Categorical regression

#Required pacakges

```
# install.packages("ROCR")
library(RcmdrMisc)
```

```
Loading required package: car
```

```
Loading required package: carData
```

```
Loading required package: sandwich
```

```
library(ggplot2)
library(ROCR)
```

#Functions ##the allSubsets() function

```
allSubsets.LogistReg <- function(data,y.name="Y",perf.measure=c("AIC","BIC")){

  Cols <- names(data)
  Cols <- Cols[! Cols %in% y.name]
  n <- length(Cols)

  id <- unlist(
    lapply(1:n,
           function(i)combn(1:n,i,simplify=F)
    )
    ,recursive=F)

  Formulas <- sapply(id,function(i)
    paste(y.name,"~",paste(Cols[i],collapse="+"))
```

```
  )

  result.mat <- matrix(0,nrow=length(Formulas),3)
  result.mat[,1] <- Formulas


  #get all AIC's

  for(i in 1:length(Formulas)){result.mat[i,2] <- AIC(glm(as.formula(Formulas[i]),
                                                          data=data,family=binomial))}
  #get all BIC's

  for(i in 1:length(Formulas)){result.mat[i,3] <- BIC(glm(as.formula(Formulas[i]),
                                                          data=data,family=binomial))}




  colnames(result.mat) <- c("Model","AIC","BIC")



  final.output <- data.frame(result.mat[order(result.mat[,perf.measure],decreasing=T),])

  return(final.output)

}
```

#Calculate the gini coefficient for a binary classifier

```
calcGini <- function(model,Y){

  if("ROCR" %in% installed.packages()[,"Package"] == "FALSE") stop("ROCR is not installed")

  library(ROCR)

  probs <- predict(model,type="response")
  pred <- prediction(probs,Y)
  perf <- performance(pred,'auc')
  gini <- abs(1-2*attr(perf,'y.values')[[1]])
  return(gini)
}
```