Options strategies and market analysis

Assignment 5

June 30,2024

Submission Deadline: July 04,23:59.

1.If we find that your code is entirely written using ChatGPT or another AI source, we will not consider your submission. However, you are allowed to take help from the internet to code. The code should be your own work.

2.Refrain from any means of plagiarism.

3.The deadline will not be extended, so please ensure that you adhere to it and submit your work before the deadline.

Ques 1. In this task, you need to implement two technical indicators in Python and back test them on stocks of your choice from the following table as per the given conditions:

1. **First Indicator:** Take the last two digits of your roll number and divide by 5, divide until it becomes less than 5. Select the row corresponding to the quotient.
2. **Second Indicator:** Take the last two digits of your roll number and divide them by 5 to get the remainder. Select the row corresponding to the remainder.

Note: If the quotient and remainder point to the same row:

- If the row number is not 0, use row2 = row1 - 1.
- If the row number is 0, use row2 = row1 + 1.

Index	Indicator Name	Date Range
0	Relative Strength Index	2014-03-01 to 2018-12-01
1	EMA	2008-01-20 to 2010-10-20
2	MACD	2019-04-05 to 2021-11-30
3	SMA	2011-02-01 to 2015-09-25
4	Donchian Channel	2019-05-15 to 2021-12-10

Ques 2. This is a strategy-based question on technical indicators. Back test a strategy on the SENSEX index from January 2021 to January 2024, using capital of INR 10 lakhs. Here are the guidelines:

1. Represent a buy signal as 1, a sell signal as -1, and all other values as 0 (no initiation of a new order).
2. Close all open positions on the last trading day of the period, with only one position held at any time.
3. Calculate parameters such as returns, Sharpe ratio, and portfolio value to evaluate the strategy.

Tasks: Implement **one** Strategy MACD or Bollinger (It should be different from above 2 TI)

(a) **MACD Strategy:**

- Use the crossover between the signal line and the MACD line to generate buy and sell signals.

(b) **Bollinger Bands Strategy:**

- Ensure signals alternate between buy and sell since only one position can be open at a time.