INTER IIT BOOTCAMP

TMinus4

Objective: Capture short-term intraday price moves using only OHLCV data, selecting a daily subset of NIFTY 100 stocks by liquidity/volatility, entering momentum-based long/short trades, and closing all positions by 15:30 to avoid overnight risk. Initial capital: INR 100,000.

Strategies applied :

1. Statistical Approach with Indicators
2.Cross-section correlation strategy
3. Machine learning based approach **Stock selection for Statistical Approach :**
1.Auto-regression
2.Ornstein-Uhlenbek Process

Stock selection for Correlation Strategy:

1.selecting a stock having more movement at the start of day (First hour)

Finalised Strategy :

Machine learning based approach (Using **Random Forest**)

Stock selection for ML strategy :

We are taking three signals :

1. Intraday returns: $ir^{(s)}_{t,m} := \frac{cp^{(s)}_{t-m}}{op^{(s)}_{t-m}} - 1,$
2. Returns with respect to last closing price: $cr^{(s)}_{t,m} := \frac{cp^{(s)}_{t-1}}{cp^{(s)}_{t-1-m}} - 1,$
3. Returns with respect to opening price: $or^{(s)}_{t,m} := \frac{op^{(s)}_{t}}{cp^{(s)}_{t-m}} - 1,$

m∈{1,2,3,…,20}∪{40,60,80,…,240}, resulting in 93 features.Values from 1 to 20 capture short-term momentum, while the larger intervals (40–240) capture long-term momentum. Now … based on these features it is trained and for seven stocks with highest probability we go long and for seven stocks with lowest probability we go short.

Strategy Implementation :

Trades executed every 15 minutes.
Strategy selects the top 7 stocks to go long and 7 bottom stocks to go short.
Focuses on low individual profits but high trade frequency.
Probabilities of stock move are estimated using a RF model based on features.
Random Forest is chosen as it outperforms ARIMA in predictive accuracy.
For a random forest 500 trees are formed with randomly chosen 10 features from 93.

Key Matrics :

Net Returns	:	517.90%	Benchmark Returns	:	11.89 %
Max. Drawdown	:	11.89 %	Sharpe Ratio	:	9.188%
Sortino Ratio	:	13.179%	No. of Trades	:	86352
Winning Trades	:	56.47%			