Task 3 Overview

Overview

This Python project analyzes F&O stocks to identify trading opportunities. It calculates key metrics like price positions, option strikes, premiums, and returns - then exports everything to Excel with charts.

How It Works

The script starts by pulling stocks from the NSE F&O list along with their lot sizes. Lot sizes are important because they determine contract quantities for trading.

Price Analysis

For each stock, we calculate where the current price sits within its 52-week range:

Percentile = (Current Price - 52W Low) / (52W High - 52W Low)

Example: If a stock trades between ₹100-₹200 this year and is currently at ₹150:

(150 - 100) / (200 - 100) = 0.5 = 50%

Options Data

The program finds the nearest call and put strikes to the current price, then fetches premiums from market data or calculates them using Black-Scholes.

Return Calculation

IRR for each option is simple:

IRR = Premium / Strike Price

So a ₹7 premium on ₹140 strike = 5% IRR

Margin Analysis

We apply a configurable margin (default 15%) to find safer strikes:

Margin Strike = Current Price × (1 - 0.15)

For ₹140 stock: 140 × 0.85 = ₹119, then we find the nearest available strike (probably ₹120 or ₹115) and recalculate returns.

Output

Excel File - Contains all stock data with current prices, 52W high/low, percentiles, strikes, premiums, IRR values, margin-adjusted returns, and lot sizes.

Charts - Visual comparisons of prices, premiums, and returns across stocks.

Main Challenges

Data Issues - Sometimes APIs return incomplete data. Added error handling and fallback values to prevent crashes.

Strike Matching - Calculated strikes don't always match available market strikes. Used rounding logic to find the closest available strike.

Premium Problems - Valid premiums require correct expiry and strike combinations. Added validation with warnings when data is missing.

Margin Precision - Market strikes have gaps (₹5 or ₹10 intervals), so matching exact calculated values needed smart rounding.

Export Errors - Mixed data types broke Excel generation. Fixed by cleaning all data before export and skipping problematic records.