Sample Strategies

Read in

```r
data = read.csv("./train.csv")
```

cross validation sets

```r
ind = sample(1:nrow(data),0.75*nrow(data))
train = data[ind,]
test = data[-ind,]
```

log regression

```r
glm1 = glm(data = train, PL~percent_profitable + SMA_k7+SMA_k20+SMA_k50,family = "binomial")
```

cross validate log regression

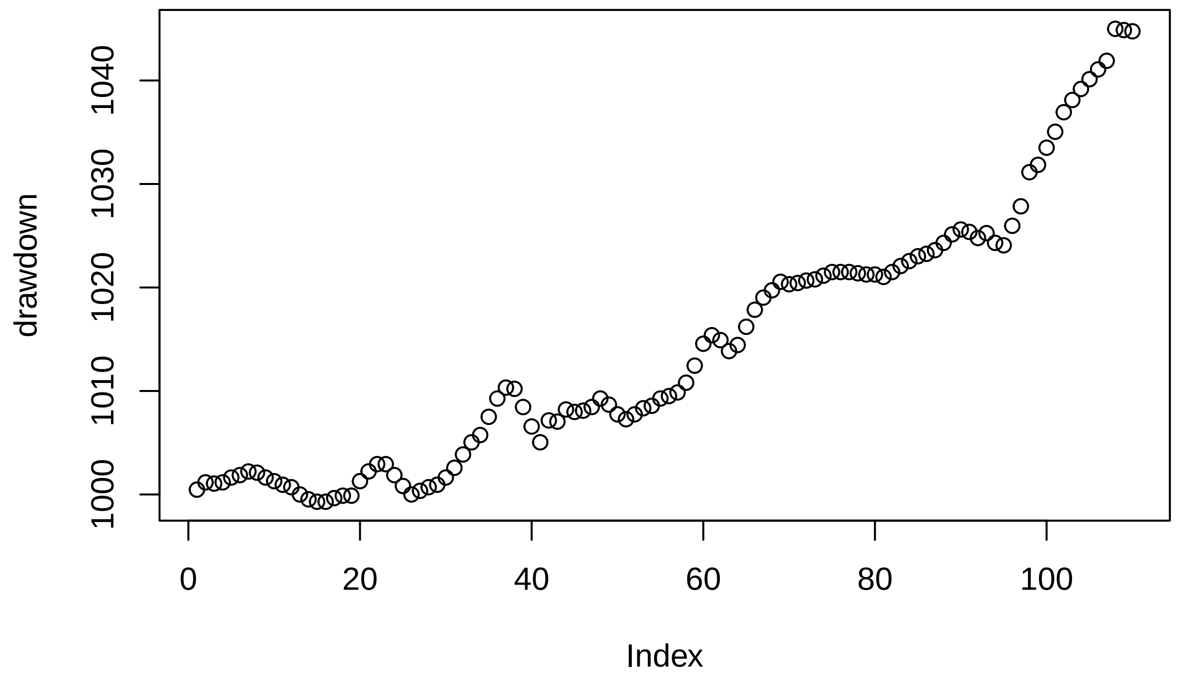
```r
pred_glm1 = ifelse(predict(glm1,test,type="response")>0.5,1,0)
mean(pred_glm1 == test$PL)
```

```
## [1] 0.6594982
```

decent accuracy! nice!

simulate log regression

```r
capital = 1000
drawdown = c()
for (i in 1:nrow(test)){
  pred_X = round(predict(glm1,test[i,],type ="response"))
  if (pred_X == 1){
    capital = capital + test$pl_value[i]
    drawdown = c(drawdown,capital)
  }
}
plot(drawdown)
```



random forests

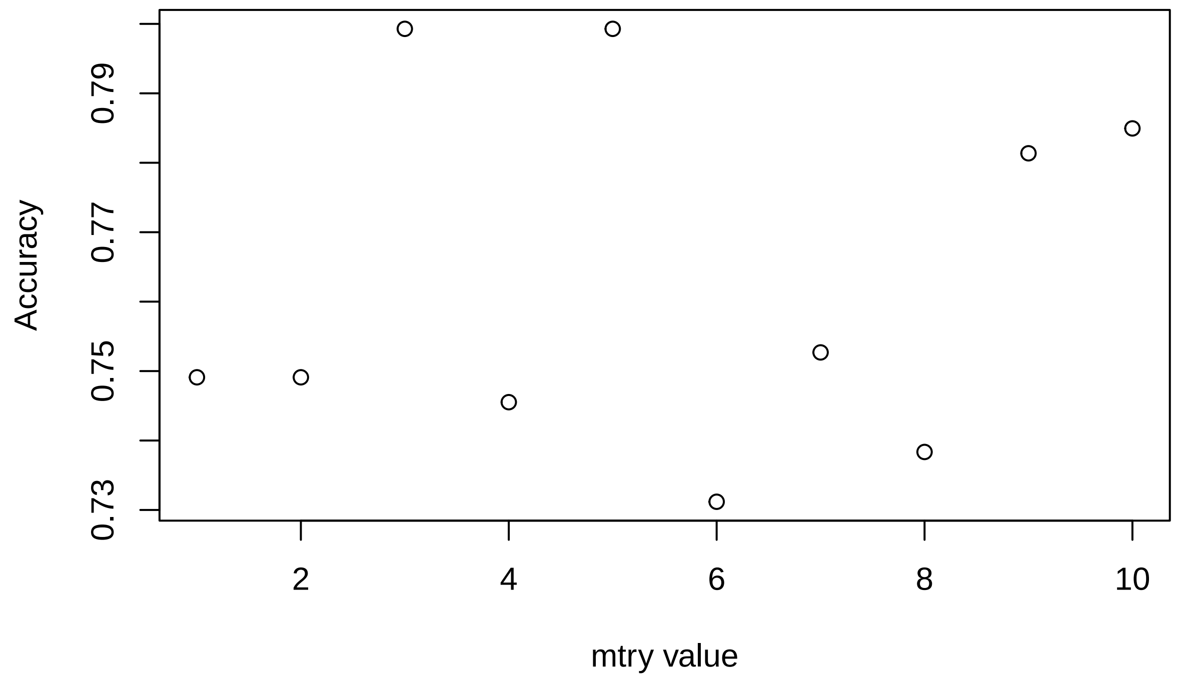
cross validate and find best the mtry tuning parameter.

```
library(randomForest)
```

```
## randomForest 4.7-1.1
```

```
## Type rfNews() to see new features/changes/bug fixes.
```

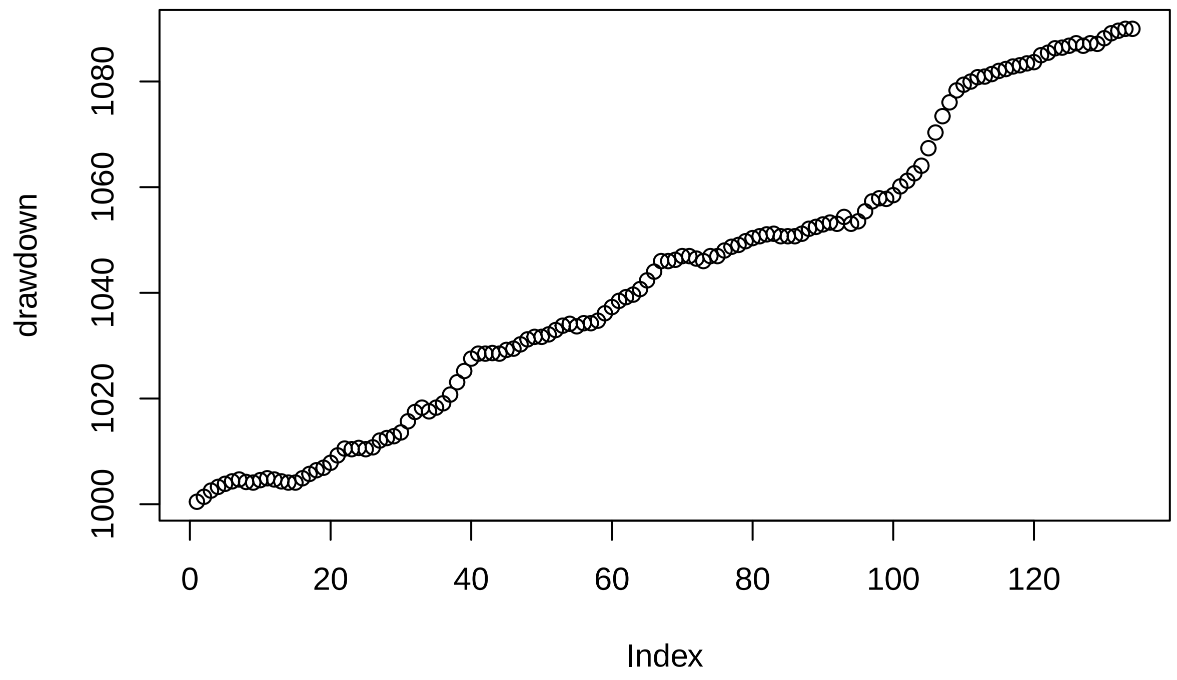
```
mtries = c()
for (i in 1:10){
  ind = sample(1:nrow(data),0.75*nrow(data))
  train = data[ind,]
  test = data[-ind,]
  rfX = randomForest(data = train, PL~percent_profitable+ SMA_k7+SMA_k20+SMA_k50,n.trees=1000, mtry = i
  pred_rfX = ifelse(predict(rfX,test,type="response")>0.5,1,0)
  mtries = c(mtries,mean(pred_rfX == test$PL))
}
plot(mtries, ylab = "Accuracy",xlab = "mtry value")
```



simulate trading rf

```
rf1 = randomForest(data = train, PL~percent_profitable+ SMA_k7+SMA_k20+SMA_k50,n.trees=1000)
```

```
capital = 1000
drawdown = c()
for (i in 1:nrow(test)){
  pred_X = round(predict(rf1,test[i,],type ="response"))
  if (pred_X == 1){
    capital = capital + test$pl_value[i]
    drawdown = c(drawdown,capital)
  }
}
plot(drawdown)
```



# Boosting

```
library(gbm)
```

```
## Warning: package 'gbm' was built under R version 4.1.3
```

```
## Loaded gbm 2.1.8.1
```

find best interaction depth

```
intdeps = c()
for (i in 1:10){
  ind = sample(1:nrow(data),0.75*nrow(data))
  train = data[ind,]
  test = data[-ind,]
  xgbX = gbm(data = train, PL~percent_profitable+ SMA_k7+SMA_k20+SMA_k50,n.trees=1000, interaction.dept
  pred_xgbX = ifelse(predict(xgbX,test,type="response")>0.5,1,0)
  intdeps = c(intdeps,mean(pred_xgbX == test$PL))
}
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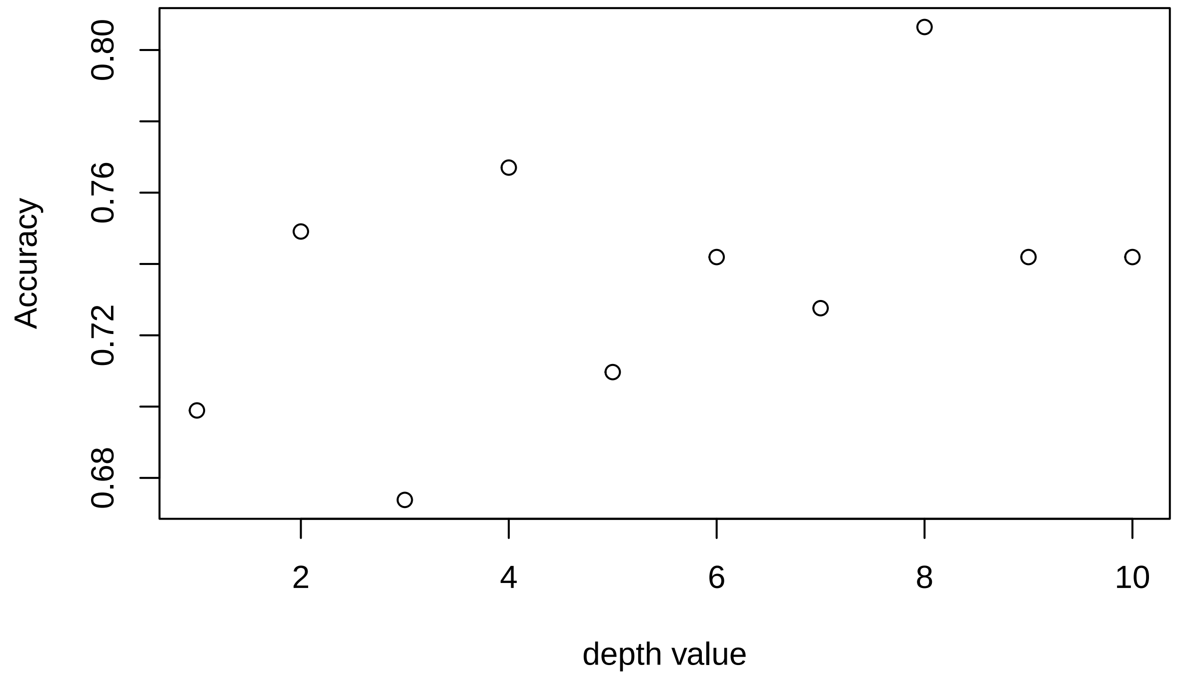
```
plot(intdeps, ylab = "Accuracy",xlab = "depth value")
```



simulate trading

```
gbm1 = gbm(data = train, PL~percent_profitable+ SMA_k7+SMA_k20+SMA_k50,n.trees=1000, interaction.depth 
capital = 1000
drawdown = c()
for (i in 1:nrow(test)){
```

```r
  pred_X = round(predict(gbm1,test[i,],type ="response"))
  if (pred_X == 1){
    capital = capital + test$pl_value[i]
    drawdown = c(drawdown,capital)
  }
}
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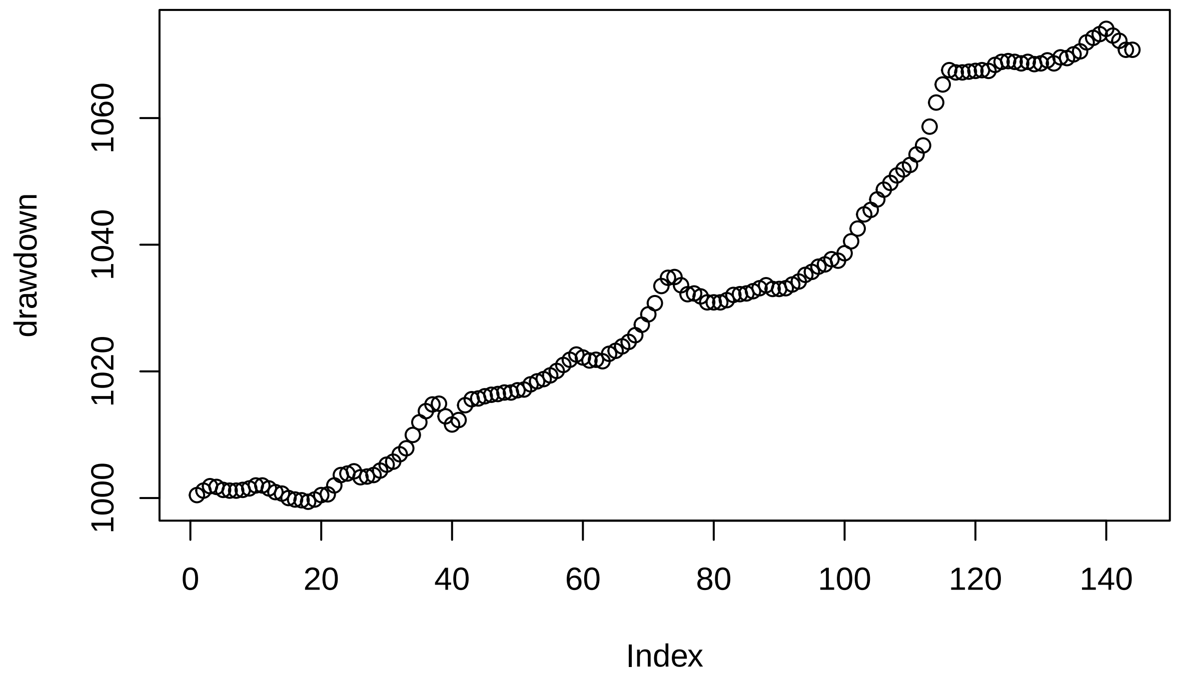
```
plot(drawdown)
```



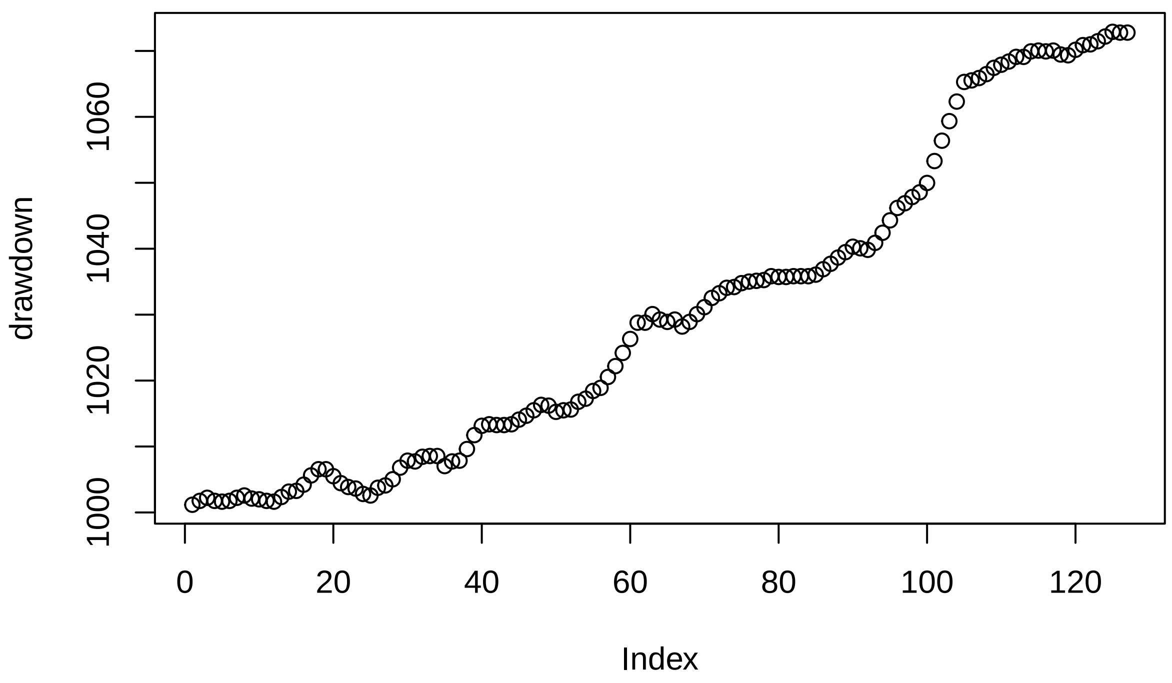
ensemble

```r
ind = sample(1:nrow(data),0.75*nrow(data))
train = data[ind,]
test = data[-ind,]
glm1 = glm(data = train, PL~percent_profitable + SMA_k7+SMA_k20+SMA_k50,family = "binomial")
rf1 = randomForest(data = train, PL~percent_profitable+ SMA_k7+SMA_k20+SMA_k50,n.trees=1000)
```

```
## Warning in randomForest.default(m, y, ...): The response has five or fewer
## unique values. Are you sure you want to do regression?
```

```r
capital = 1000
drawdown = c()

for (i in 1:nrow(test)){
  pred_1 = (predict(glm1,test[i,],type ="response"))
  pred_2 = (predict(rf1,test[i,],type ="response"))
  if (pred_1+pred_2 >= 1){
    capital = capital + test$pl_value[i]
    drawdown = c(drawdown,capital)
  }
}
plot(drawdown)
```


drawdown
1000
1020
1040
1060
0
20
40
60
80
100
120
Index