**Project README**

**Overview**

This project consists of Python scripts designed to analyze and optimize trading strategies based on stock and VIX data. It primarily focuses on strategies involving gap trades, VIX conditions, rolling averages of daily price drops, and ATR (Average True Range) optimizations to enhance profitability and trade success rate.

**Strategy Overview:**

* **Gap Trades:** Enter positions based on opening gaps relative to previous close and daily range.
* **VIX Conditions:** Identify the optimal range of VIX values to enhance trade performance.
* **Rolling Average Drops:** Use historical daily price drops to determine trade entry points.
* **Drop Filters:** Skip trades following large drops in the VIX index to avoid adverse conditions.
* **ATR Optimization:** Select the best ATR parameters to filter trades, optimizing the risk-reward ratio and profitability.

**Usage:**

Each script has an executable example at the bottom, which you can customize by changing parameters such as:

* CSV file names (main\_file, vix\_file)
* Initial investment amount (initial\_investment)
* Parameter ranges for optimization (X\_values, Y\_values, Z\_values, atr\_n\_min, atr\_n\_max, etc.)

Ensure your CSV files contain the required columns:

* Stock data (Date, Open, High, Low, Close)
* VIX historical data (DATE, OPEN)

**Dependencies:**

* Python libraries: pandas, numpy, itertools, multiprocessing

**Notes:**

* All scripts include robust error handling and provide informative messages if data files are missing or no trades meet the specified conditions.
* Warnings related to Pandas' operations have been suppressed for cleaner outputs.