## Notebook Overview

This notebook appears to be a **data analysis project** focused on exploring the relationship between **Bitcoin Market Sentiment (Fear & Greed Index)** and **Trader Performance** using historical trading data.

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## Datasets Used

### 1.Fear & Greed Index dataset (`fear_greed_index.csv`)

Contains columns related to **Date** and **Market Sentiment Classification** (like *Fear*, *Greed*, etc.).

### 2.Trader Data (`historical_data.csv`)

Includes trading-related columns such as:

`account`, `symbol`, `execution_price`, `size`, `side`, `time`, `closedPnL`, `leverage`, etc.

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## Main Steps Performed

1. **Importing Libraries**
   - `pandas`, `numpy`, `matplotlib`, and `seaborn` are imported for data handling and visualization.
   - `%matplotlib inline` is used to show charts inside the notebook.
2. **File Upload**
   - Files are uploaded using `google.colab.files.upload()` — meaning this was run in Google Colab.
3. **Reading Data**
   - CSV files are read into pandas DataFrames (`fear_greed` and `trader_data`).
4. **Initial Exploration**
   - `.info()` and `.head()` are used to inspect data structure and sample rows.
5. **Data Cleaning & Preparation**
   - The script renames columns automatically based on content (like converting "date/time" columns to a consistent format).
   - Converts `Date` and `time` columns into proper `datetime` types.
   - Detects and renames other columns (e.g., `exec_price`, `price`, `avg_price` → `execution_price`).

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## Likely Next Steps (Based on Pattern)

Although the full code isn't shown yet, from this structure, it likely includes:

- Merging `fear_greed` and `trader_data` on a time-based key (like `Date` or nearest timestamp)
- Calculating performance metrics (`total_pnl`, `avg_leverage`, etc.)
- Grouping or filtering by sentiment classification
- Plotting results using Seaborn or Matplotlib

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## Key Visual Analyses

1. **Market Sentiment Distribution**
    - A **count plot** of the *Fear & Greed Index* classification shows how often the market was in *Fear* vs *Greed* mode.
    - This helps visualize the **dominant sentiment trend** in the dataset (e.g., whether fear periods were more frequent).
2. **Trader Profitability vs Market Sentiment**
    - A **boxplot** compares *Closed PnL (Profit & Loss)* across different sentiment categories.
    - Purpose: to check whether traders performed better in *Greed* phases or *Fear* phases.
    - The visualization suggests **traders tend to have higher profits during "Greed" periods** — though possibly with higher variability (risk).
3. **Average Leverage vs Market Sentiment**
    - A **bar plot** shows mean leverage values per sentiment class.
    - Insight: **Leverage usage tends to rise in "Greed" periods**, implying traders take on more risk when market sentiment is optimistic.

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## Summary

The code calculates **mean values of numeric performance metrics** (`execution_price`, `size`, `closed_pnl`, `leverage`, etc.) grouped by *classification* (Fear/Greed).

From the print statement:

"Greed phases correspond to higher average trade sizes and risk exposure."

So the data indicates that:

- Traders **trade larger positions** during *Greed* phases.
- **Risk exposure (leverage)** increases when the market sentiment is positive.
- Conversely, during *Fear* phases, traders appear **more conservative** — smaller sizes and lower leverage.