################################

# Exercise 4.1 #

# Logit regression #

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rm(list = ls())

def<-as.data.frame(read.csv("Chap4PDlogit.csv", header = TRUE, sep = ";", dec="."))

# 1. Logit regression with Liquid only

log.regr.Liquid<- glm(formula=

yy ~ Liquid, data=def, family=binomial(link=logit))

summary(log.regr.Liquid)

plot(log.regr.Liquid$fitted)

# Function

D2<- function(mod)

 {

 1-(deviance(mod)/mod$null.deviance)

 } #mod is the object to which the function is applied to

D2.log.regr.Liquid<- D2(log.regr.Liquid)

D2.log.regr.Liquid

# Logit Graph

source("logitplot.r")

logitplot(log.regr.Liquid)

mean(log.regr.Liquid$fitted)

# 2. Logit regression with Liquid only

log.regr.multiv<- glm(formula=

yy ~ Liquid+ DDcredit+ ROA +Use, data=def, family=binomial(link=logit))

summary(log.regr.multiv)

mean(log.regr.multiv$fitted)

# D2

D2.log.regr.multiv<- D2(log.regr.multiv)

D2.log.regr.multiv

# To know all about the structure of log.regr.Liquid

# str(log.regr.Liquid)

source("logitplot.r")

logitplot(log.regr.multiv)

length(log.regr.multiv$fitted)

summary(log.regr.multiv$fitted)

sum(log.regr.multiv$fitted > 0.5)

sum(log.regr.multiv$fitted > 0.65)

sum(def$yy)

# Sensitivity

sum((log.regr.multiv$fitted > 0.5) & def$yy)

sens.5 <- sum((log.regr.multiv$fitted > 0.5) & def$yy)/sum(def$yy)

sum((log.regr.multiv$fitted > 0.9) & def$yy)

sens.9 <- sum((log.regr.multiv$fitted > 0.9) & def$yy)/sum(def$yy)

sum((log.regr.multiv$fitted > 0.2) & def$yy)

sens.2 <- sum((log.regr.multiv$fitted > 0.2) & def$yy)/sum(def$yy)

# Specificity

sum(!def$yy)

sum(log.regr.multiv$fitted < 0.5)

sum((log.regr.multiv$fitted < 0.5) & (!def$yy))

spec.5 <- sum((log.regr.multiv$fitted < 0.5) & (!def$yy))/sum(!def$yy)

spec.9 <- sum((log.regr.multiv$fitted < 0.9) & (!def$yy))/sum(!def$yy)

spec.2 <- sum((log.regr.multiv$fitted < 0.2) & (!def$yy))/sum(!def$yy)

# Graph

source("logit.plot.quad.r")

logit.plot.quad(log.regr.multiv)

#

source("logit.roc.area.r")

source("logit.roc.r")

source("logit.roc.plot.r")

# Roc Liquidity only

par(mfrow = c(1, 2))

logit.plot.quad(log.regr.Liquid)

roc.Liquid<-logit.roc(log.regr.Liquid, steps = 100)

logit.roc.plot(roc.Liquid, "ROC One Regressor")

# Roc curve multiple regression

par(mfrow = c(1, 2))

logit.plot.quad(log.regr.multiv)

roc.multiv<-logit.roc(log.regr.multiv, steps = 100)

logit.roc.plot(roc.multiv, "ROC Multiple Regressors")