

MC-MOBILE COMPUTING

Report for Mobile Computing Project

StockSeeker / Stock Tracking & Visualisation

STOCKSEEKER

Developers:

Ricardo Ribeiro (up202310095)

Ruben Viana (up202005108)

Chaimaa Mounir (up202311347)

Summary

Introduction	3
Objective	3
Architecture	4
Components	4
StockSeeker App	4
REST API Service	4
Technologies used	7
Applications operations	7
App Features	7
Navigation Map	8
Overall Navigation Structure	8
Screen Capture Sequences	8
User Guide: How to use our application?	10
References	10

Introduction

This project involves developing a simple mobile application using Flutter that allows users to compare the stock price evolution of major commercial companies.

The app provides an easy-to-use interface where users can select one or two companies from a predefined list and view their stock prices ranging from a daily perspective up to the last 6 months of data.

Objective

The primary objective of this project is to design and develop a mobile application that:

- Provides a list of ten common commercial companies.
- Allows users to select one or two companies to compare their stock prices.
- Displays a graph showing the stock price evolution.
- Ensures the graphical representation is clear, with different colors for each company when comparing two companies.

Architecture

Components

StockSeeker App

This application allows users to:

- Select companies from a predefined list.
- Fetch stock price data for the selected companies.
- Display a graph showing the price evolution over the period of choice from 1 day up to 6 months of data.

REST API Service

The app fetches stock price data using the Twelve Data API (Twelve Data Pte. Ltd, n.d.), a free web service that provides real-time and historical stock data. The API key is required to make REST requests to fetch the stock data.

Used endpoints:

- `/time_series` : This API call returns meta and time series for the requested instrument. Metaobject consists of general information about the requested symbol. Time series is the array of objects ordered by time descending with Open, High, Low, Close prices. Non-currency instruments also include volume information.

Example response:

```
{
  "meta": {
    "symbol": "AAPL",
    "interval": "1min",
    "currency": "USD",
    "exchange_timezone": "America/New_York",
    "exchange": "NASDAQ",
    "mic_code": "XNGS",
    "type": "Common Stock"
  }
}
```

```
},
"values": [
  {
    "datetime": "2024-05-23 10:30:00",
    "open": "189.06000",
    "high": "189.14000",
    "low": "188.98000",
    "close": "189.00500",
    "volume": "134687"
  },
  {
    "datetime": "2024-05-23 10:29:00",
    "open": "188.98000",
    "high": "189.05000",
    "low": "188.97501",
    "close": "189.05000",
    "volume": "110276"
  }
],
"status": "ok"
}
```

- /quote: Quote endpoint is an efficient method to retrieve the latest quote of the selected instrument.

Example response:

```
{
  "symbol": "AAPL",
  "name": "Apple Inc",
  "exchange": "NASDAQ",
  "mic_code": "XNAS",
  "currency": "USD",
  "datetime": "2021-09-16",
  "timestamp": 1631772000,
  "open": "148.44000",
  "high": "148.96840",
  "low": "147.22099",
  "close": "148.85001",
  "volume": "67903927",
  "previous_close": "149.09000",
  "change": "-0.23999",
  "percent_change": "-0.16097",
  "average_volume": "83571571",
  "rolling_1d_change": "123.123",
  "rolling_7d_change": "123.123",
}
```

```
"rolling_period_change": "123.123"
"is_market_open": false,
"fifty_two_week": {
  "low": "103.10000",
  "high": "157.25999",
  "low_change": "45.75001",
  "high_change": "-8.40999",
  "low_change_percent": "44.37440",
  "high_change_percent": "-5.34782",
  "range": "103.099998 - 157.259995"
},
"extended_change": "0.09",
"extended_percent_change": "0.05",
"extended_price": "125.22",
"extended_timestamp": 1649845281
}
```

- /logo: Returns a logo of company, cryptocurrency, or forex pair.

```
{
  "meta": {
    "symbol": "AAPL",
    "name": "Apple Inc",
    "currency": "USD",
    "exchange": "NASDAQ",
    "mic_code": "XNAS",
    "exchange_timezone": "America/New_York"
  },
  "url": "https://api.twelvedata.com/logo/apple.com"
}
```

Technologies used

- **Flutter:** Used for developing the mobile application, providing a native look and feel across different platforms.
- **Twelve Data API:** A web service that provides the required stock price data.
- **HTTP Package:** Used for making REST API calls to fetch data from the Twelve Data API.
- **fl_charts Library** (FL Chart, n.d.): Used for rendering the stock price graphs.

Applications operations

App Features

- Users can choose from a list of ten predefined companies: Apple, IBM, Hewlett Packard, Microsoft, Oracle, Google, Facebook/Meta, Twitter/X, Intel, and Amazon.
- Users can select one or two companies for comparison.
- The app displays the stock price evolution in a graph. If two companies are selected, their stock prices are shown in different colours for easy comparison.

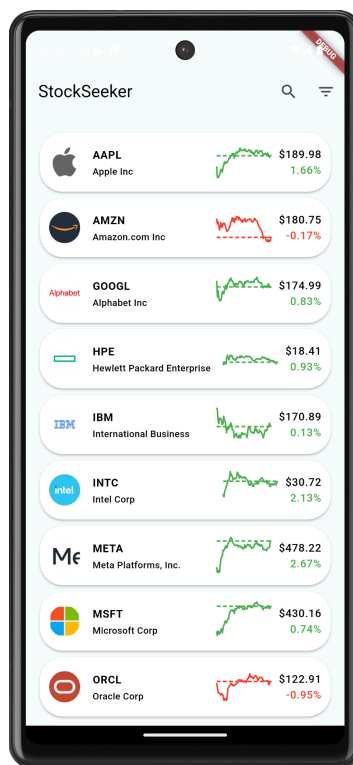
Navigation Map

Overall Navigation Structure

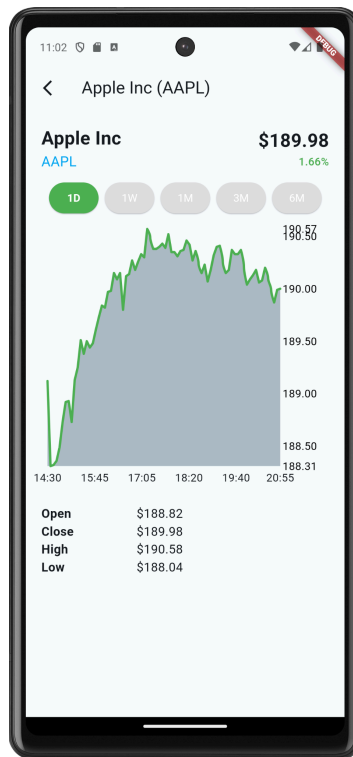
- **Home Screen:** Lists the ten companies with checkboxes for selection. When clicking on the icon of two stocks, a floating button appears in the bottom right corner of the app. Upon clicking this button, the user is redirected to the comparison screen.
- **Details Screen:** Shows the stock info (Name, ticker/symbol, last available trading price and last daily percentage change). Then a line chart shows the stock price evolution for the selected time period. Lastly, a column details the last trading session's open, close, high and low prices. If two stocks are chosen, the chart shows 2 lines.

Screen Capture Sequences

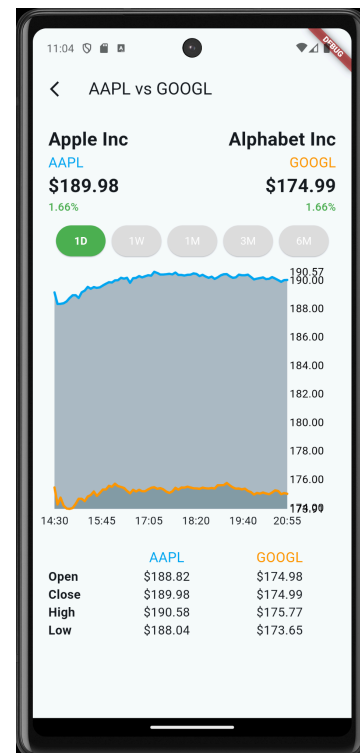
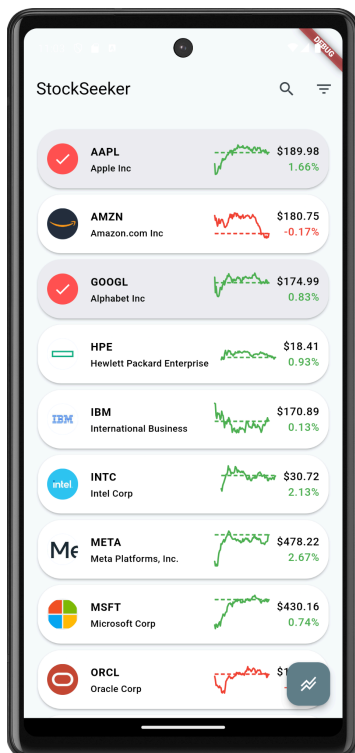
- **Home Screen**



- Single Stock Details Screen



- Stocks Comparison Details Screen



User Guide: How to use our application?

1. To run the app, open the projects on Android Studio. You can then launch the app on the emulator of a physical device.

References

FL Chart. (n.d.). *FL Chart*. FL Chart. Retrieved May 23, 2024, from <https://flchart.dev/>

Twelve Data Pte. Ltd. (n.d.). *Twelve Data*. Twelve Data | Stock, Forex, and Crypto Market Data APIs. Retrieved May 23, 2024, from <https://twelvedata.com/>