## plot logistic curve, threshold, T/F +/-, sensitivity, specificity

## arguments

## model a fitted glm

## threshold cutoff for sensitivity/specificity, default 0.5

## title (optional)

logit.plot.quad <- function(model, threshold=0.5, title="Model success") {

sf<-sort(fitted(model), index=T)

# leave extra space at bottom

par(mar=c(6,4,4,2)+.1); par(xaxs="i", yaxs="r")

plot(sf$x, ylim=c(0,1), type="l", col="blue", lwd=3, xlab="",

ylab="probability of change")

abline(h=c(0,1), lty=1)

# show threshold and crossover point

abline(h=threshold,lty=2); text(0,threshold+.02,

paste("threshold =", threshold), pos=4)

crossover <- sum(fitted(model) < threshold)

abline(v=crossover,lty=2)

text(crossover,.05,"crossover",pos=4)

text(crossover, threshold-.03,

"fitted probability of change",col="blue",pos=4)

# name of the response field

field.name <- attr(attr(terms(formula(model)), "factors"),

"dimnames")[[1]][1]

# extract the T/F from it

eval(parse(text=paste("tmp <- ",

ifelse(class(model$data) == "data.frame", "model$data$", ""),

field.name, sep="")))

# show T/F as vertical bars at the index

# colours differ with T/F predictions

points(1:length(tmp),tmp[sf$ix],

pch="|",cex=1,

col=ifelse((tmp[sf$ix] == (sf$x>threshold)),"green4","red"))

# compute proportions

tn <- sum((!tmp[sf$ix]) & (sf$x < threshold))

fn <- sum((!tmp[sf$ix]) & (sf$x >= threshold))

tp <- sum(tmp[sf$ix] & (sf$x >= threshold))

fp <- sum(tmp[sf$ix] & (sf$x < threshold))

right <- length(sf$x)\*.65

text(0,.1,paste("True negatives:",tn), col="green4",pos=4)

text(right,.1,paste("False positives:", fn), col="red",pos=4)

text(right,.9,paste("True positives:", tp), col="green4",pos=4)

text(0,.9,paste("False negatives:", fp), col="red",pos=4)

title(main=title)

title(sub=paste("Sensitivity:", round(tp/(tp+fp),4),

"; Specificity:", round(tn/(tn+fn),4)), line=4)

}