my.hat.w<-function(x,wt){

x1<-cbind(1,x)

x1%\*%solve(t(x1)%\*%diag(wt)%\*%x1)%\*%t(x1)%\*%(diag(wt))

}

bin.mean<-function(x,y,nbin,xcol=2)

{

o1<-order(x)

x1<-x[o1]

y1<-y[o1]

r1<-range(x)

inc<-(r1[2]-r1[1])/nbin

yvec<-NULL

smat<-NULL

for(i in 1:nbin){

bin.low<-r1[1]+(i-1)\*inc

bin.high<-r1[1]+i\*inc

I1<-x1>=bin.low

if(i<nbin){

I2<-x1<bin.high

}else{

I2<-x1<=(bin.high+200)

}

I3<-as.logical(I1\*I2)

yval<-mean(y1[I3])

n1<-sum(I3)

matdum<-NULL

for(i in 1:n1){

matdum<-rbind(matdum,I3\*1/n1)

}

smat<-rbind(smat,matdum)

yvec<-c(yvec,rep(yval,n1))

}

n99<-length(x1)

dferror<-length(x1)-sum(diag(2\*smat-smat%\*%(t(smat))))

delta1<-sum(diag(t(diag(n99)-smat)%\*%(diag(n99)-smat)))

R<-t(diag(n99)-smat)%\*%(diag(n99)-smat)

delta2<-2\*sum(diag(R%\*%R))

lines(x1,yvec,col=xcol)

ypred<-y1

ypred<-smat%\*%y1

resid<-y-ypred

list(smat=smat,df=sum(diag(smat)),dferror=dferror,delta1=delta1,delta2=delta2,resid=resid,pred=ypred,x=x)

}

gauss.mean<-function(x,y,lambda,xcol=3,do.plot=T)

{

o1<-order(x)

x1<-x[o1]

y1<-y[o1]

r1<-range(x)

smat<-NULL

n1<-length(x1)

for(i in 1:n1){

v1<-dnorm(x1,x1[i],lambda)

v1<-v1/sum(v1)

smat<-rbind(smat,v1)

}

yhat<-smat%\*%y1

if(do.plot){

lines(x1,yhat,col=xcol)

}

n99<-length(x1)

dferror<-length(x1)-sum(diag(2\*smat-smat%\*%(t(smat))))

delta1<-sum(diag(t(diag(n99)-smat)%\*%(diag(n99)-smat)))

R<-t(diag(n99)-smat)%\*%(diag(n99)-smat)

delta2<-2\*sum(diag(R%\*%R))

resid<-y1-smat%\*%y1

ypred<-y1

ypred[o1]<-smat%\*%y1

list(smat=smat,df=sum(diag(smat)),dferror=dferror,delta1=delta1,delta2=delta2,resid=resid,pred=ypred)

}

gauss.mean.trunc<-function(x,y,lambda,nnn,xcol=5,do.plot=T)

{

o1<-order(x)

x1<-x[o1]

y1<-y[o1]

r1<-range(x)

smat<-NULL

n1<-length(x1)

trunc.val<-n1-nnn

for(i in 1:n1){

v1<-dnorm(x1,x1[i],lambda)

o2<-order(v1)

thresh<-v1[o2[trunc.val]]

v1<-v1\*(v1>thresh)

v1<-v1/sum(v1)

smat<-rbind(smat,v1)

}

yhat<-smat%\*%y1

if(do.plot){

lines(x1,yhat,col=xcol)

}

n99<-length(x1)

dferror<-length(x1)-sum(diag(2\*smat-smat%\*%(t(smat))))

delta1<-sum(diag(t(diag(n99)-smat)%\*%(diag(n99)-smat)))

R<-t(diag(n99)-smat)%\*%(diag(n99)-smat)

delta2<-2\*sum(diag(R%\*%R))

resid<-y1-smat%\*%y1

ypred<-y1

ypred[o1]<-smat%\*%y1

list(smat=smat,df=sum(diag(smat)),dferror=dferror,delta1=delta1,delta2=delta2,resid=resid,pred=ypred)

}

gauss.reg<-function(x,y,lambda,xcol=4,do.plot=T)

{

o1<-order(x)

x1<-x[o1]

y1<-y[o1]

r1<-range(x)

smat<-NULL

n1<-length(x1)

for(i in 1:n1){

v1<-dnorm(x1,x1[i],lambda)

v1<-v1/sum(v1)

H1<-my.hat.w(x1,v1)

smat<-rbind(smat,H1[i,])

}

yhat<-smat%\*%y1

if(do.plot){

lines(x1,yhat,col=xcol)

}

n99<-length(x1)

dferror<-length(x1)-sum(diag(2\*smat-smat%\*%(t(smat))))

delta1<-sum(diag(t(diag(n99)-smat)%\*%(diag(n99)-smat)))

R<-t(diag(n99)-smat)%\*%(diag(n99)-smat)

delta2<-2\*sum(diag(R%\*%R))

resid<-y1-smat%\*%y1

ypred<-y1

ypred[o1]<-smat%\*%y1

list(smat=smat,df=sum(diag(smat)),dferror=dferror,delta1=delta1,delta2=delta2,resid=resid,pred=ypred)

}

gauss.reg.trunc<-function(x,y,lambda,nnn,xcol=6,do.plot=T)

{

o1<-order(x)

x1<-x[o1]

y1<-y[o1]

r1<-range(x)

smat<-NULL

n1<-length(x1)

trunc.val<-n1-nnn

for(i in 1:n1){

v1<-dnorm(x1,x1[i],lambda)

o1<-order(v1)

thresh<-v1[o1[trunc.val]]

v1<-v1\*(v1>thresh)

v1<-v1/sum(v1)

H1<-my.hat.w(x1,v1)

smat<-rbind(smat,H1[i,])

}

yhat<-smat%\*%y1

if(do.plot){

lines(x1,yhat,col=xcol)

}

n99<-length(x1)

dferror<-length(x1)-sum(diag(2\*smat-smat%\*%(t(smat))))

delta1<-sum(diag(t(diag(n99)-smat)%\*%(diag(n99)-smat)))

R<-t(diag(n99)-smat)%\*%(diag(n99)-smat)

delta2<-2\*sum(diag(R%\*%R))

resid<-y1-smat%\*%y1

ypred<-y1

ypred[o1]<-smat%\*%y1

list(smat=smat,df=sum(diag(smat)),dferror=dferror,delta1=delta1,delta2=delta2,resid=resid,pred=ypred)

}