Li_Xiang_SCwR_A1

Xiang Li

2023-10-10

Exercise 1

1

Nothing to output.

2

```
data_df = read.csv("data/Coca-Cola_stock_history.csv")
data_df$Date = as.Date(data_df$Date, format = "%Y-%m-%d")
sub_data_df = data_df[(data_df$Date >= "2000-01-01") & (data_df$Date <=
    "2019-12-31"), ]
colnames(sub_data_df)[ncol(sub_data_df)] = "StockSplits"
tail(sub_data_df, 10)
```

```
##             Date     Open     High      Low    Close   Volume Dividends
## 14591 2019-12-17 49.87838 50.04342 49.77752 49.89672  9230000         0
## 14592 2019-12-18 49.99757 50.19928 49.41076 49.42910 15132100         0
## 14593 2019-12-19 49.54830 49.82336 49.43827 49.80502 13385900         0
## 14594 2019-12-20 50.37348 50.61188 49.94255 50.40099 23832800         0
## 14595 2019-12-23 50.42850 50.64855 50.28180 50.34598  9300800         0
## 14596 2019-12-24 50.24512 50.42850 50.09842 50.16261  3359300         0
## 14597 2019-12-26 50.35514 50.44683 50.23595 50.44683  6228500         0
## 14598 2019-12-27 50.43767 50.84110 50.42850 50.74941  6895500         0
## 14599 2019-12-30 50.59354 50.78608 50.48352 50.67606  6431700         0
## 14600 2019-12-31 50.61188 50.77692 50.41016 50.74941  7982600         0
##       StockSplits
## 14591           0
## 14592           0
## 14593           0
## 14594           0
## 14595           0
## 14596           0
## 14597           0
## 14598           0
## 14599           0
## 14600           0
```

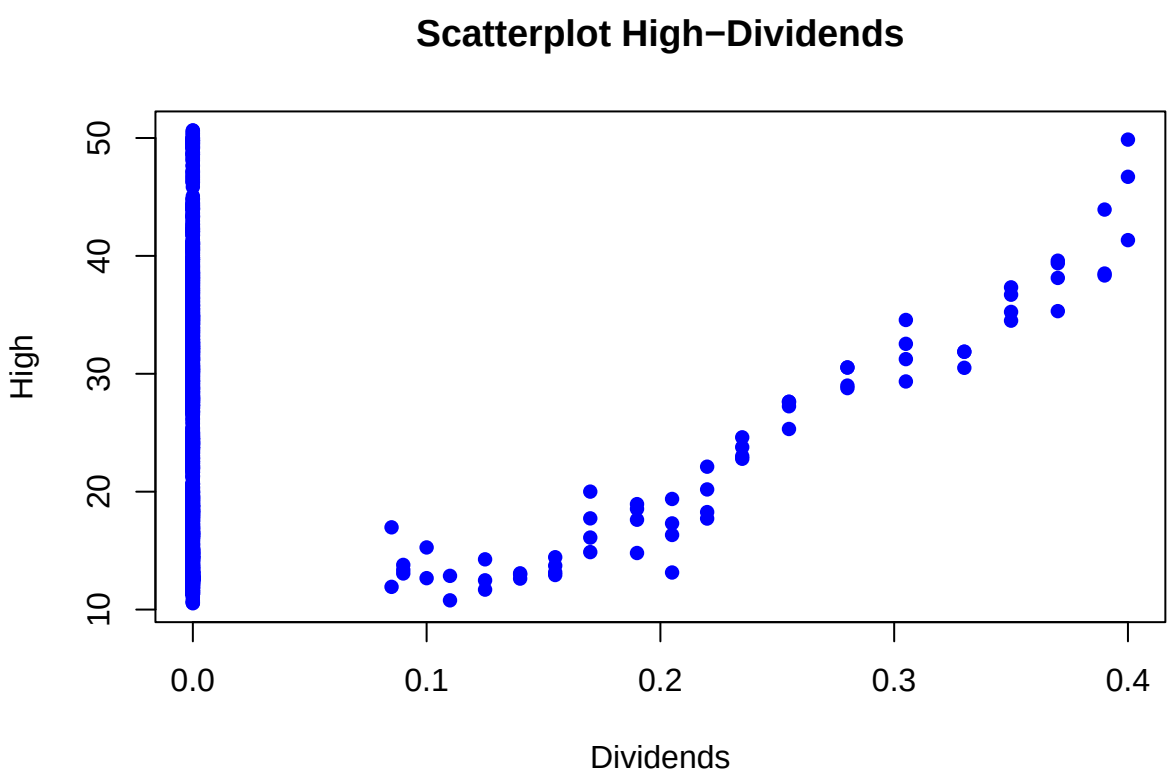
3

```
sub_data_df$HighVolume = sub_data_df$Volume > 9 * 10^6
tail(sub_data_df, 10)
```

```
##             Date     Open     High      Low    Close   Volume Dividends
## 14591 2019-12-17 49.87838 50.04342 49.77752 49.89672  9230000         0
## 14592 2019-12-18 49.99757 50.19928 49.41076 49.42910 15132100         0
## 14593 2019-12-19 49.54830 49.82336 49.43827 49.80502 13385900         0
## 14594 2019-12-20 50.37348 50.61188 49.94255 50.40099 23832800         0
## 14595 2019-12-23 50.42850 50.64855 50.28180 50.34598  9300800         0
## 14596 2019-12-24 50.24512 50.42850 50.09842 50.16261  3359300         0
## 14597 2019-12-26 50.35514 50.44683 50.23595 50.44683  6228500         0
## 14598 2019-12-27 50.43767 50.84110 50.42850 50.74941  6895500         0
## 14599 2019-12-30 50.59354 50.78608 50.48352 50.67606  6431700         0
## 14600 2019-12-31 50.61188 50.77692 50.41016 50.74941  7982600         0
##       StockSplits HighVolume
## 14591           0       TRUE
## 14592           0       TRUE
## 14593           0       TRUE
## 14594           0       TRUE
## 14595           0       TRUE
## 14596           0      FALSE
## 14597           0      FALSE
## 14598           0      FALSE
## 14599           0      FALSE
## 14600           0      FALSE
```

4

```
temp = sub_data_df[sub_data_df$HighVolume, ]
plot(temp$Dividends, temp$High, main = "Scatterplot High-Dividends",
    xlab = "Dividends", ylab = "High", col = "blue", pch = 16)
```



If we ignore the points which dividends are equal to 0, the highest price on dividends paid day increases with the increasing of dividends.

Explanation: A company which is able to pay dividends to shareholders generally has a healthy finance. Thus, more investors would like to buy its stock. To improve the opportunity that their buy orders can deal, they will give higher bid price which may improve the highest price of that day.

5

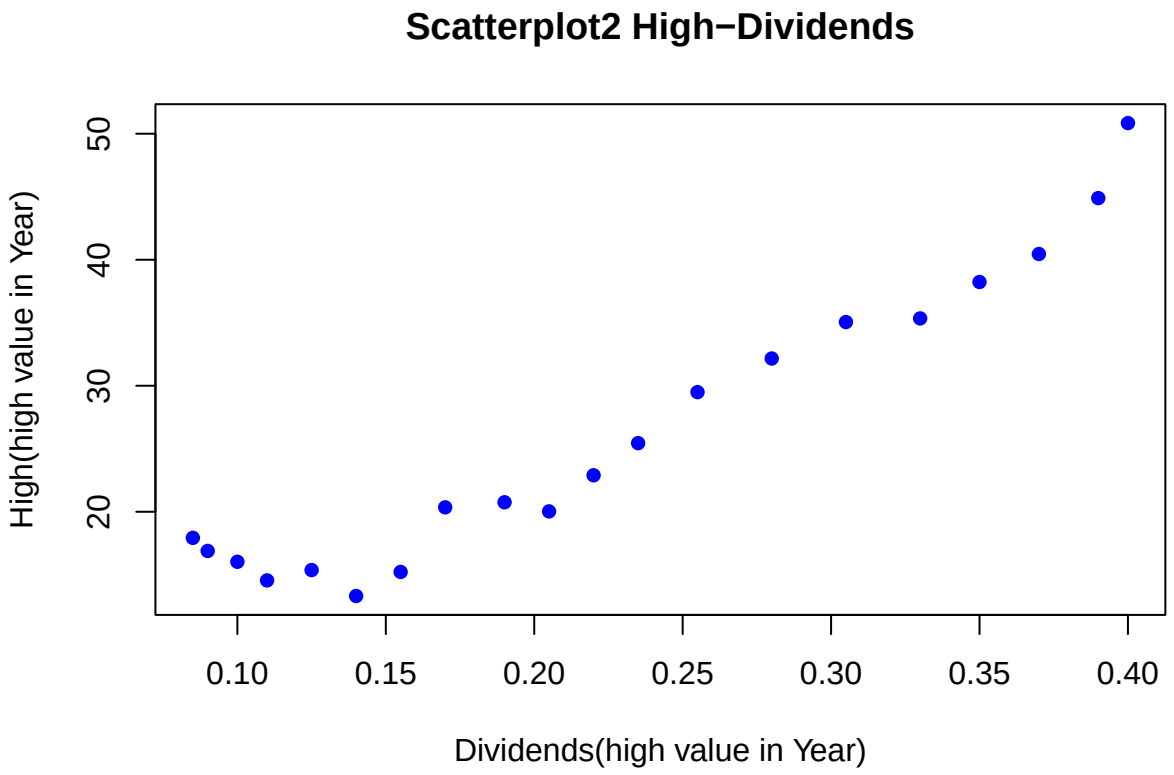
```
sub_data_df$Year = strftime(sub_data_df$Date, "%Y")
num_col = c("Open", "High", "Low", "Close", "Volume", "Dividends",
    "StockSplits")
high_value_df = aggregate(sub_data_df[, num_col], by = list(Year = sub_data_df$Year),
    max)
high_value_df
```

```
##    Year     Open     High      Low    Close    Volume Dividends StockSplits
## 1  2000 17.89677 17.93028 17.62865 17.93028  27540400     0.085           0
## 2  2001 16.55177 16.89128 16.36503 16.51985  23672000     0.090           0
## 3  2002 15.89098 16.03218 15.80516 15.95742  37382000     0.100           0
## 4  2003 14.45425 14.55433 14.41137 14.51145  31069400     0.110           0
## 5  2004 15.24548 15.37480 15.02995 15.23111  61406200     0.125           0
## 6  2005 13.29848 13.31614 13.20434 13.31320  39747600     0.140           0
## 7  2006 15.15908 15.22386 15.06036 15.11589  53627400     0.155           0
## 8  2007 20.24963 20.35087 20.16736 20.27810  50341600     0.170           0
```

```
## 9  2008 20.68626 20.75270 20.47427 20.74321  79214400      0.190           0
## 10 2009 19.92781 20.02889 19.85033 19.91433 124169000      0.205           0
## 11 2010 22.77954 22.89421 22.75173 22.85598  63648600      0.220           0
## 12 2011 25.33793 25.44443 25.21014 25.28469  50096800      0.235           0
## 13 2012 29.37658 29.49261 29.23515 29.41647  98967500      0.255           2
## 14 2013 31.87937 32.16078 31.68684 31.90900  33575600      0.280           0
## 15 2014 34.60277 35.05459 34.45476 34.92216  55953500      0.305           0
## 16 2015 35.26362 35.34412 35.01409 35.28778  44065300      0.330           0
## 17 2016 38.04524 38.23181 37.72076 38.03712  40360300      0.350           0
## 18 2017 40.31787 40.45420 39.85777 40.41160  37526500      0.370           0
## 19 2018 44.81049 44.88933 44.30789 44.79157  32477700      0.390           0
## 20 2019 50.61188 50.84110 50.48352 50.74941  58905400      0.400           0
```

6

```
plot(high_value_df$Dividends, high_value_df$High, main = "Scatterplot2 High-Dividends",
    xlab = "Dividends(high value in Year)", ylab = "High(high value in Year)",
    col = "blue", pch = 16)
```



The positive-related relationship between dividends and high price is more clear.

Missing information: The dividends values of most samples are equal to 0, but they didn't show in this plot.

7

```
num_col = c("Open", "High", "Low", "Close", "Volume", "Dividends",
    "StockSplits")
result_ls = list()
for (c in num_col) {
    c_min = min(sub_data_df[, c])
    c_min_date = as.character(sub_data_df$Date[which.min(sub_data_df[,
        c])])
    c_max = max(sub_data_df[, c])
    result_ls = c(result_ls, list(c(c, c_min, c_min_date, c_max -
        c_min)))
}
names(result_ls) = num_col
result_ls
```

```
## $Open
## [1] "Open"        "10.39588929" "2003-03-11"  "40.21598925"
##
## $High
## [1] "High"        "10.53599404" "2003-03-10"  "40.30510497"
##
## $Low
## [1] "Low"         "10.37066808" "2003-03-05"  "40.1128473"
##
## $Close
## [1] "Close"       "10.38748169" "2003-03-10"  "40.36192703"
##
## $Volume
## [1] "Volume"     "2147400"    "2003-12-26" "122021600"
##
## $Dividends
## [1] "Dividends"  "0"          "2000-01-03" "0.4"
##
## $StockSplits
## [1] "StockSplits" "0"           "2000-01-03"  "2"
```

Exercise 2

```
mybeerbottlefunction = function(num) {
    if ((num <= 0) | (length(num) > 1) | is.integer(num)) {
        stop("The input is not available!!!!")
    } else if (num == 1) {
        lyric = paste("1 bottle of beer on the wall, 1 bottle of beer. Take one ",
            "down, pass it around, no more bottles of beer on the wall.",
            sep = "")
        return(lyric)
    } else {
        lyric = paste(num, " Bottles of Beers Song\n\n\n", sep = "")
        loop_v = rev(2:num)
```

```
        for (n in loop_v) {
            lyric = paste(lyric, n, " bottles of beer on the wall, ",
                n, " bottles of beer. Take one down, pass it around, ",
                n - 1, " bottles of beer on the wall...\n\n\n",
                sep = "")
        }
        lyric = paste(lyric, "1 bottle of beer on the wall, 1 bottle of beer. ",
            "Take one down, pass it around, no more bottles of beer on the ",
            "wall.", sep = "")
        return(lyric)
    }
}
# cat(mybeerbottlefunction(5))
writeLines(strwrap(mybeerbottlefunction(5), width = 100))
```

```
## 5 Bottles of Beers Song
##
## 5 bottles of beer on the wall, 5 bottles of beer. Take one down, pass it around, 4 bottles of beer
## on the wall...
##
## 4 bottles of beer on the wall, 4 bottles of beer. Take one down, pass it around, 3 bottles of beer
## on the wall...
##
## 3 bottles of beer on the wall, 3 bottles of beer. Take one down, pass it around, 2 bottles of beer
## on the wall...
##
## 2 bottles of beer on the wall, 2 bottles of beer. Take one down, pass it around, 1 bottles of beer
## on the wall...
##
## 1 bottle of beer on the wall, 1 bottle of beer. Take one down, pass it around, no more bottles of
## beer on the wall.
```