

## **CSI Project- Tanay Sheth**

This project is designed to test candidate's problem solving capacity in a real-world situation using python.

### 1) Data download

<http://baostock.com/baostock/index.php/%E9%A6%96%E9%A1%B5>

Please download the index composition of CSI500 index at date = '2021-01-01'.

Tip1: Google translate add-on

Tip2:

<http://baostock.com/baostock/index.php/%E4%B8%AD%E8%AF%81500%E6%88%90%E5%88%86%E8%82%A1>

### 2) Download 30min bar data from 2022-04-01 to 2022-07-31 for all 500 stocks of the CSI500 index Tip1:

<http://baostock.com/baostock/index.php/A%E8%82%A1%E7%BA%BF%E6%95%B0%E6%8D%AE>

### 3) Design a mean-reverting strategy:

- We are trying to design a long only strategy where you hold a long position of 100 every day (constant notional) across the stocks that you think will rebound up.
- We are trying to do better than just buy and hold. We want to beat the 500 stocks equal-weighted.
- Design 3-5 features that would describe how much a stock is oversold or overbought • Test the features from 2022-04-01 to 2022-06-30
- What would be your idea to improve the performance of the strategy?
- How you quantify how good is your strategy?
- Test the out-sample from 2022-07-01 to 2022-07-31

Requirements:

- 1) Send the project via github or textfile .py
- 2) If you use any third part package or library please include the lib install in the code as well
- 3) Explain clearly the objectif of each section of your code

**Solution Repository** : [https://github.com/tanayvsheth/CSI\\_project/tree/main/V2](https://github.com/tanayvsheth/CSI_project/tree/main/V2)

Contains complete code, inputs and output along with the backtesting report

## Backtesting Report

### Returns (Without leverage)

	Raw Total Return	Alpha	Annualized Return
In-Sample	46.992%	34.088%	54.261%
Out-Sample	17.428%	17.162%	60.372%

Alpha is returns against benchmark : (Raw Returns - Index Returns)

Annualized Return = monthly returns \*  $(12)^{0.5}$

### Strategy Performance

	Hit ratio	Sharpe Ratio	Treynor ratio
In-Sample	0.375	0.433	3.51
Out-Sample	0.456	0.414	63.095 (*Very weak benchmark performance during this month)

Hit Ratio is Profit making trades/ Total number of trades

Sharpe is risk-adjusted return

Treynor is risk-adjusted performance relative to systematic risk

### Drawdowns

	Maximum Drawdown	Maximum Drawdown Duration
In-Sample	4.21%	3 Trading sessions
Out-Sample	4.08%	3 Trading sessions

Max Drawdown is maximum consecutive losses combined, drawdown duration is maximum non profit making trading sessions.

### Other Expenses

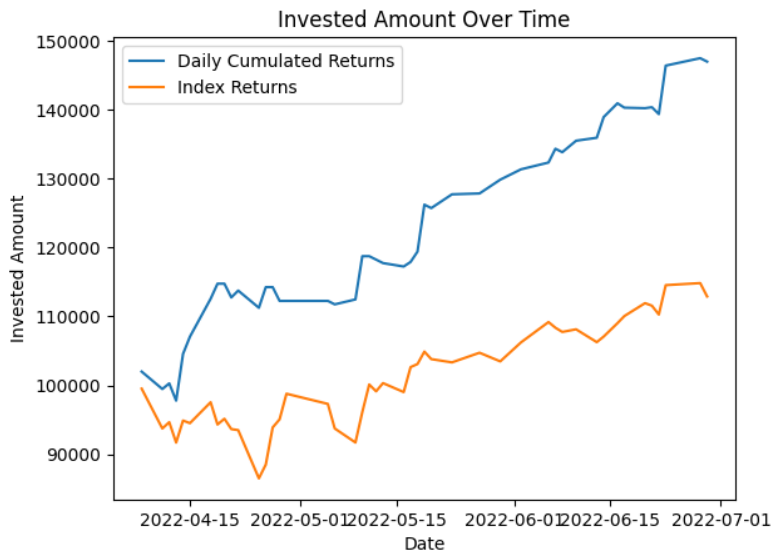
	Brokerage	Slippage PnL
In-Sample	6400 (6.4%)	34.957% (12% decrease)
Out-Sample	2850(2.85%)	11.716% (5.7% decrease)

Intraday Brokerage is taken as Transaction value \* 0.05 (.05%)

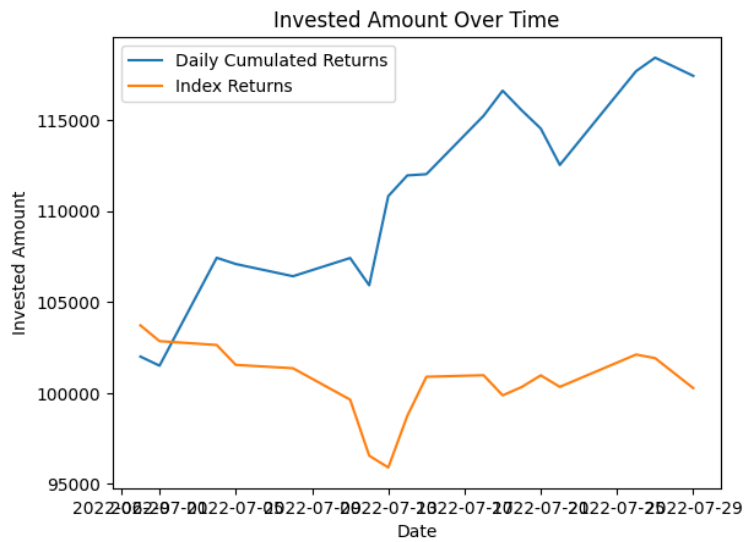
Slippage is considered as the PnL of strategy if entry position is entered 0.1% price late because of execution time

## Plots of Invested Amount over time

In-Sample Plot :



Out-Sample Plot:



## **Strategy**

Entry conditions : (Everyday at 10:00)

Filter stocks for : RSI indicator < 30 and MACD Line > Signal Line

Rank stocks based on K% (Stochastic Oscillator) and choose top 5 from the filtered stocks

Exit Conditions:

Target 2% , stop loss 0.5%

Else square off at end of day

### **Ways we can improve this strategy:**

- Additional indicators can be introduced to refine the strategy (like VWAP - volume based indicator)
- Increase the testing period both in-sample and out-sample to frame a bigger picture and historical observations ( Can additionally how strategy performs under black swan events)
- Minimize the universe, once a month, based on fundamentals as we are dealing with mid cap and small cap stocks