

vector-computations

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Computations on Vectors

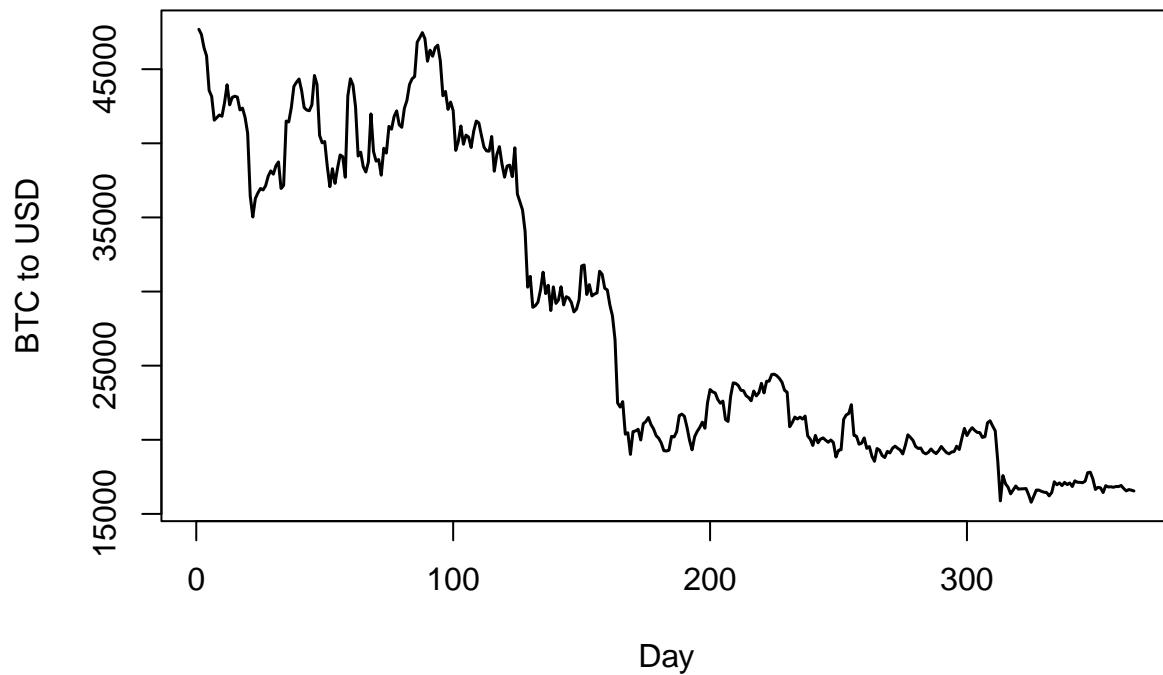
Introduction

First plot shows the exchange rates of BTC to USD in the year 2022. The dataset dates from 2022-01-01 to 2022-12-31. The Y plane shows the values of one BTC in USD, while the X plane shows the days, where 1 is the first day of the year, and 365 is the last day of the year.

Plot of BTC-USD Exchange Rates for 2022 - Close

```
x <- scan("https://github.com/gagolews/teaching-data/raw/master/marek/btcusd_close_2022.csv", skip = 3)
y <- 1:365

plot(y, rev(x), xlab = "Day", ylab = "BTC to USD", type = "l", lwd = 1.5)
```

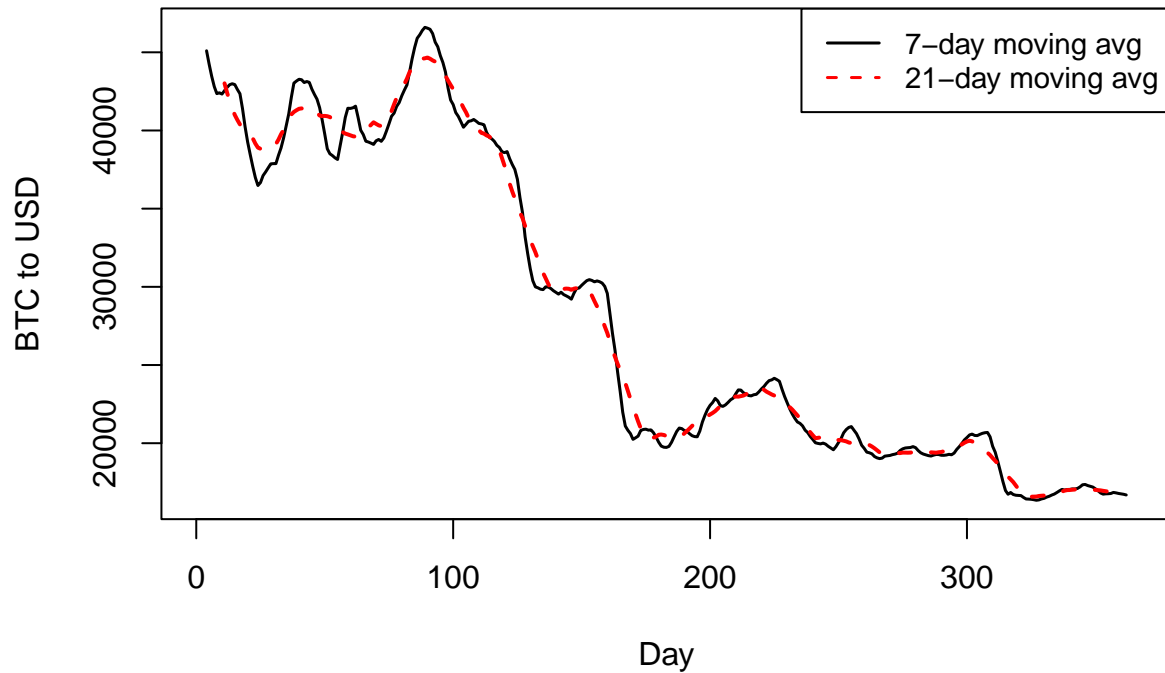


The next plot shows the moving averages of the exchange rates of BTC to USD in the year 2022. The black line shows the 7-day moving average, while the red dotted line shows the 21-day moving average, as shown in the legend of the plot.

Plot of Moving Average of BTC-USD Rates for 2022 - Close

```
suppressPackageStartupMessages(library("forecast"))
library(forecast)

plot(y, rev(ma(x,7)), xlab = "Day", ylab = "BTC to USD", type = "l", lwd = 1.5)
lines(y, rev(ma(x,21)), col="red", type="l", lwd = 2, lty = 2)
legend("topright",
legend=c("7-day moving avg", "21-day moving avg"),
col=c("black", "red"),
lty=1:2, lwd=1.5, cex = 0.9,
inset = 0)
```



#Q5:

I will be comparing three scenarios for this question. First scenario is a person who wants a short-term profit and not a long-term investment, but that person does not want to spend hours day-trading. That person should view and analyse the 7-day moving average and do his investments according to the fluctuation of the values.

Second scenario is a person who wants to invest long-term into a project and is not worried about short-term profits or losses. That person should analyse the 21-day moving average in order to see the bigger picture in a longer period of time.

Third scenario is a person who does not want to invest his money for personal reasons, and wants to do day-trading. Than that person should use neither the 7-day nor 21-day average, and do his analysis on the daily prices.