Team Name
    Group 14

Team Members
    Joshua Caron, Nicholas Lara

Project Title
    Stock Market Trend Prediction

Problem: What problem are we trying to solve?
    Predicting the short term price movement of stocks using historical data

Motivation: Why is this a problem?
    The market is volatile and hard to predict, many people lose money in short term trades

Features: When do we know that we have solved the problem?
    When the program produces valid predictions on historical data

Data: (Public data set we will be using and the link to the public data set)
    https://www.yahoofinanceapi.com/

Tools: Programming languages or any tools/frameworks we will be using
    Python with Pandas and Matplotlib

Strategy: Preliminary _algorithms_ or _data structures_ you may want to implement and how would you represent the data
    1) Simple Moving Average (SMA) represented with sliding window
    2) Linear Regression with feature vectors and labels

Distribution of Responsibility and Roles: Who is responsible for what?
    Josh- implement LR, visualization, documentation, testing
    Nico- source dataset, implement SMA, documentation, testing, video

Visuals: (console driven program for now, may turn into web app) examples:

```
=== Stock Trend Predictor by Josh Caron and Nico Lara ===
1. Load Dataset
2. Run SMA Prediction
3. Run Linear Regression Prediction
4. Compare Results
5. Exit


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----- SMA (50-day) Results -----
Current Price: $152.30
SMA: $150.85
Signal: BUY (Price > SMA)

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```

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----- Linear Regression Results -----
Predicted Next Day Price: $153.70
Signal: BUY (Predicted > Current)

Regression Coefficients:
- Slope (m): 0.45
- Intercept (b): 120.10

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----- Algorithm Comparison -----
| Metric          | SMA      | Linear Regression |
|-----------------|----------|-------------------|
| Accuracy        | 58.2%    | 64.7%             |
| Speed (100K rows)| 0.1 sec | 1.8 sec           |
| Simulated Profit| +9.3%    | +14.2%            |

Conclusion: Linear Regression is more accurate but slower.
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References

https://balsamiq.com/blog/what-are-wireframes/ - Wireframes

https://www.investopedia.com/terms/m/movingaverage.asp - SMA

https://towardsdatascience.com/linear-regression-in-python-from-scratch-24db98184276 - Linear Regression

https://www.geeksforgeeks.org/python-moving-average-trading-strategy/ - Algorithm Comparison