

## A24N2253s.R

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# In order for the program to run properly, please make sure you have
installed
# the gss package version 1.1-5 (downloadable from the archive of the
package).
# NOTE: A newer version of gss may not be compatible with this program
source("~/sim/fda/sinica_gflr.R")
datfile <- "~/sim/fda/sinica_dat.R"
# create Gaussian quadrature on xdomain
xdomain <- c(0,1)
xquad <- gauss.quad(200,xdomain)

ntest <- 500
npred <- 10000
nu <- 2

# data set for prediction
set.seed(5732)
n <- npred
source(datfile)
xmat.pred <- xmat
mu.pred <- mu.true
yy.pred <- yy
n <- ntest

# values of true beta at the quadrature points
beta.true <- beta0(xquad$pt)

postscript("sinica.ps")
set.seed(4)
source(datfile)
fit <- gflr(yy,xmat,"binomial",xquad,1:30,seq(-2.25,-1.75,len=101))
est0 <- estimate.gflr(fit,xquad$pt,se=TRUE)
est <- est0$fit
se <- est0$se
# pointwise CIs for coefficient function
est.ul <- est + qnorm(.975)*se
est.ll <- est - qnorm(.975)*se
# mean prediction interval
pred0 <- predict.gflr(fit,xmat.pred,se=TRUE)
wk1 <- pred0$pred-qnorm(0.975)*pred0$se
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wk2 <- pred0$pred+qnorm(0.975)*pred0$se
#cov <- mean(mu.pred>=wk1 & mu.pred<=wk2)
# estimation error
ee <- sum(xquad$wt*(est-beta.true)^2)
# prediction error
muwk <- apply(xquad$wt*est*xmat.pred,2,sum)
pe <- mean((muwk - mu.pred)^2)
# misclassification error using prediction set
mc <- mean(ifelse(1/(1+exp(-muwk))>=0.5,1,0)!=yy.pred[,1])
# plot coefficient estimate against true function
plot(rep(xquad$pt,4),c(est,beta.true,est.ul,est.ll),type="n",xlab="t",ylab="beta(t)")
lines(xquad$pt,beta.true)
lines(xquad$pt,est,lty=2)
lines(xquad$pt,est.ll,lty=3)
lines(xquad$pt,est.ul,lty=3)
dev.off()
# clean up by removing all variables
rm(list=ls())
```