**Assignment 16.1**

1. Use the below given data set

Data Set

2. Perform the below given activities:

a. Predict the no of comments in next H hrs

Note:-

1. Use LASSO, Elastic Net and Ridge and other regression techniques that are covered in the module

2. Report the training accuracy and test accuracy

3. compare with linear models and report the accuracy

4. create a graph displaying the accuracy of all models

# Loading the environment of the previous Assignment 15.1 for the regular linear models.

load("E:/kamagyana/Computing/DARET/R-code-submissions/Asst15.1.new.RData")

# Dowloading the package glmnet for non-linear regressions

library(glmnet)

install.packages("glmnet")

library(glmnet)

install.packages("glmnet")

# Loading the first variant from the dataset of Assignment 15.1

read.csv("E:/kamagyana/Computing/DARET/Assignments/Dataset/Training/Features\_Variant\_1.csv", header=FALSE, stringsAsFactors=FALSE)

View(Features\_Variant\_1)

FV1 <- Features\_Variant\_1

head(FV1)

ncol(FV1)

# Converting the data frame into a matrix to feed into the glmnet kind of functions for the ridge, lasso and elastic regressions. The dependent and Independent variables have to be split into two different matrices.

xFV1 <- model.matrix(ncH~., FV1)[,-54]

yFV1 <- FV1$ncH

# Estimating Ridge Regression on the Train Data

ridge.FV1 <- glmnet(xFV1, yFV1,family="gaussian",alpha=0,lambda=grid)

# Predicting using ridge regression model with Training Data

pred.ridge = predict(ridge.FV1,xFV1,type="link")

# Calculating the Mean Square Error of Ridge Predictions

mse.ridge <- mean((yFV1 - pred.ridge)^2)

mse.ridge

# Estimating Lasso Regression on the Train Data

lasso.FV1 <- glmnet(xFV1, yFV1, family = "gaussian",alpha=1,lambda=grid)

# Predicting using lasso regression model with Training Data

pred.lasso = predict(lasso.FV1,xFV1,type="link")

# Calculating the Mean Square Error of lasso Predictions

mse.lasso <- mean((yFV1 - pred.lasso)^2)

mse.lasso

# Estimating elastic Regression on the Train Data

elastic.FV1 <- glmnet(xFV1, yFV1, family = "gaussian", alpha=0.5, lambda=grid)

# Predicting using elastic regression model with Training Data

pred.elastic <- predict(elastic.FV1,XFV1, type = "link")

pred.elastic <- predict(elastic.FV1,xFV1, type = "link")

# Calculating the Mean Square Error of elastic Predictions

mse.elastic <- mean((yFV1 - pred.elastic)^2)

mse.elastic

# Visualising the Test Data Set

ncol(test)

colnames(test)[,53:55]

colnames(test)[c(53:55)]

test <- test[,-55]

ncol(test)

# Converting the data frame into a matrix to feed into the glmnet kind of functions for the ridge, lasso and elastic regressions. The dependent and Independent variables have to be split into two different matrices.

xtest <- model.matrix(ncH~., test)[,-54]

ytest <- test$ncH

# Predicting using ridge regression model with Testing Data

testpred.ridge <- predict(ridge.FV1,xtest, type="link")

# Predicting using lasso regression model with Testing Data

testpred.lasso <- predict(lasso.FV1,xtest, type = "link")

# Predicting using elastic regression model with Testing Data

testpred.elastic <- predict(elastic.FV1, xtest, type = "link")

# Calculating the Mean Square Error of ridge Predictions

mse.testpred.ridge <-mean((ytest - testpred.ridge)^2)

# Calculating the Mean Square Error of lasso Predictions

mse.testpred.lasso <-mean((ytest - testpred.lasso)^2)

# Calculating the Mean Square Error of elastic Predictions

mse.testpred.elastic <-mean((ytest - testpred.elastic)^2)

# Loading the mse results from the previous linear regressions from Assignment 1 in the environment Asst15.1.Rdata, and script Asst15.1.R

msemodel1

msemodel2

msemodel3

msemodel4

msemodel6

msemodel5

# Attempting to plot the mse of various models

msetab <- c(mse.ridge,mse.lasso, mse.elastic,mse.testpred.ridge,mse.testpred.lasso,mse.testpred.elastic,msemodel1,msemodel2,msemodel3,msemodel4,msemodel5)

plot(msetab)

msetab <- as.data.frame(msetab)

class(msetab)

ncol(msetab)

msetab <- as.matrix(msetab,byrow=FALSE,NROW=1)

msetab

nrow(msetab)

ncol(msetab)

rownames(msetab) <-c ("mse.ridge","mse.lasso","mse.elastic","mse.testpred.ridge","mse.testpred.lasso","mse.testpred.elastic","msemodel","msemodel2","msemodel3","msemodel4","msemodel5")

msetab

colnames(msetab) <- c("mse")

msetab

plot(msetab)

msetab <- as.data.frame(msetab)

ncol(msetab)

msetab

str(msetab)

nrow(msetab)

plot(msetab)

plot(msetab, x=rownames, y=mse)

msetab <- as.matrix(msetab)

msetab

colnames(msetab)

rownames(msetab)

plot(msetab, xlab = "model", ylab = "MSE", type = "b", main = "MSE of various Models",xaxt = "n",ylim = c(700,14000));axis(1, at=1:11, labels=rownames(msetab),las=2)

