

FACULDADE DE ENGENHARIA DA UNIVERSIDADE DO PORTO  
Mestrado em Engenharia Informática e de Computação



Computação Móvel

**Practical Assignment #2**  
**My Stocks' Analysis**

Group 4

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## Architecture

- **User Interface Layer**

The UI layer is implemented using Flutter widgets, providing a responsive and visually appealing interface for users. The screens are designed to facilitate easy navigation and interaction, with intuitive controls for selecting companies and viewing stock price graphs.

- **Data Access Layer**

The data access layer uses an external API to fetch stock price data for the selected companies. The Alpha Vantage API retrieves historical stock price information, obtaining daily price data. Due to the 25 calls per day limit, we store the API data locally for efficient access. The app updates automatically once per day when running on the phone, ensuring users have the latest stock information.

- **Scalability and Maintainability**

The architecture of the application is designed with scalability and maintainability in mind, allowing for easy extension with additional features or integration of new data sources. Modularization of components promotes code reuse and facilitates future enhancements, while adherence to Flutter best practices ensures compatibility across platforms and ease of maintenance.

## Included Features

- **Company selection screen**

The application includes a user-friendly interface for selecting companies from a list. Upon launching the app, users are presented with a list of ten commonly traded companies, including Apple, IBM, Hewlett Packard, Microsoft, Oracle, Google, Facebook/Meta, Twitter/X, Intel, and Amazon. Users can easily scroll through this list and select one company of interest.

- **Stock price evolution graph**

After selecting a company, the application displays a graph of the stock price evolution for the chosen company. The graph shows the closing session quotes for each available day, giving users a clear visual of price fluctuations over time. Users can choose to view the graphical representation for different periods: 7 days, 1 month, 3 months, 6 months, 1 year, and 10 years.

- **Graph Comparison**

The application also includes a feature for comparing stock price graphs of different companies. At the top of the stock price evolution graph screen, a sliding preview of graphs for other companies is displayed. This allows users to easily select a company to compare stock price trends over the same timeframe. By tapping on a company in the preview, another graph is superimposed on the first one, enabling direct comparison. This helps users

make informed decisions by visually contrasting the performance of various stocks side-by-side.

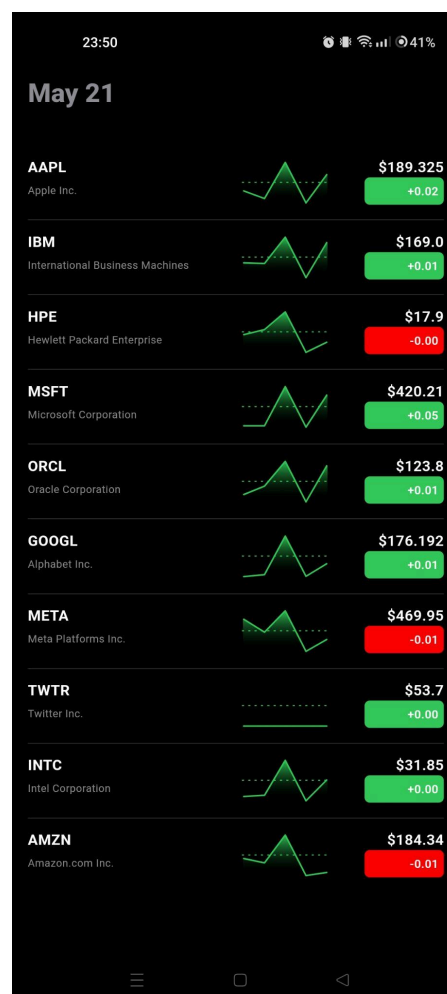
## Performed Scenario Tests

We conducted manual tests with our input, resulting in the refinement of certain conditions to operate within specific intervals.

## Interface

### - Company Selection Screen

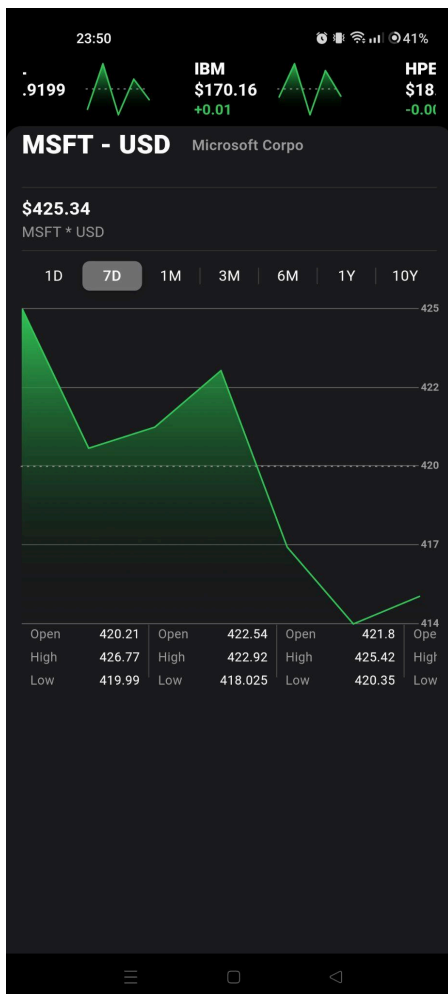
Upon launching the app, users are greeted by a company selection screen featuring the current date. Displayed in a scrollable layout are ten well-known companies: Apple, IBM, Hewlett Packard, Microsoft, Oracle, Google, Facebook/Meta, Twitter/X, Intel, and Amazon. Each company is clearly labeled, accompanied by a snapshot graph showcasing key information such as open, high, low, and close values of the current day, along with the current market price and change from the previous trading day's close. Users can easily navigate through the options and select a company of interest by tapping on the respective entries.



Picture 1 - Company Selection Screen

## - Stock Price Evolution Graph

Upon selecting a company, the app generates a visual representation of the stock price evolution. Each day's closing session quotes are graphically displayed, offering insights into price fluctuations over the chosen timeframe: 7 days, 1 month, 3 months, 6 months, 1 year, or 10 years. The graph excludes data from Saturdays, Sundays, and holidays. Open, high, and low values from the previous 7 days are shown in a scrollable section below the graph. Additionally, a sliding preview of other companies is provided at the top, facilitating easy stock comparisons. Clicking on another company draws its graph in the same space, allowing for superimposed comparison. A second click removes the graph, restoring the original view. Only two graphs can be selected at a time.



Picture 2 - Stock Price Evolution Graph Screen 7 days



Picture 3 - Stock Price Evolution Graph Screen 3 months



Picture 4 - Stock Price Evolution  
Graph Screen 10 years



Picture 5 - Graph Comparison

## How to use

- **Launching the App**

Open the application and see the Company Selection Screen.

- **Company Selection**

Scroll through the list of companies presented on the screen with some familiar names like Apple, IBM, Microsoft, etc.

Each company entry includes:

- Name of the company
- Glimpse of graph showcasing key information such as open, high, low and close values
- Current market price
- Change from the previous trading day's close

Tap on a company to select it. This action will lead to the Stock Price Evolution Graph screen.

- **Stock Price Evolution Graph**

At the top of the page, a sliding preview of graphs for other companies enables easy stock comparison. The app generates a visual representation of stock price evolution over the selected timeframe. Each day's closing session quotes are displayed, providing insight into price fluctuations. Data from Saturdays, Sundays, and holidays are excluded. Open, high, and low values for each day are also shown for further analysis.

- **Graph Comparison**

Clicking on another company's name displays its graph superimposed for easy comparison. Clicking on the same company again restores the original graph, allowing selection of another company. Only two companies can be selected at a time.

- **Returning to Company Selection Screen**

To explore another company, scroll down to navigate back to the Company Selection Screen.