

Moving average algorithm

What it is?

- Assume using a 30-day window for monitoring short-term trends in the stock (Its Adjacent closing price).
- Assume using a 100-day window for monitoring long-term trends in the stock (Its Adjacent closing price).
- When the 30-day moving average crosses above the 100-day moving average, it suggests a bullish signal. This means that the short-term trend is becoming stronger than the long-term trend. Traders may interpret this as a buy signal and consider opening a long position.
- Conversely, when the 30-day moving average crosses below the 100-day moving average, it indicates a bearish signal. The short-term trend is weakening compared to the long-term trend. Traders may interpret this as a sell signal and consider opening a short position or exiting a long position.

Approach :

1) downloaded data for the Amazon stock over a period of three years into a data frame named AMZN

2) add a column MA_30 and MA_100 using the code `AMZN['Adj Close'].rolling(window=30).mean()` and `AMZN['Adj Close'].rolling(window=100).mean()` 3) using the `plt.plot` function plot the: daily trend in stock price: `plt.plot(AMZN['Adj Close'],color='white',label='share price')`

30 days moving average :

```
plt.plot(AMZN['MA_30'],color='yellow',label='30 days moving avg')
```

100 days moving average :

```
plt.plot(AMZN['MA_100'],color='pink',label='10 days moving avg')
```

the trend in the 30-day moving window is more sensitive to changes than 100 days which is much smoother.

4)`AMZN['signal']=np.where(AMZN['MA_30']>AMZN['MA_100'],1,0)`: for bullish trends set signal to 1 else 0

`AMZN['position']=AMZN['signal'].diff()` : finding their diff if==1 then bullish so buy else -1 sell signal

`AMZN['buy_signals']=np.where(AMZN['position']==1, AMZN['Adj Close'], np.NaN)`: if diff=1 set the buy signal to the price it should be bought else to null

`AMZN['sell_signals']=np.where(AMZN['position']==-1, AMZN['Adj Close'], np.NaN)`: if diff=-1 set the sell signal to the price it should be sold at else to null.

5) plotting the trend visually :

```
plt.figure(figsize=(20,18))
```

`plt.plot(AMZN['Adj Close'],label='share price',alpha=0.5):` plotting the daily trend with low opacity

`plt.plot(AMZN['MA_30'],color='yellow',label='30 days moving avg')`

`plt.plot(AMZN['MA_100'],color='pink',label='100 days moving avg')`

`plt.scatter(AMZN.index, AMZN['buy_signals'],label='buy signal',marker="^",color='green'):` plotting the buy signal using scatter plot with the date as the x-axis and price of buy signal as y-axis.

`plt.scatter(AMZN.index, AMZN['sell_signals'],label='sell signal',marker="v",color='red'):` plotting the sell signal using scatter plot with the date as x-axis and price of sell signal as y-axis.

Link:

<https://youtu.be/r3Ulu0jZCJI>

Notebook link :

<https://colab.research.google.com/drive/1iy5S1tV1uiS4zjQRCYDoHGF00fox-ZyM?usp=sharing>