PROBLEM

Algorithmic trading is a method of executing orders using automated pre-programmed trading instructions accounting for variables such as price movements, time, and volume. Instead of using basic variables like opening and closing prices, traders prefer using several mathematical indicators that aid them in identifying certain signs and trends in the stock market. In this problem, you will build one of the most commonly used trading strategies by traders, run it on the dataset provided and plot the results obtained.

Dataset :

You are provided with an Excel file called SBIN.csv. It contains candle stick data [Timestamp, Open, High, Low, Close, Volume] of SBI bank stock for the past 10 years. Candlestick data is the most common form of data representation used in the algorithmic trading. It splits all the trades that happen over a period of time into smaller timeframes like 1 minute, 5 minutes, 30 minutes, or 1 day. It consists of 5 main parameters -

- Timestamp: Timestamp of the start of the timeframe
- Open: Price of the stock just before the timeframe started
- Close: Price of the stock when the timeframe ended
- High: Highest price achieved by the stock in the given timeframe
- Low: Lowest price achieved by the stock in the given timeframe

The data provided is for a timeframe of 1 day.

Indicator :

For our strategy, we will use an indicator called simple moving average (SMA). Its value is simply the average of the price value of a given period of time. For example, SMA(20) means the current value is given by the average value of the past 20 values (including the current value).

Strategy :

We are going to build a strategy called SMA crossover. We are going to use two indicators, one SMA(20) and the other SMA(50). SMA(20) is called a short-period indicator and SMA(50) is called a long-period indicator. SMA crossover strategy says that when the short-period indicator crosses above the long-period indicator (i.e. the value of SMA(20) becomes higher than the value of SMA(50)) we BUY the stock, and vice versa.

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If SMA(20) > SMA(50):
        BUY 1 share of SBIN
If SMA(20) < SMA(50):
        SELL 1 share of SBIN
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Points to note:

- We only trade when the SMA(20) intersects (or crosses) SMA(50), we don't keep trading as long as SMA(20) is greater or lower than SMA(50).
- SMA values are calculated based on the closing price of the stock.
- If you only have 10 values in your dataset, then SMA(20) gives the average of only the 10 values.

TASK :

1. Load the dataset into the pandas data frame
2. Create two new columns in your data frame **SMA-20** and **SMA-50** that store the values of SMA(20) and SMA(50) calculated based on the closing price of the candle.
3. Code the SMA crossover strategy.
4. Run the SMA crossover strategy on the entire dataset provided, where **every trade implies buying or selling 1 SBIN stock at the open price of the next candle after crossover or intersection.**
5. Plot the graph that consists of -
    a. Line chart for closing price values of every candle
    b. Line chart for SMA(20) values at every timestamp
    c. Line chart for SMA(50) values at every timestamp
    d. Points where trade was performed
6. Output - <Total profit or loss from all trades><space><Number of trades taken> in the command line