

```
options("getSymbols.warning4.0"=FALSE)
Sys.setenv(TZ="UTC")
currency('USD')
```

```
[1] "USD"
```

```
initDate = "1990-01-01"
from = "2003-01-01"
to = "2013-12-31"
options(width = 70)
```

Backtesting

```
source(file.path(data.dir, "common.r"))
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/XLB?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I '
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/XLB?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I '
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/XLE?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I '
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/XLE?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I '
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/XLF?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I '
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/XLF?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I '
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query1.finance.yahoo.com/v7/finance/download/XLP?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query1.finance.yahoo.com/v7/finance/download/XLP?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query2.finance.yahoo.com/v7/finance/download/XLI?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query2.finance.yahoo.com/v7/finance/download/XLI?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query1.finance.yahoo.com/v7/finance/download/XLU?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query1.finance.yahoo.com/v7/finance/download/XLU?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query2.finance.yahoo.com/v7/finance/download/XLV?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query2.finance.yahoo.com/v7/finance/download/XLV?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query2.finance.yahoo.com/v7/finance/download/XLK?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader
```

```
on 'https://query1.finance.yahoo.com/v7/finance/download/XLK?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I '

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/XLY?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I '

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/XLY?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I '

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/RWR?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I '

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/RWR?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I '

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/EWJ?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I '

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/EWJ?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I '

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/EWU?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I '

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/EWU?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I '

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/EWC?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I '

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
```

```
on 'https://query2.finance.yahoo.com/v7/finance/download/EWC?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/EWY?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/EWY?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/EWA?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/EWA?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/EWH?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/EWH?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/EWS?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/EWS?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'

Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/IYZ?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query1.finance.yahoo.com/v7/finance/download/IYZ?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query2.finance.yahoo.com/v7/finance/download/EZU?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query1.finance.yahoo.com/v7/finance/download/EZU?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query1.finance.yahoo.com/v7/finance/download/IYR?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query2.finance.yahoo.com/v7/finance/download/IYR?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query2.finance.yahoo.com/v7/finance/download/EWT?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query2.finance.yahoo.com/v7/finance/download/EWT?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query1.finance.yahoo.com/v7/finance/download/EWZ?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader  
on 'https://query1.finance.yahoo.com/v7/finance/download/EWZ?  
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,  
quote = quote, : incomplete final line found by readTableHeader
```

```
on 'https://query2.finance.yahoo.com/v7/finance/download/EFA?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/EFA?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/IGE?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/IGE?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/EPP?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/EPP?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/LQD?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/LQD?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/SHY?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/SHY?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/IEF?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/IEF?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query2.finance.yahoo.com/v7/finance/download/TLT?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
Warning in read.table(file = file, header = header, sep = sep,
quote = quote, : incomplete final line found by readTableHeader
on 'https://query1.finance.yahoo.com/v7/finance/download/TLT?
period1=-2208988800&period2=1584662400&interval=1d&events=split&crumb=tYf5QUUA19I'
```

```
# Define the instrument type
```

```
stock(symbols, currency = "USD", multiplier = 1)
```

```
[1] "XLB" "XLE" "XLF" "XLP" "XLI" "XLU" "XLV" "XLK" "XLY" "RWR" "EWJ"
[12] "EWU" "EWC" "EWY" "EWA" "EWH" "EWS" "IYZ" "EZU" "IYR" "EWT" "EWZ"
[23] "EFA" "IGE" "EPP" "LQD" "SHY" "IEF" "TLT"
```

The first strategy: A simple trend follower

```
"lagATR" <- function(HLC, n = 14, maType, lag = 1, ...) {
  ATR <- ATR(HLC, n = n, maType = maType, ...)
  ATR <- lag(ATR, lag)
  out <- ATR$atr
  colnames(out) <- "atr"
  return(out)
}
```

```
"osDollarATR" <- function(orderside, tradeSize, pctATR,
  maxPctATR = pctATR, data, timestamp,
  symbol, prefer = "Open", portfolio, integerQty = TRUE,
  atrMod = "", rebal = FALSE, ...) {
  if(tradeSize > 0 & orderside == "short"){
    tradeSize <- tradeSize * -1
  }
}
```

```
pos <- getPosQty(portfolio, symbol, timestamp)
```

```
atrString <- paste0("atr", atrMod)
atrCol <- grep(atrString, colnames(mktdata))

if(length(atrCol) == 0) {
  stop(paste("Term", atrString,
    "not found in mktdata column names."))
}

atrTimeStamp <- mktdata[timestamp, atrCol]
if(is.na(atrTimeStamp) | atrTimeStamp == 0) {
  stop(paste("ATR corresponding to", atrString,
    "is invalid at this point in time. Add a logical
    operator to account for this."))
}

dollarATR <- pos * atrTimeStamp

desiredDollarATR <- pctATR * tradeSize
remainingRiskCapacity <- tradeSize *
  maxPctATR - dollarATR

if(orderside == "long"){
  qty <- min(tradeSize * pctATR / atrTimeStamp,
    remainingRiskCapacity / atrTimeStamp)
} else {
  qty <- max(tradeSize * pctATR / atrTimeStamp,
    remainingRiskCapacity / atrTimeStamp)
}

if(integerQty) {
  qty <- trunc(qty)
}
if(!rebal) {
  if(orderside == "long" & qty < 0) {
    qty <- 0
  }
  if(orderside == "short" & qty > 0) {
    qty <- 0
  }
}
if(rebal) {
  if(pos == 0) {
    qty <- 0
  }
}
```



```

    return(qty)
}

initDate = "1990-01-01"
from = "2003-01-01"
to = "2013-12-31"
options(width = 70)

source(file.path(data.dir, "common.r"))

# Trade sizing and initial equity settings
tradeSize <- 10000
initEq <- tradeSize * length(symbols)

strategy.st <- "Clenow_Simple"

portfolio.st <- "Clenow_Simple"
account.st <- "Clenow_Simple"

rm.strat(portfolio.st)
rm.strat(strategy.st)

initPortf(portfolio.st, symbols = symbols,
  initDate = initDate, currency = 'USD')

[1] "Clenow_Simple"

initAcct(account.st, portfolios = portfolio.st,
  initDate = initDate, currency = 'USD', initEq = initEq)

[1] "Clenow_Simple"

initOrders(portfolio.st, initDate = initDate)

strategy(strategy.st, store=TRUE)

```

Backtesting Strategy 1

```

nLag = 252
pctATR = 0.02
period = 10

namedLag <- function(x, k = 1, na.pad = TRUE, ...) {
  out <- lag(x, k = k, na.pad = na.pad, ...)
  out[is.na(out)] <- x[is.na(out)]
}

```

```
colnames(out) <- "namedLag"
return(out)
}
```

```
add.indicator(strategy.st, name = "namedLag",
  arguments = list(x = quote(Cl(mktdata)), k = nLag),
  label = "ind")
```

```
[1] "Clenow_Simple"
```

```
add.indicator(strategy.st, name = "lagATR",
  arguments = list(HLC = quote(HLC(mktdata)), n = period),
  label = "atrX")
```

```
[1] "Clenow_Simple"
```

```
test <- applyIndicators(strategy.st, mktdata = OHLC(XLB))
head(round(test, 2), 253)
```

	XLB.Open	XLB.High	XLB.Low	XLB.Close	namedLag.ind	atr.atrX
2003-01-02	15.47	15.73	15.33	15.72	15.72	NA
2003-01-03	15.67	15.69	15.55	15.64	15.64	NA
2003-01-06	15.74	16.04	15.74	15.94	15.94	NA
2003-01-07	16.01	16.01	15.81	15.88	15.88	NA
2003-01-08	15.83	15.83	15.45	15.47	15.47	NA
2003-01-09	15.59	15.76	15.56	15.71	15.71	NA
2003-01-10	15.58	15.91	15.58	15.88	15.88	NA
2003-01-13	15.98	16.00	15.76	15.81	15.81	NA
2003-01-14	15.76	15.89	15.76	15.89	15.89	NA
2003-01-15	15.81	15.81	15.54	15.63	15.63	NA
2003-01-16	15.60	15.81	15.60	15.71	15.71	NA
2003-01-17	15.61	15.77	15.57	15.59	15.59	0.27
2003-01-21	15.61	15.61	15.23	15.25	15.25	0.27
2003-01-22	15.24	15.31	15.06	15.06	15.06	0.28
2003-01-23	15.14	15.37	15.14	15.29	15.29	0.28
2003-01-24	15.23	15.31	14.89	14.95	14.95	0.28
2003-01-27	14.71	14.82	14.48	14.48	14.48	0.29
2003-01-28	14.48	14.69	14.48	14.61	14.61	0.31
2003-01-29	14.66	14.79	14.38	14.72	14.72	0.30
2003-01-30	14.57	14.66	14.36	14.40	14.40	0.31
2003-01-31	14.42	14.66	14.36	14.55	14.55	0.32
2003-02-03	14.51	14.69	14.51	14.59	14.59	0.32
2003-02-04	14.44	14.55	14.35	14.53	14.53	0.30
2003-02-05	14.53	14.76	14.48	14.49	14.49	0.30
2003-02-06	14.45	14.52	14.27	14.32	14.32	0.29
2003-02-07	14.47	14.47	14.22	14.25	14.25	0.29

2003-02-10	14.25	14.38	14.18	14.32	14.32	0.29
2003-02-11	14.42	14.42	14.13	14.16	14.16	0.28
2003-02-12	14.21	14.24	14.09	14.13	14.13	0.28
2003-02-13	14.17	14.24	14.05	14.17	14.17	0.27
2003-02-14	14.19	14.34	13.95	14.18	14.18	0.26
2003-02-18	14.36	14.56	14.36	14.49	14.49	0.27
2003-02-19	14.49	14.59	14.25	14.36	14.36	0.28
2003-02-20	14.39	14.41	14.15	14.21	14.21	0.29
2003-02-21	14.19	14.45	14.13	14.45	14.45	0.28
2003-02-24	14.45	14.45	14.09	14.09	14.09	0.29
2003-02-25	13.98	14.06	13.76	14.06	14.06	0.29
2003-02-26	14.15	14.25	14.08	14.12	14.12	0.30
2003-02-27	14.17	14.25	14.05	14.14	14.14	0.29
2003-02-28	14.16	14.28	14.12	14.17	14.17	0.28
2003-03-03	14.15	14.34	14.11	14.11	14.11	0.27
2003-03-04	14.11	14.11	13.77	13.77	13.77	0.26
2003-03-05	13.77	13.85	13.64	13.83	13.83	0.27
2003-03-06	13.79	13.79	13.54	13.59	13.59	0.26
2003-03-07	13.44	13.72	13.40	13.67	13.67	0.27
2003-03-10	13.59	13.62	13.40	13.40	13.40	0.27
2003-03-11	13.39	13.57	13.30	13.30	13.30	0.27
2003-03-12	13.28	13.32	13.13	13.32	13.32	0.27
2003-03-13	13.60	13.91	13.55	13.91	13.91	0.26
2003-03-14	13.98	14.15	13.84	13.99	13.99	0.30
2003-03-17	13.95	14.46	13.91	14.46	14.46	0.30
2003-03-18	14.59	14.81	14.52	14.75	14.75	0.32
2003-03-19	14.76	14.76	14.55	14.69	14.69	0.32
2003-03-20	14.57	14.74	14.47	14.72	14.72	0.31
2003-03-21	14.85	15.25	14.74	15.25	15.25	0.31
2003-03-24	14.98	15.01	14.61	14.65	14.65	0.33
2003-03-25	14.62	14.84	14.62	14.67	14.67	0.36
2003-03-26	14.68	14.73	14.54	14.63	14.63	0.35
2003-03-27	14.50	14.52	14.35	14.46	14.46	0.33
2003-03-28	14.43	14.49	14.33	14.49	14.49	0.33
2003-03-31	14.23	14.33	14.10	14.26	14.26	0.31
2003-04-01	14.31	14.41	14.09	14.41	14.41	0.32
2003-04-02	14.61	14.75	14.57	14.71	14.71	0.32
2003-04-03	14.75	14.75	14.56	14.56	14.56	0.32
2003-04-04	14.64	14.71	14.54	14.64	14.64	0.31
2003-04-07	14.83	15.12	14.76	14.76	14.76	0.29
2003-04-08	14.75	14.78	14.58	14.67	14.67	0.31
2003-04-09	14.74	14.76	14.41	14.41	14.41	0.30
2003-04-10	14.41	14.50	14.39	14.47	14.47	0.30
2003-04-11	14.62	14.68	14.41	14.43	14.43	0.29
2003-04-14	14.44	14.73	14.44	14.72	14.72	0.28

2003-04-15	14.71	14.98	14.63	14.98	14.98	0.28
2003-04-16	15.04	15.04	14.75	14.78	14.78	0.29
2003-04-17	14.85	14.99	14.77	14.98	14.98	0.29
2003-04-21	15.05	15.09	14.93	14.96	14.96	0.28
2003-04-22	14.89	15.27	14.88	15.27	15.27	0.27
2003-04-23	15.28	15.44	15.19	15.39	15.39	0.28
2003-04-24	15.35	15.51	15.27	15.30	15.30	0.28
2003-04-25	15.32	15.32	14.97	15.07	15.07	0.28
2003-04-28	15.03	15.39	15.03	15.33	15.33	0.28
2003-04-29	15.41	15.53	15.30	15.47	15.47	0.29
2003-04-30	15.47	15.66	15.37	15.54	15.54	0.29
2003-05-01	15.50	15.50	15.23	15.43	15.43	0.29
2003-05-02	15.47	15.64	15.46	15.64	15.64	0.29
2003-05-05	15.60	15.69	15.54	15.60	15.60	0.28
2003-05-06	15.64	15.78	15.59	15.70	15.70	0.27
2003-05-07	15.67	15.70	15.51	15.59	15.59	0.26
2003-05-08	15.50	15.62	15.42	15.43	15.43	0.25
2003-05-09	15.55	15.73	15.44	15.72	15.72	0.25
2003-05-12	15.73	15.97	15.61	15.95	15.95	0.25
2003-05-13	15.90	15.93	15.77	15.84	15.84	0.26
2003-05-14	15.87	15.87	15.64	15.74	15.74	0.25
2003-05-15	15.80	15.85	15.69	15.84	15.84	0.25
2003-05-16	15.77	15.85	15.67	15.77	15.77	0.24
2003-05-19	15.73	15.73	15.44	15.47	15.47	0.24
2003-05-20	15.53	15.59	15.29	15.43	15.43	0.25
2003-05-21	15.45	15.58	15.36	15.53	15.53	0.25
2003-05-22	15.59	15.69	15.46	15.66	15.66	0.25
2003-05-23	15.67	15.70	15.57	15.68	15.68	0.25
2003-05-27	15.70	16.00	15.64	15.96	15.96	0.23
2003-05-28	15.98	16.02	15.84	15.92	15.92	0.25
2003-05-29	15.93	16.02	15.74	15.78	15.78	0.24
2003-05-30	15.82	16.05	15.80	16.02	16.02	0.24
2003-06-02	16.13	16.38	16.10	16.18	16.18	0.25
2003-06-03	16.17	16.24	16.09	16.19	16.19	0.26
2003-06-04	16.16	16.50	16.16	16.46	16.46	0.25
2003-06-05	16.49	16.53	16.36	16.50	16.50	0.26
2003-06-06	16.60	16.71	16.41	16.47	16.47	0.25
2003-06-09	16.38	16.40	16.18	16.19	16.19	0.25
2003-06-10	16.23	16.37	16.23	16.30	16.30	0.26
2003-06-11	16.40	16.47	16.31	16.46	16.46	0.25
2003-06-12	16.60	16.60	16.42	16.60	16.60	0.24
2003-06-13	16.56	16.60	16.33	16.38	16.38	0.24
2003-06-16	16.40	16.71	16.39	16.71	16.71	0.24
2003-06-17	16.75	16.81	16.62	16.78	16.78	0.25
2003-06-18	16.78	16.78	16.58	16.61	16.61	0.24

2003-06-19	16.68	16.73	16.52	16.53	16.53	0.24
2003-06-20	16.55	16.61	16.43	16.45	16.45	0.23
2003-06-23	16.42	16.43	16.07	16.15	16.15	0.23
2003-06-24	16.15	16.26	16.11	16.18	16.18	0.24
2003-06-25	16.21	16.29	16.04	16.08	16.08	0.23
2003-06-26	16.13	16.34	16.05	16.32	16.32	0.24
2003-06-27	16.36	16.36	16.10	16.18	16.18	0.24
2003-06-30	16.11	16.25	16.02	16.17	16.17	0.24
2003-07-01	16.11	16.16	15.87	16.13	16.13	0.24
2003-07-02	16.21	16.35	16.12	16.33	16.33	0.25
2003-07-03	16.25	16.31	16.11	16.22	16.22	0.25
2003-07-07	16.17	16.46	16.17	16.43	16.43	0.24
2003-07-08	16.42	16.43	16.31	16.41	16.41	0.25
2003-07-09	16.41	16.41	16.22	16.36	16.36	0.24
2003-07-10	16.25	16.25	15.99	16.08	16.08	0.23
2003-07-11	16.19	16.23	16.13	16.18	16.18	0.24
2003-07-14	16.32	16.36	16.18	16.24	16.24	0.24
2003-07-15	16.34	16.34	16.08	16.12	16.12	0.23
2003-07-16	16.15	16.20	15.97	16.05	16.05	0.23
2003-07-17	15.93	16.13	15.93	16.02	16.02	0.23
2003-07-18	16.16	16.38	16.15	16.38	16.38	0.23
2003-07-21	16.38	16.41	16.25	16.32	16.32	0.24
2003-07-22	16.39	16.65	16.28	16.65	16.65	0.24
2003-07-23	16.68	16.70	16.50	16.69	16.69	0.25
2003-07-24	16.78	17.10	16.77	16.89	16.89	0.24
2003-07-25	16.94	17.28	16.85	17.28	17.28	0.26
2003-07-28	17.33	17.35	17.14	17.28	17.28	0.28
2003-07-29	17.34	17.34	16.98	17.23	17.23	0.27
2003-07-30	17.28	17.28	17.16	17.24	17.24	0.28
2003-07-31	17.35	17.63	17.28	17.44	17.44	0.26
2003-08-01	17.43	17.46	17.17	17.26	17.26	0.28
2003-08-04	17.26	17.36	17.02	17.30	17.30	0.28
2003-08-05	17.32	17.32	16.98	16.98	16.98	0.28
2003-08-06	16.96	17.10	16.86	16.95	16.95	0.29
2003-08-07	16.99	17.02	16.78	16.96	16.96	0.29
2003-08-08	17.06	17.16	16.96	17.14	17.14	0.28
2003-08-11	17.19	17.28	17.08	17.22	17.22	0.27
2003-08-12	17.25	17.32	17.13	17.32	17.32	0.27
2003-08-13	17.38	17.38	17.24	17.30	17.30	0.26
2003-08-14	17.28	17.63	17.28	17.58	17.58	0.25
2003-08-15	17.67	17.67	17.39	17.51	17.51	0.26
2003-08-18	17.64	17.78	17.54	17.74	17.74	0.26
2003-08-19	17.79	17.93	17.74	17.93	17.93	0.26
2003-08-20	17.90	17.97	17.83	17.90	17.90	0.25
2003-08-21	17.94	18.17	17.94	18.01	18.01	0.24

2003-08-22	17.98	18.05	17.71	17.71	17.71	0.24
2003-08-25	17.64	17.67	17.48	17.63	17.63	0.25
2003-08-26	17.59	17.67	17.35	17.65	17.65	0.25
2003-08-27	17.65	17.75	17.57	17.71	17.71	0.26
2003-08-28	17.77	17.95	17.57	17.90	17.90	0.25
2003-08-29	17.85	17.95	17.81	17.92	17.92	0.26
2003-09-02	18.02	18.17	17.84	18.13	18.13	0.25
2003-09-03	18.20	18.20	18.06	18.14	18.14	0.26
2003-09-04	18.04	18.05	17.89	17.98	17.98	0.25
2003-09-05	17.91	17.97	17.78	17.91	17.91	0.25
2003-09-08	17.96	18.15	17.87	18.06	18.06	0.24
2003-09-09	17.98	18.10	17.94	17.99	17.99	0.25
2003-09-10	18.00	18.00	17.60	17.65	17.65	0.24
2003-09-11	17.71	17.78	17.61	17.71	17.71	0.25
2003-09-12	17.77	18.06	17.63	17.99	17.99	0.24
2003-09-15	18.09	18.09	17.87	17.92	17.92	0.26
2003-09-16	17.92	18.05	17.87	18.01	18.01	0.26
2003-09-17	17.94	17.94	17.74	17.74	17.74	0.25
2003-09-18	17.81	17.92	17.74	17.88	17.88	0.25
2003-09-19	17.96	17.96	17.80	17.96	17.96	0.24
2003-09-22	17.76	17.80	17.59	17.67	17.67	0.24
2003-09-23	17.60	17.75	17.54	17.72	17.72	0.25
2003-09-24	17.77	17.77	17.38	17.45	17.45	0.24
2003-09-25	17.45	17.45	17.16	17.16	17.16	0.26
2003-09-26	17.09	17.19	17.08	17.12	17.12	0.26
2003-09-29	17.25	17.39	17.12	17.38	17.38	0.25
2003-09-30	17.30	17.30	17.01	17.12	17.12	0.25
2003-10-01	17.22	17.42	17.18	17.41	17.41	0.26
2003-10-02	17.41	17.56	17.39	17.53	17.53	0.27
2003-10-03	17.76	17.91	17.67	17.74	17.74	0.26
2003-10-06	17.68	17.81	17.65	17.74	17.74	0.27
2003-10-07	17.72	17.82	17.59	17.81	17.81	0.26
2003-10-08	17.88	17.99	17.84	17.88	17.88	0.25
2003-10-09	18.03	18.09	17.88	17.95	17.95	0.25
2003-10-10	17.99	18.03	17.88	17.89	17.89	0.24
2003-10-13	18.03	18.14	17.99	18.08	18.08	0.24
2003-10-14	18.17	18.20	18.03	18.20	18.20	0.24
2003-10-15	18.28	18.28	18.07	18.18	18.18	0.23
2003-10-16	18.16	18.38	18.09	18.25	18.25	0.23
2003-10-17	18.32	18.32	18.03	18.07	18.07	0.23
2003-10-20	18.10	18.19	18.06	18.14	18.14	0.24
2003-10-21	18.15	18.26	18.14	18.19	18.19	0.23
2003-10-22	18.07	18.07	17.84	17.88	17.88	0.22
2003-10-23	17.86	18.03	17.85	17.96	17.96	0.23
2003-10-24	17.98	17.98	17.80	17.93	17.93	0.23

2003-10-27	17.92	18.12	17.92	18.06	18.06	0.22
2003-10-28	18.15	18.25	18.03	18.21	18.21	0.22
2003-10-29	18.15	18.48	18.14	18.46	18.46	0.22
2003-10-30	18.67	18.86	18.62	18.78	18.78	0.23
2003-10-31	18.79	18.89	18.68	18.75	18.75	0.25
2003-11-03	18.75	19.05	18.67	18.79	18.79	0.24
2003-11-04	18.78	18.83	18.67	18.76	18.76	0.26
2003-11-05	18.74	18.78	18.58	18.68	18.68	0.25
2003-11-06	18.65	18.74	18.55	18.74	18.74	0.24
2003-11-07	18.74	18.90	18.74	18.81	18.81	0.24
2003-11-10	18.82	18.82	18.53	18.54	18.54	0.23
2003-11-11	18.56	18.61	18.48	18.50	18.50	0.24
2003-11-12	18.58	18.79	18.51	18.79	18.79	0.22
2003-11-13	18.66	18.78	18.66	18.77	18.77	0.23
2003-11-14	18.76	18.95	18.64	18.66	18.66	0.22
2003-11-17	18.62	18.65	18.37	18.54	18.54	0.23
2003-11-18	18.61	18.61	18.40	18.48	18.48	0.24
2003-11-19	18.48	18.54	18.39	18.49	18.49	0.23
2003-11-20	18.42	18.54	18.25	18.35	18.35	0.23
2003-11-21	18.36	18.46	18.34	18.39	18.39	0.23
2003-11-24	18.49	18.65	18.48	18.64	18.64	0.22
2003-11-25	18.64	18.94	18.64	18.90	18.90	0.22
2003-11-26	19.05	19.15	19.01	19.13	19.13	0.23
2003-11-28	19.13	19.21	19.13	19.17	19.17	0.23
2003-12-01	19.29	19.74	19.29	19.74	19.74	0.22
2003-12-02	19.72	19.77	19.63	19.72	19.72	0.25
2003-12-03	19.81	19.99	19.74	19.88	19.88	0.24
2003-12-04	19.88	20.04	19.83	20.02	20.02	0.25
2003-12-05	19.99	19.99	19.80	19.84	19.84	0.24
2003-12-08	19.88	20.17	19.84	20.17	20.17	0.24
2003-12-09	20.29	20.33	20.14	20.14	20.14	0.25
2003-12-10	20.14	20.19	19.84	19.90	19.90	0.24
2003-12-11	19.90	20.14	19.82	20.10	20.10	0.26
2003-12-12	20.21	20.30	20.12	20.27	20.27	0.26
2003-12-15	20.50	20.50	20.17	20.24	20.24	0.26
2003-12-16	20.28	20.29	20.05	20.24	20.24	0.26
2003-12-17	20.10	20.38	20.10	20.36	20.36	0.26
2003-12-18	20.35	20.59	20.31	20.53	20.53	0.26
2003-12-19	20.65	20.66	20.45	20.55	20.55	0.26
2003-12-22	20.66	20.77	20.60	20.75	20.75	0.26
2003-12-23	20.84	20.84	20.66	20.80	20.80	0.26
2003-12-24	20.66	20.78	20.66	20.72	20.72	0.25
2003-12-26	20.78	20.90	20.76	20.88	20.88	0.24
2003-12-29	21.02	21.25	20.90	21.22	21.22	0.23
2003-12-30	21.25	21.29	20.99	21.09	21.09	0.25

2003-12-31	21.14	21.16	20.96	21.05	21.05	0.25
2004-01-02	21.18	21.22	20.90	20.95	15.72	0.25

```
# Signals
```

```
add.signal(strategy.st, name = "sigCrossover",
  arguments = list(columns = c("Close", "namedLag.ind"),
    relationship = "gt"),
  label = "coverOrBuy")
```

```
[1] "Clenow_Simple"
```

```
add.signal(strategy.st, name = "sigCrossover",
  arguments = list(columns = c("Close", "namedLag.ind"),
    relationship = "lt"),
  label = "sellOrShort")
```

```
[1] "Clenow_Simple"
```

```
# Long rules
```

```
add.rule(strategy.st, name = "ruleSignal",
  arguments = list(sigcol = "coverOrBuy",
    signal = TRUE, ordertype = "market",
    orderside = "long", replace = FALSE,
    prefer = "Open", osFUN = osDollarATR,
    tradeSize = tradeSize, pctATR = pctATR,
    atrMod = "X"), type = "enter", path.dep = TRUE)
```

```
[1] "Clenow_Simple"
```

```
add.rule(strategy.st, name = "ruleSignal",
  arguments = list(sigcol = "sellOrShort",
    signal = TRUE, orderqty = "all",
    ordertype = "market", orderside = "long",
    replace = FALSE, prefer = "Open"),
  type = "exit", path.dep = TRUE)
```

```
[1] "Clenow_Simple"
```

```
# Short rules
```

```
add.rule(strategy.st, name = "ruleSignal",
  arguments = list(sigcol = "sellOrShort",
    signal = TRUE, ordertype = "market",
    orderside = "short", replace = FALSE,
    prefer = "Open", osFUN = osDollarATR,
    tradeSize = -tradeSize, pctATR = pctATR,
    atrMod = "X"), type = "enter", path.dep = TRUE)
```

```
[1] "Clenow_Simple"
```



```
add.rule(strategy.st, name = "ruleSignal",
  arguments = list(sigcol = "coverOrBuy",
    signal = TRUE, orderqty = "all",
    ordertype = "market", orderside = "short",
    replace = FALSE, prefer = "Open"),
  type = "exit", path.dep = TRUE)
```

```
[1] "Clenow_Simple"
```

```
# Get begin time
```

```
t1 <- Sys.time()
```

```
out <- applyStrategy(strategy = strategy.st,
  portfolios = portfolio.st)
```

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[1] "2004-01-05 00:00:00 EFA 1610 @ 11.886583510574"
[1] "2008-01-22 00:00:00 EFA -1610 @ 55.4344470812123"
[1] "2008-01-22 00:00:00 EFA -153 @ 55.4344470812123"
[1] "2008-01-30 00:00:00 EFA 153 @ 59.4690711734721"
[1] "2008-01-30 00:00:00 EFA 108 @ 59.4690711734721"
[1] "2008-01-31 00:00:00 EFA -108 @ 58.5604497361679"
[1] "2008-01-31 00:00:00 EFA -116 @ 58.5604497361679"
[1] "2008-02-04 00:00:00 EFA 116 @ 61.1946313078133"
[1] "2008-02-04 00:00:00 EFA 112 @ 61.1946313078133"
[1] "2008-02-05 00:00:00 EFA -112 @ 59.1689807538013"
[1] "2008-02-05 00:00:00 EFA -117 @ 59.1689807538013"
[1] "2008-02-28 00:00:00 EFA 117 @ 61.3196664124072"
[1] "2008-02-28 00:00:00 EFA 162 @ 61.3196664124072"
[1] "2008-03-07 00:00:00 EFA -162 @ 58.3103670229693"
[1] "2008-03-07 00:00:00 EFA -165 @ 58.3103670229693"
[1] "2008-03-13 00:00:00 EFA 165 @ 58.718835537887"
[1] "2008-03-13 00:00:00 EFA 142 @ 58.718835537887"
[1] "2008-03-17 00:00:00 EFA -142 @ 56.8182275908755"
[1] "2008-03-17 00:00:00 EFA -149 @ 56.8182275908755"
[1] "2008-05-19 00:00:00 EFA 149 @ 65.487669952348"
[1] "2008-05-19 00:00:00 EFA 254 @ 65.487669952348"
[1] "2008-05-20 00:00:00 EFA -254 @ 64.9875103611558"
[1] "2008-05-20 00:00:00 EFA -256 @ 64.9875103611558"
[1] "2009-09-17 00:00:00 EFA 256 @ 48.6667754952624"
[1] "2009-09-17 00:00:00 EFA 200 @ 48.6667754952624"
[1] "2009-09-21 00:00:00 EFA -200 @ 48.0079292803932"
[1] "2009-09-21 00:00:00 EFA -209 @ 48.0079292803932"
[1] "2009-09-30 00:00:00 EFA 209 @ 48.4120207470514"
[1] "2009-09-30 00:00:00 EFA 214 @ 48.4120207470514"
[1] "2009-10-02 00:00:00 EFA -214 @ 46.0753128383152"
[1] "2009-10-02 00:00:00 EFA -225 @ 46.0753128383152"
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[1] "2009-10-05 00:00:00 EFA 225 @ 46.2861418701501"
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[1] "2010-08-24 00:00:00 EFA -215 @ 44.6742754188833"
[1] "2010-08-24 00:00:00 EFA -245 @ 44.6742754188833"
[1] "2010-09-02 00:00:00 EFA 245 @ 46.6315390765613"
[1] "2010-09-02 00:00:00 EFA 255 @ 46.6315390765613"
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[1] "2010-09-14 00:00:00 EFA 253 @ 48.3272322757834"
[1] "2010-09-14 00:00:00 EFA 273 @ 48.3272322757834"
[1] "2010-09-17 00:00:00 EFA -273 @ 48.5978205701904"
[1] "2010-09-17 00:00:00 EFA -270 @ 48.5978205701904"
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[1] "2011-08-09 00:00:00 EFA -144 @ 47.9665145705095"
[1] "2011-08-10 00:00:00 EFA 144 @ 47.920108267065"
[1] "2011-08-10 00:00:00 EFA 123 @ 47.920108267065"
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[1] "2011-09-07 00:00:00 EFA -144 @ 47.0847771703163"
[1] "2011-09-08 00:00:00 EFA 144 @ 47.1404667763679"
[1] "2011-09-08 00:00:00 EFA 134 @ 47.1404667763679"
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[1] "2012-03-20 00:00:00 EFA -281 @ 51.6805547309938"
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[1] "2012-08-08 00:00:00 EFA 293 @ 49.4915346030659"
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[1] "2012-08-15 00:00:00 EFA -284 @ 49.5684276625219"
[1] "2012-08-16 00:00:00 EFA 284 @ 49.8471729328449"
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[1] "2012-08-31 00:00:00 EFA -305 @ 49.7702760286398"
[1] "2012-08-31 00:00:00 EFA -410 @ 49.7702760286398"
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[1] "2012-10-31 00:00:00 EFA -390 @ 51.8272158314199"
[1] "2012-10-31 00:00:00 EFA -301 @ 51.8272158314199"
[1] "2012-11-01 00:00:00 EFA 301 @ 51.7599327223182"
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[1] "2008-06-17 00:00:00 EPP -922 @ 12.4620728217466"
[1] "2008-06-18 00:00:00 EPP 922 @ 12.4054994470116"
[1] "2008-06-18 00:00:00 EPP 974 @ 12.4054994470116"
[1] "2008-06-19 00:00:00 EPP -974 @ 12.3330153161472"
[1] "2008-06-19 00:00:00 EPP -979 @ 12.3330153161472"
[1] "2008-07-25 00:00:00 EPP 979 @ 35.4972516094952"
[1] "2008-07-25 00:00:00 EPP 863 @ 35.4972516094952"
[1] "2009-07-27 00:00:00 EPP -863 @ 28.6834717038951"
[1] "2009-07-27 00:00:00 EPP -282 @ 28.6834717038951"
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[1] "2009-09-04 00:00:00 EPP 312 @ 30.74416144392"
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[1] "2011-08-09 00:00:00 EPP -192 @ 36.3332392851236"
[1] "2011-08-10 00:00:00 EPP 192 @ 36.5028973903168"
[1] "2011-08-10 00:00:00 EPP 164 @ 36.5028973903168"
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[1] "2011-09-20 00:00:00 EPP -182 @ 36.4939663244957"
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[1] "2011-10-28 00:00:00 EPP 201 @ 39.5924273653185"
[1] "2011-10-28 00:00:00 EPP 190 @ 39.5924273653185"
[1] "2011-11-01 00:00:00 EPP -190 @ 36.7350568835538"
[1] "2011-11-01 00:00:00 EPP -172 @ 36.7350568835538"
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[1] "2012-03-14 00:00:00 EPP 363 @ 40.0744600706901"
[1] "2012-03-21 00:00:00 EPP -363 @ 39.5431853966348"
[1] "2012-03-21 00:00:00 EPP -368 @ 39.5431853966348"
[1] "2012-08-06 00:00:00 EPP 368 @ 40.6344838796598"
[1] "2012-08-06 00:00:00 EPP 345 @ 40.6344838796598"
[1] "2013-12-13 00:00:00 EPP -345 @ 44.7390565028914"
[1] "2013-12-13 00:00:00 EPP -451 @ 44.7390565028914"
[1] "2013-12-16 00:00:00 EPP 451 @ 45.1600147933791"
[1] "2013-12-16 00:00:00 EPP 430 @ 45.1600147933791"
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[1] "2008-04-16 00:00:00 EWA 412 @ 20.5958345922009"
[1] "2008-04-16 00:00:00 EWA 430 @ 20.5958345922009"
[1] "2008-06-13 00:00:00 EWA -430 @ 20.1378156676204"
[1] "2008-06-13 00:00:00 EWA -489 @ 20.1378156676204"
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[1] "2008-06-16 00:00:00 EWA 489 @ 20.1528326815411"
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[1] "2008-06-17 00:00:00 EWA -492 @ 20.4982232508658"
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[1] "2011-08-09 00:00:00 EWA -536 @ 18.8911473041397"
[1] "2011-08-09 00:00:00 EWA -324 @ 18.8911473041397"
[1] "2011-08-10 00:00:00 EWA 324 @ 19.2052726172801"
[1] "2011-08-10 00:00:00 EWA 279 @ 19.2052726172801"
[1] "2011-09-13 00:00:00 EWA -279 @ 19.3361581644219"
[1] "2011-09-13 00:00:00 EWA -297 @ 19.3361581644219"
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[1] "2011-09-16 00:00:00 EWA 311 @ 19.7724433215614"
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[1] "2011-09-20 00:00:00 EWA -344 @ 19.3012562244211"
[1] "2011-10-19 00:00:00 EWA 344 @ 20.0080373064167"
[1] "2011-10-19 00:00:00 EWA 323 @ 20.0080373064167"
[1] "2011-10-20 00:00:00 EWA -323 @ 19.6677357564183"
[1] "2011-10-20 00:00:00 EWA -310 @ 19.6677357564183"
[1] "2011-10-27 00:00:00 EWA 310 @ 21.7531779349747"
[1] "2011-10-27 00:00:00 EWA 327 @ 21.7531779349747"
[1] "2011-11-02 00:00:00 EWA -327 @ 20.2087284787009"
[1] "2011-11-02 00:00:00 EWA -281 @ 20.2087284787009"
[1] "2011-11-14 00:00:00 EWA 281 @ 20.4094187784148"
[1] "2011-11-14 00:00:00 EWA 307 @ 20.4094187784148"
[1] "2011-11-15 00:00:00 EWA -307 @ 20.2087284787009"
[1] "2011-11-15 00:00:00 EWA -306 @ 20.2087284787009"
[1] "2011-12-01 00:00:00 EWA 306 @ 20.1040209135577"
[1] "2011-12-01 00:00:00 EWA 347 @ 20.1040209135577"
[1] "2011-12-02 00:00:00 EWA -347 @ 20.6450136358404"
[1] "2011-12-02 00:00:00 EWA -312 @ 20.6450136358404"
[1] "2012-03-15 00:00:00 EWA 312 @ 20.9890156447004"
[1] "2012-03-15 00:00:00 EWA 596 @ 20.9890156447004"
[1] "2012-03-21 00:00:00 EWA -596 @ 20.7910060631466"
[1] "2012-03-21 00:00:00 EWA -638 @ 20.7910060631466"
[1] "2012-08-03 00:00:00 EWA 638 @ 21.5028993295504"
[1] "2012-08-03 00:00:00 EWA 577 @ 21.5028993295504"
[1] "2013-12-12 00:00:00 EWA -577 @ 23.0044406727347"
[1] "2013-12-12 00:00:00 EWA -754 @ 23.0044406727347"
[1] "2013-12-23 00:00:00 EWA 754 @ 24.2360690505549"
[1] "2013-12-23 00:00:00 EWA 577 @ 24.2360690505549"
[1] "2004-01-05 00:00:00 EWC 1370 @ 12.3890474855999"
[1] "2008-07-18 00:00:00 EWC -1370 @ 28.2856312596349"
[1] "2008-07-18 00:00:00 EWC -279 @ 28.2856312596349"
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[1] "2008-07-22 00:00:00 EWC 279 @ 28.3655601481435"
[1] "2008-07-22 00:00:00 EWC 286 @ 28.3655601481435"
[1] "2008-07-25 00:00:00 EWC -286 @ 27.1399956988638"
[1] "2008-07-25 00:00:00 EWC -305 @ 27.1399956988638"
[1] "2008-07-28 00:00:00 EWC 305 @ 27.2820899218321"
[1] "2008-07-28 00:00:00 EWC 288 @ 27.2820899218321"
[1] "2008-09-03 00:00:00 EWC -288 @ 26.0210036929881"
[1] "2008-09-03 00:00:00 EWC -365 @ 26.0210036929881"
[1] "2009-09-18 00:00:00 EWC 365 @ 23.7564510534074"
[1] "2009-09-18 00:00:00 EWC 395 @ 23.7564510534074"
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[1] "2009-09-21 00:00:00 EWC -399 @ 23.2649373627833"
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[1] "2011-09-23 00:00:00 EWC -348 @ 23.7602141195889"
[1] "2011-09-23 00:00:00 EWC -305 @ 23.7602141195889"
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[1] "2011-11-01 00:00:00 EWC -276 @ 25.5857523038352"
[1] "2012-08-08 00:00:00 EWC 276 @ 25.8818516739762"
[1] "2012-08-08 00:00:00 EWC 477 @ 25.8818516739762"
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[1] "2012-08-09 00:00:00 EWC -467 @ 25.7856356498405"
[1] "2012-08-20 00:00:00 EWC 467 @ 26.6996797008491"
[1] "2012-08-20 00:00:00 EWC 552 @ 26.6996797008491"
[1] "2012-08-23 00:00:00 EWC -552 @ 26.6515731320072"
[1] "2012-08-23 00:00:00 EWC -598 @ 26.6515731320072"
[1] "2012-09-11 00:00:00 EWC 598 @ 27.5078862215234"
[1] "2012-09-11 00:00:00 EWC 599 @ 27.5078862215234"
[1] "2012-10-31 00:00:00 EWC -599 @ 27.1999980231713"
[1] "2012-10-31 00:00:00 EWC -570 @ 27.1999980231713"
[1] "2012-11-01 00:00:00 EWC 570 @ 27.3250776037518"
[1] "2012-11-01 00:00:00 EWC 587 @ 27.3250776037518"
[1] "2012-11-15 00:00:00 EWC -587 @ 26.0454172793508"
[1] "2012-11-15 00:00:00 EWC -623 @ 26.0454172793508"
[1] "2012-11-19 00:00:00 EWC 623 @ 26.3917915024969"
[1] "2012-11-19 00:00:00 EWC 570 @ 26.3917915024969"
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[1] "2013-02-26 00:00:00 EWC -825 @ 27.3095771649964"
[1] "2013-02-28 00:00:00 EWC 825 @ 27.5045749559076"
[1] "2013-02-28 00:00:00 EWC 750 @ 27.5045749559076"
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[1] "2013-03-01 00:00:00 EWC -712 @ 27.5435756840824"
[1] "2013-03-08 00:00:00 EWC 712 @ 27.7385754249812"
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[1] "2013-04-10 00:00:00 EWC 666 @ 27.2218277203391"
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[1] "2013-04-16 00:00:00 EWC -636 @ 26.1200856679697"
[1] "2013-04-26 00:00:00 EWC 636 @ 26.6368314226241"
[1] "2013-04-26 00:00:00 EWC 536 @ 26.6368314226241"
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[1] "2013-05-02 00:00:00 EWC -517 @ 27.1048274858023"
[1] "2013-05-03 00:00:00 EWC 517 @ 27.3485759431835"
[1] "2013-05-03 00:00:00 EWC 519 @ 27.3485759431835"
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[1] "2013-09-23 00:00:00 EWC -654 @ 27.8952660635344"
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[1] "2013-09-25 00:00:00 EWC 674 @ 27.9347208976157"
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[1] "2013-10-09 00:00:00 EWC -697 @ 27.5894814820477"
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[1] "2013-10-11 00:00:00 EWC 661 @ 27.924855956101"
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[1] "2008-07-03 00:00:00 EWH -669 @ 13.8021357519854"
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[1] "2008-08-19 00:00:00 EWH -594 @ 12.9127572225105"
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[1] "2009-08-21 00:00:00 EWH -635 @ 13.2908459766339"
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[1] "2009-08-24 00:00:00 EWH 651 @ 13.4053463064524"
[1] "2009-08-28 00:00:00 EWH -651 @ 13.1851533644936"
[1] "2009-08-28 00:00:00 EWH -774 @ 13.1851533644936"
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[1] "2009-09-04 00:00:00 EWH 729 @ 13.04422988164"
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[1] "2011-09-13 00:00:00 EWH -522 @ 15.4185808005489"
[1] "2012-02-23 00:00:00 EWH 522 @ 16.8405964276688"
[1] "2012-02-23 00:00:00 EWH 941 @ 16.8405964276688"
[1] "2012-02-28 00:00:00 EWH -941 @ 17.0850718643631"
[1] "2012-02-28 00:00:00 EWH -1050 @ 17.0850718643631"
[1] "2012-03-01 00:00:00 EWH 1050 @ 17.1508921742423"
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[1] "2012-03-22 00:00:00 EWH -901 @ 16.5867171492731"
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[1] "2012-03-28 00:00:00 EWH 931 @ 16.8217896845561"
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[1] "2012-03-29 00:00:00 EWH -969 @ 16.370451357103"
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[1] "2012-08-07 00:00:00 EWH 898 @ 16.4655415180189"
[1] "2012-08-31 00:00:00 EWH -898 @ 16.311656037874"
[1] "2012-08-31 00:00:00 EWH -1337 @ 16.311656037874"
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[1] "2006-06-30 00:00:00 EWT 385 @ 20.1050364535132"
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[1] "2006-07-31 00:00:00 EWT 462 @ 19.1334758454713"
[1] "2006-08-02 00:00:00 EWT -462 @ 19.1178055130835"
[1] "2006-08-02 00:00:00 EWT -454 @ 19.1178055130835"
[1] "2006-08-10 00:00:00 EWT 454 @ 19.6819382625599"
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[1] "2007-05-14 00:00:00 EWT 621 @ 22.8242367680283"
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[1] "2004-07-16 00:00:00 EWY 408 @ 20.5768903503227"
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[1] "2013-07-12 00:00:00 EWY 214 @ 53.7387815292415"
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[1] "2011-01-05 00:00:00 EWZ 165 @ 71.3140355753983"
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[1] "2006-09-21 00:00:00 IGE -993 @ 9.02222070808276"
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[1] "2006-10-04 00:00:00 IGE -1031 @ 8.960648630584"
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[1] "2011-10-07 00:00:00 IGE 152 @ 34.1694390330659"
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[1] "2004-05-26 00:00:00 LQD 461 @ 67.8153168037169"
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[1] "2005-11-15 00:00:00 LQD -538 @ 72.0361419291115"
[1] "2005-11-16 00:00:00 LQD 538 @ 72.3404893814725"
[1] "2005-11-16 00:00:00 LQD 521 @ 72.3404893814725"
[1] "2005-12-13 00:00:00 LQD -521 @ 72.3614013780531"
[1] "2005-12-13 00:00:00 LQD -630 @ 72.3614013780531"
[1] "2005-12-16 00:00:00 LQD 630 @ 72.8433581880187"
[1] "2005-12-16 00:00:00 LQD 618 @ 72.8433581880187"
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[1] "2006-01-31 00:00:00 LQD -663 @ 73.2431295441953"
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[1] "2006-04-13 00:00:00 LQD -538 @ 71.9252204948614"
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[1] "2006-09-01 00:00:00 LQD -909 @ 74.5467117763066"
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[1] "2008-12-22 00:00:00 LQD -189 @ 79.3734133488014"
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[1] "2007-08-03 00:00:00 RWR 123 @ 59.1549764107488"
[1] "2007-08-06 00:00:00 RWR -123 @ 57.7359431589963"
[1] "2007-08-06 00:00:00 RWR -115 @ 57.7359431589963"
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[1] "2007-08-07 00:00:00 RWR 115 @ 58.3596901404445"
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[1] "2008-08-18 00:00:00 RWR -96 @ 57.1607783379632"
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[1] "2009-10-13 00:00:00 RWR -150 @ 39.3485389390917"
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[1] "2011-08-10 00:00:00 RWR 123 @ 53.6180388302418"
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[1] "2011-10-19 00:00:00 RWR 106 @ 55.3410307273378"
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[1] "2013-08-21 00:00:00 RWR 180 @ 69.9108680543414"
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[1] "2006-09-20 00:00:00 TLT 560 @ 66.9912677122898"
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[1] "2007-01-23 00:00:00 TLT 469 @ 67.7229597388764"
[1] "2007-01-23 00:00:00 TLT 491 @ 67.7229597388764"
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[1] "2005-10-18 00:00:00 XLB 623 @ 21.590508437231"
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[1] "2011-11-18 00:00:00 XLB -211 @ 31.6607797763254"
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[1] "2006-01-26 00:00:00 XLY -655 @ 29.6722527915923"
[1] "2006-01-30 00:00:00 XLY 655 @ 29.4493542513039"
[1] "2006-01-30 00:00:00 XLY 683 @ 29.4493542513039"
[1] "2006-02-01 00:00:00 XLY -683 @ 29.5741765422713"
[1] "2006-02-01 00:00:00 XLY -645 @ 29.5741765422713"
[1] "2006-02-23 00:00:00 XLY 645 @ 29.9040690566805"
[1] "2006-02-23 00:00:00 XLY 748 @ 29.9040690566805"
[1] "2006-03-03 00:00:00 XLY -748 @ 29.7881609241364"
[1] "2006-03-03 00:00:00 XLY -721 @ 29.7881609241364"
[1] "2006-03-15 00:00:00 XLY 721 @ 30.0734710557055"
[1] "2006-03-15 00:00:00 XLY 759 @ 30.0734710557055"
[1] "2006-06-13 00:00:00 XLY -759 @ 29.1254670184061"
[1] "2006-06-13 00:00:00 XLY -567 @ 29.1254670184061"
[1] "2006-06-16 00:00:00 XLY 567 @ 29.6613503467377"
[1] "2006-06-16 00:00:00 XLY 579 @ 29.6613503467377"
[1] "2006-06-19 00:00:00 XLY -579 @ 29.7954037467804"
[1] "2006-06-19 00:00:00 XLY -523 @ 29.7954037467804"
[1] "2006-06-26 00:00:00 XLY 523 @ 29.3753716665047"
[1] "2006-06-26 00:00:00 XLY 569 @ 29.3753716665047"
[1] "2006-06-29 00:00:00 XLY -569 @ 29.1876990512851"
[1] "2006-06-29 00:00:00 XLY -593 @ 29.1876990512851"
[1] "2006-06-30 00:00:00 XLY 593 @ 29.9205194193823"
[1] "2006-06-30 00:00:00 XLY 617 @ 29.9205194193823"
[1] "2006-07-11 00:00:00 XLY -617 @ 29.4379295028057"
[1] "2006-07-11 00:00:00 XLY -610 @ 29.4379295028057"
[1] "2006-09-05 00:00:00 XLY 610 @ 29.6613503467377"
[1] "2006-09-05 00:00:00 XLY 655 @ 29.6613503467377"
[1] "2006-09-07 00:00:00 XLY -655 @ 29.2413209475122"
[1] "2006-09-07 00:00:00 XLY -699 @ 29.2413209475122"
[1] "2006-09-11 00:00:00 XLY 699 @ 29.7507204716773"
[1] "2006-09-11 00:00:00 XLY 655 @ 29.7507204716773"
[1] "2007-10-22 00:00:00 XLY -655 @ 32.3578902440892"
[1] "2007-10-22 00:00:00 XLY -393 @ 32.3578902440892"
[1] "2007-10-23 00:00:00 XLY 393 @ 33.1349828930463"
[1] "2007-10-23 00:00:00 XLY 358 @ 33.1349828930463"
[1] "2007-10-25 00:00:00 XLY -358 @ 32.8639040199869"
[1] "2007-10-25 00:00:00 XLY -333 @ 32.8639040199869"
[1] "2009-09-30 00:00:00 XLY 333 @ 25.9947501870299"
[1] "2009-09-30 00:00:00 XLY 449 @ 25.9947501870299"
[1] "2009-10-02 00:00:00 XLY -449 @ 24.8800194224419"
```

```
[1] "2009-10-02 00:00:00 XLY -442 @ 24.8800194224419"
[1] "2009-10-05 00:00:00 XLY 442 @ 24.9362261612067"
[1] "2009-10-05 00:00:00 XLY 421 @ 24.9362261612067"
```

```
# Record end time
```

```
t2 <- Sys.time()
print(t2 - t1)
```

Time difference of 13.40702 secs

```
# applyStrategy()
```

Evaluating Performance

```
updatePortf(portfolio.st)
```

```
[1] "Clenow_Simple"
```

```
dateRange <- time(getPortfolio(portfolio.st)$summary)[-1]
updateAcct(portfolio.st, dateRange)
```

```
[1] "Clenow_Simple"
```

```
updateEndEq(account.st)
```

```
[1] "Clenow_Simple"
```

```
tStats <- tradeStats(Portfolios = portfolio.st, use = "trades",
  inclZeroDays = FALSE)
tStats[, 4:ncol(tStats)] <- round(tStats[, 4:ncol(tStats)], 2)
```

```
print(data.frame(t(tStats[, -c(1,2)])))
```

	EFA	EPP	EWA	EWC	EWB
Num.Txns	77.00	37.00	49.00	69.00	41.00
Num.Trades	39.00	19.00	25.00	35.00	21.00
Net.Trading.PL	73281.62	1523.47	22340.14	17720.95	14929.24
Avg.Trade.PL	1879.02	80.18	893.61	506.31	710.92
Med.Trade.PL	-127.04	-165.76	-101.78	-138.84	-92.14
Largest.Winner	70112.06	29758.43	22452.58	21778.32	10510.67
Largest.Loser	-1291.75	-22677.79	-928.65	-990.17	-742.29
Gross.Profits	81082.34	33571.83	26394.37	25383.61	18092.14
Gross.Losses	-7800.71	-32048.36	-4054.23	-7662.66	-3162.90
Std.Dev.Trade.PL	11266.66	8948.31	4521.50	3723.48	2557.78
Std.Err.Trade.PL	1804.11	2052.88	904.30	629.38	558.15
Percent.Positive	28.21	31.58	36.00	25.71	38.10
Percent.Negative	71.79	68.42	64.00	74.29	61.90
Profit.Factor	10.39	1.05	6.51	3.31	5.72

Avg.Win.Trade	7371.12	5595.31	2932.71	2820.40	2261.52
Med.Win.Trade	223.10	989.69	187.72	523.14	218.87
Avg.Losing.Trade	-278.60	-2465.26	-253.39	-294.72	-243.30
Med.Losing.Trade	-203.72	-401.60	-138.06	-224.24	-161.80
Avg.Daily.PL	1802.98	53.34	929.54	499.91	488.44
Med.Daily.PL	-129.40	-177.81	-104.55	-149.86	-106.27
Std.Dev.Daily.PL	11407.75	9206.95	4615.10	3779.28	2406.75
Std.Err.Daily.PL	1850.58	2170.10	942.05	648.14	538.16
Ann.Sharpe	2.51	0.09	3.20	2.10	3.22
Max.Drawdown	-27168.67	-52256.02	-12578.26	-10524.11	-11334.82
Profit.To.Max.Draw	2.70	0.03	1.78	1.68	1.32
Avg.WinLoss.Ratio	26.46	2.27	11.57	9.57	9.30
Med.WinLoss.Ratio	1.10	2.46	1.36	2.33	1.35
Max.Equity	93537.66	42169.18	32153.96	26646.80	20888.28
Min.Equity	-1217.17	-10086.84	-1792.59	-1860.05	-2049.17
End.Equity	73281.62	1523.47	22340.14	17720.95	14929.24
	EWJ	EWS	EWT	EWU	EWY
Num.Txns	161.00	43.00	161.00	69.00	105.00
Num.Trades	81.00	22.00	80.00	35.00	53.00
Net.Trading.PL	7056.20	10927.69	-480.06	11188.82	12212.79
Avg.Trade.PL	87.11	496.71	-6.00	319.68	230.43
Med.Trade.PL	-74.52	-137.14	-62.50	-56.82	-135.90
Largest.Winner	7685.31	10252.68	1536.67	8669.71	10218.37
Largest.Loser	-1435.85	-992.94	-1701.35	-647.63	-1470.57
Gross.Profits	21977.80	15085.52	12659.56	15510.55	22637.86
Gross.Losses	-14921.60	-4157.82	-13139.62	-4321.72	-10425.07
Std.Dev.Trade.PL	1184.03	2279.10	528.89	1613.91	1589.34
Std.Err.Trade.PL	131.56	485.91	59.13	272.80	218.31
Percent.Positive	38.27	40.91	36.25	37.14	39.62
Percent.Negative	61.73	59.09	63.75	62.86	60.38
Profit.Factor	1.47	3.63	0.96	3.59	2.17
Avg.Win.Trade	708.96	1676.17	436.54	1193.12	1077.99
Med.Win.Trade	161.44	333.59	165.02	203.07	196.96
Avg.Losing.Trade	-298.43	-319.83	-257.64	-196.44	-325.78
Med.Losing.Trade	-161.08	-219.83	-182.56	-118.69	-246.82
Avg.Daily.PL	16.09	542.67	-34.27	224.99	197.89
Med.Daily.PL	-75.66	-133.58	-62.50	-64.48	-137.85
Std.Dev.Daily.PL	1002.94	2324.91	462.43	1536.34	1586.92
Std.Err.Daily.PL	112.13	507.34	51.70	263.48	220.07
Ann.Sharpe	0.25	3.71	-1.18	2.32	1.98
Max.Drawdown	-12482.38	-6139.97	-7565.34	-5956.47	-7575.65
Profit.To.Max.Draw	0.57	1.78	-0.06	1.88	1.61
Avg.WinLoss.Ratio	2.38	5.24	1.69	6.07	3.31
Med.WinLoss.Ratio	1.00	1.52	0.90	1.71	0.80
Max.Equity	13282.39	16488.22	1424.17	13050.05	17813.71

Min.Equity	-1295.75	-1128.66	-6141.17	-461.54	-2333.63
End.Equity	7056.20	10927.69	-480.06	11188.82	12212.79
	EWZ	EZU	IEF	IGE	IYR
Num.Txns	39.00	173.00	75.00	97.00	73.00
Num.Trades	20.00	87.00	38.00	49.00	37.00
Net.Trading.PL	19926.80	-16246.74	28147.97	65002.65	62144.09
Avg.Trade.PL	996.34	-186.74	740.74	1326.58	1679.57
Med.Trade.PL	-131.77	-79.28	-99.72	-74.74	-124.74
Largest.Winner	25452.08	12043.67	18056.79	49881.41	60600.85
Largest.Loser	-5257.35	-12573.12	-1154.14	-1545.38	-485.03
Gross.Profits	30491.23	21341.17	34668.87	72485.13	68249.62
Gross.Losses	-10564.42	-37587.92	-6520.90	-7482.48	-6105.53
Std.Dev.Trade.PL	5931.45	2244.85	3400.09	7538.35	9988.04
Std.Err.Trade.PL	1326.31	240.67	551.57	1076.91	1642.02
Percent.Positive	40.00	22.99	42.11	34.69	21.62
Percent.Negative	60.00	77.01	57.89	65.31	78.38
Profit.Factor	2.89	0.57	5.32	9.69	11.18
Avg.Win.Trade	3811.40	1067.06	2166.80	4263.83	8531.20
Med.Win.Trade	456.54	123.44	227.81	156.68	888.96
Avg.Losing.Trade	-880.37	-561.01	-296.40	-233.83	-210.54
Med.Losing.Trade	-380.91	-137.55	-213.33	-154.87	-201.47
Avg.Daily.PL	1029.91	-245.41	718.78	1320.11	1741.28
Med.Daily.PL	-141.58	-80.52	-126.17	-75.79	-124.42
Std.Dev.Daily.PL	6092.03	2189.91	3444.26	7617.99	10122.56
Std.Err.Daily.PL	1397.61	236.14	566.23	1099.56	1687.09
Ann.Sharpe	2.68	-1.78	3.31	2.75	2.73
Max.Drawdown	-30705.67	-39782.95	-9429.67	-21395.74	-29586.13
Profit.To.Max.Draw	0.65	-0.41	2.99	3.04	2.10
Avg.WinLoss.Ratio	4.33	1.90	7.31	18.23	40.52
Med.WinLoss.Ratio	1.20	0.90	1.07	1.01	4.41
Max.Equity	49392.88	17343.29	28783.09	80099.68	88201.72
Min.Equity	-2838.32	-22439.67	-978.52	-839.02	-2344.71
End.Equity	19926.80	-16246.74	28147.97	65002.65	62144.09
	IYZ	LQD	RWR	SHY	TLT
Num.Txns	69.00	79.00	77.00	17.00	63.00
Num.Trades	35.00	40.00	39.00	9.00	32.00
Net.Trading.PL	9922.35	2054.94	117180.03	45236.62	15466.57
Avg.Trade.PL	283.50	51.37	3004.62	5026.29	483.33
Med.Trade.PL	-53.12	-145.22	-94.34	-88.02	-32.60
Largest.Winner	5049.88	8481.80	116096.91	44787.74	7844.68
Largest.Loser	-1499.51	-1533.92	-529.00	-721.92	-1397.48
Gross.Profits	15678.14	11486.42	122580.58	46928.94	20017.75
Gross.Losses	-5755.79	-9431.48	-5400.55	-1692.31	-4551.18
Std.Dev.Trade.PL	1226.97	1443.31	18593.66	14924.62	1734.04
Std.Err.Trade.PL	207.40	228.21	2977.37	4974.87	306.54

Percent.Positive	37.14	30.00	25.64	33.33	43.75
Percent.Negative	62.86	70.00	74.36	66.67	56.25
Profit.Factor	2.72	1.22	22.70	27.73	4.40
Avg.Win.Trade	1206.01	957.20	12258.06	15642.98	1429.84
Med.Win.Trade	227.47	112.10	659.91	1447.09	391.42
Avg.Losing.Trade	-261.63	-336.84	-186.23	-282.05	-252.84
Med.Losing.Trade	-139.89	-179.41	-135.66	-170.81	-182.75
Avg.Daily.PL	180.60	76.47	3083.20	5567.82	435.76
Med.Daily.PL	-63.75	-144.58	-102.46	-124.26	-40.12
Std.Dev.Daily.PL	1081.35	1453.31	18836.69	15860.28	1741.34
Std.Err.Daily.PL	185.45	232.72	3055.71	5607.46	312.75
Ann.Sharpe	2.65	0.84	2.60	5.57	3.97
Max.Drawdown	-8162.50	-8157.89	-47183.10	-4513.14	-13785.12
Profit.To.Max.Draw	1.22	0.25	2.48	10.02	1.12
Avg.WinLoss.Ratio	4.61	2.84	65.82	55.46	5.66
Med.WinLoss.Ratio	1.63	0.62	4.86	8.47	2.14
Max.Equity	13969.83	6433.28	160900.69	46169.13	19706.85
Min.Equity	-229.12	-5521.68	-2004.80	-728.93	-1116.89
End.Equity	9922.35	2054.94	117180.03	45236.62	15466.57
	XLB	XLE	XLF	XLI	XLK
Num.Txns	73.00	77.00	109.00	65.00	105.00
Num.Trades	37.00	39.00	55.00	33.00	53.00
Net.Trading.PL	10395.85	21864.73	15749.55	18100.21	5898.63
Avg.Trade.PL	280.97	560.63	286.36	548.49	111.29
Med.Trade.PL	-48.64	-49.73	-11.27	-67.88	-97.78
Largest.Winner	4218.87	13518.89	6014.71	6773.21	7203.51
Largest.Loser	-850.35	-463.14	-1593.93	-541.48	-1541.41
Gross.Profits	14624.02	25487.05	22443.34	21652.75	16376.18
Gross.Losses	-4228.18	-3622.32	-6693.79	-3552.54	-10477.55
Std.Dev.Trade.PL	1072.70	2267.06	1305.58	1685.92	1191.88
Std.Err.Trade.PL	176.35	363.02	176.04	293.48	163.72
Percent.Positive	40.54	46.15	47.27	36.36	35.85
Percent.Negative	59.46	53.85	52.73	63.64	64.15
Profit.Factor	3.46	7.04	3.35	6.10	1.56
Avg.Win.Trade	974.93	1415.95	863.21	1804.40	861.90
Med.Win.Trade	529.05	381.58	196.07	805.38	162.15
Avg.Losing.Trade	-192.19	-172.49	-230.82	-169.17	-308.16
Med.Losing.Trade	-127.85	-149.72	-134.32	-167.13	-172.44
Avg.Daily.PL	166.42	493.47	170.92	374.83	51.89
Med.Daily.PL	-57.01	-61.47	-16.92	-75.46	-98.89
Std.Dev.Daily.PL	827.14	2257.83	994.98	1380.82	1121.49
Std.Err.Daily.PL	137.86	366.27	135.40	244.10	155.52
Ann.Sharpe	3.19	3.47	2.73	4.31	0.73
Max.Drawdown	-5654.62	-5101.57	-4580.18	-5606.96	-8098.16
Profit.To.Max.Draw	1.84	4.29	3.44	3.23	0.73

Avg.WinLoss.Ratio	5.07	8.21	3.74	10.67	2.80
Med.WinLoss.Ratio	4.14	2.55	1.46	4.82	0.94
Max.Equity	10760.92	21968.05	15793.58	18137.94	5950.03
Min.Equity	-1823.09	-93.25	-656.13	-1032.49	-5258.58
End.Equity	10395.85	21864.73	15749.55	18100.21	5898.63
	XLP	XLU	XLV	XLY	
Num.Txns	33.00	41.00	93.00	69.00	
Num.Trades	17.00	21.00	45.00	35.00	
Net.Trading.PL	23414.63	19981.06	24220.71	16240.18	
Avg.Trade.PL	1377.33	951.48	538.24	464.01	
Med.Trade.PL	-41.14	-114.53	-79.73	-136.29	
Largest.Winner	5403.21	14892.02	1710.61	2287.43	
Largest.Loser	-231.73	-895.41	-1196.50	-786.38	
Gross.Profits	24621.81	23594.04	31266.00	22776.41	
Gross.Losses	-1207.19	-3612.97	-7045.29	-6536.23	
Std.Dev.Trade.PL	4149.34	3387.06	3623.94	3023.46	
Std.Err.Trade.PL	1006.36	739.12	540.22	511.06	
Percent.Positive	35.29	33.33	37.78	31.43	
Percent.Negative	64.71	66.67	62.22	68.57	
Profit.Factor	20.40	6.53	4.44	3.48	
Avg.Win.Trade	4103.64	3370.58	1839.18	2070.58	
Med.Win.Trade	1287.93	2091.41	225.36	219.68	
Avg.Losing.Trade	-109.74	-258.07	-251.62	-272.34	
Med.Losing.Trade	-115.39	-193.78	-202.68	-209.24	
Avg.Daily.PL	428.50	894.48	2.99	-37.87	
Med.Daily.PL	-48.45	-130.49	-60.48	-141.43	
Std.Dev.Daily.PL	1428.19	3464.70	491.87	579.12	
Std.Err.Daily.PL	357.05	774.73	72.52	99.32	
Ann.Sharpe	4.76	4.10	0.10	-1.04	
Max.Drawdown	-3819.66	-8212.15	-5755.91	-7084.34	
Profit.To.Max.Draw	6.13	2.43	4.21	2.29	
Avg.WinLoss.Ratio	37.39	13.06	7.31	7.60	
Med.WinLoss.Ratio	11.16	10.79	1.11	1.05	
Max.Equity	23458.27	21210.20	24220.71	16244.39	
Min.Equity	-330.74	-709.54	-3914.56	-4354.96	
End.Equity	23414.63	19981.06	24220.71	16240.18	

```
aggPF <- sum(tStats$Gross.Profits) / -sum(tStats$Gross.Losses)
aggCorrect <- mean(tStats$Percent.Positive)
numTrades <- sum(tStats$Num.Trades)
meanAvgWLR <- mean(tStats$Avg.WinLoss.Ratio[
  tStats$Avg.WinLoss.Ratio < Inf], na.rm = TRUE)
```

```
tStats
```

```
Portfolio Symbol Num.Txns Num.Trades Net.Trading.PL
```

EFA Clenow_Simple	EFA	77	39	73281.62
EPP Clenow_Simple	EPP	37	19	1523.47
EWA Clenow_Simple	EWA	49	25	22340.14
EWK Clenow_Simple	EWK	69	35	17720.95
EWJ Clenow_Simple	EWJ	41	21	14929.24
EWJ Clenow_Simple	EWJ	161	81	7056.20
EWS Clenow_Simple	EWS	43	22	10927.69
EWT Clenow_Simple	EWT	161	80	-480.06
EWU Clenow_Simple	EWU	69	35	11188.82
EWY Clenow_Simple	EWY	105	53	12212.79
EWZ Clenow_Simple	EWZ	39	20	19926.80
EZU Clenow_Simple	EZU	173	87	-16246.74
IEF Clenow_Simple	IEF	75	38	28147.97
IGE Clenow_Simple	IGE	97	49	65002.65
IYR Clenow_Simple	IYR	73	37	62144.09
IYZ Clenow_Simple	IYZ	69	35	9922.35
LQD Clenow_Simple	LQD	79	40	2054.94
RWR Clenow_Simple	RWR	77	39	117180.03
SHY Clenow_Simple	SHY	17	9	45236.62
TLT Clenow_Simple	TLT	63	32	15466.57
XLB Clenow_Simple	XLB	73	37	10395.85
XLE Clenow_Simple	XLE	77	39	21864.73
XLF Clenow_Simple	XLF	109	55	15749.55
XLI Clenow_Simple	XLI	65	33	18100.21
XLK Clenow_Simple	XLK	105	53	5898.63
XLP Clenow_Simple	XLP	33	17	23414.63
XLU Clenow_Simple	XLU	41	21	19981.06
XLV Clenow_Simple	XLV	93	45	24220.71
XLY Clenow_Simple	XLY	69	35	16240.18

	Avg.Trade.PL	Med.Trade.PL	Largest.Winner	Largest.Loser
EFA	1879.02	-127.04	70112.06	-1291.75
EPP	80.18	-165.76	29758.43	-22677.79
EWA	893.61	-101.78	22452.58	-928.65
EWK	506.31	-138.84	21778.32	-990.17
EWJ	710.92	-92.14	10510.67	-742.29
EWJ	87.11	-74.52	7685.31	-1435.85
EWS	496.71	-137.14	10252.68	-992.94
EWT	-6.00	-62.50	1536.67	-1701.35
EWU	319.68	-56.82	8669.71	-647.63
EWY	230.43	-135.90	10218.37	-1470.57
EWZ	996.34	-131.77	25452.08	-5257.35
EZU	-186.74	-79.28	12043.67	-12573.12
IEF	740.74	-99.72	18056.79	-1154.14
IGE	1326.58	-74.74	49881.41	-1545.38
IYR	1679.57	-124.74	60600.85	-485.03

IYZ	283.50	-53.12	5049.88	-1499.51
LQD	51.37	-145.22	8481.80	-1533.92
RWR	3004.62	-94.34	116096.91	-529.00
SHY	5026.29	-88.02	44787.74	-721.92
TLT	483.33	-32.60	7844.68	-1397.48
XLB	280.97	-48.64	4218.87	-850.35
XLE	560.63	-49.73	13518.89	-463.14
XLF	286.36	-11.27	6014.71	-1593.93
XLI	548.49	-67.88	6773.21	-541.48
XLK	111.29	-97.78	7203.51	-1541.41
XLP	1377.33	-41.14	5403.21	-231.73
XLU	951.48	-114.53	14892.02	-895.41
XLV	538.24	-79.73	1710.61	-1196.50
XLY	464.01	-136.29	2287.43	-786.38
Gross.Profits Gross.Losses Std.Dev.Trade.PL Std.Err.Trade.PL				
EFA	81082.34	-7800.71	11266.66	1804.11
EPP	33571.83	-32048.36	8948.31	2052.88
EWA	26394.37	-4054.23	4521.50	904.30
EWC	25383.61	-7662.66	3723.48	629.38
EWH	18092.14	-3162.90	2557.78	558.15
EWJ	21977.80	-14921.60	1184.03	131.56
EWS	15085.52	-4157.82	2279.10	485.91
EWT	12659.56	-13139.62	528.89	59.13
EWU	15510.55	-4321.72	1613.91	272.80
EWY	22637.86	-10425.07	1589.34	218.31
EWZ	30491.23	-10564.42	5931.45	1326.31
EZU	21341.17	-37587.92	2244.85	240.67
IEF	34668.87	-6520.90	3400.09	551.57
IGE	72485.13	-7482.48	7538.35	1076.91
IYR	68249.62	-6105.53	9988.04	1642.02
IYZ	15678.14	-5755.79	1226.97	207.40
LQD	11486.42	-9431.48	1443.31	228.21
RWR	122580.58	-5400.55	18593.66	2977.37
SHY	46928.94	-1692.31	14924.62	4974.87
TLT	20017.75	-4551.18	1734.04	306.54
XLB	14624.02	-4228.18	1072.70	176.35
XLE	25487.05	-3622.32	2267.06	363.02
XLF	22443.34	-6693.79	1305.58	176.04
XLI	21652.75	-3552.54	1685.92	293.48
XLK	16376.18	-10477.55	1191.88	163.72
XLP	24621.81	-1207.19	4149.34	1006.36
XLU	23594.04	-3612.97	3387.06	739.12
XLV	31266.00	-7045.29	3623.94	540.22
XLY	22776.41	-6536.23	3023.46	511.06
Percent.Positive Percent.Negative Profit.Factor Avg.Win.Trade				

EFA	28.21	71.79	10.39	7371.12
EPP	31.58	68.42	1.05	5595.31
EWA	36.00	64.00	6.51	2932.71
EWK	25.71	74.29	3.31	2820.40
EWJ	38.10	61.90	5.72	2261.52
EWJ	38.27	61.73	1.47	708.96
EWS	40.91	59.09	3.63	1676.17
EWT	36.25	63.75	0.96	436.54
EWU	37.14	62.86	3.59	1193.12
EWY	39.62	60.38	2.17	1077.99
EWZ	40.00	60.00	2.89	3811.40
EZU	22.99	77.01	0.57	1067.06
IEF	42.11	57.89	5.32	2166.80
IGE	34.69	65.31	9.69	4263.83
IYR	21.62	78.38	11.18	8531.20
IYZ	37.14	62.86	2.72	1206.01
LQD	30.00	70.00	1.22	957.20
RWR	25.64	74.36	22.70	12258.06
SHY	33.33	66.67	27.73	15642.98
TLT	43.75	56.25	4.40	1429.84
XLB	40.54	59.46	3.46	974.93
XLE	46.15	53.85	7.04	1415.95
XLF	47.27	52.73	3.35	863.21
XLI	36.36	63.64	6.10	1804.40
XLK	35.85	64.15	1.56	861.90
XLP	35.29	64.71	20.40	4103.64
XLU	33.33	66.67	6.53	3370.58
XLV	37.78	62.22	4.44	1839.18
XLY	31.43	68.57	3.48	2070.58

Med.Win.Trade Avg.Losing.Trade Med.Losing.Trade Avg.Daily.PL

EFA	223.10	-278.60	-203.72	1802.98
EPP	989.69	-2465.26	-401.60	53.34
EWA	187.72	-253.39	-138.06	929.54
EWK	523.14	-294.72	-224.24	499.91
EWJ	218.87	-243.30	-161.80	488.44
EWJ	161.44	-298.43	-161.08	16.09
EWS	333.59	-319.83	-219.83	542.67
EWT	165.02	-257.64	-182.56	-34.27
EWU	203.07	-196.44	-118.69	224.99
EWY	196.96	-325.78	-246.82	197.89
EWZ	456.54	-880.37	-380.91	1029.91
EZU	123.44	-561.01	-137.55	-245.41
IEF	227.81	-296.40	-213.33	718.78
IGE	156.68	-233.83	-154.87	1320.11
IYR	888.96	-210.54	-201.47	1741.28

IYZ	227.47	-261.63	-139.89	180.60
LQD	112.10	-336.84	-179.41	76.47
RWR	659.91	-186.23	-135.66	3083.20
SHY	1447.09	-282.05	-170.81	5567.82
TLT	391.42	-252.84	-182.75	435.76
XLB	529.05	-192.19	-127.85	166.42
XLE	381.58	-172.49	-149.72	493.47
XLF	196.07	-230.82	-134.32	170.92
XLI	805.38	-169.17	-167.13	374.83
XLK	162.15	-308.16	-172.44	51.89
XLP	1287.93	-109.74	-115.39	428.50
XLU	2091.41	-258.07	-193.78	894.48
XLV	225.36	-251.62	-202.68	2.99
XLY	219.68	-272.34	-209.24	-37.87

Med.Daily.PL Std.Dev.Daily.PL Std.Err.Daily.PL Ann.Sharpe

EFA	-129.40	11407.75	1850.58	2.51
EPP	-177.81	9206.95	2170.10	0.09
EWA	-104.55	4615.10	942.05	3.20
EWC	-149.86	3779.28	648.14	2.10
EWH	-106.27	2406.75	538.16	3.22
EWJ	-75.66	1002.94	112.13	0.25
EWS	-133.58	2324.91	507.34	3.71
EWT	-62.50	462.43	51.70	-1.18
EWU	-64.48	1536.34	263.48	2.32
EWY	-137.85	1586.92	220.07	1.98
EWZ	-141.58	6092.03	1397.61	2.68
EZU	-80.52	2189.91	236.14	-1.78
IEF	-126.17	3444.26	566.23	3.31
IGE	-75.79	7617.99	1099.56	2.75
IYR	-124.42	10122.56	1687.09	2.73
IYZ	-63.75	1081.35	185.45	2.65
LQD	-144.58	1453.31	232.72	0.84
RWR	-102.46	18836.69	3055.71	2.60
SHY	-124.26	15860.28	5607.46	5.57
TLT	-40.12	1741.34	312.75	3.97
XLB	-57.01	827.14	137.86	3.19
XLE	-61.47	2257.83	366.27	3.47
XLF	-16.92	994.98	135.40	2.73
XLI	-75.46	1380.82	244.10	4.31
XLK	-98.89	1121.49	155.52	0.73
XLP	-48.45	1428.19	357.05	4.76
XLU	-130.49	3464.70	774.73	4.10
XLV	-60.48	491.87	72.52	0.10
XLY	-141.43	579.12	99.32	-1.04

Max.Drawdown Profit.To.Max.Draw Avg.WinLoss.Ratio

EFA	-27168.67	2.70	26.46
EPP	-52256.02	0.03	2.27
EWA	-12578.26	1.78	11.57
EWC	-10524.11	1.68	9.57
EWH	-11334.82	1.32	9.30
EWJ	-12482.38	0.57	2.38
EWS	-6139.97	1.78	5.24
EWT	-7565.34	-0.06	1.69
EWU	-5956.47	1.88	6.07
EWY	-7575.65	1.61	3.31
EWZ	-30705.67	0.65	4.33
EZU	-39782.95	-0.41	1.90
IEF	-9429.67	2.99	7.31
IGE	-21395.74	3.04	18.23
IYR	-29586.13	2.10	40.52
IYZ	-8162.50	1.22	4.61
LQD	-8157.89	0.25	2.84
RWR	-47183.10	2.48	65.82
SHY	-4513.14	10.02	55.46
TLT	-13785.12	1.12	5.66
XLB	-5654.62	1.84	5.07
XLE	-5101.57	4.29	8.21
XLF	-4580.18	3.44	3.74
XLI	-5606.96	3.23	10.67
XLK	-8098.16	0.73	2.80
XLP	-3819.66	6.13	37.39
XLU	-8212.15	2.43	13.06
XLV	-5755.91	4.21	7.31
XLY	-7084.34	2.29	7.60

	Med.WinLoss.Ratio	Max.Equity	Min.Equity	End.Equity
EFA	1.10	93537.66	-1217.17	73281.62
EPP	2.46	42169.18	-10086.84	1523.47
EWA	1.36	32153.96	-1792.59	22340.14
EWC	2.33	26646.80	-1860.05	17720.95
EWH	1.35	20888.28	-2049.17	14929.24
EWJ	1.00	13282.39	-1295.75	7056.20
EWS	1.52	16488.22	-1128.66	10927.69
EWT	0.90	1424.17	-6141.17	-480.06
EWU	1.71	13050.05	-461.54	11188.82
EWY	0.80	17813.71	-2333.63	12212.79
EWZ	1.20	49392.88	-2838.32	19926.80
EZU	0.90	17343.29	-22439.67	-16246.74
IEF	1.07	28783.09	-978.52	28147.97
IGE	1.01	80099.68	-839.02	65002.65
IYR	4.41	88201.72	-2344.71	62144.09

IYZ	1.63	13969.83	-229.12	9922.35
LQD	0.62	6433.28	-5521.68	2054.94
RWR	4.86	160900.69	-2004.80	117180.03
SHY	8.47	46169.13	-728.93	45236.62
TLT	2.14	19706.85	-1116.89	15466.57
XLB	4.14	10760.92	-1823.09	10395.85
XLE	2.55	21968.05	-93.25	21864.73
XLF	1.46	15793.58	-656.13	15749.55
XLI	4.82	18137.94	-1032.49	18100.21
XLK	0.94	5950.03	-5258.58	5898.63
XLP	11.16	23458.27	-330.74	23414.63
XLU	10.79	21210.20	-709.54	19981.06
XLV	1.11	24220.71	-3914.56	24220.71
XLV	1.05	16244.39	-4354.96	16240.18

```
aggPF <- sum(tStats$Gross.Profits) / -sum(tStats$Gross.Losses)
## [1] 3.663545
```

```
aggCorrect <- mean(tStats$Percent.Positive)
## [1] 36.00233
```

```
numTrades <- sum(tStats$Num.Trades)
## [1] 1134
```

```
meanAvgWLR <- mean(tStats$Avg.WinLoss.Ratio[
  tStats$Avg.WinLoss.Ratio < Inf], na.rm = TRUE)
## [1] 9.871333
```

```
instRets <- PortfReturns(account.st)
portfRets <- xts(rowMeans(instRets) * ncol(instRets),
  order.by = index(instRets))
portfRets <- portfRets[!is.na(portfRets)]
cumPortfRets <- cumprod(1 + portfRets)
firstNonZeroDay <- as.character(index(portfRets)[
  min(which(portfRets != 0))])
```

```
# Obtain symbol
getSymbols("SPY", from = firstNonZeroDay, to = to)
```

```
[1] "SPY"
```

```
SPYrets <- diff(log(Cl(SPY)))[-1]
cumSPYrets <- cumprod(1 + SPYrets)
comparison <- cbind(cumPortfRets, cumSPYrets)
colnames(comparison) <- c("strategy", "SPY")
chart.TimeSeries(comparison, legend.loc = "topleft")
```



```
# Calculate risk metrics
```

```
SharpeRatio.annualized(portfRets)
```

```
[,1]
```

```
Annualized Sharpe Ratio (Rf=0%) 0.7040448
```

```
Return.annualized(portfRets)
```

```
[,1]
```

```
Annualized Return 0.1926319
```

```
maxDrawdown(portfRets)
```

```
[1] 0.3484096
```

```
SharpeRatio.annualized(portfRets)
```

```
[,1]
```

```
Annualized Sharpe Ratio (Rf=0%) 0.7040448
```

```
## [1] 0.6424366
```

```
Return.annualized(portfRets)
```

```
[,1]
```

```
Annualized Return 0.1926319
```

```
## [1] 0.1392711
```

```
maxDrawdown(portfRets)
```

```
[1] 0.3484096
```

```
## [1] 0.278221
```

```
chart.Posn(portfolio.st, "XLB")
```



```
tmp <- namedLag(Cl(XLB), k = nLag)
add_TA(tmp$namedLag, col = "blue", on = 1)
```



Strategy Two: Connors RSI

```
# Compute Connor's RSI, depends on RSI TTR function
connorsRSI <- function(price, nRSI = 3, nStreak = 2,
  nPercentLookBack = 100 ) {
```

```

priceRSI <- RSI(price, nRSI)
streakRSI <- RSI(computeStreak(price), nStreak)
percents <- round(runPercentRank(x = diff(log(price)),
  n = 100, cumulative = FALSE, exact.multiplier = 1) * 100)
ret <- (priceRSI + streakRSI + percents) / 3
colnames(ret) <- "connorsRSI"
return(ret)
}

# Computes a running streak of positives and
# negatives of price changes
computeStreak <- function(priceSeries) {
  signs <- sign(diff(priceSeries))
  posDiffs <- negDiffs <- rep(0, length(signs))
  posDiffs[signs == 1] <- 1
  negDiffs[signs == -1] <- -1

  # Create vector of cumulative sums and cumulative
  # sums not incremented during streaks.
  # Zero out any leading NAs after na.locf
  posCum <- cumsum(posDiffs)
  posNACum <- posCum
  posNACum[posDiffs == 1] <- NA
  posNACum <- na.locf(posNACum, na.rm = FALSE)
  posNACum[is.na(posNACum)] <- 0
  posStreak <- posCum - posNACum

  # Repeat for negative cumulative sums
  negCum <- cumsum(negDiffs)
  negNACum <- negCum
  negNACum[negDiffs == -1] <- NA
  negNACum <- na.locf(negNACum, na.rm = FALSE)
  negNACum[is.na(negNACum)] <- 0
  negStreak <- negCum - negNACum

  streak <- posStreak + negStreak
  streak <- xts(streak, order.by = index(priceSeries))
  return (streak)
}

sigAND <- function(label, data=mktdata,
  columns, cross = FALSE) {
  ret_sig = NULL
  colNums <- rep(0, length(columns))

```



```

for(i in 1:length(columns)) {
  colNums[i] <- match.names(columns[i], colnames(data))
}
ret_sig <- data[, colNums[1]]
for(i in 2:length(colNums)) {
  ret_sig <- ret_sig & data[, colNums[i]]
}
ret_sig <- ret_sig * 1
if (isTRUE(cross))
  ret_sig <- diff(ret_sig) == 1
colnames(ret_sig) <- label
return(ret_sig)
}

```

```

cumCRSI <- function(price, nCum = 2, ...) {
  CRSI <- connorsRSI(price, ...)
  out <- runSum(CRSI, nCum)
  colnames(out) <- "cumCRSI"
  out
}

```

```

rm(list = ls(.blotter), envir = .blotter)
initDate = '1990-01-01'
from = "2003-01-01"
to = "2013-12-31"
initEq = 10000

```

```

currency('USD')

```

```

[1] "USD"

```

```

Sys.setenv(TZ="UTC")
source(file.path(data.dir, "common.r"))

```

```

strategy.st <- "CRSICumStrat"
portfolio.st <- "CRSICumStrat"
account.st <- "CRSICumStrat"

```

```

rm.strat(portfolio.st)
rm.strat(strategy.st)

```

```

initPortf(portfolio.st, symbols = symbols,
  initDate = initDate, currency = 'USD')

```

```

[1] "CRSICumStrat"

```

```

initAcct(account.st, portfolios = portfolio.st,
  initDate = initDate, currency = 'USD',
  initEq = initEq)

[1] "CRSIcumStrat"

initOrders(portfolio.st, initDate = initDate)
strategy(strategy.st, store = TRUE)

# Parameters
cumThresh <- 40
exitThresh <- 75
nCum <- 2
nRSI <- 3
nStreak <- 2
nPercentLookBack <- 100
nSMA <- 200
pctATR <- .02
period <- 10

# Indicators
add.indicator(strategy.st, name = "cumCRSI",
  arguments = list(price = quote(C1(mktdata)), nCum = nCum,
    nRSI = nRSI, nStreak = nStreak,
    nPercentLookBack = nPercentLookBack),
  label = "CRSIcum")

```

```

[1] "CRSIcumStrat"

add.indicator(strategy.st, name = "connorsRSI",
  arguments = list(price = quote(C1(mktdata)), nRSI = nRSI,
    nStreak = nStreak,
    nPercentLookBack = nPercentLookBack),
  label = "CRSI")

```

```

[1] "CRSIcumStrat"

add.indicator(strategy.st, name = "SMA",
  arguments = list(x = quote(C1(mktdata)), n = nSMA),
  label = "sma")

```

```

[1] "CRSIcumStrat"

add.indicator(strategy.st, name = "lagATR",
  arguments = list(HLC = quote(HLC(mktdata)), n = period),
  label = "atrX")

```

```

[1] "CRSIcumStrat"

```

Signals

```
add.signal(strategy.st, name = "sigThreshold",
  arguments = list(column = "cumCRSI.CRSIcum",
    threshold = cumThresh, relationship = "lt", cross = FALSE),
  label="cumCRSI.lt.thresh")
```

```
[1] "CRSIcumStrat"
```

```
add.signal(strategy.st, name = "sigComparison",
  arguments = list(columns = c("Close", "SMA.sma"),
    relationship = "gt"), label = "Cl.gt.SMA")
```

```
[1] "CRSIcumStrat"
```

```
add.signal(strategy.st, name = "sigAND",
  arguments = list(columns = c("cumCRSI.lt.thresh",
    "Cl.gt.SMA"), cross = TRUE), label = "longEntry")
```

```
[1] "CRSIcumStrat"
```

```
add.signal(strategy.st, name = "sigThreshold",
  arguments = list(column = "connorsRSI.CRSI",
    threshold = exitThresh, relationship = "gt",
    cross = TRUE), label = "longExit")
```

```
[1] "CRSIcumStrat"
```

Rules

```
add.rule(strategy.st, name = "ruleSignal",
  arguments = list(sigcol = "longEntry", sigval = TRUE,
    ordertype = "market", orderside = "long", replace = FALSE,
    prefer = "Open", osFUN = osDollarATR, tradeSize = tradeSize,
    pctATR = pctATR, atrMod = "X"), type = "enter", path.dep = TRUE)
```

```
[1] "CRSIcumStrat"
```

```
add.rule(strategy.st, name = "ruleSignal",
  arguments = list(sigcol = "longExit", sigval = TRUE,
    orderqty = "all", ordertype = "market", orderside = "long",
    replace = FALSE, prefer = "Open"), type = "exit", path.dep = TRUE)
```

```
[1] "CRSIcumStrat"
```

Apply Strategy

```
t1 <- Sys.time()
out <- applyStrategy(strategy = strategy.st,
  portfolios = portfolio.st)
```

```
[1] "2003-10-24 00:00:00 EFA 1721 @ 10.371953926806"
```

```
[1] "2003-10-29 00:00:00 EFA -1721 @ 10.5757386940943"
[1] "2004-03-11 00:00:00 EFA 1319 @ 11.7420521028587"
[1] "2004-03-18 00:00:00 EFA -1319 @ 11.9165154813358"
[1] "2004-03-23 00:00:00 EFA 1229 @ 11.7420521028587"
[1] "2004-03-26 00:00:00 EFA -1229 @ 11.869478427724"
[1] "2004-04-16 00:00:00 EFA 1330 @ 12.0319690178964"
[1] "2004-04-30 00:00:00 EFA 15 @ 11.869478427724"
[1] "2004-05-05 00:00:00 EFA -1345 @ 12.0456525710496"
[1] "2004-05-10 00:00:00 EFA 1149 @ 11.2332014161314"
[1] "2004-05-20 00:00:00 EFA -1149 @ 11.3580623634143"
[1] "2004-10-15 00:00:00 EFA 1676 @ 12.2107082822409"
[1] "2004-10-22 00:00:00 EFA -1676 @ 12.3791847534389"
[1] "2004-12-13 00:00:00 EFA 1117 @ 13.3284696439448"
[1] "2004-12-14 00:00:00 EFA -1117 @ 13.3832030868672"
[1] "2005-01-05 00:00:00 EFA 1424 @ 13.563671651091"
[1] "2005-01-27 00:00:00 EFA -1424 @ 13.5671457572522"
[1] "2005-03-22 00:00:00 EFA 1846 @ 14.0812100482693"
[1] "2005-04-06 00:00:00 EFA -1846 @ 13.8458870284268"
[1] "2005-04-15 00:00:00 EFA 1564 @ 13.7199756886493"
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[1] "2013-02-19 00:00:00 EWJ 476 @ 39.568418394736"
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[1] "2013-08-09 00:00:00 IGE -437 @ 40.4974939415866"
[1] "2013-10-10 00:00:00 IGE 415 @ 40.9332251932276"
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[1] "2003-11-24 00:00:00 IYR 1187 @ 15.2049610523034"
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[1] "2004-03-12 00:00:00 IYR 1305 @ 17.2068555926772"
[1] "2004-03-18 00:00:00 IYR -1305 @ 17.5855980597243"
[1] "2004-04-06 00:00:00 IYR 1010 @ 17.0810183105121"
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[1] "2005-01-18 00:00:00 IYR -685 @ 19.752273478039"
[1] "2005-01-26 00:00:00 IYR 584 @ 19.3042452798947"
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[1] "2013-11-21 00:00:00 IYZ 732 @ 28.2020925052384"
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[1] "2005-07-29 00:00:00 LQD -603 @ 73.9104023532356"
[1] "2005-09-19 00:00:00 LQD 583 @ 73.6142040542252"
[1] "2005-09-22 00:00:00 LQD -583 @ 74.0772300288369"
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[1] "2005-10-24 00:00:00 LQD -601 @ 73.1810478185517"
[1] "2006-01-27 00:00:00 LQD 633 @ 73.5088481235358"
[1] "2006-02-21 00:00:00 LQD -633 @ 73.53043243786"
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[1] "2006-08-16 00:00:00 LQD -748 @ 73.7093613105223"
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[1] "2006-10-19 00:00:00 LQD -372 @ 74.9575246732543"
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[1] "2010-06-07 00:00:00 LQD -339 @ 91.1769281402053"
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[1] "2012-05-29 00:00:00 LQD -435 @ 109.231122733507"
[1] "2012-06-07 00:00:00 LQD 380 @ 109.517124479333"
[1] "2012-06-11 00:00:00 LQD -380 @ 110.055779768762"
[1] "2012-08-09 00:00:00 LQD 376 @ 113.743259152221"
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[1] "2013-01-29 00:00:00 LQD 546 @ 115.347431531846"
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[1] "2003-11-24 00:00:00 RWR 1935 @ 10.4492555895372"
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[1] "2004-03-12 00:00:00 RWR 2098 @ 11.7525667072107"
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[1] "2004-08-03 00:00:00 RWR -1513 @ 11.8380326048845"
[1] "2004-09-15 00:00:00 RWR 1605 @ 12.3617398747045"
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[1] "2005-01-18 00:00:00 RWR -1185 @ 13.6275659912249"
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[1] "2005-02-03 00:00:00 RWR -957 @ 13.4879554153528"
[1] "2005-02-23 00:00:00 RWR 1217 @ 13.7477862545812"
[1] "2005-02-28 00:00:00 RWR -1217 @ 13.8175923569136"
[1] "2005-03-23 00:00:00 RWR 903 @ 13.4014518926921"
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[1] "2005-08-16 00:00:00 RWR -1007 @ 15.9019086028885"
[1] "2005-08-22 00:00:00 RWR 807 @ 15.7511762598223"
[1] "2005-08-26 00:00:00 RWR -807 @ 15.8900721370994"
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[1] "2005-09-23 00:00:00 RWR -1106 @ 47.3070470614163"
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[1] "2006-05-26 00:00:00 RWR -235 @ 54.0296984242456"
[1] "2006-07-17 00:00:00 RWR 279 @ 56.7502378834256"
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[1] "2007-01-11 00:00:00 RWR -228 @ 68.4931168859711"
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[1] "2009-09-03 00:00:00 RWR 163 @ 34.8419399584253"
[1] "2009-09-09 00:00:00 RWR -163 @ 36.8097311300583"
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[1] "2010-04-19 00:00:00 RWR 216 @ 47.5973453935564"
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[1] "2011-02-28 00:00:00 RWR -293 @ 58.9171440176102"
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[1] "2012-01-03 00:00:00 SHY -5709 @ 83.9791981648314"
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[1] "2006-03-14 00:00:00 XLE -176 @ 46.3069215543481"
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[1] "2007-07-03 00:00:00 XLE -167 @ 63.0550576081268"
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[1] "2013-05-07 00:00:00 XLU 515 @ 39.16064367982"
[1] "2013-05-16 00:00:00 XLU -515 @ 38.9569355743994"
[1] "2013-05-24 00:00:00 XLU 392 @ 37.9868923579054"
[1] "2013-06-10 00:00:00 XLU -392 @ 36.9586446083353"
[1] "2013-06-13 00:00:00 XLU 375 @ 36.1341098144019"
[1] "2013-06-14 00:00:00 XLU -375 @ 36.7743383372879"
[1] "2013-08-15 00:00:00 XLU 516 @ 37.368198929762"
[1] "2013-09-11 00:00:00 XLU -516 @ 36.6429814836774"
[1] "2013-11-21 00:00:00 XLU 418 @ 38.2208454270511"
[1] "2013-11-29 00:00:00 XLU 32 @ 37.6173053460828"
[1] "2013-12-05 00:00:00 XLU -450 @ 37.646986607079"
[1] "2004-03-11 00:00:00 XLV 700 @ 25.7671047951339"
[1] "2004-03-30 00:00:00 XLV -700 @ 25.2658150966394"
[1] "2004-05-11 00:00:00 XLV 603 @ 25.9580292088761"
[1] "2004-05-20 00:00:00 XLV 13 @ 25.6625719658482"
[1] "2004-05-27 00:00:00 XLV -616 @ 25.8314046761498"
[1] "2004-06-23 00:00:00 XLV 904 @ 25.9033584519516"
[1] "2004-07-14 00:00:00 XLV -904 @ 25.1414958145856"
[1] "2005-01-05 00:00:00 XLV 657 @ 25.1918620124116"
[1] "2005-01-11 00:00:00 XLV -657 @ 25.3792245699122"
[1] "2005-03-17 00:00:00 XLV 671 @ 25.3110924211295"
[1] "2005-03-24 00:00:00 XLV -671 @ 25.5939815318781"
[1] "2005-06-24 00:00:00 XLV 820 @ 26.8719968546221"
[1] "2005-06-29 00:00:00 XLV -820 @ 26.914854903832"
[1] "2005-08-08 00:00:00 XLV 818 @ 27.1291451498816"
[1] "2005-08-10 00:00:00 XLV -818 @ 27.2662900501924"
[1] "2005-08-25 00:00:00 XLV 799 @ 26.7005646577824"
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[1] "2005-08-30 00:00:00 XLV -799 @ 26.7862807562022"
[1] "2005-10-07 00:00:00 XLV 564 @ 26.6093372860617"
[1] "2005-10-17 00:00:00 XLV -564 @ 26.4373859485948"
[1] "2006-01-26 00:00:00 XLV 689 @ 27.4645353296135"
[1] "2006-01-30 00:00:00 XLV -689 @ 27.9389532619863"
[1] "2006-02-08 00:00:00 XLV 631 @ 27.2833927453247"
[1] "2006-02-09 00:00:00 XLV -631 @ 27.6715561652974"
[1] "2006-03-07 00:00:00 XLV 721 @ 27.6888043075227"
[1] "2006-03-09 00:00:00 XLV -721 @ 28.0338378835565"
[1] "2006-03-29 00:00:00 XLV 847 @ 27.9786121101332"
[1] "2006-05-01 00:00:00 XLV -847 @ 26.7670404897105"
[1] "2006-10-12 00:00:00 XLV 922 @ 28.7956372065169"
[1] "2006-10-13 00:00:00 XLV -922 @ 28.882789326439"
[1] "2006-11-01 00:00:00 XLV 891 @ 28.9786594472768"
[1] "2006-11-07 00:00:00 XLV -891 @ 29.1355364006756"
[1] "2006-11-10 00:00:00 XLV 644 @ 28.2117045813441"
[1] "2006-11-15 00:00:00 XLV -644 @ 28.5603209048801"
[1] "2007-01-24 00:00:00 XLV 770 @ 30.042526012687"
[1] "2007-02-01 00:00:00 XLV -770 @ 30.3049096662147"
[1] "2007-03-05 00:00:00 XLV 614 @ 28.9492753663301"
[1] "2007-03-20 00:00:00 XLV -614 @ 29.2506432591843"
[1] "2007-03-29 00:00:00 XLV 585 @ 29.4876682795919"
[1] "2007-04-04 00:00:00 XLV -585 @ 30.0231701294942"
[1] "2007-06-07 00:00:00 XLV 920 @ 31.5506629497131"
[1] "2007-06-18 00:00:00 XLV -920 @ 31.7825501198211"
[1] "2007-06-26 00:00:00 XLV 587 @ 30.9617323991083"
[1] "2007-06-28 00:00:00 XLV -587 @ 31.1735554729018"
[1] "2007-07-23 00:00:00 XLV 679 @ 31.367729124589"
[1] "2007-08-03 00:00:00 XLV -679 @ 30.1585596874842"
[1] "2007-12-18 00:00:00 XLV 331 @ 31.8756559719296"
[1] "2007-12-24 00:00:00 XLV -331 @ 31.7874396059457"
[1] "2007-12-31 00:00:00 XLV 437 @ 31.8763333280011"
[1] "2008-01-08 00:00:00 XLV -437 @ 31.6985503284431"
[1] "2008-08-22 00:00:00 XLV 414 @ 29.6387530771696"
[1] "2008-08-25 00:00:00 XLV -414 @ 29.6566942104505"
[1] "2009-09-02 00:00:00 XLV 546 @ 25.8180794013035"
[1] "2009-09-10 00:00:00 XLV -546 @ 26.3406754687305"
[1] "2009-10-05 00:00:00 XLV 565 @ 25.8947690494806"
[1] "2009-10-07 00:00:00 XLV -565 @ 26.2723243458082"
[1] "2010-01-25 00:00:00 XLV 455 @ 29.6119744625966"
[1] "2010-02-03 00:00:00 XLV -455 @ 29.6304935210473"
[1] "2010-02-08 00:00:00 XLV 422 @ 28.5656476601346"
[1] "2010-02-18 00:00:00 XLV -422 @ 29.0656613123494"
[1] "2010-04-23 00:00:00 XLV 676 @ 28.8377947147518"
[1] "2010-04-30 00:00:00 XLV -676 @ 29.1443820842518"
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[1] "2011-02-24 00:00:00 XLV 754 @ 30.1336444398632"
[1] "2011-03-01 00:00:00 XLV -754 @ 30.9167031113843"
[1] "2011-03-17 00:00:00 XLV 532 @ 30.1147745900331"
[1] "2011-03-22 00:00:00 XLV -532 @ 30.6595104668217"
[1] "2011-05-24 00:00:00 XLV 566 @ 33.7965443845425"
[1] "2011-06-01 00:00:00 XLV -566 @ 34.1093017384401"
[1] "2011-06-06 00:00:00 XLV 588 @ 33.2563304109253"
[1] "2011-06-10 00:00:00 XLV -588 @ 33.4743114879989"
[1] "2011-07-19 00:00:00 XLV 531 @ 33.3335896950779"
[1] "2011-07-22 00:00:00 XLV -531 @ 33.9335952619776"
[1] "2011-07-28 00:00:00 XLV 529 @ 32.6764427363346"
[1] "2011-08-15 00:00:00 XLV -529 @ 30.4097576846811"
[1] "2012-04-11 00:00:00 XLV 629 @ 35.739031112212"
[1] "2012-04-18 00:00:00 XLV -629 @ 35.8648396630817"
[1] "2012-05-07 00:00:00 XLV 639 @ 35.5454809843365"
[1] "2012-05-25 00:00:00 XLV -639 @ 35.2454763506282"
[1] "2012-06-04 00:00:00 XLV 536 @ 34.3745027106897"
[1] "2012-06-07 00:00:00 XLV -536 @ 35.4099958948236"
[1] "2012-07-24 00:00:00 XLV 475 @ 36.7489524719976"
[1] "2012-07-27 00:00:00 XLV -475 @ 37.1186817660739"
[1] "2012-10-11 00:00:00 XLV 582 @ 39.6205475069893"
[1] "2012-10-16 00:00:00 XLV -582 @ 40.1094486361476"
[1] "2012-11-09 00:00:00 XLV 402 @ 38.1147320291817"
[1] "2012-11-20 00:00:00 XLV -402 @ 38.456964775197"
[1] "2012-12-27 00:00:00 XLV 544 @ 39.2741661814544"
[1] "2013-01-02 00:00:00 XLV -544 @ 39.9918157764643"
[1] "2013-06-06 00:00:00 XLV 294 @ 46.7603104291777"
[1] "2013-06-10 00:00:00 XLV -294 @ 48.1030895854468"
[1] "2013-06-21 00:00:00 XLV 285 @ 46.8529880723737"
[1] "2013-06-27 00:00:00 XLV -285 @ 47.7257756930162"
[1] "2013-08-16 00:00:00 XLV 418 @ 49.1143071785633"
[1] "2013-09-05 00:00:00 XLV -418 @ 49.7986533586704"
[1] "2013-09-25 00:00:00 XLV 425 @ 50.7908312105208"
[1] "2013-10-02 00:00:00 XLV -425 @ 50.6812813629916"
[1] "2013-11-08 00:00:00 XLV 408 @ 52.1751293397716"
[1] "2013-11-11 00:00:00 XLV -408 @ 52.8822163862155"
[1] "2013-12-13 00:00:00 XLV 369 @ 53.7088142584977"
[1] "2013-12-19 00:00:00 XLV -369 @ 54.6250390257922"
[1] "2003-11-18 00:00:00 XLY 662 @ 25.9895547587681"
[1] "2003-11-25 00:00:00 XLY -662 @ 26.1818765897968"
[1] "2004-02-05 00:00:00 XLY 582 @ 27.3052472777152"
[1] "2004-02-09 00:00:00 XLY -582 @ 27.699705103557"
[1] "2004-03-10 00:00:00 XLY 631 @ 27.9451446519522"
[1] "2004-03-18 00:00:00 XLY -631 @ 27.4367323430895"
[1] "2004-03-24 00:00:00 XLY 526 @ 26.859104170609"
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[1] "2004-03-26 00:00:00 XLY -526 @ 27.4823047294988"
[1] "2004-05-03 00:00:00 XLY 503 @ 27.5174155473396"
[1] "2004-05-10 00:00:00 XLY 3 @ 26.271012674063"
[1] "2004-05-25 00:00:00 XLY -506 @ 26.9468798985883"
[1] "2004-07-07 00:00:00 XLY 714 @ 27.246031163048"
[1] "2004-07-21 00:00:00 XLY -714 @ 26.8329470533512"
[1] "2005-01-05 00:00:00 XLY 772 @ 30.7261237623107"
[1] "2005-01-19 00:00:00 XLY -772 @ 30.7702696101882"
[1] "2005-01-21 00:00:00 XLY 651 @ 29.8696798333591"
[1] "2005-02-01 00:00:00 XLY -651 @ 29.8608487213275"
[1] "2005-02-23 00:00:00 XLY 814 @ 29.5165042209928"
[1] "2005-03-07 00:00:00 XLY -814 @ 30.2405106063118"
[1] "2005-03-22 00:00:00 XLY 744 @ 29.5763403957471"
[1] "2005-03-29 00:00:00 XLY -744 @ 29.1784515360599"
[1] "2005-08-08 00:00:00 XLY 710 @ 30.1596825243798"
[1] "2005-08-10 00:00:00 XLY -710 @ 30.6024259424492"
[1] "2005-12-21 00:00:00 XLY 617 @ 30.2161252298959"
[1] "2006-01-04 00:00:00 XLY -617 @ 29.4226073180635"
[1] "2006-03-08 00:00:00 XLY 709 @ 29.4493542513039"
[1] "2006-03-15 00:00:00 XLY -709 @ 30.0734710557055"
[1] "2006-04-13 00:00:00 XLY 747 @ 30.6504063777449"
[1] "2006-04-19 00:00:00 XLY -747 @ 30.2312734285027"
[1] "2006-05-15 00:00:00 XLY 791 @ 30.3650374418634"
[1] "2006-05-26 00:00:00 XLY -791 @ 30.0350805015284"
[1] "2006-06-07 00:00:00 XLY 550 @ 29.633780435445"
[1] "2006-06-16 00:00:00 XLY -550 @ 29.6613503467377"
[1] "2006-11-29 00:00:00 XLY 647 @ 33.6939893716063"
[1] "2006-12-05 00:00:00 XLY -647 @ 34.0163350943121"
[1] "2007-01-29 00:00:00 XLY 663 @ 34.9107046436411"
[1] "2007-02-01 00:00:00 XLY -663 @ 35.4678408785303"
[1] "2007-02-13 00:00:00 XLY 667 @ 35.3689946054674"
[1] "2007-02-15 00:00:00 XLY -667 @ 35.7733657225428"
[1] "2007-02-27 00:00:00 XLY 682 @ 35.1173868090007"
[1] "2007-03-07 00:00:00 XLY -682 @ 33.8773144847002"
[1] "2007-03-15 00:00:00 XLY 402 @ 33.6886088620008"
[1] "2007-03-20 00:00:00 XLY -402 @ 34.0378498246094"
[1] "2007-03-29 00:00:00 XLY 475 @ 34.3169205754917"
[1] "2007-04-04 00:00:00 XLY -475 @ 34.7490320128324"
[1] "2007-05-01 00:00:00 XLY 607 @ 35.0011002437864"
[1] "2007-05-03 00:00:00 XLY -607 @ 35.5142336446564"
[1] "2007-06-08 00:00:00 XLY 571 @ 35.0371069045489"
[1] "2007-06-15 00:00:00 XLY -571 @ 36.009838498405"
[1] "2007-06-26 00:00:00 XLY 539 @ 35.4867786850128"
[1] "2007-06-28 00:00:00 XLY -539 @ 35.5138361151272"
[1] "2007-07-26 00:00:00 XLY 406 @ 34.4767374353625"
```

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[1] "2007-08-03 00:00:00 XLY -406 @ 33.6921513225707"
[1] "2009-06-17 00:00:00 XLY 315 @ 21.2074255000182"
[1] "2009-06-26 00:00:00 XLY -315 @ 21.4567483338523"
[1] "2009-09-02 00:00:00 XLY 390 @ 23.8377200356831"
[1] "2009-09-08 00:00:00 XLY -390 @ 24.7807712026627"
[1] "2009-10-05 00:00:00 XLY 421 @ 24.9362261612067"
[1] "2009-10-07 00:00:00 XLY -421 @ 25.5732127607627"
[1] "2009-10-29 00:00:00 XLY 386 @ 25.460803966972"
[1] "2009-10-30 00:00:00 XLY -386 @ 25.7418282933182"
[1] "2009-11-23 00:00:00 XLY 392 @ 27.0720101046906"
[1] "2009-12-11 00:00:00 XLY -392 @ 27.7745709205562"
[1] "2010-01-25 00:00:00 XLY 510 @ 27.5119425858373"
[1] "2010-02-03 00:00:00 XLY -510 @ 27.8886913853912"
[1] "2010-04-29 00:00:00 XLY 399 @ 32.9810644909288"
[1] "2010-05-11 00:00:00 XLY -399 @ 31.6316237511963"
[1] "2010-05-21 00:00:00 XLY 220 @ 28.8761243074763"
[1] "2010-05-28 00:00:00 XLY -220 @ 30.9238756064052"
[1] "2010-06-08 00:00:00 XLY 221 @ 29.2724632685594"
[1] "2010-06-11 00:00:00 XLY -221 @ 30.0368312649337"
[1] "2010-06-23 00:00:00 XLY 276 @ 29.8212369490239"
[1] "2010-07-08 00:00:00 XLY -276 @ 28.5526509962718"
[1] "2010-08-13 00:00:00 XLY 317 @ 29.2816145661368"
[1] "2010-08-18 00:00:00 XLY -317 @ 29.5182910498592"
[1] "2010-11-17 00:00:00 XLY 427 @ 33.7255877009829"
[1] "2010-11-23 00:00:00 XLY -427 @ 34.1909666465029"
[1] "2011-02-24 00:00:00 XLY 453 @ 36.8192211988341"
[1] "2011-03-01 00:00:00 XLY -453 @ 37.7076974527635"
[1] "2011-03-17 00:00:00 XLY 318 @ 36.3510973909009"
[1] "2011-03-22 00:00:00 XLY -318 @ 36.559168952944"
[1] "2011-05-25 00:00:00 XLY 415 @ 37.9203145846341"
[1] "2011-05-27 00:00:00 XLY -415 @ 38.4475181360584"
[1] "2011-06-03 00:00:00 XLY 411 @ 37.3068384855029"
[1] "2011-06-15 00:00:00 XLY -411 @ 36.4824867171133"
[1] "2011-07-29 00:00:00 XLY 357 @ 38.1119232936638"
[1] "2011-08-15 00:00:00 XLY -357 @ 34.870198239917"
[1] "2012-04-11 00:00:00 XLY 404 @ 42.7898780465191"
[1] "2012-04-13 00:00:00 XLY -404 @ 43.4131290920962"
[1] "2012-05-09 00:00:00 XLY 339 @ 42.8093545503973"
[1] "2012-05-22 00:00:00 XLY -339 @ 41.7868390706185"
[1] "2012-06-04 00:00:00 XLY 299 @ 40.6474655413958"
[1] "2012-06-07 00:00:00 XLY -299 @ 42.5561619476315"
[1] "2012-07-12 00:00:00 XLY 334 @ 41.8075117716372"
[1] "2012-07-16 00:00:00 XLY -334 @ 42.393874353787"
[1] "2012-07-25 00:00:00 XLY 317 @ 41.9150112200332"
[1] "2012-07-27 00:00:00 XLY -317 @ 42.6577376134812"
```

```
[1] "2012-09-27 00:00:00 XLY 435 @ 45.7976827605537"
[1] "2012-10-04 00:00:00 XLY -435 @ 46.3664742774052"
[1] "2012-10-11 00:00:00 XLY 391 @ 45.9055573857312"
[1] "2012-10-16 00:00:00 XLY -391 @ 45.9840096972306"
[1] "2012-10-24 00:00:00 XLY 368 @ 45.4250239838078"
[1] "2012-11-02 00:00:00 XLY -368 @ 46.1997609089423"
[1] "2012-11-09 00:00:00 XLY 336 @ 44.3953116525686"
[1] "2012-11-20 00:00:00 XLY -336 @ 45.2386960664524"
[1] "2013-02-22 00:00:00 XLY 421 @ 49.4866260756547"
[1] "2013-02-28 00:00:00 XLY -421 @ 49.9603712090823"
[1] "2013-03-20 00:00:00 XLY 426 @ 51.6244815027784"
[1] "2013-03-21 00:00:00 XLY -426 @ 51.6145793039545"
[1] "2013-06-13 00:00:00 XLY 263 @ 54.9209227983183"
[1] "2013-06-14 00:00:00 XLY -263 @ 55.8811490065968"
[1] "2013-08-16 00:00:00 XLY 344 @ 57.7087203328702"
[1] "2013-09-05 00:00:00 XLY -344 @ 58.3740916379848"
[1] "2013-10-10 00:00:00 XLY 281 @ 59.3123432610405"
[1] "2013-10-11 00:00:00 XLY -281 @ 59.9597511937319"
[1] "2013-12-05 00:00:00 XLY 316 @ 64.083224051204"
[1] "2013-12-09 00:00:00 XLY -316 @ 64.8999595136647"
```

```
t2 <- Sys.time()
print(t2 - t1)
```

Time difference of 37.28748 secs

```
# Set up analytics
updatePortf(portfolio.st)
```

```
[1] "CRSIcumStrat"
```

```
dateRange <- time(getPortfolio(portfolio.st)$summary)[-1]
updateAcct(portfolio.st,dateRange)
```

```
[1] "CRSIcumStrat"
```

```
updateEndEq(account.st)
```

```
[1] "CRSIcumStrat"
```

Performance: Connors RSI

```
aggPF <- sum(tStats$Gross.Profits)/-sum(tStats$Gross.Losses)
## [1] 1.699368
```

```
aggCorrect <- mean(tStats$Percent.Positive)
## [1] 71.608
```

```

numTrades <- sum(tStats$Num.Trades)
## [1] 1500

meanAvgWLR <- mean(tStats$Avg.WinLoss.Ratio[
  tStats$Avg.WinLoss.Ratio < Inf], na.rm = TRUE)
## [1] 0.725

dStats <- dailyStats(Portfolios = portfolio.st, use = "Equity")
rownames(dStats) <- gsub(".DailyEndEq", "", rownames(dStats))
print(data.frame(t(dStats)))

```

	EFA.DailyEqPL	EPP.DailyEqPL	EWA.DailyEqPL
Total.Net.Profit	5609.41	6834.95	2137.68
Total.Days	313.00	342.00	378.00
Winning.Days	174.00	192.00	202.00
Losing.Days	139.00	150.00	176.00
Avg.Day.PL	17.92	19.99	5.66
Med.Day.PL	22.00	23.26	15.01
Largest.Winner	398.77	784.16	795.62
Largest.Loser	-499.21	-768.47	-745.58
Gross.Profits	22771.01	28743.43	26460.83
Gross.Losses	-17161.60	-21908.48	-24323.15
Std.Dev.Daily.PL	162.22	192.16	175.25
Percent.Positive	55.59	56.14	53.44
Percent.Negative	44.41	43.86	46.56
Profit.Factor	1.33	1.31	1.09
Avg.Win.Day	130.87	149.71	130.99
Med.Win.Day	109.51	126.16	115.43
Avg.Losing.Day	-123.46	-146.06	-138.20
Med.Losing.Day	-96.19	-105.84	-99.59
Avg.Daily.PL	17.92	19.99	5.66
Med.Daily.PL	22.00	23.26	15.01
Std.Dev.Daily.PL.1	162.22	192.16	175.25
Skewness	-0.03	0.14	-0.84
Kurtosis	24.79	32.01	32.20
Ann.Sharpe	1.75	1.65	0.51
Max.Drawdown	-1540.67	-2238.40	-4178.74
Profit.To.Max.Draw	3.64	3.05	0.51
Avg.WinLoss.Ratio	1.06	1.02	0.95
Med.WinLoss.Ratio	1.14	1.19	1.16
Max.Equity	5692.78	8194.47	5622.38
Min.Equity	-208.86	-67.52	0.00
End.Equity	5609.41	6834.95	2137.68
	EWC.DailyEqPL	EWH.DailyEqPL	EWJ.DailyEqPL

Total.Net.Profit	3748.30	1513.44	2536.08
Total.Days	380.00	377.00	203.00
Winning.Days	217.00	195.00	114.00
Losing.Days	163.00	182.00	89.00
Avg.Day.PL	9.86	4.01	12.49
Med.Day.PL	26.22	12.27	34.06
Largest.Winner	654.94	476.91	559.29
Largest.Loser	-676.77	-630.42	-544.88
Gross.Profits	25990.15	25136.40	15774.46
Gross.Losses	-22241.86	-23622.96	-13238.38
Std.Dev.Daily.PL	163.75	169.08	177.36
Percent.Positive	57.11	51.72	56.16
Percent.Negative	42.89	48.28	43.84
Profit.Factor	1.17	1.06	1.19
Avg.Win.Day	119.77	128.90	138.37
Med.Win.Day	104.27	101.78	120.39
Avg.Losing.Day	-136.45	-129.80	-148.75
Med.Losing.Day	-109.16	-94.53	-135.08
Avg.Daily.PL	9.86	4.01	12.49
Med.Daily.PL	26.22	12.27	34.06
Std.Dev.Daily.PL.1	163.75	169.08	177.36
Skewness	-0.52	-0.72	-0.50
Kurtosis	29.84	24.24	41.76
Ann.Sharpe	0.96	0.38	1.12
Max.Drawdown	-2297.23	-2380.56	-2534.07
Profit.To.Max.Draw	1.63	0.64	1.00
Avg.WinLoss.Ratio	0.88	0.99	0.93
Med.WinLoss.Ratio	0.96	1.08	0.89
Max.Equity	4257.20	3138.99	3841.00
Min.Equity	-81.17	-1368.66	-24.12
End.Equity	3748.30	1513.44	2536.08
	EWS.DailyEqPL	EWT.DailyEqPL	EWU.DailyEqPL
Total.Net.Profit	4247.30	2068.64	3445.69
Total.Days	270.00	374.00	284.00
Winning.Days	155.00	205.00	148.00
Losing.Days	115.00	169.00	136.00
Avg.Day.PL	15.73	5.53	12.13
Med.Day.PL	29.05	20.56	10.90
Largest.Winner	561.09	535.87	442.38
Largest.Loser	-638.60	-635.98	-522.52
Gross.Profits	20148.93	26534.26	19534.21
Gross.Losses	-15901.63	-24465.62	-16088.52
Std.Dev.Daily.PL	172.17	175.39	162.66
Percent.Positive	57.41	54.81	52.11
Percent.Negative	42.59	45.19	47.89

Profit.Factor	1.27	1.08	1.21
Avg.Win.Day	129.99	129.44	131.99
Med.Win.Day	114.48	105.87	108.99
Avg.Losing.Day	-138.28	-144.77	-118.30
Med.Losing.Day	-108.02	-118.34	-83.61
Avg.Daily.PL	15.73	5.53	12.13
Med.Daily.PL	29.05	20.56	10.90
Std.Dev.Daily.PL.1	172.17	175.39	162.66
Skewness	-0.49	-0.16	0.37
Kurtosis	36.04	23.69	29.18
Ann.Sharpe	1.45	0.50	1.18
Max.Drawdown	-3874.53	-2047.49	-1397.97
Profit.To.Max.Draw	1.10	1.01	2.46
Avg.WinLoss.Ratio	0.94	0.89	1.12
Med.WinLoss.Ratio	1.06	0.89	1.30
Max.Equity	7686.59	3332.20	3525.51
Min.Equity	0.00	-1691.08	-218.23
End.Equity	4247.30	2068.64	3445.69
	EWY.DailyEqPL	EWZ.DailyEqPL	EZU.DailyEqPL
Total.Net.Profit	1130.17	7014.51	3618.23
Total.Days	320.00	266.00	340.00
Winning.Days	174.00	165.00	181.00
Losing.Days	146.00	101.00	159.00
Avg.Day.PL	3.53	26.37	10.64
Med.Day.PL	20.86	36.39	12.27
Largest.Winner	710.76	449.90	953.61
Largest.Loser	-934.82	-437.57	-623.39
Gross.Profits	24116.14	20109.72	25722.98
Gross.Losses	-22985.97	-13095.21	-22104.75
Std.Dev.Daily.PL	201.65	152.70	188.93
Percent.Positive	54.37	62.03	53.24
Percent.Negative	45.62	37.97	46.76
Profit.Factor	1.05	1.54	1.16
Avg.Win.Day	138.60	121.88	142.12
Med.Win.Day	111.92	104.69	113.71
Avg.Losing.Day	-157.44	-129.66	-139.02
Med.Losing.Day	-102.74	-104.07	-90.98
Avg.Daily.PL	3.53	26.37	10.64
Med.Daily.PL	20.86	36.39	12.27
Std.Dev.Daily.PL.1	201.65	152.70	188.93
Skewness	-1.82	0.49	0.65
Kurtosis	44.61	26.57	39.99
Ann.Sharpe	0.28	2.74	0.89
Max.Drawdown	-3085.03	-1007.50	-2444.52
Profit.To.Max.Draw	0.37	6.96	1.48

Avg.WinLoss.Ratio	0.88	0.94	1.02
Med.WinLoss.Ratio	1.09	1.01	1.25
Max.Equity	3146.50	7411.97	3706.17
Min.Equity	-861.55	-209.01	-1388.99
End.Equity	1130.17	7014.51	3618.23
	IEF.DailyEqPL	IGE.DailyEqPL	IYR.DailyEqPL
Total.Net.Profit	-654.21	7466.40	2317.94
Total.Days	428.00	414.00	352.00
Winning.Days	217.00	239.00	184.00
Losing.Days	211.00	175.00	168.00
Avg.Day.PL	-1.53	18.03	6.59
Med.Day.PL	3.84	24.30	8.06
Largest.Winner	488.78	513.38	961.67
Largest.Loser	-806.54	-797.44	-965.91
Gross.Profits	25629.02	30166.89	22861.00
Gross.Losses	-26283.23	-22700.49	-20543.06
Std.Dev.Daily.PL	160.60	166.26	177.08
Percent.Positive	50.70	57.73	52.27
Percent.Negative	49.30	42.27	47.73
Profit.Factor	0.98	1.33	1.11
Avg.Win.Day	118.11	126.22	124.24
Med.Win.Day	99.49	117.23	96.56
Avg.Losing.Day	-124.57	-129.72	-122.28
Med.Losing.Day	-87.94	-98.06	-82.02
Avg.Daily.PL	-1.53	18.03	6.59
Med.Daily.PL	3.84	24.30	8.06
Std.Dev.Daily.PL.1	160.60	166.26	177.08
Skewness	-1.62	-0.90	-1.17
Kurtosis	32.09	29.98	65.59
Ann.Sharpe	-0.15	1.72	0.59
Max.Drawdown	-2919.87	-2590.20	-2545.41
Profit.To.Max.Draw	-0.22	2.88	0.91
Avg.WinLoss.Ratio	0.95	0.97	1.02
Med.WinLoss.Ratio	1.13	1.20	1.18
Max.Equity	942.20	8741.12	4757.88
Min.Equity	-1977.67	-341.54	-743.54
End.Equity	-654.21	7466.40	2317.94
	IYZ.DailyEqPL	LQD.DailyEqPL	RWR.DailyEqPL
Total.Net.Profit	4442.29	534.76	4688.61
Total.Days	468.00	406.00	357.00
Winning.Days	250.00	217.00	192.00
Losing.Days	218.00	189.00	165.00
Avg.Day.PL	9.49	1.32	13.13
Med.Day.PL	16.71	10.15	9.87
Largest.Winner	735.22	403.70	816.17

Largest.Loser	-1014.10	-674.73	-812.98
Gross.Profits	31341.72	22540.59	23462.92
Gross.Losses	-26899.43	-22005.84	-18774.31
Std.Dev.Daily.PL	171.19	144.45	164.88
Percent.Positive	53.42	53.45	53.78
Percent.Negative	46.58	46.55	46.22
Profit.Factor	1.17	1.02	1.25
Avg.Win.Day	125.37	103.87	122.20
Med.Win.Day	99.06	76.55	97.53
Avg.Losing.Day	-123.39	-116.43	-113.78
Med.Losing.Day	-86.30	-89.41	-76.25
Avg.Daily.PL	9.49	1.32	13.13
Med.Daily.PL	16.71	10.15	9.87
Std.Dev.Daily.PL.1	171.19	144.45	164.88
Skewness	-1.16	-1.37	-0.36
Kurtosis	40.77	28.10	48.12
Ann.Sharpe	0.88	0.14	1.26
Max.Drawdown	-3423.75	-2844.58	-2313.17
Profit.To.Max.Draw	1.30	0.19	2.03
Avg.WinLoss.Ratio	1.02	0.89	1.07
Med.WinLoss.Ratio	1.15	0.86	1.28
Max.Equity	5026.31	899.27	6751.02
Min.Equity	-231.91	-1945.32	-424.48
End.Equity	4442.29	534.76	4688.61
	SHY.DailyEqPL	TLT.DailyEqPL	XLB.DailyEqPL
Total.Net.Profit	4226.03	156.11	5827.15
Total.Days	315.00	405.00	364.00
Winning.Days	176.00	204.00	204.00
Losing.Days	139.00	201.00	160.00
Avg.Day.PL	13.42	0.39	16.01
Med.Day.PL	40.41	3.27	24.49
Largest.Winner	412.04	474.23	652.58
Largest.Loser	-745.95	-740.37	-835.70
Gross.Profits	21592.00	23290.30	27212.14
Gross.Losses	-17365.97	-23134.19	-21385.00
Std.Dev.Daily.PL	154.70	152.45	180.33
Percent.Positive	55.87	50.37	56.04
Percent.Negative	44.13	49.63	43.96
Profit.Factor	1.24	1.01	1.27
Avg.Win.Day	122.68	114.17	133.39
Med.Win.Day	106.22	95.13	114.02
Avg.Losing.Day	-124.94	-115.10	-133.66
Med.Losing.Day	-96.97	-86.98	-81.64
Avg.Daily.PL	13.42	0.39	16.01
Med.Daily.PL	40.41	3.27	24.49

Std.Dev.Daily.PL.1	154.70	152.45	180.33
Skewness	-1.54	-1.66	-1.08
Kurtosis	40.32	36.95	38.79
Ann.Sharpe	1.38	0.04	1.41
Max.Drawdown	-1996.57	-2758.33	-2274.03
Profit.To.Max.Draw	2.12	0.06	2.56
Avg.WinLoss.Ratio	0.98	0.99	1.00
Med.WinLoss.Ratio	1.10	1.09	1.40
Max.Equity	4269.59	652.71	5827.15
Min.Equity	-501.89	-2591.55	-630.16
End.Equity	4226.03	156.11	5827.15
	XLE.DailyEqPL	XLF.DailyEqPL	XLI.DailyEqPL
Total.Net.Profit	6665.37	3921.73	7258.91
Total.Days	366.00	292.00	337.00
Winning.Days	218.00	159.00	191.00
Losing.Days	148.00	133.00	146.00
Avg.Day.PL	18.21	13.43	21.54
Med.Day.PL	29.21	22.77	21.70
Largest.Winner	454.62	460.94	548.37
Largest.Loser	-830.37	-934.72	-468.09
Gross.Profits	25283.31	21395.14	24090.73
Gross.Losses	-18617.95	-17473.41	-16831.82
Std.Dev.Daily.PL	159.34	174.54	155.25
Percent.Positive	59.56	54.45	56.68
Percent.Negative	40.44	45.55	43.32
Profit.Factor	1.36	1.22	1.43
Avg.Win.Day	115.98	134.56	126.13
Med.Win.Day	95.44	106.92	99.86
Avg.Losing.Day	-125.80	-131.38	-115.29
Med.Losing.Day	-89.44	-92.37	-94.64
Avg.Daily.PL	18.21	13.43	21.54
Med.Daily.PL	29.21	22.77	21.70
Std.Dev.Daily.PL.1	159.34	174.54	155.25
Skewness	-1.34	-1.14	1.20
Kurtosis	40.06	47.68	25.41
Ann.Sharpe	1.81	1.22	2.20
Max.Drawdown	-2040.23	-1560.52	-1009.06
Profit.To.Max.Draw	3.27	2.51	7.19
Avg.WinLoss.Ratio	0.92	1.02	1.09
Med.WinLoss.Ratio	1.07	1.16	1.06
Max.Equity	6740.50	4214.72	7258.91
Min.Equity	-222.56	-284.63	-244.71
End.Equity	6665.37	3921.73	7258.91
	XLK.DailyEqPL	XLP.DailyEqPL	XLU.DailyEqPL
Total.Net.Profit	4568.74	4689.30	2822.94

Total.Days	335.00	349.00	385.00
Winning.Days	189.00	195.00	206.00
Losing.Days	146.00	154.00	179.00
Avg.Day.PL	13.64	13.44	7.33
Med.Day.PL	26.14	16.40	15.17
Largest.Winner	543.22	787.45	725.60
Largest.Loser	-666.02	-797.22	-950.60
Gross.Profits	22932.46	24745.17	23039.40
Gross.Losses	-18363.72	-20055.87	-20216.46
Std.Dev.Daily.PL	160.45	176.65	155.75
Percent.Positive	56.42	55.87	53.51
Percent.Negative	43.58	44.13	46.49
Profit.Factor	1.25	1.23	1.14
Avg.Win.Day	121.34	126.90	111.84
Med.Win.Day	96.76	100.51	92.74
Avg.Losing.Day	-125.78	-130.23	-112.94
Med.Losing.Day	-101.53	-102.56	-78.88
Avg.Daily.PL	13.64	13.44	7.33
Med.Daily.PL	26.14	16.40	15.17
Std.Dev.Daily.PL.1	160.45	176.65	155.75
Skewness	-0.01	-0.50	-1.49
Kurtosis	32.29	52.46	54.15
Ann.Sharpe	1.35	1.21	0.75
Max.Drawdown	-1535.64	-2004.85	-1844.95
Profit.To.Max.Draw	2.98	2.34	1.53
Avg.WinLoss.Ratio	0.96	0.97	0.99
Med.WinLoss.Ratio	0.95	0.98	1.18
Max.Equity	4709.91	4970.73	4345.55
Min.Equity	-42.43	-957.81	-729.00
End.Equity	4568.74	4689.30	2822.94
	XLV.DailyEqPL	XLY.DailyEqPL	
Total.Net.Profit	3844.99	4081.34	
Total.Days	314.00	344.00	
Winning.Days	168.00	191.00	
Losing.Days	146.00	153.00	
Avg.Day.PL	12.25	11.86	
Med.Day.PL	13.00	18.76	
Largest.Winner	690.22	632.56	
Largest.Loser	-821.22	-782.98	
Gross.Profits	21038.17	24586.04	
Gross.Losses	-17193.18	-20504.70	
Std.Dev.Daily.PL	166.35	178.05	
Percent.Positive	53.50	55.52	
Percent.Negative	46.50	44.48	
Profit.Factor	1.22	1.20	

Avg.Win.Day	125.23	128.72
Med.Win.Day	95.73	102.38
Avg.Losing.Day	-117.76	-134.02
Med.Losing.Day	-79.56	-85.41
Avg.Daily.PL	12.25	11.86
Med.Daily.PL	13.00	18.76
Std.Dev.Daily.PL.1	166.35	178.05
Skewness	-1.01	-1.28
Kurtosis	56.32	37.19
Ann.Sharpe	1.17	1.06
Max.Drawdown	-2201.70	-2248.17
Profit.To.Max.Draw	1.75	1.82
Avg.WinLoss.Ratio	1.06	0.96
Med.WinLoss.Ratio	1.20	1.20
Max.Equity	3892.76	4081.34
Min.Equity	-1228.58	-631.80
End.Equity	3844.99	4081.34

```
durationStatistics <- function(Portfolio, Symbols,
  includeOpenTrade = FALSE, ...) {

  tmp <- list()
  length(tmp) <- length(Symbols)
  for(Symbol in Symbols) {
    pts <- perTradeStats(Portfolio = Portfolio,
      Symbol = Symbol, includeOpenTrade = includeOpenTrade)
    pts$diff <- pts$End - pts$Start

    durationSummary <- summary(as.numeric(pts$diff))
    winDurationSummary <- summary(as.numeric(
      pts$diff[pts$Net.Trading.PL > 0]))
    lossDurationSummary <- summary(as.numeric(
      pts$diff[pts$Net.Trading.PL <= 0]))
    names(durationSummary) <-
      c("Min", "Q1", "Med", "Mean", "Q3", "Max")
    names(winDurationSummary) <-
      c("Min", "Q1", "Med", "Mean", "Q3", "Max")
    names(lossDurationSummary) <-
      c("Min", "Q1", "Med", "Mean", "Q3", "Max")
    names(winDurationSummary) <-
      paste0("W", names(winDurationSummary))
    names(lossDurationSummary) <-
      paste0("L", names(lossDurationSummary))
    dataRow <- data.frame(cbind(t(round(durationSummary)),
      t(round(winDurationSummary)),
```

```

      t(round(lossDurationSummary))))
    tmp[[Symbol]] <- dataRow
  }
  out <- do.call(rbind, tmp)
  return(out)
}

durStats <- durationStatistics(Portfolio=portfolio.st,
  Symbols=sort(symbols))
print(t(durStats))

```

	EFA	EPP	EWA	EWG	EWJ	EWS	EWT	EWU	EWY	EWZ	EZU	IEF	IGE	IYR	IYZ
Min	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Q1	3	3	5	5	5	3	2	4	4	4	3	4	5	4	3
Med	6	6	8	8	7	6	4	6	6	6	6	7	7	7	7
Mean	8	9	10	9	10	8	7	9	8	8	7	9	11	8	10
Q3	12	11	14	12	13	7	10	10	11	9	9	12	16	10	14
Max	22	32	31	29	34	55	34	48	22	42	21	27	49	27	40
WMin	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1
WQ1	2	3	4	4	4	3	2	3	2	2	2	3	4	4	2
WMed	5	5	6	6	6	5	4	5	5	6	4	5	6	6	6
WMean	7	7	7	6	7	5	5	5	6	5	6	7	7	7	7
WQ3	8	9	10	8	8	6	6	7	7	7	7	8	7	8	8
WMax	22	22	19	14	18	24	20	9	22	22	21	27	20	24	28
LMin	1	1	2	3	3	1	3	1	5	1	6	5	1	4	3
LQ1	5	6	10	11	10	7	11	8	8	7	8	7	8	9	10
LMed	12	11	16	13	18	12	15	12	12	13	10	10	14	10	15
LMean	11	13	16	15	16	16	16	15	12	15	9	12	15	12	17
LQ3	15	18	20	19	20	16	19	20	15	18	11	14	20	15	22
LMax	19	32	31	29	34	55	34	48	22	42	13	26	49	27	40
	LQD	RWR	SHY	TLT	XLB	XLE	XLF	XLI	XLK	XLP	XLU	XLV	XLY		
Min	1	1	1	1	1	1	1	1	1	1	1	1	1		
Q1	4	3	3	6	6	4	4	4	4	3	5	4	3		
Med	7	7	7	10	7	7	7	6	6	7	8	6	6		
Mean	10	8	9	13	9	8	9	8	8	9	10	8	7		
Q3	13	10	12	14	13	11	10	10	13	13	14	10	10		
Max	33	26	35	50	27	22	33	27	23	29	27	33	22		
WMin	1	1	1	2	1	1	1	1	1	1	1	1	1		
WQ1	4	3	3	5	4	4	4	4	3	3	2	3	2		
WMed	7	6	6	8	6	6	6	6	5	6	6	5	5		
WMean	8	6	6	10	8	6	7	7	6	6	7	6	6		
WQ3	11	8	10	12	10	8	8	8	7	7	8	7	7		
WMax	25	20	16	32	27	20	30	22	15	15	21	20	20		
LMin	1	5	3	1	6	3	5	1	4	3	6	6	1		

LQ1	6	8	7	10	8	9	8	6	8	11	11	9	8
LMed	12	12	12	16	15	11	11	12	14	16	17	16	12
LMean	14	14	15	19	13	12	16	11	14	15	16	15	11
LQ3	21	21	19	27	15	15	28	15	18	20	21	18	14
LMax	33	26	35	50	22	22	33	27	23	29	27	33	22

```
SharpeRatio.annualized(portfRets)
```

```
[,1]
```

```
Annualized Sharpe Ratio (Rf=0%) 0.7040448
```

```
## [1] 0.6973019
```

```
Return.annualized(portfRets)
```

```
[,1]
```

```
Annualized Return 0.1926319
```

```
## [1] 0.03370045
```

```
maxDrawdown(portfRets)
```

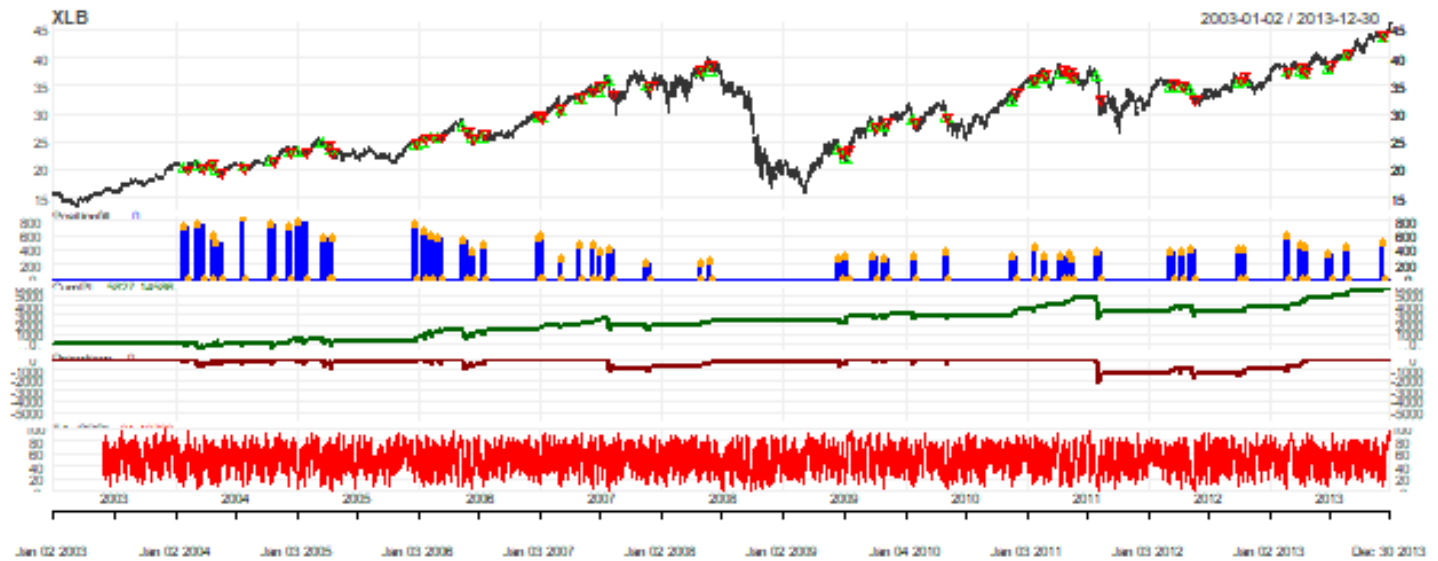
```
[1] 0.3484096
```

```
## [1] 0.09120687
```

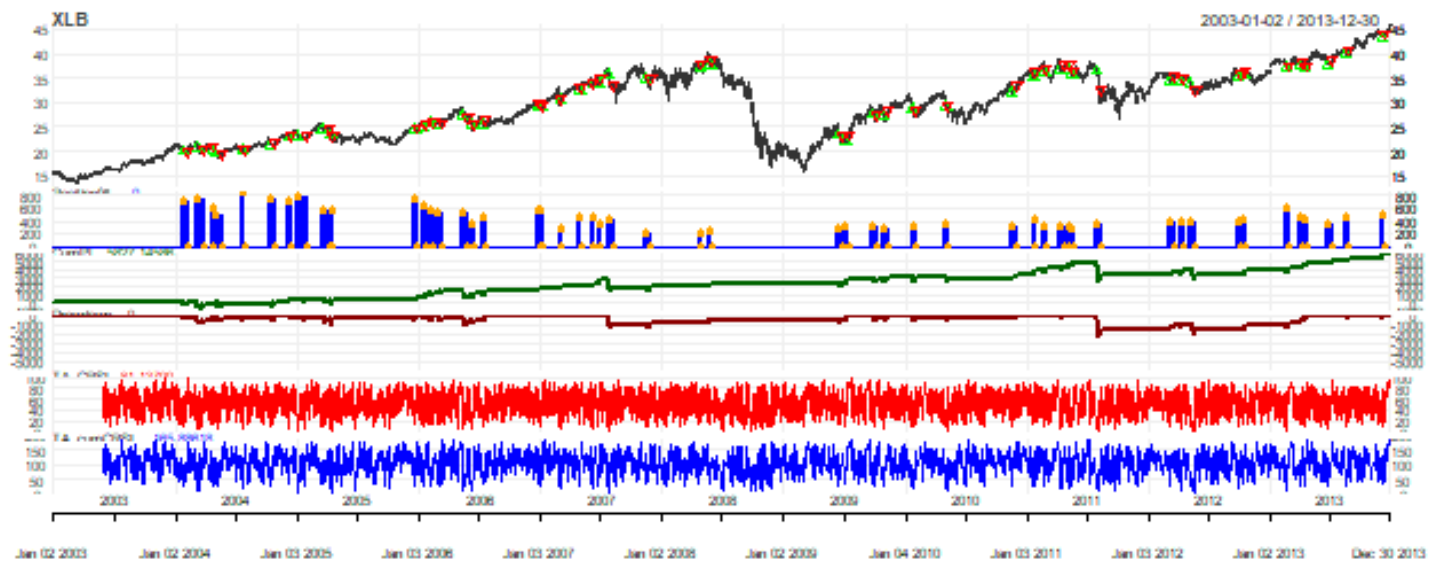
```
chart.Posn(portfolio.st, "XLB")
```



```
TA_CRSI <- connorsRSI(CI(XLB), nRSI = nRSI,
  nStreak = nStreak, nPercentLookBack = nPercentLookBack)
add_TA(TA_CRSI, col = "red")
```

```
TA_cumCRSI <- cumCRSI(price = Cl(XLB),
  nCum = nCum, nRSI = nRSI, nStreak = nStreak,
  nPercentLookBack = nPercentLookBack)
add_TA(TA_cumCRSI, col = "blue")
```



```
TA_lagATR <- lagATR(HLC = HLC(XLB), n = period)
add_TA(TA_lagATR, col = "purple")
```



```
TA_SMA <- SMA(Cl(XLB), n = nSMA)
add_TA(TA_SMA, col = "blue", lwd = 2, on = 1)
```

