

Subset Large Stock Data Counts ROI Group Counts

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%%%%%%%%%

This file relies on all others made, but can be ran using the kaggle large data set. To understand the file, it would be helpful to look at all files in the github folder. Both links are below.

```
library(lubridate)
library(dplyr)
```

%%%%%%%%%

Retrieve the large (approximately 442 mb file size) from [Kaggle](#) called allStocksGathered1.csv for the large data processed in the last part of this script and to get the individual stock stats and counts of increasing and decreasing days. This script is in [github](#) as newStocksLagsCountsGroups.Rmd that made the csv large data file just mentioned.

```
allStocksGathered1 <- read.csv('allStocksGathered1.csv', sep=',', header=TRUE,
                               na.strings=c('', ' ', 'NA'))
```

This data set is also needed and can be retrieved at the github link above.

```
newStocks <- read.csv('StockSwingTradeBotCom.csv', header=TRUE,
                      na.strings=c('', ' ', 'NA'),
                      sep=',')
```

```
head(newStocks)
```

##	stockSymbol	stockName	dailyClose	volatility	avgVolume
## 1	A	Agilent Technolog...	65.76	34.988	2,515,221
## 2	AA	Alcoa Inc.	5.83	121.188	7,431,897
## 3	AAC	AAC Holdings, Inc.	0.48	99.106	279,165
## 4	AACG	ATA Creativity Gl...	0.74	45.638	25,584
## 5	AAL	American Airlines...	10.29	97.428	24,309,238
## 6	AAMC	Altisource Asset ...	11.12	91.945	7,226

Lets create the lag and count/group by counts fields to analyze by each stock, using subsets of each stock.

```
DF <- allStocksGathered1
DF$Date <- as.Date(DF$Date)
```

What stock ticker are you interested in? And what lag are you interested in? You can keep the lag from the top of this script or these defaults or change them here. You need to enter the stock name in the chunk for Rmarkdown below. Also, pick a start date and end date of the time you want to select for running the counts and groups of counts.

```
stock_1 <- toupper("ubsi")
lag <- 3
startDate <- '2005-01-22'
endDate <- '2008-01-22'
```

Lets subset our large table to get the dates requested.

```
SDF <- subset(DF, DF$Date>=startDate & DF$Date<=endDate)

lagN <- paste('lag',lag,sep='')
cat('The number of days to retrieve the stock value compared to each day
value listed as an instance is ',lag,'and the stock to look up this
information for is ',stock_1)

## The number of days to retrieve the stock value compared to each day value
listed as an instance is 3 and the stock to look up this information for is
UBSI

stkname <- as.character(newStocks[newStocks$stockSymbol==stock_1,2])
cat('\nThis stock is ',stkname)

##
## This stock is United Bankshares...

Lstock_1 <- subset(SDF, SDF$stockName==stock_1)

cat('The number of days for trading that this time period will provide counts
of increasing and decreasing days is ', length(Lstock_1$Date), ' trading
days.')

## The number of days for trading that this time period will provide counts
of increasing and decreasing days is 754 trading days.
```

Generic automation of above stock to look up and the lag to use for generating the counts, group of counts, and lag values to get those counts.

```
Lstock_1$startDayValue <-Lstock_1$stockValue[1]
Lstock_1$startDayDate <- Lstock_1$Date[1]
Lstock_1$finalDayValue <-Lstock_1$stockValue[length(Lstock_1$stockValue)]
Lstock_1$finalDayDate <- Lstock_1$Date[length(Lstock_1$Date)]
```

```

stock_1LN <- lag(Lstock_1$stockValue, lag)
Lstock_1$lagN <- stock_1LN
Lstock_1$today2_lagN <- Lstock_1$stockValue/Lstock_1$lagN
Lstock_1 <- Lstock_1[complete.cases(Lstock_1),]

```

Lets look at the data we will be adding counts of increasing and decreasing days, for the time interval dates and stock values at the beginning and end of the time interval available or requested.

```

cat('\n\nThe lag for this table was for ',lag,'days.','\n\nThe stock to look up
was ', stock_1,'.\n\nThe start date of this stock and starting value was
',as.character(paste(Lstock_1$startDayDate[1])), ' and
', '$',Lstock_1$startDayValue[1], '\n\nThe end date and end date price of this
stock analysis is ',as.character(paste(Lstock_1$finalDayDate[1])), ' and
', '$',Lstock_1$finalDayValue[1])

##
## The lag for this table was for 3 days.
## The stock to look up was UBSI .
## The start date of this stock and starting value was 2005-01-24 and $
33.97
## The end date and end date price of this stock analysis is 2008-01-22 and
$ 26.34

roi <- Lstock_1$finalDayValue[1]/Lstock_1$startDayValue[1]
cat('\n\nThe return on investment as a percentage of the amount invested for
this time period is ',roi)

##
## The return on investment as a percentage of the amount invested for this
time period is 0.7753901

cat('\n\nIn dollars initially invested your return is
$',Lstock_1$finalDayValue[1]-Lstock_1$startDayValue[1], 'for the dates:',
as.character(paste(Lstock_1$startDayDate[1])), 'through ',
as.character(paste(Lstock_1$finalDayDate[1])))

##
##
## In dollars initially invested your return is $ -7.63 for the dates: 2005-
01-24 through 2008-01-22

```

Now, lets look at the counts and group counts of increasing and decreasing days for this stock and the time period available.

```

#assign a 1 to increasing values
Lstock_1$todayGrtrThan_lagN <- ifelse(Lstock_1$today2_lagN>1, 1,0)

Lstock_1$cumulativeSumTodayGrtrThan_lagN <-
cumsum(Lstock_1$todayGrtrThan_lagN)

```

```

# get the count of how many instances repeat,
# those counts repeating are counts that measure the days cumulatively
decreasing
# those cumulative counts that don't repeat, are counting increasing days.
# These are stock values for today's value to 7 days prior value.
countstock_10 <- Lstock_1 %>% group_by(cumulativeSumTodayGrtrThan_lagN) %>%
count(n=n())
countstock_10 <- as.data.frame(countstock_10)
countstock_10 <- countstock_10[, -3]
colnames(countstock_10)[2] <- 'nRepeatsTodayGrtrThan_lagN'

# Count the REPEATS of each number (minus the initial start)
countstock_10$decrDaysThisCycle <- countstock_10$n-1

# Count the number of times the cycle count repeats in this time span exactly
that many days
countstock_10b <- countstock_10 %>% group_by(decrDaysThisCycle) %>%
count(n=n())
countstock_10b <- as.data.frame(countstock_10b)
countstock_10b <- countstock_10b[, -3]
colnames(countstock_10b)[2] <- 'nTimesDecrDayCountsOccurs'

#combine these two count matrices of decreasing days
countsstock_tableDecr <- merge(countstock_10, countstock_10b,
by.x='decrDaysThisCycle',
by.y='decrDaysThisCycle')

#combine the counts to the stock subset
stock_3 <- merge(Lstock_1, countsstock_tableDecr,
by.x='cumulativeSumTodayGrtrThan_lagN',
by.y='cumulativeSumTodayGrtrThan_lagN')

#assign a 1 to decreasing values
stock_3$todayLessThan_lagN <- ifelse(stock_3$today2_lagN>1, 0,1)

stock_3$cumulativeSumTodayLessThan_lagN <- cumsum(stock_3$todayLessThan_lagN)

# get the count of how many instances repeat,
# those counts repeating are counts that measure the days cumulatively
increasing
# those cumulative counts that don't repeat, are counting decreasing days.
# These are stock values for today's value to 7 days prior value.
countstock_11 <- stock_3 %>% group_by(cumulativeSumTodayLessThan_lagN) %>%
count(n=n())
countstock_11 <- as.data.frame(countstock_11)
countstock_11 <- countstock_11[, -3]
colnames(countstock_11)[2] <- 'nRepeatsTodayLessThan_lagN'

# Count the REPEATS of each number (minus the initial start)

```

```

countstock_11$incrDaysThisCycle <- countstock_11$n-1

# Count the number of times the cycle count repeats in this time span exactly
that many days
countstock_11b <- countstock_11 %>% group_by(incrDaysThisCycle) %>%
count(n=n())
countstock_11b <- as.data.frame(countstock_11b)
countstock_11b <- countstock_11b[,-3]
colnames(countstock_11b)[2] <- 'nTimesIncrDayCountsOccurs'

#combine these two count matrices of decreasing days
countsstock_tableIncr <- merge(countstock_11, countstock_11b,
                               by.x='incrDaysThisCycle',
                               by.y='incrDaysThisCycle')

#combine the counts to the stock subset
stock_4 <- merge(stock_3, countsstock_tableIncr,
                 by.x='cumulativeSumTodayLessThan_lagN',
                 by.y='cumulativeSumTodayLessThan_lagN')

colnames(stock_4)

## [1] "cumulativeSumTodayLessThan_lagN" "cumulativeSumTodayGrtrThan_lagN"
## [3] "Date" "stockName"
## [5] "stockValue" "startDayValue"
## [7] "startDayDate" "finalDayValue"
## [9] "finalDayDate" "lagN"
## [11] "today2_lagN" "todayGrtrThan_lagN"
## [13] "decrDaysThisCycle" "nRepeatsTodayGrtrThan_lagN"
## [15] "nTimesDecrDayCountsOccurs" "todayLessThan_lagN"
## [17] "incrDaysThisCycle" "nRepeatsTodayLessThan_lagN"
## [19] "nTimesIncrDayCountsOccurs"

stock_5 <- stock_4[,c(3:11,
                     12,2,14,13,15,
                     16,1,18,17,19)]
colnames(stock_5) <- gsub('lagN',lagN,colnames(stock_5))
colnames(stock_5)

## [1] "Date" "stockName"
## [3] "stockValue" "startDayValue"
## [5] "startDayDate" "finalDayValue"
## [7] "finalDayDate" "lag3"
## [9] "today2_lag3" "todayGrtrThan_lag3"
## [11] "cumulativeSumTodayGrtrThan_lag3" "nRepeatsTodayGrtrThan_lag3"
## [13] "decrDaysThisCycle" "nTimesDecrDayCountsOccurs"
## [15] "todayLessThan_lag3" "cumulativeSumTodayLessThan_lag3"
## [17] "nRepeatsTodayLessThan_lag3" "incrDaysThisCycle"
## [19] "nTimesIncrDayCountsOccurs"

```

Using this information on one stock of the thousands available in our large csv file and table, lets return the count information and the number of times this stock has seen those exact days of counts.

```
cat('\nThe number of times this stock has decreased in the current cycle from
the start of this time period retrieved in price comparison of the number of
days in lags retrieved prior to each instance dates\' stock value is ',
stock_5$decrDaysThisCycle[length(stock_5$decrDaysThisCycle)], '\n')

##
## The number of times this stock has decreased in the current cycle from the
start of this time period retrieved in price comparison of the number of days
in lags retrieved prior to each instance dates\' stock value is 0

cat('\nThe number of times this stock has increased in the current cycle from
the start of this time period retrieved in price comparison of the number of
days in lags retrieved prior to each instance dates\' stock value is ',
stock_5$incrDaysThisCycle[length(stock_5$incrDaysThisCycle)], '\n')

##
## The number of times this stock has increased in the current cycle from the
start of this time period retrieved in price comparison of the number of days
in lags retrieved prior to each instance dates\' stock value is 1

cat('\nThe number of times this stock has decreased exactly this number of
days compared to its price ', lag, ' days ago, is ',
stock_5$nTimesDecrDayCountsOccurs[length(stock_5$nTimesDecrDayCountsOccurs)],
'\n')

##
## The number of times this stock has decreased exactly this number of days
compared to its price 3 days ago, is 236

cat('\nThe number of times this stock has increased exactly this number of
days compared to its price ', lag, ' days ago, is ',
stock_5$nTimesIncrDayCountsOccurs[length(stock_5$nTimesIncrDayCountsOccurs)],
'\n')

##
## The number of times this stock has increased exactly this number of days
compared to its price 3 days ago, is 35
```

top and bottom ordered instances by descending value of increasing days and date this stock selected (for the time period retrieved) decreased is shown in the table below.

```
sd5 <- stock_5[with(stock_5, order(stock_5$decrDaysThisCycle,
stock_5$Date, decreasing =
TRUE)), c(1:3, 8, 9, 13, 14)]
sd5b <- rbind(head(sd5), tail(sd5))
sd5b
```

```
##           Date stockName stockValue lag3 today2_lag3 decrDaysThisCycle
## 236 2006-01-03      UBSI      35.58 36.07  0.9864153          19
## 235 2005-12-30      UBSI      35.24 35.83  0.9835334          19
## 234 2005-12-29      UBSI      35.60 36.41  0.9777534          19
## 233 2005-12-28      UBSI      36.07 36.38  0.9914788          19
## 232 2005-12-27      UBSI      35.83 36.48  0.9821820          19
## 231 2005-12-23      UBSI      36.41 36.49  0.9978076          19
## 8   2005-02-07      UBSI      35.97 35.25  1.0204255           0
## 7   2005-02-04      UBSI      35.75 34.83  1.0264140           0
## 6   2005-02-03      UBSI      35.22 34.10  1.0328446           0
## 5   2005-02-02      UBSI      35.25 33.98  1.0373749           0
## 4   2005-02-01      UBSI      34.83 34.17  1.0193152           0
## 1   2005-01-27      UBSI      34.17 33.97  1.0058875           0
##           nTimesDecrDayCountsOccurs
## 236                      1
## 235                      1
## 234                      1
## 233                      1
## 232                      1
## 231                      1
## 8                        236
## 7                        236
## 6                        236
## 5                        236
## 4                        236
## 1                        236
```

The top and bottom ordered instances by descending value of increasing days and date this stock selected (for the time period retrieved) increased is shown in the table below.

```
si5 <- stock_5[with(stock_5, order(stock_5$incrDaysThisCycle,
                                   stock_5$Date, decreasing =
TRUE)),c(1:3,8,9,18,19)]
si5b <- rbind(head(si5),tail(si5))
si5b

##           Date stockName stockValue lag3 today2_lag3 incrDaysThisCycle
## 723 2007-12-10      UBSI      33.09 31.66  1.0451674           9
## 722 2007-12-07      UBSI      32.63 31.03  1.0515630           9
## 721 2007-12-06      UBSI      33.35 30.81  1.0824408           9
## 720 2007-12-05      UBSI      31.66 31.08  1.0186615           9
## 719 2007-12-04      UBSI      31.03 30.13  1.0298706           9
## 718 2007-12-03      UBSI      30.81 30.16  1.0215517           9
## 15   2005-02-16      UBSI      34.61 35.20  0.9832386           0
## 14   2005-02-15      UBSI      34.88 35.02  0.9960023           0
## 13   2005-02-14      UBSI      34.90 35.03  0.9962889           0
## 12   2005-02-11      UBSI      35.20 36.11  0.9747992           0
## 11   2005-02-10      UBSI      35.02 35.97  0.9735891           0
## 10   2005-02-09      UBSI      35.03 35.75  0.9798601           0
##           nTimesIncrDayCountsOccurs
```

## 723	1
## 722	1
## 721	1
## 720	1
## 719	1
## 718	1
## 15	297
## 14	297
## 13	297
## 12	297
## 11	297
## 10	297

The following will automate for the subset stock chosen and the date provided above. It will produce answers to the following questions:

- Was this date requested an available trading date?
- If not, then what is the earliest date after the requested date?
- What is the earliest date before the date requested for an available trading day?
- After the user selects to know whether the day is in an increasing or decreasing cycle, the ROI based on the number of days earlier (lag) to the date selected will be provided, the value at lag days earlier, the value of the current date requested of the stock, if the stock will increase or decrease the next day based on the lead for the next day.

What date in this above time period would you like to find the number of increasing or decreasing days? And if the stock increased or decreased (put 1 for increasing or 0 for decreasing) compared to its value lag days earlier?

```
findThisDate <- '2006-07-15'
fd <- as.Date(findThisDate)
incr <- 0

interest <- ifelse(incr==1,'increasing','decreasing')

cat('The date you want to search is ',findThisDate,' and you would like to
know if it is ', interest,' on this date.\n' )

## The date you want to search is  2006-07-15  and you would like to know if
it is  decreasing  on this date.
```

This first run will show you for the date closest to the date requested, but after that date for instances where the date requested is not available.


```

t <- stock_5$Date==fd

tt <- stock_5$Date==fd+1
t1 <- ifelse(sum(t)==0,
            ifelse(sum(tt)==0,as.character(paste(fd+2)),
                  as.character(paste(fd+1))),
            as.character(paste(fd)))
t1 <- as.Date(t1)

cat('The closest available trading date after the date you entered of
',findThisDate, 'is ',as.character(paste(t1)),'\n\n')

## The closest available trading date after the date you entered of 2006-07-
15 is 2006-07-17

ttt <- stock_5$Date==fd-1

t2 <- ifelse(sum(t)==0,
            ifelse(sum(ttt)==0,as.character(paste(fd-2)),
                  as.character(paste(fd-1))),
            as.character(paste(fd)))
t2 <- as.Date(t2)

cat('The closest available trading date before the date you entered of
',findThisDate, 'is ',as.character(paste(t2)),'\n\n')

## The closest available trading date before the date you entered of 2006-
07-15 is 2006-07-14

T1 <- subset(stock_5, stock_5$Date==t1 | stock_5$Date==t1+1 |
stock_5$Date==t1+2 |
            stock_5$Date==t1-1 | stock_5$Date==t1-2 | stock_5$Date==t1-3 )

T1$nextDayDecr <- lead(T1$decrDaysThisCycle,1)
T1$nextDayIncr <- lead(T1$incrDaysThisCycle,1)

T1$nextDayPrice <- lead(T1$stockValue,1)
T1$nextDayROI <- lead(T1$today2_lag3,1)

t1ROI <- subset(T1, T1$Date==t1)
t2ROI <- subset(T1, T1$Date==t2)

nextDecr <- ifelse(t1ROI$nextDayDecr==0,0,1)
nextIncr <- ifelse(t1ROI$nextDayIncr==0,0,1)
plusMinus <- ifelse(nextDecr==0, 'increase', 'decrease')

nextDecr1 <- ifelse(t2ROI$nextDayDecr==0,0,1)
nextIncr1 <- ifelse(t2ROI$nextDayIncr==0,0,1)
plusMinus1 <- ifelse(nextDecr1==0, 'increase', 'decrease')

```

```

afterROI <- t1ROI$today2_lag3
priceLag <- t1ROI$lag3
nDaysIncr <- t1ROI$incrDaysThisCycle
nDaysDecr <- t1ROI$decrDaysThisCycle
price2day <- t1ROI$stockValue
price2morrow <- t1ROI$nextDayPrice
nxtROI <- t1ROI$nextDayROI

beforeROI <- t2ROI$today2_lag3
priceLag2 <- t2ROI$lag3
nDaysIncr2 <- t2ROI$incrDaysThisCycle
nDaysDecr2 <- t2ROI$decrDaysThisCycle
price2day2 <- t2ROI$stockValue
price2morrow2 <- t2ROI$nextDayPrice
nxtROI2 <- t2ROI$nextDayROI

if (interest=='increasing'){
  cat("This date is in a cycle that is in the date range
",as.character(paste(range(T1$Date))), ' with ',length(T1$Date), ' trading
days for these dates: ',as.character(paste(T1$Date)),'.\\n\\n','The earliest
trading date of either the date requested or the nearest date after the date
requested is ',as.character(paste(t1)), '. This stock has a return on
investment from the price ', lag , ' days earlier of $',priceLag,' as
',afterROI,'.\\n\\nAnd the number of days including this date
',as.character(paste(t1)), ' that the stock is or will be increasing ', ' is
',nDaysIncr, ' days compared to the price ', lag, ' trading days
earlier.\\n\\n', 'The next trading day, this stock will have a price
',plusMinus,' from the price ',lag,' days earlier of ', price2day,' to the
price the next trading day of ',price2morrow,' that gives a ',lag,' day ROI
of ', nxtROI,'.\\n\\n')
} else {
  cat("This date is in a cycle that is in the date range
",as.character(paste(range(T1$Date))), ' with ',length(T1$Date), ' trading
days for these dates: ',as.character(paste(T1$Date)),'.\\n\\n','The earliest
trading date after this trading date requested is ',as.character(paste(t1)), '
and has a return on investment from the price ', lag , ' days earlier of
$',priceLag,' as ',afterROI,'.\\n\\nAnd the number of days that this date ',
as.character(paste(t1)), ' will decrease or is decreasing for this cycle of
decreasing days is ',nDaysDecr, ' days compared to the price ', lag, '
trading days earlier.\\n\\nThe next trading day, this stock will have a price
', plusMinus, ' from the price ',lag,' days earlier of ', price2day,' to the
price the next trading day of ',price2morrow,' that gives a ',lag,' day ROI
of ',nxtROI,'.\\n\\n')
}

## This date is in a cycle that is in the date range 2006-07-14 2006-07-19
with 4 trading days for these dates: 2006-07-14 2006-07-17 2006-07-18
2006-07-19 .
##

```

```
## The earliest trading date after this trading date requested is 2006-07-17
and has a return on investment from the price 3 days earlier of $ 35.27 as
0.9781684 .
##
## And the number of days that this date 2006-07-17 will decrease or is
decreasing for this cycle of decreasing days is 9 days compared to the
price 3 trading days earlier.
##
## The next trading day, this stock will have a price increase from the
price 3 days earlier of 34.5 to the price the next trading day of 35.27
that gives a 3 day ROI of 1.012924 .
```

%%%%%%%%%

Here is an example when selecting increasing instead of decreasing for the information provided above for the date in this time period chosen.

What date in this above time period would you like to find the number of increasing or decreasing days? And if the stock increased or decreased (put 1 for increasing or 0 for decreasing) compared to its value lag days earlier?

```
findThisDate <- '2006-07-15'
fd <- as.Date(findThisDate)
incr <- 1

interest <- ifelse(incr==1,'increasing','decreasing')

cat('The date you want to search is ',findThisDate,' and you would like to
know if it is ', interest,' on this date.\n' )

## The date you want to search is 2006-07-15 and you would like to know if
it is increasing on this date.
```

This first run will show you for the date closest to the date requested, but after that date for instances where the date requested is not available.

```
t <- stock_5$Date==fd

tt <- stock_5$Date==fd+1
t1 <- ifelse(sum(t)==0,
            ifelse(sum(tt)==0,as.character(paste(fd+2)),
                  as.character(paste(fd+1))),
            as.character(paste(fd)))
t1 <- as.Date(t1)

cat('The closest available trading date after the date you entered of
',findThisDate, 'is ',as.character(paste(t1)),'\n\n')

## The closest available trading date after the date you entered of 2006-07-
15 is 2006-07-17
```

```

ttt <- stock_5$Date==fd-1
t2 <- ifelse(sum(t)==0,
            ifelse(sum(ttt)==0,as.character(paste(fd-2)),
                  as.character(paste(fd-1))),
            as.character(paste(fd)))
t2 <- as.Date(t2)

cat('The closest available trading date before the date you entered of
',findThisDate, 'is ',as.character(paste(t2)),'\n\n')

## The closest available trading date before the date you entered of 2006-
07-15 is 2006-07-14

T1 <- subset(stock_5, stock_5$Date==t1 | stock_5$Date==t1+1 |
stock_5$Date==t1+2 |
            stock_5$Date==t1-1 | stock_5$Date==t1-2 | stock_5$Date==t1-3 )

T1$nextDayDecr <- lead(T1$decrDaysThisCycle,1)
T1$nextDayIncr <- lead(T1$incrDaysThisCycle,1)

T1$nextDayPrice <- lead(T1$stockValue,1)
T1$nextDayROI <- lead(T1$today2_lag3,1)

t1ROI <- subset(T1, T1$Date==t1)
t2ROI <- subset(T1, T1$Date==t2)

nxtDecr <- ifelse(t1ROI$nextDayDecr==0,0,1)
nxtIncr <- ifelse(t1ROI$nextDayIncr==0,0,1)
plusMinus <- ifelse(nxtDecr==0, 'increase', 'decrease')

nxtDecr1 <- ifelse(t2ROI$nextDayDecr==0,0,1)
nxtIncr1 <- ifelse(t2ROI$nextDayIncr==0,0,1)
plusMinus1 <- ifelse(nxtDecr1==0, 'increase', 'decrease')

afterROI <- t1ROI$today2_lag3
priceLag <- t1ROI$lag3
nDaysIncr <- t1ROI$incrDaysThisCycle
nDaysDecr <- t1ROI$decrDaysThisCycle
price2day <- t1ROI$stockValue
price2morrow <- t1ROI$nextDayPrice
nxtROI <- t1ROI$nextDayROI

beforeROI <- t2ROI$today2_lag3
priceLag2 <- t2ROI$lag3
nDaysIncr2 <- t2ROI$incrDaysThisCycle
nDaysDecr2 <- t2ROI$decrDaysThisCycle
price2day2 <- t2ROI$stockValue
price2morrow2 <- t2ROI$nextDayPrice
nxtROI2 <- t2ROI$nextDayROI

```

```

if (interest=='increasing'){
  cat("This date is in a cycle that is in the date range
",as.character(paste(range(T1$Date))), ' with ',length(T1$Date), ' trading
days for these dates: ',as.character(paste(T1$Date)),'.\\n\\n','The earliest
trading date of either the date requested or the nearest date after the date
requested is ',as.character(paste(t1)), '. This stock has a return on
investment from the price ', lag , ' days earlier of $',priceLag,' as
',afterROI,'.\\n\\nAnd the number of days including this date
',as.character(paste(t1)), ' that the stock is or will be increasing ', ' is
',nDaysIncr, ' days compared to the price ', lag, ' trading days
earlier.\\n\\n', 'The next trading day, this stock will have a price
',plusMinus,' from the price ',lag,' days earlier of ', price2day,' to the
price the next trading day of ',price2morrow,' that gives a ',lag,' day ROI
of ', nxtROI,'.\\n\\n')
} else {
  cat("This date is in a cycle that is in the date range
",as.character(paste(range(T1$Date))), ' with ',length(T1$Date), ' trading
days for these dates: ',as.character(paste(T1$Date)),'.\\n\\n','The earliest
trading date after this trading date requested is',as.character(paste(t1)), '
and has a return on investment from the price ', lag , ' days earlier of
$',priceLag,' as ',afterROI,'.\\n\\nAnd the number of days that this date ',
as.character(paste(t1)), ' will decrease or is decreasing for this cycle of
decreasing days is ',nDaysDecr, ' days compared to the price ', lag, '
trading days earlier.\\n\\nThe next trading day, this stock will have a price
', plusMinus, ' from the price ',lag,' days earlier of ', price2day,' to the
price the next trading day of ',price2morrow,' that gives a ',lag,' day ROI
of ',nxtROI,'.\\n\\n')
}

```

```

## This date is in a cycle that is in the date range 2006-07-14 2006-07-19
with 4 trading days for these dates: 2006-07-14 2006-07-17 2006-07-18
2006-07-19 .

```

```
##
```

```

## The earliest trading date of either the date requested or the nearest
date after the date requested is 2006-07-17 . This stock has a return on
investment from the price 3 days earlier of $ 35.27 as 0.9781684 .

```

```
##
```

```

## And the number of days including this date 2006-07-17 that the stock is
or will be increasing is 3 days compared to the price 3 trading days
earlier.

```

```
##
```

```

## The next trading day, this stock will have a price increase from the
price 3 days earlier of 34.5 to the price the next trading day of 35.27
that gives a 3 day ROI of 1.012924 .

```

The next section will show an increasing number of days interested in or decreasing number of days interested in, but with the earliest date closest to the date requested if the date requested is not available.

What date in this above time period would you like to find the number of increasing or decreasing days? And if the stock increased or decreased (put 1 for increasing or 0 for decreasing) compared to its value lag days earlier?

```
findThisDate <- '2006-07-15'
fd <- as.Date(findThisDate)
incr <- 0

interest <- ifelse(incr==1,'increasing','decreasing')

cat('The date you want to search is ',findThisDate,' and you would like to
know if it is ', interest,' on this date.\n' )

## The date you want to search is 2006-07-15 and you would like to know if
it is decreasing on this date.

t <- stock_5$Date==fd

tt <- stock_5$Date==fd+1
t1 <- ifelse(sum(t)==0,
            ifelse(sum(tt)==0,as.character(paste(fd+2)),
                  as.character(paste(fd+1))),
            as.character(paste(fd)))
t1 <- as.Date(t1)

cat('The closest available trading date after the date you entered of
',findThisDate, 'is ',as.character(paste(t1)),'\n\n')

## The closest available trading date after the date you entered of 2006-07-
15 is 2006-07-17

ttt <- stock_5$Date==fd-1
t2 <- ifelse(sum(t)==0,
            ifelse(sum(ttt)==0,as.character(paste(fd-2)),
                  as.character(paste(fd-1))),
            as.character(paste(fd)))
t2 <- as.Date(t2)

cat('The closest available trading date before the date you entered of
',findThisDate, 'is ',as.character(paste(t2)),'\n\n')

## The closest available trading date before the date you entered of 2006-
07-15 is 2006-07-14
```

```

T1 <- subset(stock_5, stock_5$Date==t1 | stock_5$Date==t1+1 |
stock_5$Date==t1+2 |
stock_5$Date==t1-1 | stock_5$Date==t1-2 | stock_5$Date==t1-3 )

T1$nextDayDecr <- lead(T1$decrDaysThisCycle,1)
T1$nextDayIncr <- lead(T1$incrDaysThisCycle,1)

T1$nextDayPrice <- lead(T1$stockValue,1)
T1$nextDayROI <- lead(T1$today2_lag3,1)

t1ROI <- subset(T1, T1$Date==t1)
t2ROI <- subset(T1, T1$Date==t2)

nxtDecr <- ifelse(t1ROI$nextDayDecr==0,0,1)
nxtIncr <- ifelse(t1ROI$nextDayIncr==0,0,1)
plusMinus <- ifelse(nxtDecr==0, 'increase', 'decrease')

nxtDecr1 <- ifelse(t2ROI$nextDayDecr==0,0,1)
nxtIncr1 <- ifelse(t2ROI$nextDayIncr==0,0,1)
plusMinus1 <- ifelse(nxtDecr1==0, 'increase', 'decrease')

afterROI <- t1ROI$today2_lag3
priceLag <- t1ROI$lag3
nDaysIncr <- t1ROI$incrDaysThisCycle
nDaysDecr <- t1ROI$decrDaysThisCycle
price2day <- t1ROI$stockValue
price2morrow <- t1ROI$nextDayPrice
nxtROI <- t1ROI$nextDayROI

beforeROI <- t2ROI$today2_lag3
priceLag2 <- t2ROI$lag3
nDaysIncr2 <- t2ROI$incrDaysThisCycle
nDaysDecr2 <- t2ROI$decrDaysThisCycle
price2day2 <- t2ROI$stockValue
price2morrow2 <- t2ROI$nextDayPrice
nxtROI2 <- t2ROI$nextDayROI

if (interest=='increasing'){
  cat("This date is in a cycle that is in the date range
",as.character(paste(range(T1$Date))), ' with ',length(T1$Date), ' trading
days for these dates: ',as.character(paste(T1$Date)),'.\\n\\n','The earliest
trading date of either the date requested or the nearest date after the date
requested is ',as.character(paste(t1)), '. This stock has a return on
investment from the price ', lag, ' days earlier of $',priceLag2,' as
',beforeROI,'.\\n\\nAnd the number of days including this date
',as.character(paste(t2)), ' that the stock is or will be increasing ', ' is
',nDaysIncr2, ' days compared to the price ', lag, ' trading days
earlier.\\n\\n', 'The next trading day, this stock will have a price
',plusMinus1,' from the price ',lag,' days earlier of ', price2day2,' to the

```

```

price the next trading day of ',price2morrow2,' that gives a ',lag,' day ROI
of ', nxtROI2, '.\n\n')
} else {
  cat("This date is in a cycle that is in the date range
",as.character(paste(range(T1$Date))), ' with ',length(T1$Date), ' trading
days for these dates: ',as.character(paste(T1$Date)), '.\n\n','The earliest
trading date after this trading date requested is',as.character(paste(t2)), '
and has a return on investment from the price ', lag , ' days earlier of
$',priceLag2,' as ',beforeROI, '.\n\nAnd the number of days that this date ',
as.character(paste(t2)), ' will decrease or is decreasing for this cycle of
decreasing days is ',nDaysDecr2, ' days compared to the price ', lag, '
trading days earlier.\n\nThe next trading day, this stock will have a price
', plusMinus1, ' from the price ',lag,' days earlier of ', price2day2,' to
the price the next trading day of ',price2morrow2,' that gives a ',lag,' day
ROI of ',nxtROI2, '.\n\n')
}

```

```

## This date is in a cycle that is in the date range 2006-07-14 2006-07-19
with 4 trading days for these dates: 2006-07-14 2006-07-17 2006-07-18
2006-07-19 .
##
## The earliest trading date after this trading date requested is 2006-07-14
and has a return on investment from the price 3 days earlier of $ 36.26 as
0.9528406 .
##
## And the number of days that this date 2006-07-14 will decrease or is
decreasing for this cycle of decreasing days is 9 days compared to the
price 3 trading days earlier.
##
## The next trading day, this stock will have a price decrease from the
price 3 days earlier of 34.55 to the price the next trading day of 34.5
that gives a 3 day ROI of 0.9781684 .

```

%%%%%%%%%

Here is an example when selecting increasing instead of decreasing for the information provided above for the date in this time period chosen.

What date in this above time period would you like to find the number of increasing or decreasing days? And if the stock increased or decreased (put 1 for increasing or 0 for decreasing) compared to its value lag days earlier?

```

findThisDate <- '2006-07-15'
fd <- as.Date(findThisDate)
incr <- 1

interest <- ifelse(incr==1,'increasing','decreasing')

cat('The date you want to search is ',findThisDate,' and you would like to
know if it is ', interest,' on this date.\n' )

```



```

## The date you want to search is 2006-07-15 and you would like to know if
it is increasing on this date.

t <- stock_5$Date==fd

tt <- stock_5$Date==fd+1
t1 <- ifelse(sum(t)==0,
            ifelse(sum(tt)==0,as.character(paste(fd+2)),
                  as.character(paste(fd+1))),
            as.character(paste(fd)))
t1 <- as.Date(t1)

cat('The closest available trading date after the date you entered of
',findThisDate, 'is ',as.character(paste(t1)),'\n\n')

## The closest available trading date after the date you entered of 2006-07-
15 is 2006-07-17

ttt <- stock_5$Date==fd-1
t2 <- ifelse(sum(t)==0,
            ifelse(sum(ttt)==0,as.character(paste(fd-2)),
                  as.character(paste(fd-1))),
            as.character(paste(fd)))
t2 <- as.Date(t2)

cat('The closest available trading date before the date you entered of
',findThisDate, 'is ',as.character(paste(t2)),'\n\n')

## The closest available trading date before the date you entered of 2006-
07-15 is 2006-07-14

T1 <- subset(stock_5, stock_5$Date==t1 | stock_5$Date==t1+1 |
stock_5$Date==t1+2 |
            stock_5$Date==t1-1 | stock_5$Date==t1-2 | stock_5$Date==t1-3 )

T1$nextDayDecr <- lead(T1$decrDaysThisCycle,1)
T1$nextDayIncr <- lead(T1$incrDaysThisCycle,1)

T1$nextDayPrice <- lead(T1$stockValue,1)
T1$nextDayROI <- lead(T1$today2_lag3,1)

t1ROI <- subset(T1, T1$Date==t1)
t2ROI <- subset(T1, T1$Date==t2)

nxtDecr <- ifelse(t1ROI$nextDayDecr==0,0,1)
nxtIncr <- ifelse(t1ROI$nextDayIncr==0,0,1)
plusMinus <- ifelse(nxtDecr==0, 'increase', 'decrease')

nxtDecr1 <- ifelse(t2ROI$nextDayDecr==0,0,1)
nxtIncr1 <- ifelse(t2ROI$nextDayIncr==0,0,1)

```

```

plusMinus1 <- ifelse(nxtDecr1==0, 'increase','decrease')

afterROI <- t1ROI$today2_lag3
priceLag <- t1ROI$lag3
nDaysIncr <- t1ROI$incrDaysThisCycle
nDaysDecr <- t1ROI$decrDaysThisCycle
price2day <- t1ROI$stockValue
price2morrow <- t1ROI$nextDayPrice
nxtROI <- t1ROI$nextDayROI

beforeROI <- t2ROI$today2_lag3
priceLag2 <- t2ROI$lag3
nDaysIncr2 <- t2ROI$incrDaysThisCycle
nDaysDecr2 <- t2ROI$decrDaysThisCycle
price2day2 <- t2ROI$stockValue
price2morrow2 <- t2ROI$nextDayPrice
nxtROI2 <- t2ROI$nextDayROI

if (interest=='increasing'){
  cat("This date is in a cycle that is in the date range
",as.character(paste(range(T1$Date))), ' with ',length(T1$Date), ' trading
days for these dates: ',as.character(paste(T1$Date)),'.\\n\\n','The earliest
trading date of either the date requested or the nearest date after the date
requested is ',as.character(paste(t1)), '. This stock has a return on
investment from the price ', lag, ' days earlier of $',priceLag2,' as
',beforeROI,'.\\n\\nAnd the number of days including this date
',as.character(paste(t2)), ' that the stock is or will be increasing ', ' is
',nDaysIncr2, ' days compared to the price ', lag, ' trading days
earlier.\\n\\n', 'The next trading day, this stock will have a price
',plusMinus1,' from the price ',lag,' days earlier of ', price2day2,' to the
price the next trading day of ',price2morrow2,' that gives a ',lag,' day ROI
of ', nxtROI2,'.\\n\\n')
} else {
  cat("This date is in a cycle that is in the date range
",as.character(paste(range(T1$Date))), ' with ',length(T1$Date), ' trading
days for these dates: ',as.character(paste(T1$Date)),'.\\n\\n','The earliest
trading date after this trading date requested is',as.character(paste(t2)), '
and has a return on investment from the price ', lag, ' days earlier of
$',priceLag2,' as ',beforeROI,'.\\n\\nAnd the number of days that this date ',
as.character(paste(t2)), ' will decrease or is decreasing for this cycle of
decreasing days is ',nDaysDecr2, ' days compared to the price ', lag, '
trading days earlier.\\n\\nThe next trading day, this stock will have a price
', plusMinus1, ' from the price ',lag,' days earlier of ', price2day2,' to
the price the next trading day of ',price2morrow2,' that gives a ',lag,' day
ROI of ',nxtROI2,'.\\n\\n')
}

## This date is in a cycle that is in the date range 2006-07-14 2006-07-19
with 4 trading days for these dates: 2006-07-14 2006-07-17 2006-07-18
2006-07-19 .

```

```
##
## The earliest trading date of either the date requested or the nearest
date after the date requested is 2006-07-17 . This stock has a return on
investment from the price 3 days earlier of $ 36.26 as 0.9528406 .
##
## And the number of days including this date 2006-07-14 that the stock is
or will be increasing is 0 days compared to the price 3 trading days
earlier.
##
## The next trading day, this stock will have a price decrease from the
price 3 days earlier of 34.55 to the price the next trading day of 34.5
that gives a 3 day ROI of 0.9781684 .
```

%%

S