Practical: Technical Indicators

In today's practical we'll focus on implementing technical indicators, which can eventually be used as part of a trading strategy. While you are implementing the different indicators, pay particular attention to the period length; remember that if the period length is larger than the data available at the beginning of the file, that price should be excluded from the indicator calculation.

Reading the file

Download from Moodle the csv file Unilever.csv provided for today's practical. This file presents the daily closing prices of Unilever, a publicly listed company at FTSE 100.

Task 1

Given the Moving Average (MA) formula below, calculate the 15 days moving average. Once you are done with this, also calculate the 50 days moving average.

$$SMA(L,\ t) = \frac{\sum_{i=1}^{L} P_{t-i}}{L}$$

where t is the current time index and L is the length of the period. Add the values of MA as a separate column next to the corresponding closing price.

Task 2

In this task we are going to use the two MA indicators from above to generate buy and sell signals. For each indicator entry, you should compare MA_15 (15 days moving average) to MA_50 (50 days moving average), and generate signals in the following manner:

If MA_15 = MA_50 => 0 (hold)
If MA_15 > MA_50 => 1 (buy)
If MA_15 < MA_50 => 2 (sell)

Task 3

Using an initial budget of £3000 and an empty share portfolio, simulate a trading session using the rules from Task 2. Every time a "buy" recommendation is received, you should buy as many shares as your budget allows according the current price. Similarly, if a "sell" recommendation is received, you should sell as many shares as your share portfolio has. Then note down the following aspects:

- Did you make a profit or loss?
- If you decide to buy/sell a pre-specified amount, instead the whole available amount, can you increase your profit/reduce your losses?

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Task 4

Repeat tasks 1, 2 and 3, but now using the Momentum (MOM) indicator and $x = 10$.

$$MOM(x,\ t) = P_t - P_x$$

where t is the current time index and x is the pre-specified number of days. The buy and sell signals should be generated using in the following manner:

If MOM_10 = 0 => 0 (hold)
If MOM_10 > 0 => 1 (buy)
If MOM_10 < 0 => 2 (sell)

Note down the following aspects:

- Did you make a profit or loss?
- If you decide to buy/sell a pre-specified amount, instead the whole available amount, can you increase your profit/reduce your losses?
- Was this more profitable than the strategy from Task 3?