DCS211 Final Project
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Investment Analyzer - User Instructions

Project Overview

- Investment Analyzer is a Python-based financial analysis tool with two main utilities:
    1) <u>Stock Analysis Tool</u> - Analyzes individual stocks with current metrics and historical performance
    2) <u>Portfolio Growth Projector</u> - Projects future portfolio growth based on historical CAGR with inflation adjustments

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Required Libraries

- yfinance - Retrieves stock market data
- pandas - Data manipulation and CSV/Excel handling
- matplotlib - Generates charts
- requests - HTTP requests
- openpyxl - Excel file support
- beautifulsoup4 - Parses XML/RSS news feeds
- lxml - XML parser for BeautifulSoup

Installation:

- "pip install yfinance pandas matplotlib requests openpyx beautifulsoup4 lxmll"

How to Run:

- "python/python3 investment_analyzer.py"
    - Upon running our utility, you'll be presented with 4 options: Stock Analysis Tool, Portfolio Growth Projector, help menu, and exit the utility

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Stock Analysis Tool (Option 1)

1) Enter a stock ticker (e.g., AAPL)
    - View current price, daily change, volume, market cap, P/E ratio
    - View 1-year and 5-year historical returns
    - View plot of historical performance (1 year and 5 year charts)
    - View earnings data
    - View the recent news of the selected stock

Portfolio Growth Projector (Option 2)
- For convenience, users have two different methods for using this utility, described below

Method 1: Manual Entry
1) Choose option 1
2) Enter ticker and dollar amount for each stock
3) Enter holding period in years
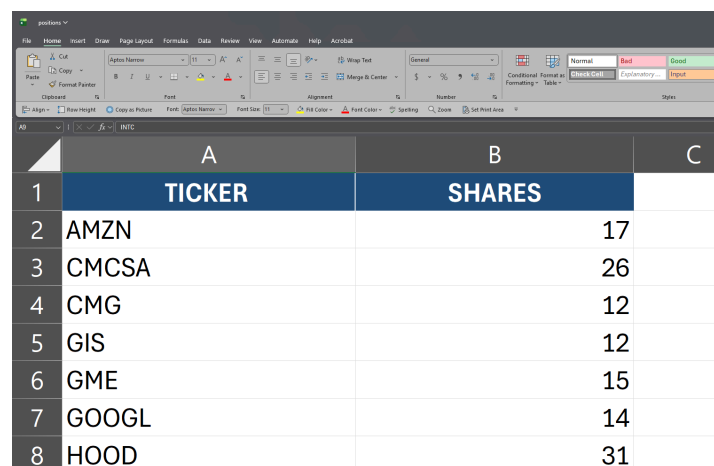4) View projections and charts

Method 2: CSV/Excel Import
- Most brokerages allow you to easily export your positions to a CSV/Excel file.

Once you've exported your stock position from your brokerage account, you'll need to make two edits to the file in Excel.
1) Change the top cell of the column that contains your holdings ticker symbols to "TICKER" *(capitalization does not matter)*
2) Change the top cell of the column that contains your shares held of each position to "SHARES" *(capitalization does not matter)*

Example of this formatting (all other data has been deleted for simplicity; however, this isn't necessary to run your file):

3) Once you run the utility and select the option to import a csv/excel file, you can either:
- Enter file path

- Or, enter the filename if you've already placed the file in the same folder as our utility.

4) Once our utility has processed your file. Enter your holding period in years

Understanding Results

Portfolio Summary shows:
1) Total Initial Investment
2) Total Projected Value (nominal and inflation-adjusted)
3) Portfolio CAGR - overall portfolio growth rate
4) Average Stock CAGR - average of individual stocks

Two charts display:
1) Total portfolio growth over time
2) Individual stock projections (with distinct colors)
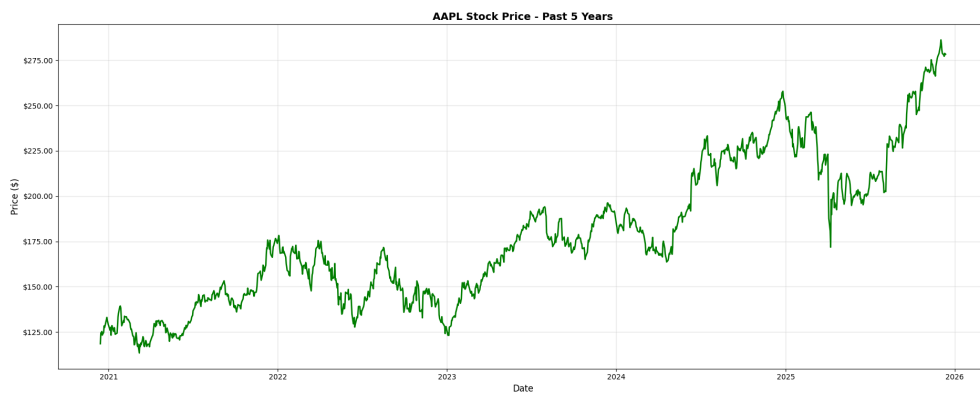
Notes:
- CAGR capped at 15% for realistic projections
- Uses 2.5% inflation rate for real returns
- Smart historical data selection based on company age:
  - The tool analyzes how long a company has been publicly traded and selects the most relevant historical period for CAGR calculation. We use all available data for young companies (<5 years), recent 5-year data for mid-age companies (5-10 years) to exclude early high growth periods, and recent 5-year data for mature companies (>10 years) to ensure realistic projections based on current business conditions rather than initial surges.

Example Outputs

Stock Analysis Tool:


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--- Current Stock Metrics ---
Current Price:          278.37
Previous Close:         278.03
Daily Change (%):       0.12%
Volume:                 28,127,814
Market Cap:             4130.75B
Trailing P/E Ratio:     37.361748

--- Historical Performance ---
1-Year Return:          12.66%
5-Year Return:          134.74%
```



```
--- Recent News ---
1. After a 42% Six-Month Rally, What's Next for Apple Stock in 2026? - Yahoo Finance
   Link: https://news.google.com/rss/articles/CBMiekFVX3lxTE83djlrWFJHVkdJTUppdVZjQlo5cHpwdFRqczBIWk44NTRhQ2R4WHdfTU5Ea1RZbHJJX1RlOVI2X1dNd2pTa3djcGdGandJTDdUZ0VTNVA1ek8wcGdlN1N0VTlCQ1NYdWIwVm1Ga0V2WDJReVFPa1Q0cmhB?oc=5
   Date: Fri, 12 Dec 2025 14:57:00 GMT
2. Apple Inc. Stock (AAPL) Opinions on AI Developments and Leadership Changes - Quiver Quantitative
   Link: https://news.google.com/rss/articles/CBMisAFBVV95cUxPTE91TjFRdkJVNzdLOElkeEVmRy1YTGglUUl5MEs4WlpGUm55LUI3aEJnNldOUHVlN05WVUhuTnNxN2NITWpQUG4yZXdnY3FibENPbWxFZVJkamlKcHJjcVRLVU05elgwT2hWaFpDdjVwNUhNNFJhZjJFSV81bWVCNm51TlhWcEVMQkhXb25jN3BxSC1SYW54YjNWY2JSTDJYYUFxbE5MMHdQSnREaV96Mg?oc=5
   Date: Fri, 12 Dec 2025 14:07:00 GMT
3. Apple Inc. (AAPL/NASDAQ): Navigating Innovation, Growth, and Geopolitical Headwinds - Markets Financial Content
   Link: https://news.google.com/rss/articles/CBMi5gFBVV95cUxOakNpZFNmYVZtcU1ZS0RmWm8wR3ZaaFk2dGNJeS0tZE5HT1NwR0pKeDA1SVcxcExZczZ6TTd5cjBEczcwWUpSd0x2c1JLejV2X3lkYk1LZVhXdV9zQUduNmNsRzRsVmo5VnlyM3ZFTEVFREJpOEJMdGU2d2JJSkxMTnZ6Wko4QkxaWHBSSHplajc4cXBHbVpVa2wxOFdlVkxHR3pMWnY2dllPdzVjSlBiQzJtTjNxU0MwZF8takxpcnQ0SUU5ZFhIYXJOZHFWMURVbUV4R2tnS3BwZXV0SHYwaWZJek5FZw?oc=5
   Date: Fri, 12 Dec 2025 15:03:00 GMT
4. Apple Inc. (AAPL): Our Calculation of Intrinsic Value - The Acquirer's Multiple
   Link: https://news.google.com/rss/articles/CBMilAFBVV95cUxPeUFmRHZRejJhU0dCZ19JZ0MzWnQ4WmI3ejAtLUVaYVk3OGJgRkM2b2tJVEotNVRhWTU4WHZJMFNiMkQzNXRKZi1jbWw2dmgzRGVWeDZEWWYtSHpfcFRXeXptTmkxRENIVXNPWWhHajR1ZG96SjBpdWU2dmxhWWJ6Wkd5ajl2ZmkxNURjOWFkaC1Fb0ly?oc=5
   Date: Thu, 11 Dec 2025 23:21:14 GMT
5. Apple Stock (AAPL) News Today: Epic Games App Store Ruling, Analyst Price Targets, and the 2026 Outlook (Dec. 12, 2025) - ts2.tech
   Link: https://news.google.com/rss/articles/CBMiywFBVV95cUxNMnRNRUlNSldrbXJVTGgwdUs4UjJvSmZwQ3UyTkx4dmpSaE9hWEI0ZFVhZU90bHpvNk42emg2cFB3YjB4NkpsajByYjNOX3BSMFpzOV9vQmZoOHlySlNid2IxZjRnWU5neE9YQ0t6UTJCNXE1dWx5TFI4dWRBd2gtTWxhOEtNeFVsckFmeDd6VkY2MDlqTGVDbTBTRlFieDdSVGM1Zm1iOEc5X1FOaWhUX1BvNGtpbkctUnJkMHM0aHZXdHBLRklJR1FrYw?oc=5
   Date: Fri, 12 Dec 2025 13:33:31 GMT
```

```
--- Earnings Information ---
Most Recent Quarter Net Income: $27,466,000,000
Quarter Date: 2025-09-30
Trailing EPS (12 months): $7.45
Next Earnings Date: Not available
```


AAPL Stock Price - Past Year

AAPL Stock Price - Past 5 Years

Portfolio Growth Projector:

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Calculating projections for 18 stock(s) over 10 years...
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Analyzing Amazon.com, Inc. (AMZN)...
  Years since IPO: 28.6
  Using recent 5 years (mature company)
  Historical CAGR (4 years): 7.48%
  Initial Investment: $3,845.23
  Projected Value (nominal): $7,913.77
  Projected Value (inflation-adjusted): $6,182.22

Analyzing Comcast Corporation (CMCSA)...
  Years since IPO: 45.7
  Using recent 5 years (mature company)
  Historical CAGR (4 years): -9.32%
  Initial Investment: $707.98
  Projected Value (nominal): $266.12
  Projected Value (inflation-adjusted): $207.89

Analyzing Chipotle Mexican Grill, Inc. (CMG)...
  Years since IPO: 19.9
  Using recent 5 years (mature company)
  Historical CAGR (4 years): 6.68%
  Initial Investment: $433.74
  Projected Value (nominal): $827.81
  Projected Value (inflation-adjusted): $646.69
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PORTFOLIO SUMMARY
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Total Initial Investment: $89,862.27
Total Projected Value (nominal): $320,763.49
Total Projected Value (inflation-adjusted): $250,579.93
Total Nominal Gain: $230,901.22 (256.95%)
Total Real Gain: $160,717.65 (178.85%)

Portfolio CAGR: 13.57%
Average Stock CAGR: 7.03%

Generating charts...

Debug - Total yearly values: ['$89,862', '$100,498', '$113,071', '$127,800', '$144,952']... to $320,763
Debug - Number of years: 11, Number of values: 11

Projection complete! Charts displayed.
```


Total Portfolio Projected Growth (10 Years)

Individual Stock Projected Growth (10 Years)