### Deliverables for the Breakout Analysis

**1. Process Explanation:**

The primary objective of this project was to analyze historical stock data to identify potential breakout trading opportunities based on volume and price movement thresholds. Here's a step-by-step breakdown of the process:

* **Data Source:**  
  The stock price data was fetched using the yfinance library. It provides historical price, volume, and other relevant data for the analysis.
* **Stock List:**  
  A list of three tickers (AAPL, GOOGL, TSLA) was used to demonstrate the breakout analysis. (Trade logs Stored in trades folder)
* **Key Metrics:**
  + **Volume Breakout:** Identified when the day's volume exceeded 200% of the 20-day rolling average volume.
  + **Price Breakout:** Marked when the price increased by at least 2% compared to the previous day.
  + **Breakout Condition:** A Day was flagged as a breakout if both the volume and price thresholds were met.
* **Trade Logic:**
  + Entry was triggered on a breakout day.
  + Exit was executed after a 10-day holding period or when data availability ended.
  + Returns were calculated based on the percentage change between entry and exit prices.
* **Compilation:**  
  The results were stored in a Pandas DataFrame and exported to a CSV file named tickername\_breakout\_trades.csv

**2. Challenges and Roadblocks:**

* **Data Gaps:**  
  Missing or inconsistent data from yfinance for certain tickers caused occasional errors. This was handled using a try- except block, ensuring the process continued without interruptions.
* **Rolling Calculations:**  
  Calculating the 20-day rolling average volume for the first 20 days of data resulted in NaN values. This was resolved by ensuring only valid rows were used in calculations.
* **Performance Optimization:**  
  Iterating over large datasets with loops initially caused performance issues. Using vectorized operations where possible (e.g., for breakout condition checks) improved runtime significantly.

**3. Time Spent on the Project:**

* **Setup and Research:** 30 mins  
  Researching the yfinance library and understanding breakout strategies.
* **Development:** 45-50 mins  
  Writing and testing the logic for data fetching, breakout identification, and trade tracking.
* **Debugging and Optimization:** 20-25 mins  
  Fixing issues with NaN values, managing exceptions, and optimizing the loops.
* **Documentation and Finalization:** 30-40 mins  
  Preparing the CSV export, testing edge cases, and documenting the process.

**4. Steps:**

1. Save breakout\_analysis.py.
2. Save the requirements.txt file in the same directory.
3. Install dependencies using:

pip install -r requirements.txt

1. Run the script with:

python breakout\_analysis.py

**5. Output Screenshot:**

**(AAPL, TSLA, GOOGL)**

**Data used for analysis 2020-01-01 to 2024-12-16**



