi);**

**resid = yt - yhat;**

**yt\_trn = yt(:,tr.trainInd);**

**yt\_val = yt(:,tr.valInd);**

**yt\_tst = yt(:,tr.testInd);**

**yhat\_trn = yhat(:,tr.trainInd);**

**yhat\_val = yhat(:,tr.valInd);**

**yhat\_tst = yhat(:,tr.testInd);**

**resid\_trn = resid(:,tr.trainInd);**

**resid\_val = resid(:,tr.valInd);**

**resid\_tst = resid(:,tr.testInd);**

**%fitting test**

**figure, plot(yt\_trn); %jawapan sebenar**

**hold on;**

**plot(yhat\_trn,'r--'); %merah prediction**

**hold off;**

**%fitting test**

**figure, plot(yt\_tst); %jawapan sebenar**

**hold on;**

**plot(yhat\_tst,'r--'); %merah prediction**

**hold off;**

**rsq\_trn = 100 \* (1 - (sum(resid\_trn .^2)/sum((yt\_trn - mean(yt\_trn)) .^2)))**

**rsq\_tst = 100 \* (1 - (sum(resid\_tst .^2)/sum((yt\_tst - mean(yt\_tst)) .^2)))**

**mse\_trn = mse(resid\_trn)**

**mse\_tst = mse(resid\_tst)**

**psi\_trn = psi(:,tr.trainInd)';**

**psi\_tst = psi(:,tr.testInd)';**

**yt\_trn = yt(:,tr.trainInd)';**

**yt\_tst = yt(:,tr.testInd)';**

**reverseOri\_trn = mapminmax('reverse',yt\_trn,ys);**

**reverseANN\_trn=mapminmax('reverse',yhat\_trn,ys);**

**reverseQR\_trn=mapminmax('reverse',yhat\_trnQR,ys);**

**figure, plot(reverseOri\_trn);**

**hold on;**

**plot(reverseANN\_trn,'r--');**

**plot(reverseQR\_trn, 'g--');**

**hold off;**

**reverseOri\_tst = mapminmax('reverse',yt\_tst,ys);**

**reverseANN\_tst=mapminmax('reverse',yhat\_tst,ys);**

**reverseQR\_tst=mapminmax('reverse',yhat\_tstQR,ys);**

**reverseResidTrnANN = reverseOri\_trn - reverseANN\_trn**

**reverseResidTrnQR = reverseOri\_trn - reverseQR\_trn**

**reverseResidTstANN = reverseOri\_tst - reverseANN\_tst**

**reverseResidTstQR = reverseOri\_tst - reverseQR\_tst**

**clc**

**rsq\_trnANN = 100 \* (1 - (sum(reverseResidTrnANN .^2)/sum((reverseOri\_trn - mean(reverseOri\_trn)) .^2)))**

**rsq\_trnQR = 100 \* (1 - (sum(reverseResidTrnQR .^2)/sum((reverseOri\_trn - mean(reverseOri\_trn)) .^2)))**

**rsq\_tstANN = 100 \* (1 - (sum(reverseResidTstANN .^2)/sum((reverseOri\_tst - mean(reverseOri\_tst)) .^2)))**

**rsq\_tstQR = 100 \* (1 - (sum(reverseResidTstQR .^2)/sum((reverseOri\_tst - mean(reverseOri\_tst)) .^2)))**

**mse\_reverseANN\_trn = mse(reverseResidTrnANN)**

**mse\_reverseANN\_tst = mse(reverseResidTstANN)**

**mse\_reverseQR\_trn = mse(reverseResidTrnQR)**

**mse\_reverseQR\_tst = mse(reverseResidTstQR)**

**figure, plot(reverseOri\_tst);**

**hold on;**

**plot(reverseANN\_tst,'r--');**

**plot(reverseQR\_tst, 'g--');**

**hold off;**

**END**