Rise & Shine

project documentation

Prepared, designed and programmed
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as the final project at
CFGdegree SW Development summer 2022

Table of content

Main objectives

Rise & Shine is a stock market application. It allows users to track and trade stocks, manage multiple portfolios and see the gains in a friendly graphic interface. Results are available online through API as well.

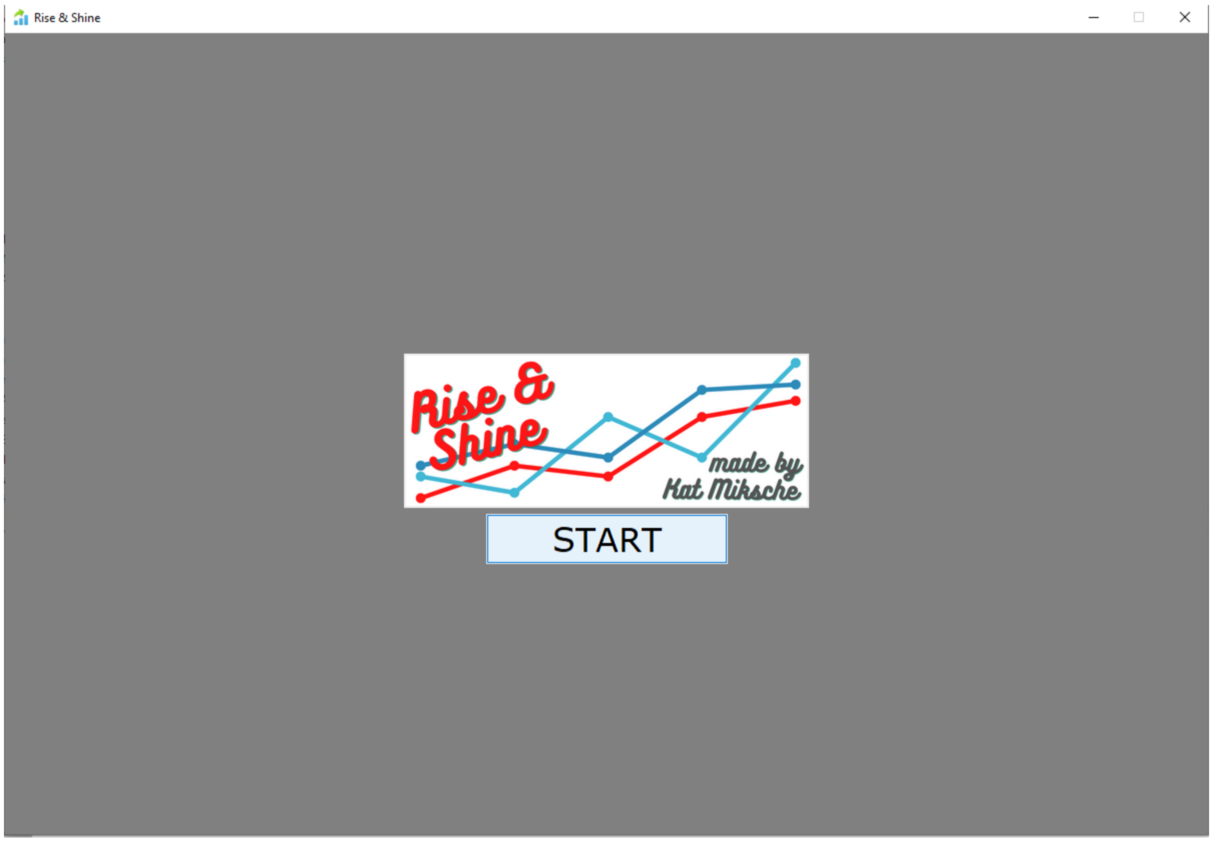
Full functionality available through the graphic interface includes an overview of portfolios including their current values, more detailed view of each portfolio and its historic performance including graph, search tool for tickers and stock performance view, buy/sell functionality, monetary operations in wallet, start of new portfolio and option to close it fast as well.

Limited functionality available online via own API includes an overview of portfolios including their current values, more detailed view of each portfolio and its historic performance, stock performance view and most recent stock price.

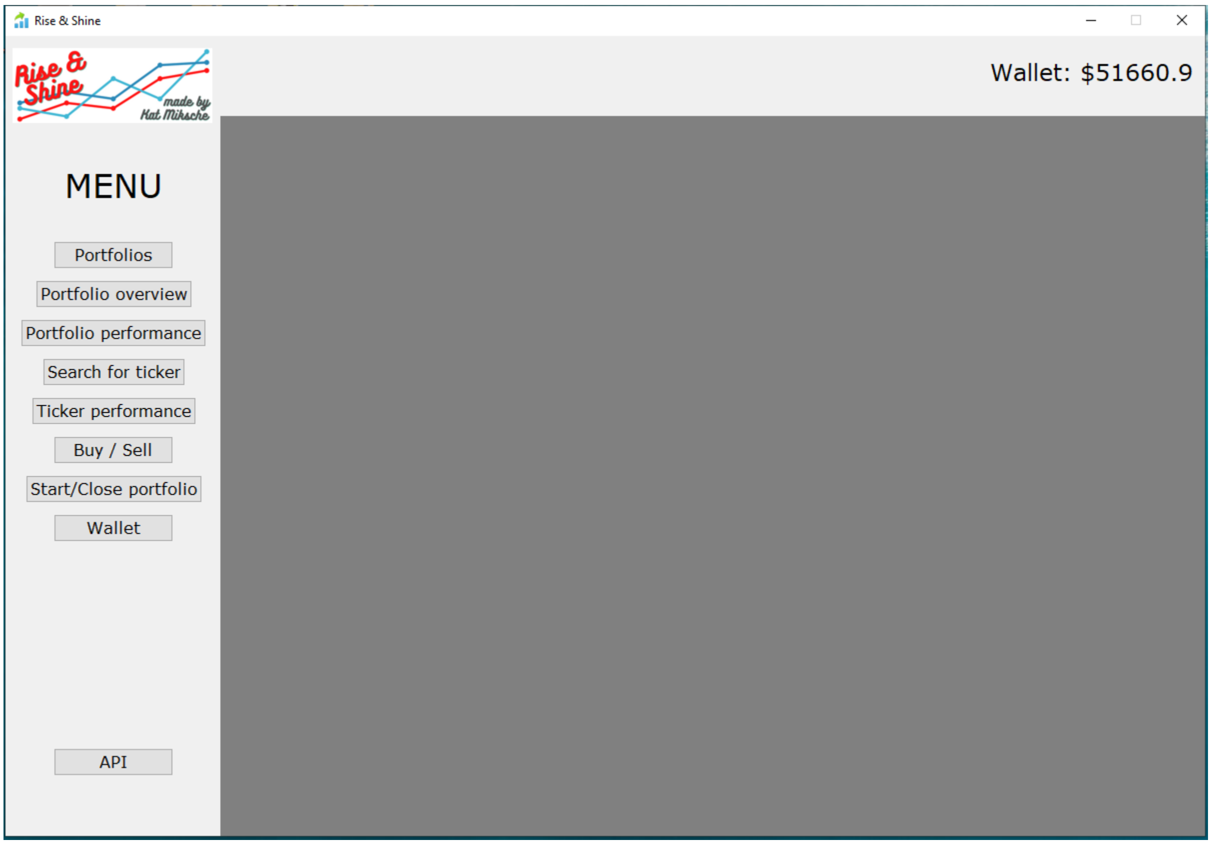
Functionality

GUI

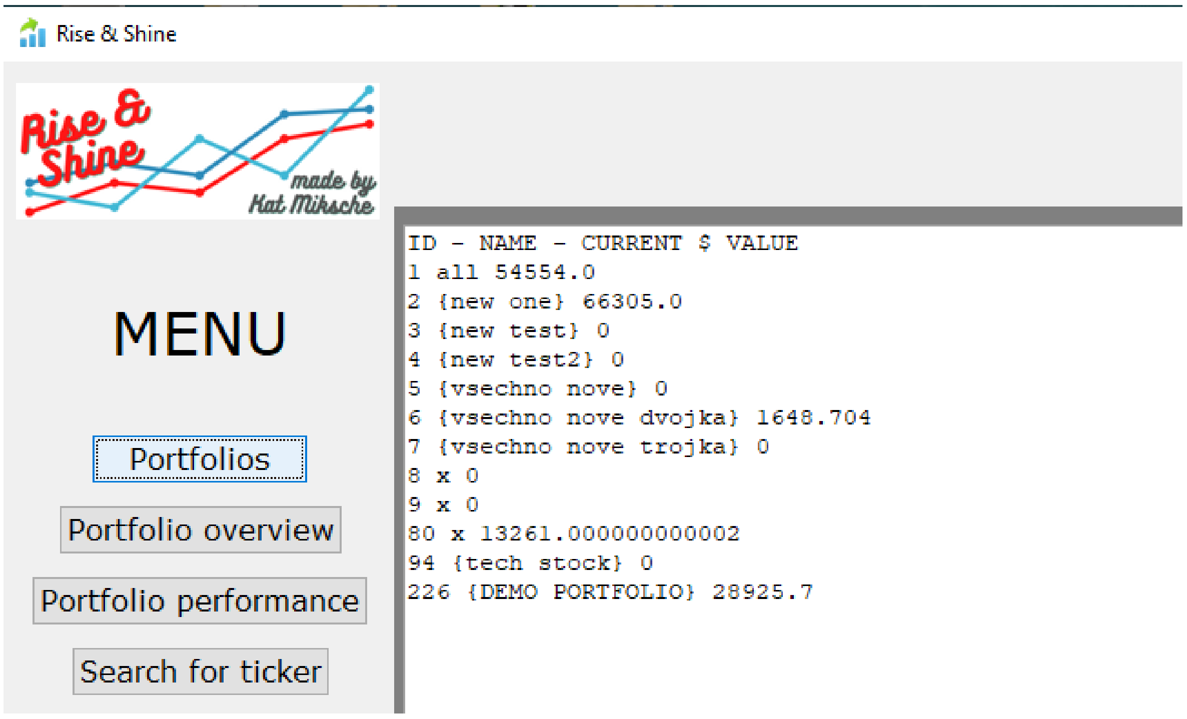
Start screen



First screen after start and successful load of data

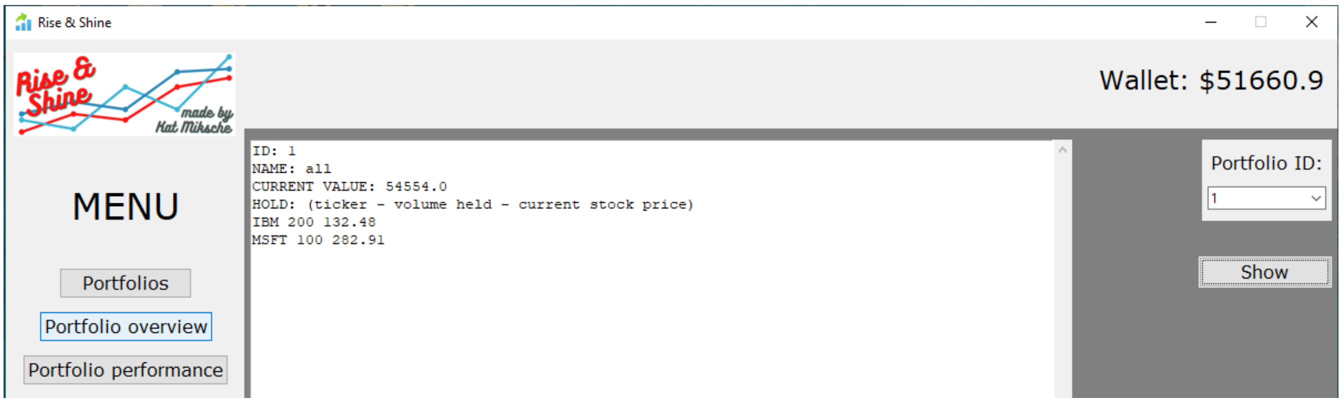


Portfolios - top view



```
ID - NAME - CURRENT $ VALUE
1 all 54554.0
2 {new one} 66305.0
3 {new test} 0
4 {new test2} 0
5 {vsechno nove} 0
6 {vsechno nove dvojka} 1648.704
7 {vsechno nove trojka} 0
8 x 0
9 x 0
80 x 13261.000000000002
94 {tech stock} 0
226 {DEMO PORTFOLIO} 28925.7
```

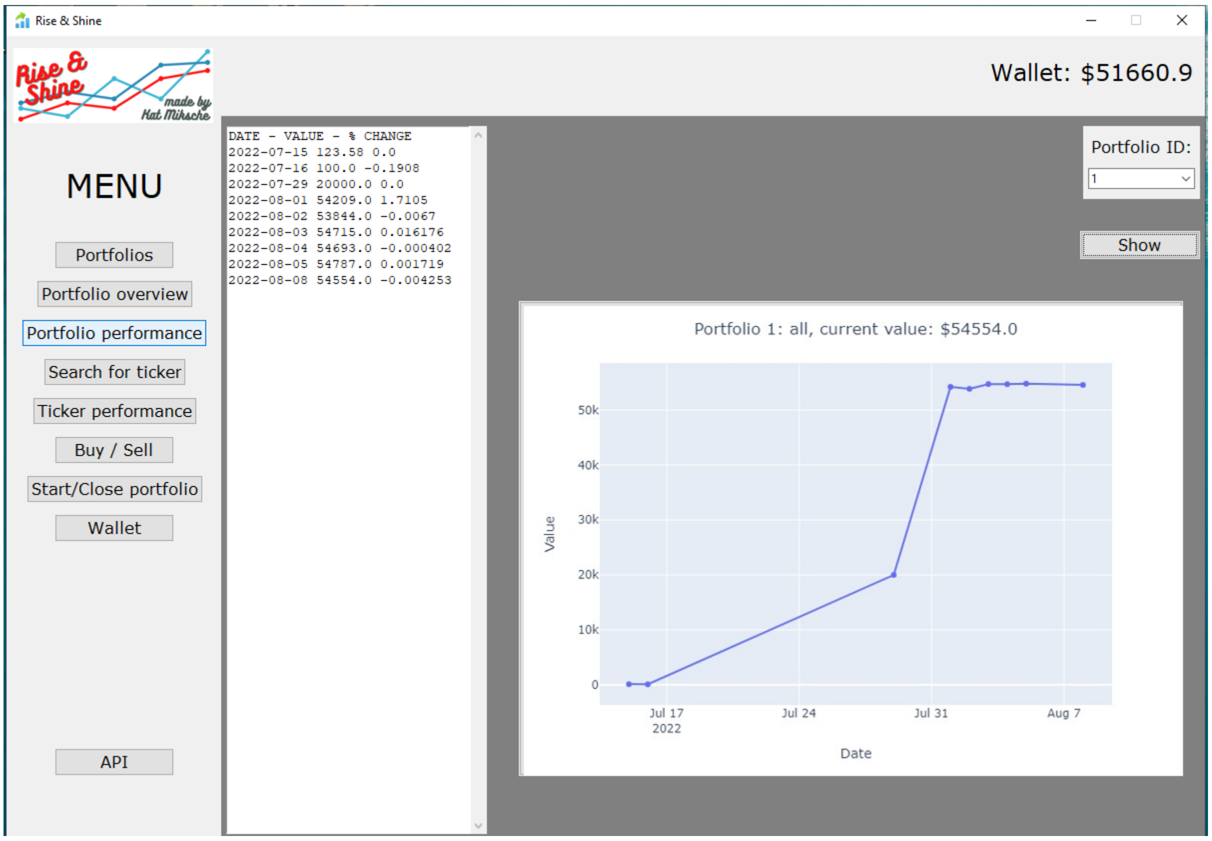
Portfolio overview



```
ID: 1
NAME: all
CURRENT VALUE: 54554.0
HOLD: (ticker - volume held - current stock price)
IBM 200 132.48
MSFT 100 282.91
```

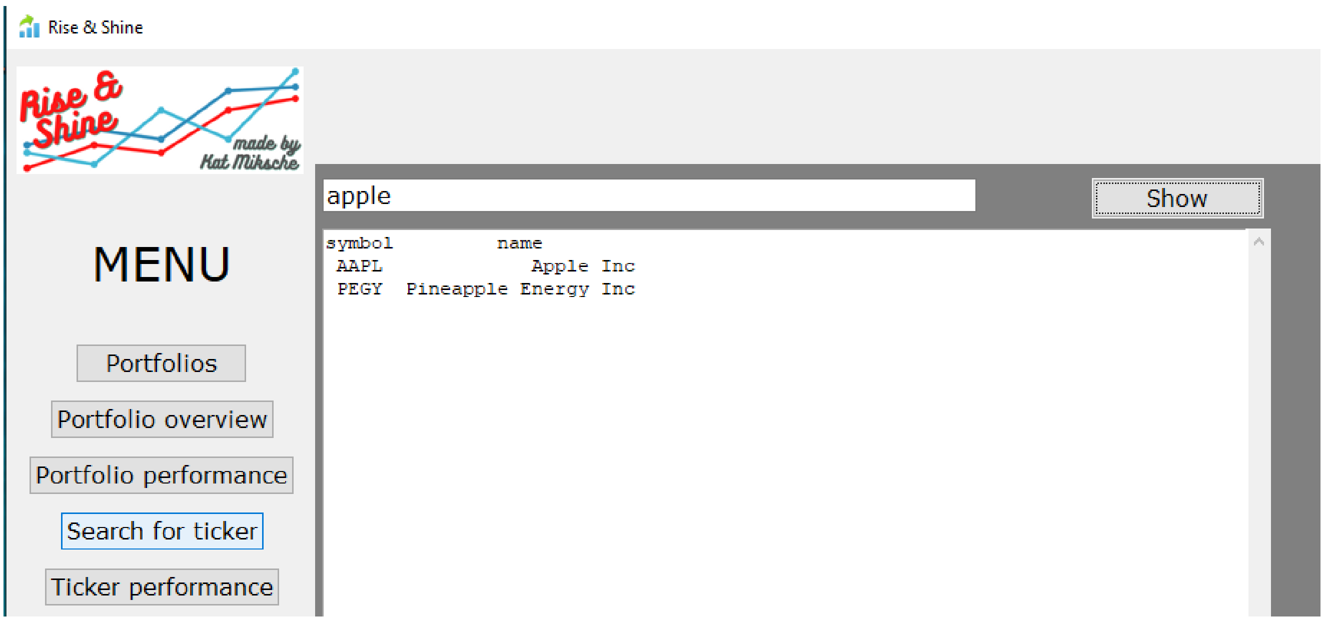
Portfolio performance with graph

(graph is clickable, opens as an active object in a browser)



```
DATE - VALUE - % CHANGE
2022-07-15 123.58 0.0
2022-07-16 100.0 -0.1908
2022-07-29 20000.0 0.0
2022-08-01 54209.0 1.7105
2022-08-02 53844.0 -0.0067
2022-08-03 54715.0 0.016176
2022-08-04 54693.0 -0.000402
2022-08-05 54787.0 0.001719
2022-08-08 54554.0 -0.004253
```

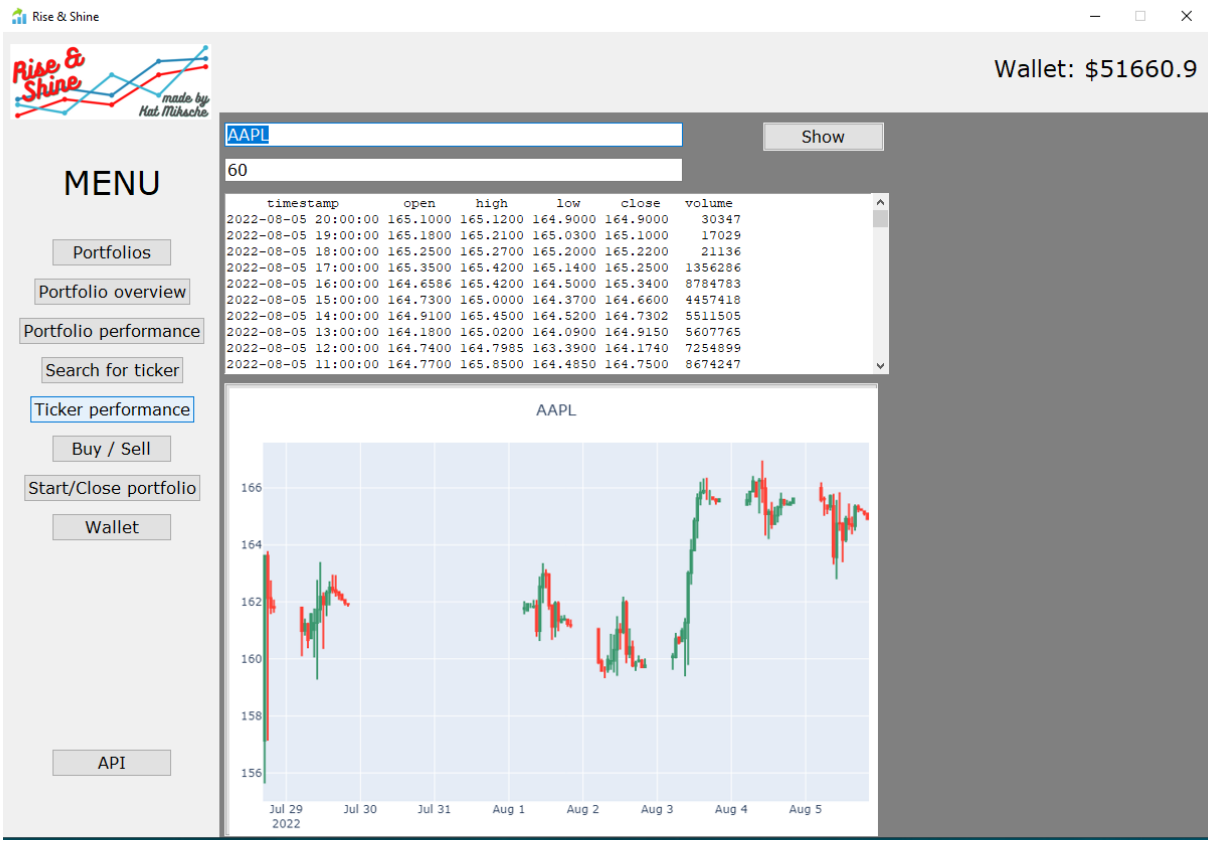
Search for ticker tool



```
symbol          name
 AAPL              Apple Inc
 PEGY   Pineapple Energy Inc
```

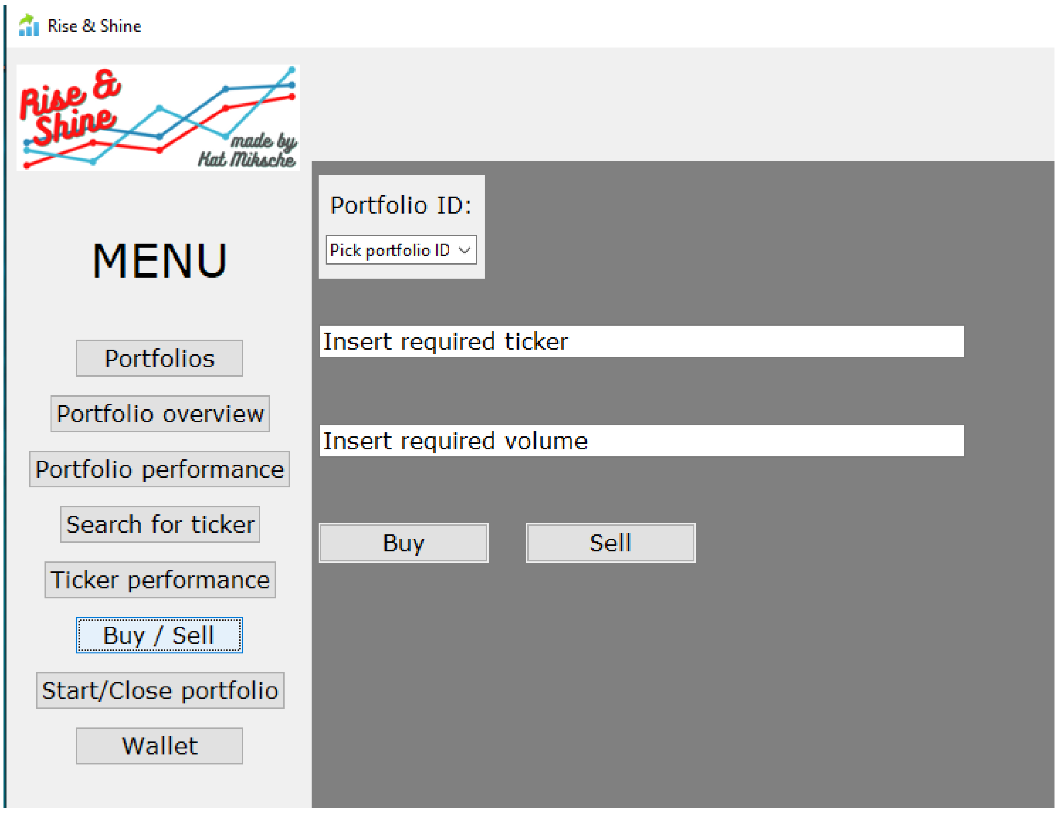
Ticker performance with graph

(graph is clickable, opens as an active object in a browser)

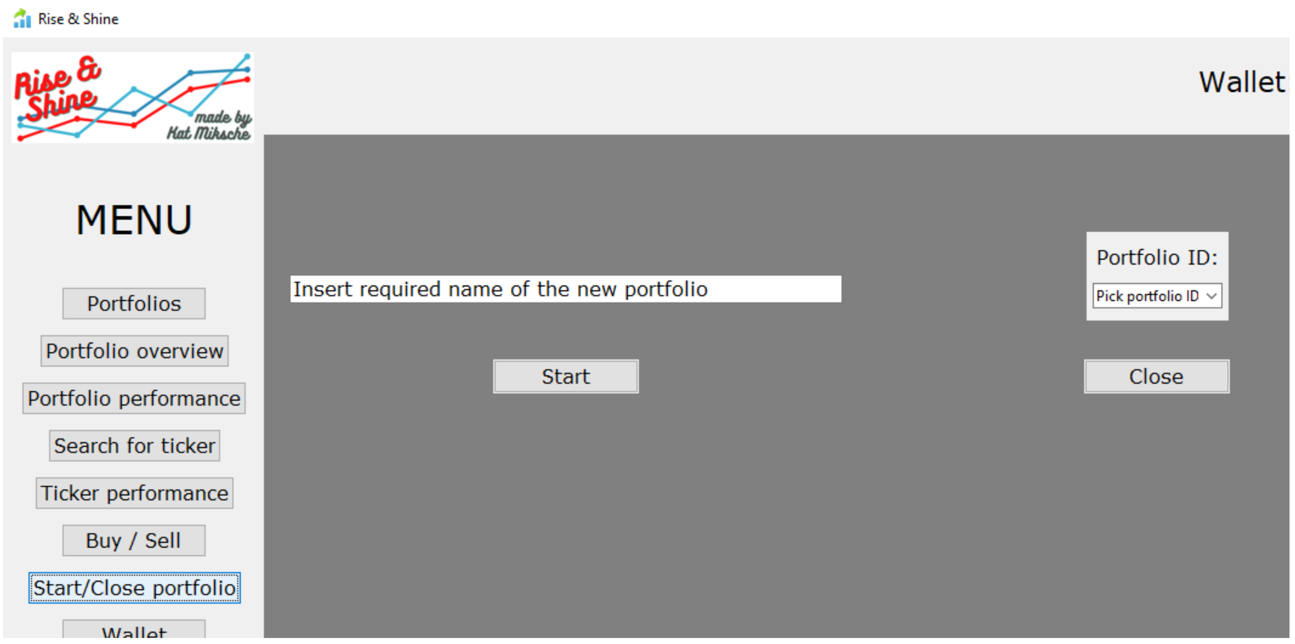


```
     timestamp         open     high      low    close   volume
2022-08-05 20:00:00 165.1000 165.1200 164.9000 164.9000    30347
2022-08-05 19:00:00 165.1800 165.2100 165.0300 165.1000    17029
2022-08-05 18:00:00 165.2500 165.2700 165.2000 165.2200    21136
2022-08-05 17:00:00 165.3500 165.4200 165.1400 165.2500  1356286
2022-08-05 16:00:00 164.6586 165.4200 164.5000 165.3400  8784783
2022-08-05 15:00:00 164.7300 165.0000 164.3700 164.6600  4457418
2022-08-05 14:00:00 164.9100 165.4500 164.5200 164.7302  5511505
2022-08-05 13:00:00 164.1800 165.0200 164.0900 164.9150  5607765
2022-08-05 12:00:00 164.7400 164.7985 163.3900 164.1740  7254899
2022-08-05 11:00:00 164.7700 165.8500 164.4850 164.7500  8674247
```

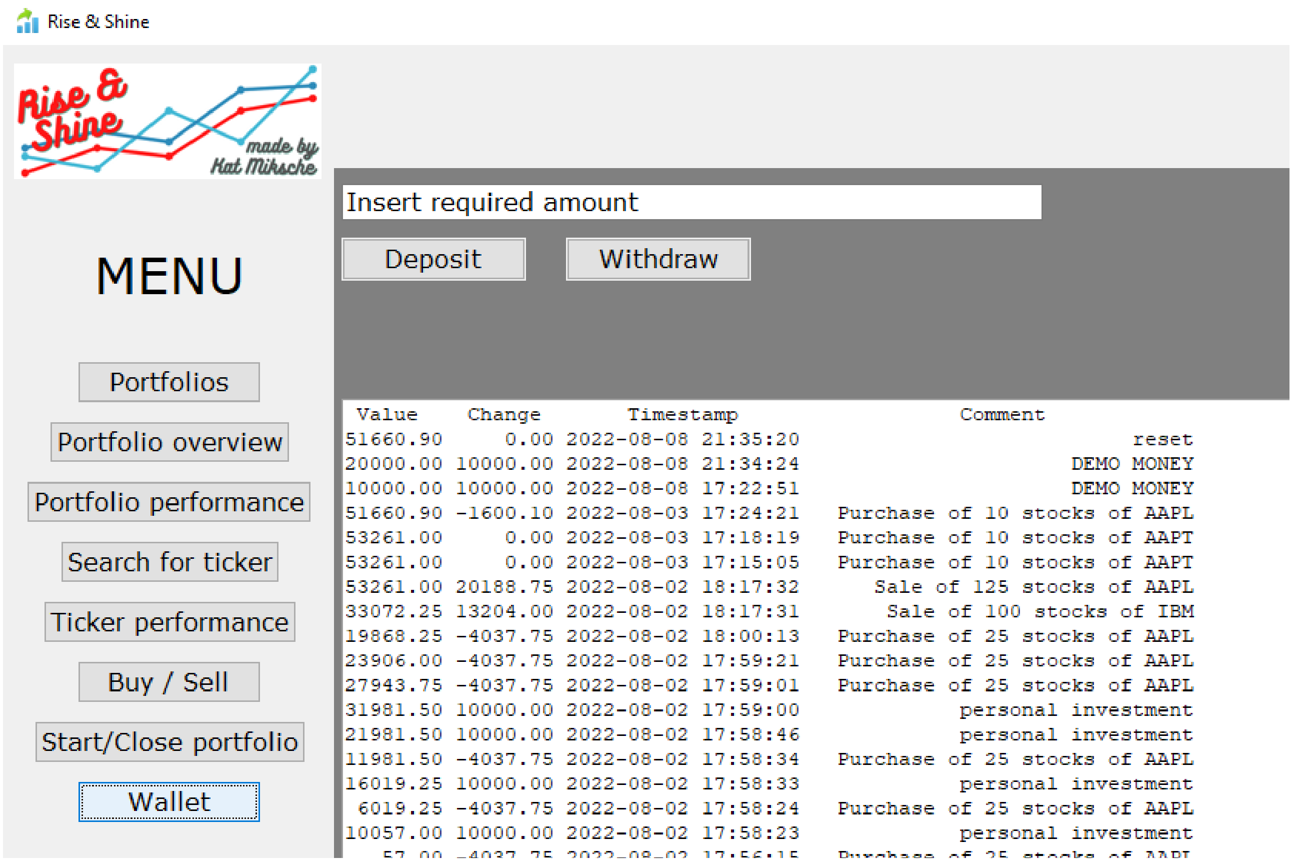
Buy / Sell tool



Start / Close portfolio

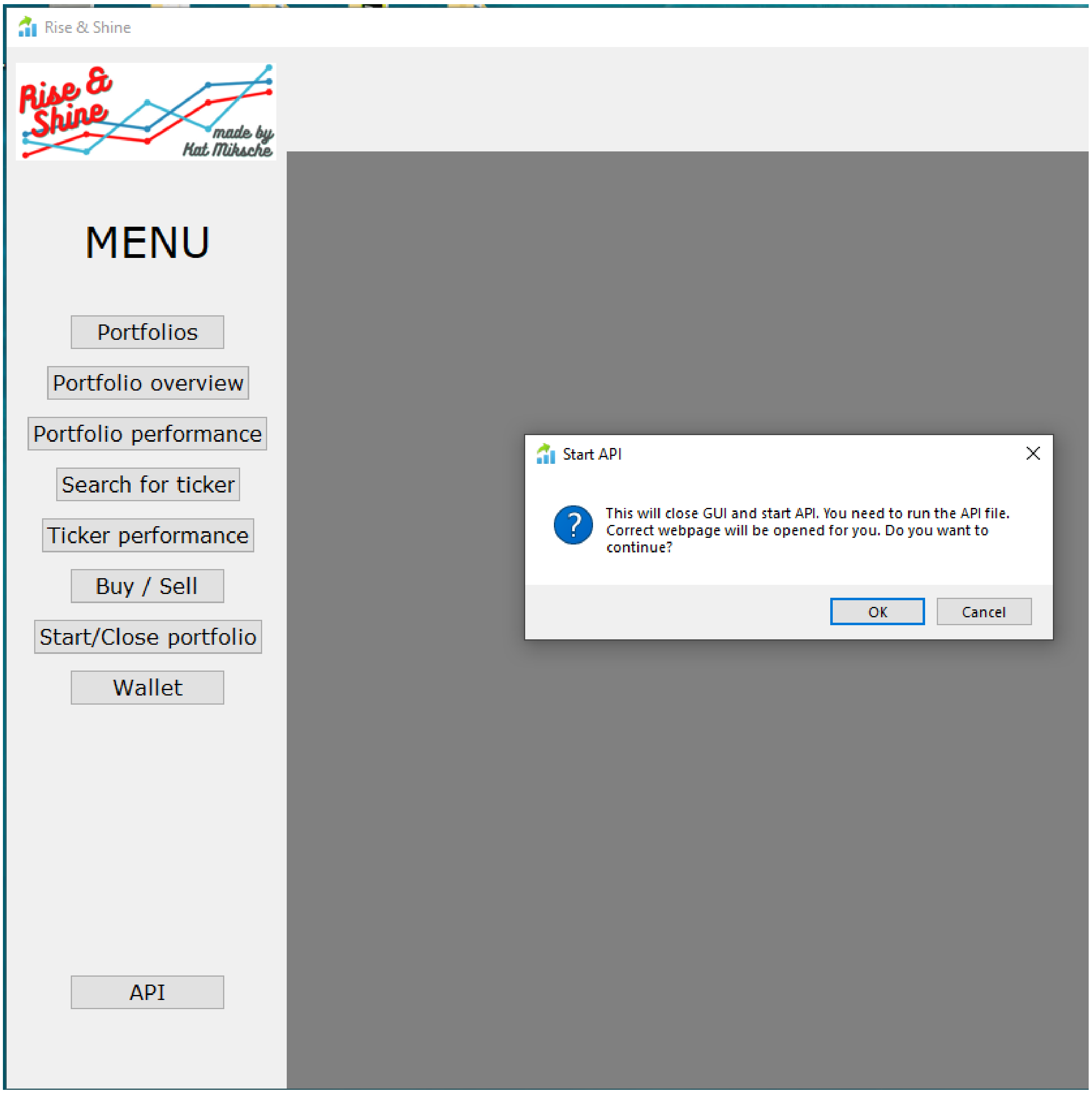


Wallet - Deposit / Withdrawal, see records



```
 Value     Change        Timestamp                      Comment
51660.90      0.00 2022-08-08 21:35:20                                reset
20000.00 10000.00 2022-08-08 21:34:24                            DEMO MONEY
10000.00 10000.00 2022-08-08 17:22:51                            DEMO MONEY
51660.90 -1600.10 2022-08-03 17:24:21   Purchase of 10 stocks of AAPL
53261.00      0.00 2022-08-03 17:18:19   Purchase of 10 stocks of AAPT
53261.00      0.00 2022-08-03 17:15:05   Purchase of 10 stocks of AAPT
53261.00 20188.75 2022-08-02 18:17:32      Sale of 125 stocks of AAPL
33072.25 13204.00 2022-08-02 18:17:31       Sale of 100 stocks of IBM
19868.25 -4037.75 2022-08-02 18:00:13   Purchase of 25 stocks of AAPL
23906.00 -4037.75 2022-08-02 17:59:21   Purchase of 25 stocks of AAPL
27943.75 -4037.75 2022-08-02 17:59:01   Purchase of 25 stocks of AAPL
31981.50 10000.00 2022-08-02 17:59:00             personal investment
21981.50 10000.00 2022-08-02 17:58:46             personal investment
11981.50 -4037.75 2022-08-02 17:58:34   Purchase of 25 stocks of AAPL
16019.25 10000.00 2022-08-02 17:58:33             personal investment
 6019.25 -4037.75 2022-08-02 17:58:24   Purchase of 25 stocks of AAPL
10057.00 10000.00 2022-08-02 17:58:23             personal investment
   57.00 -4037.75 2022-08-02 17:56:15   Purchase of 25 stocks of AAPL
```

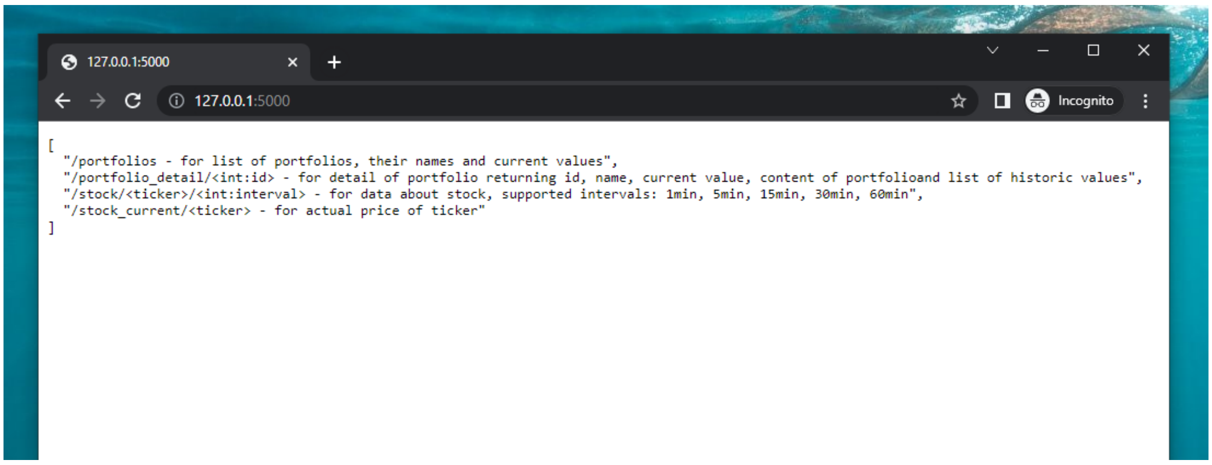
API - button will open API file and close GUI



This will close GUI and start API. You need to run the API file. Correct webpage will be opened for you. Do you want to continue?

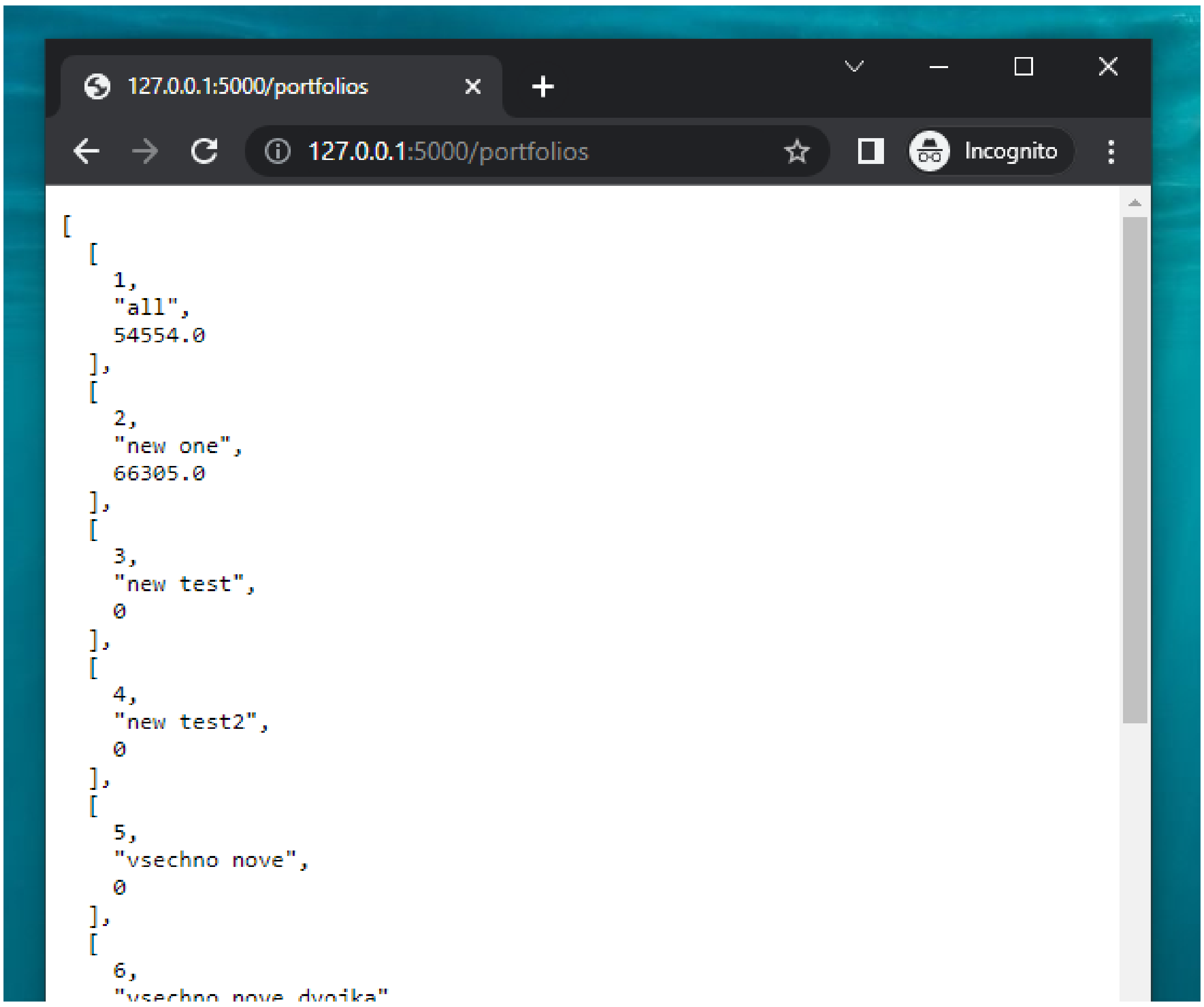
API

Home - http://127.0.0.1:5000/



```
[
  "/portfolios - for list of portfolios, their names and current values",
  "/portfolio_detail/<int:id> - for detail of portfolio returning id, name, current value, content of portfolioand list of historic values",
  "/stock/<ticker>/<int:interval> - for data about stock, supported intervals: 1min, 5min, 15min, 30min, 60min",
  "/stock_current/<ticker> - for actual price of ticker"
]
```

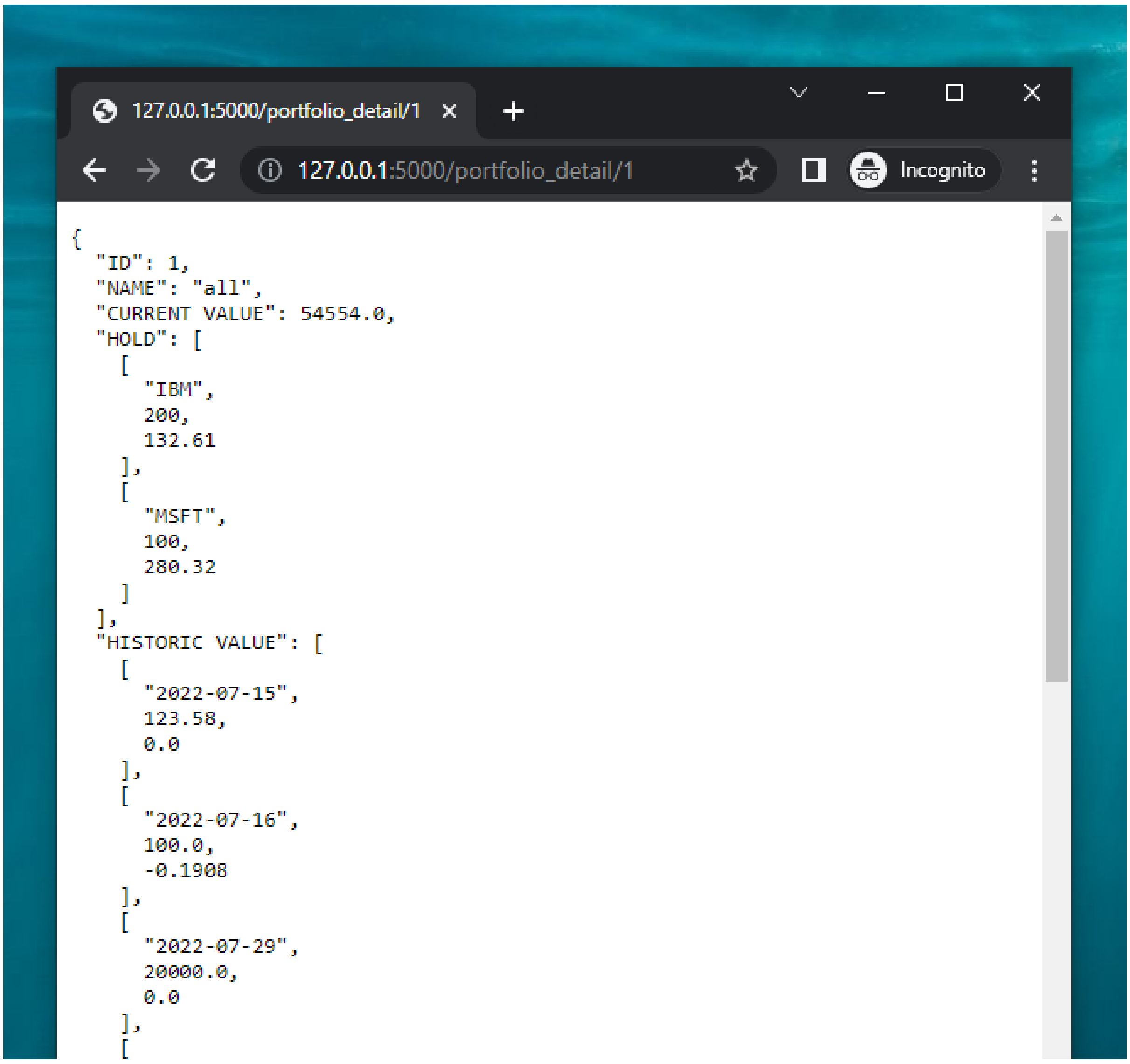
/portfolios - for list of portfolios, their names and current values



```
[
  [
    1,
    "all",
    54554.0
  ],
  [
    2,
    "new one",
    66305.0
  ],
  [
    3,
    "new test",
    0
  ],
  [
    4,
    "new test2",
    0
  ],
  [
    5,
    "vsechno nove",
    0
  ],
  [
    6,
    "vsechno nove dvojka"
```

/portfolio_detail/<int:id> - for detail of portfolio

returning id, name, current value, content of portfolio and list of historic values

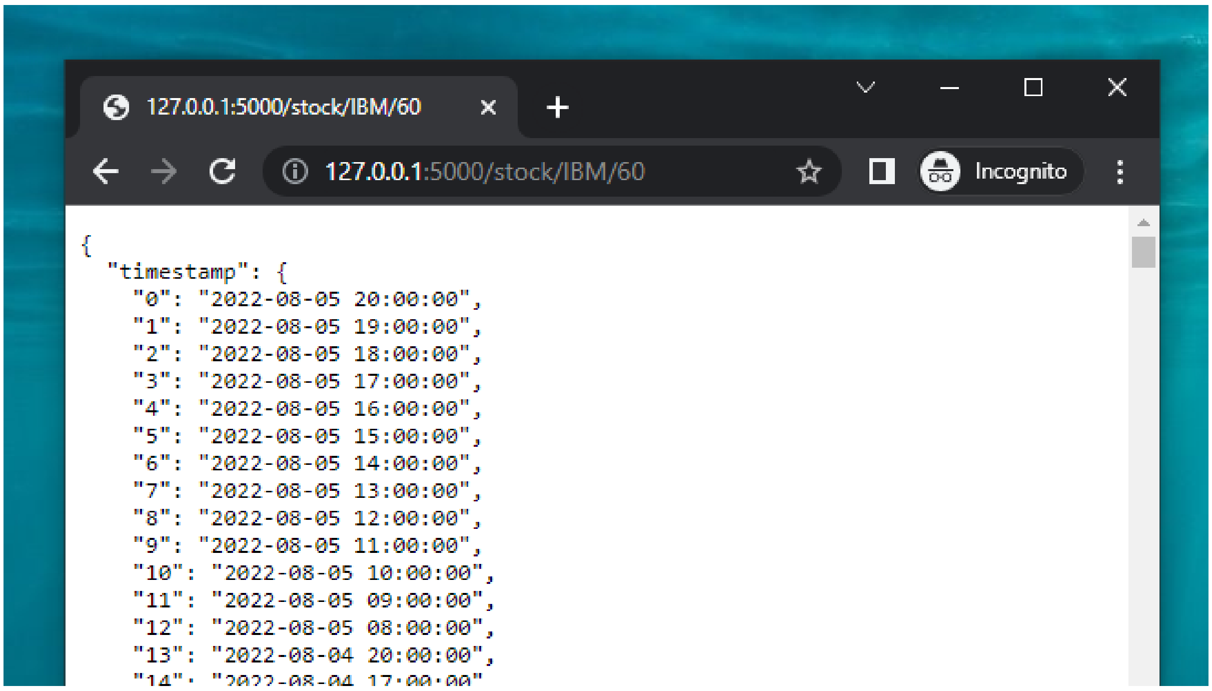


127.0.0.1:5000/portfolio_detail/1

```
{
  "ID": 1,
  "NAME": "all",
  "CURRENT VALUE": 54554.0,
  "HOLD": [
    [
      "IBM",
      200,
      132.61
    ],
    [
      "MSFT",
      100,
      280.32
    ]
  ],
  "HISTORIC VALUE": [
    [
      "2022-07-15",
      123.58,
      0.0
    ],
    [
      "2022-07-16",
      100.0,
      -0.1908
    ],
    [
      "2022-07-29",
      20000.0,
      0.0
    ],
    [
```

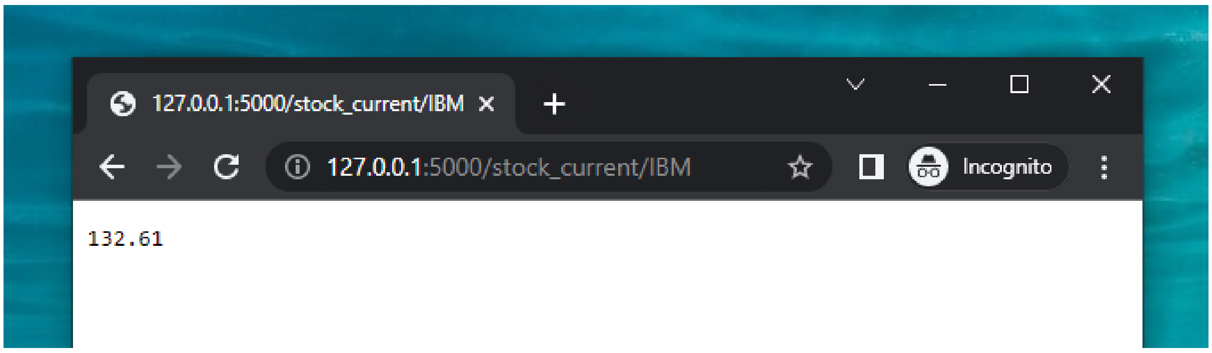
/stock/<ticker>/<int:interval> - for performance data about stock

supported intervals: 1min, 5min, 15min, 30min, 60min



```
{
  "timestamp": {
    "0": "2022-08-05 20:00:00",
    "1": "2022-08-05 19:00:00",
    "2": "2022-08-05 18:00:00",
    "3": "2022-08-05 17:00:00",
    "4": "2022-08-05 16:00:00",
    "5": "2022-08-05 15:00:00",
    "6": "2022-08-05 14:00:00",
    "7": "2022-08-05 13:00:00",
    "8": "2022-08-05 12:00:00",
    "9": "2022-08-05 11:00:00",
    "10": "2022-08-05 10:00:00",
    "11": "2022-08-05 09:00:00",
    "12": "2022-08-05 08:00:00",
    "13": "2022-08-04 20:00:00",
    "14": "2022-08-04 17:00:00"
```

/stock_current/<ticker> - for actual price of ticker


127.0.0.1:5000/stock_current/IBM
127.0.0.1:5000/stock_current/IBM
Incognito

```
132.61
```

Technical specifications, used technologies & architecture

Application system requirements

- Browser (ideally Chrome)
- MySQL (any version)
- Python 3 including modules mysql, requests, io, os, csv, itertools, plotly, datetime, pandas, numpy, webbroser, PIL, tkinter and flask (for API - optional)

Installation

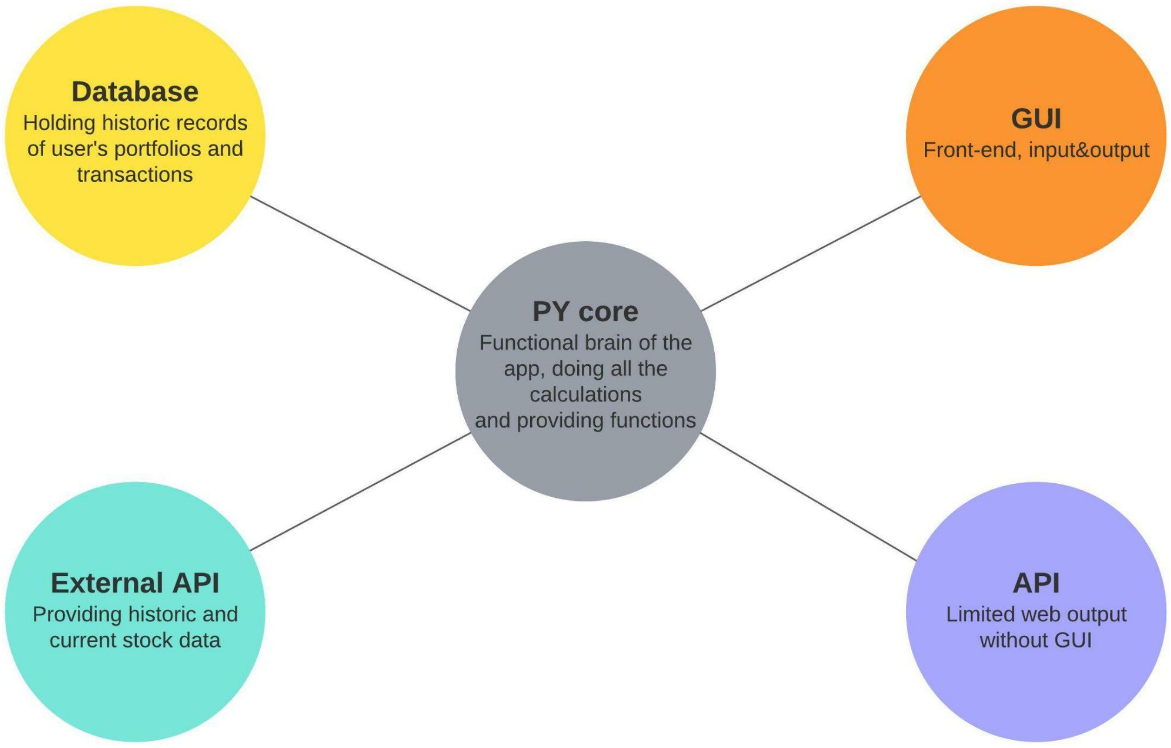
1. rise-shine-SQL-setup.sql - required
2. DEMO data.sql - optional
3. change sql connection config details in RSSQL.py
4. run tests in Test folder - optional
5. GUI.py - run the main file
6. API.py - optional for API use

Other used technologies during project

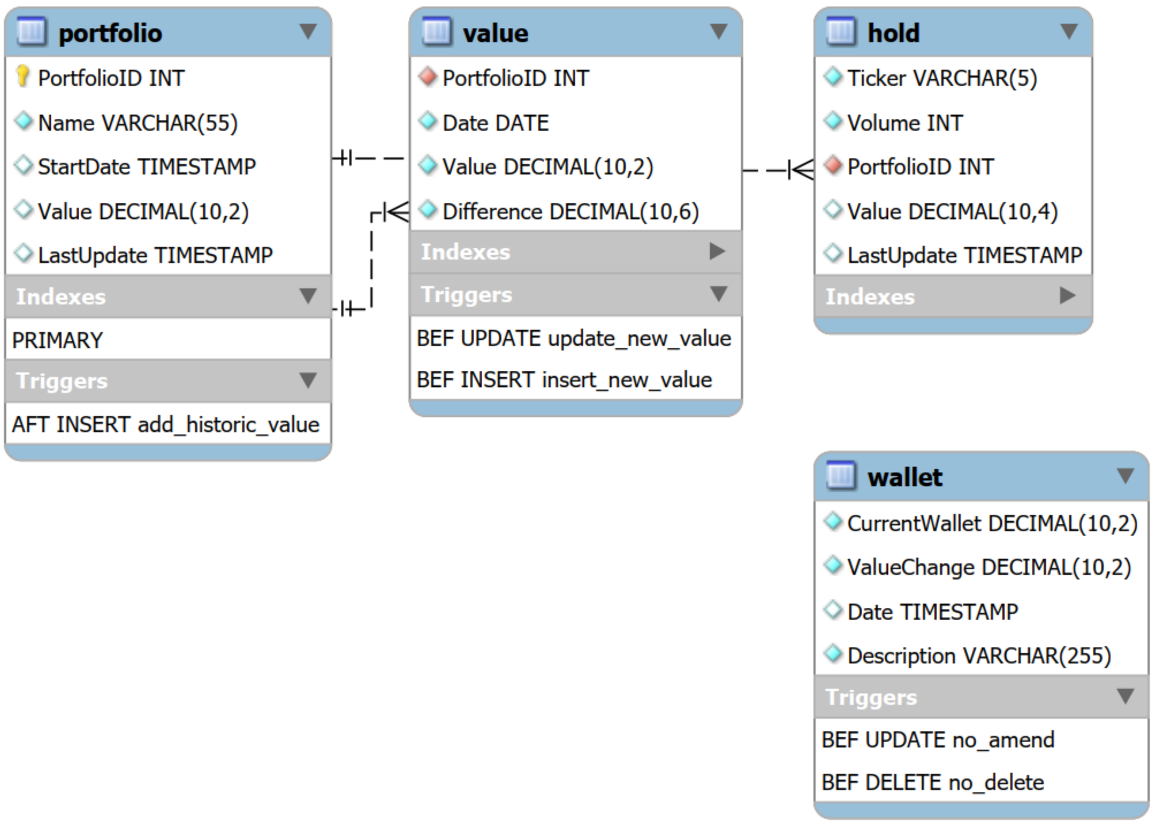
Application was developed in following environment:

- Asus G752VS, Intel i7--6820HK 2.7GHz, 32GB RAM
- Windows 10 Pro 64-bit
- MySQL Community Server - GPL 8.0.27 64-bit
- PyCharm 2022.1.1 (Community Edition) 64-bit
- Python 3.10.4 64-bit
- Google Chrome 104.0 64-bit
- ALPHA VANTAGE API - https://www.alphavantage.co

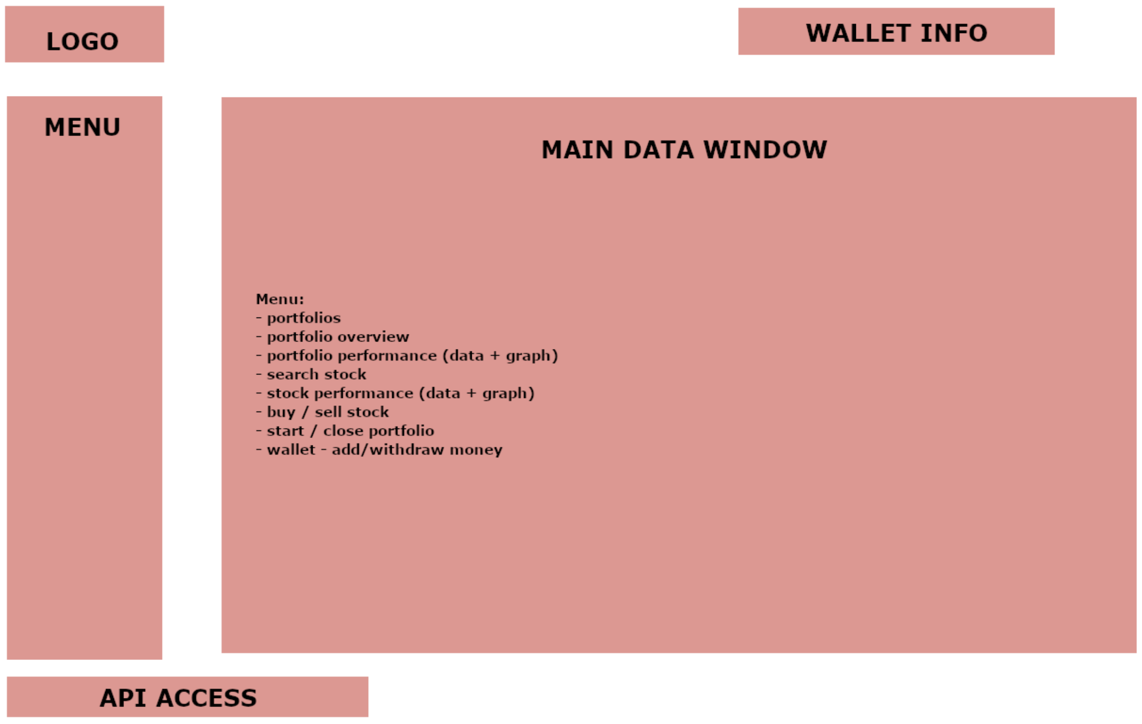
Application architecture


Database
Holding historic records of user's portfolios and transactions
GUI
Front-end, input&output
PY core
Functional brain of the app, doing all the calculations and providing functions
External API
Providing historic and current stock data
API
Limited web output without GUI

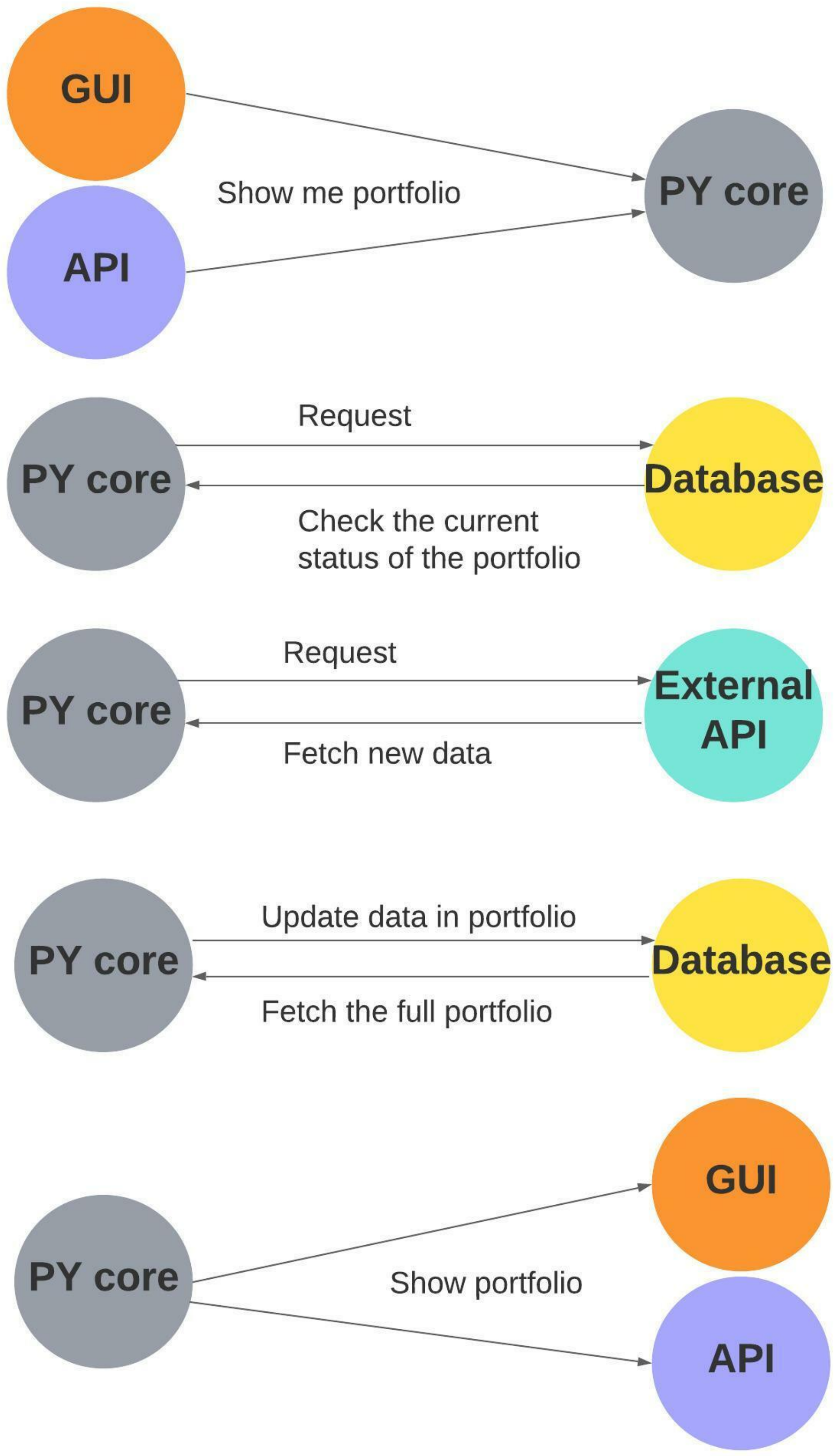
SQL architecture



GUI design


LOGO
WALLET INFO
MENU
MAIN DATA WINDOW
Menu:
- portfolios
- portfolio overview
- portfolio performance (data + graph)
- search stock
- stock performance (data + graph)
- buy / sell stock
- start / close portfolio
- wallet - add/withdraw money
API ACCESS

Example of function Show portfolio:



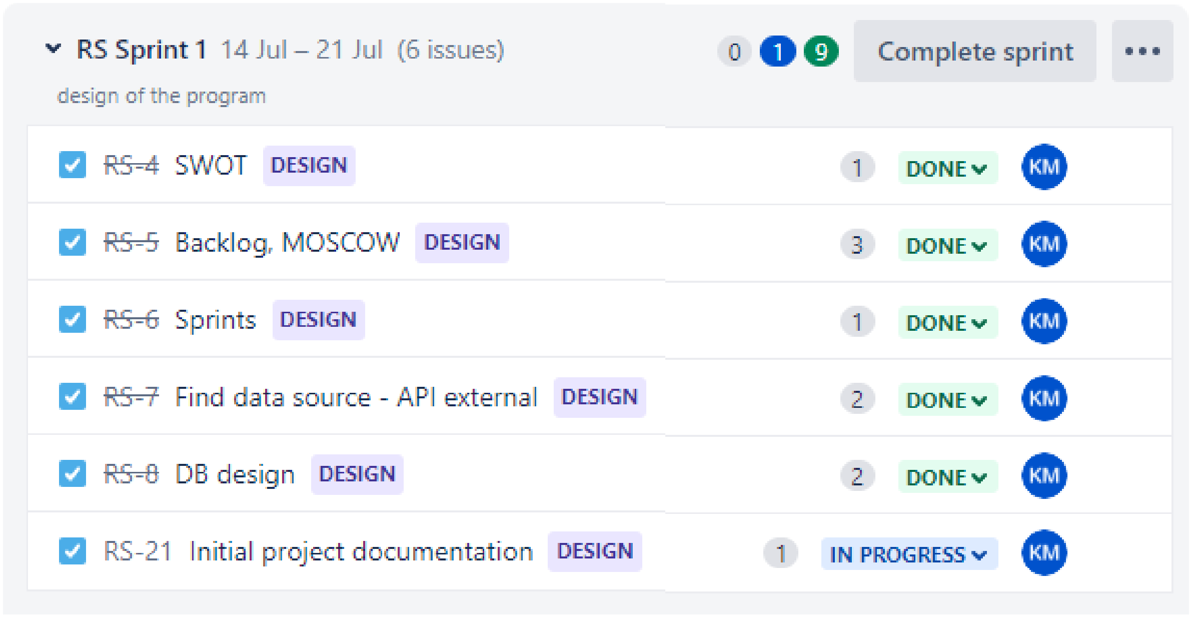
Development process

During project many other applications were used:
GitHub, Jira, Confluence, Gimp, Canva, Lucidspark, Google Docs, Slack, Zoom

Planning of development was made in Jira.

Sprint 1

Planning and designing the application without any programming using agile methodology. SWOT analysis completed as first, then stories were added to backlog, evaluated by MOSCOW and assigned story points estimate. Further sprints were created, database architecture designed (not programmed) and initial documentation created.

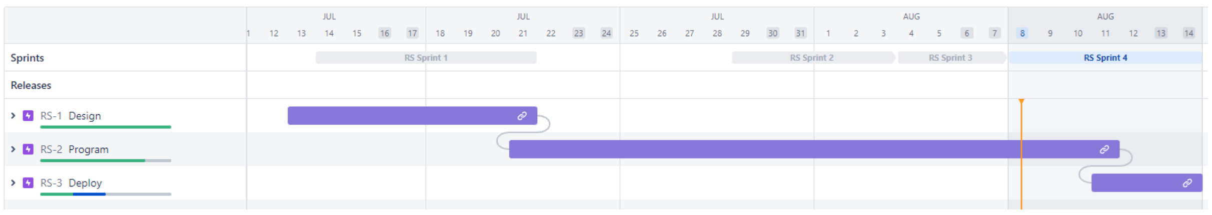


RS Sprint 1 14 Jul – 21 Jul (6 issues) 0 1 9 Complete sprint

design of the program

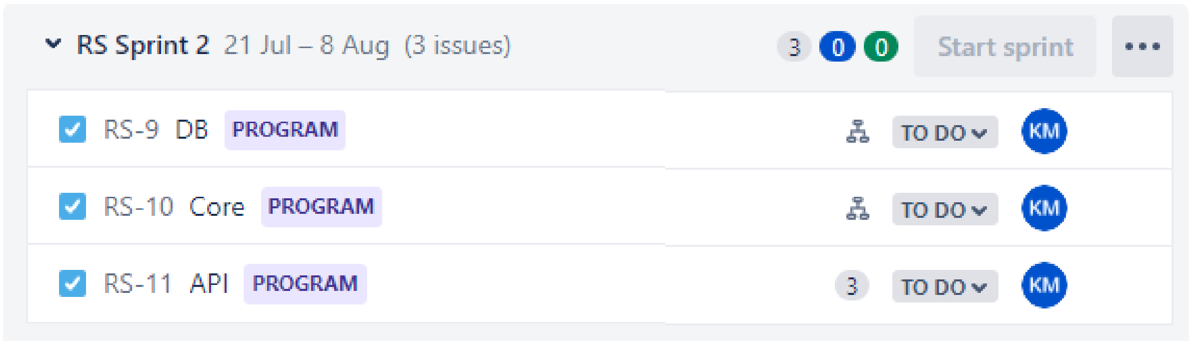
✓	~~RS-4~~	SWOT	DESIGN	1	DONE	KM
✓	~~RS-5~~	Backlog, MOSCOW	DESIGN	3	DONE	KM
✓	~~RS-6~~	Sprints	DESIGN	1	DONE	KM
✓	~~RS-7~~	Find data source - API external	DESIGN	2	DONE	KM
✓	~~RS-8~~	DB design	DESIGN	2	DONE	KM
✓	RS-21	Initial project documentation	DESIGN	1	IN PROGRESS	KM

Roadmap created:



Sprint 2

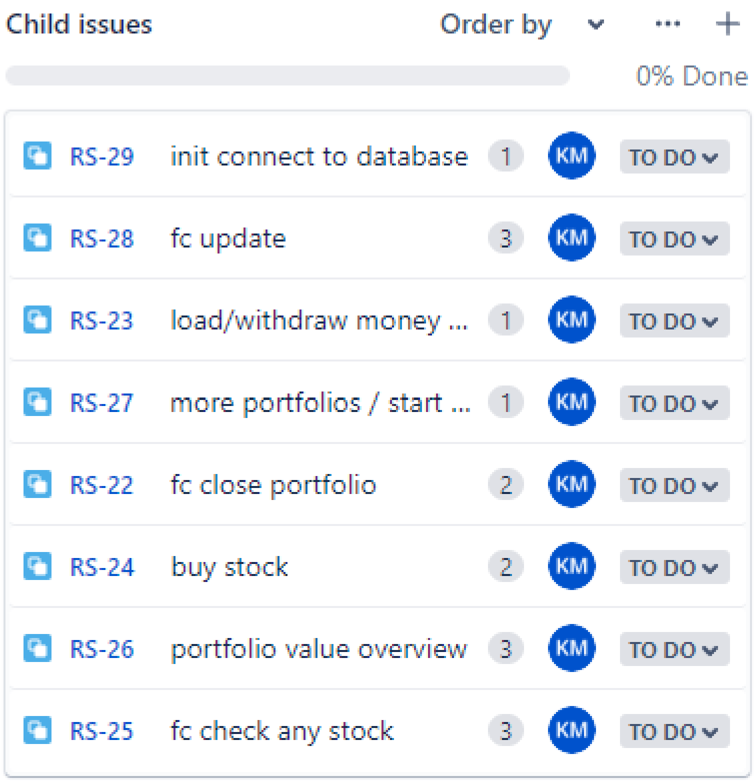
Main programming part without GUI. First creating a database including triggers and functions. Then move to Python - creating functions for external API (exAPI.py) and classes including methods for wallet (wallet.py) and portfolio (portfolio.py). File RSSQL.py holds connection functions to database and configuration details. File Main.py administers a dictionary of portfolios and starts of new portfolios.
The most complicated function was the hidden one - update. It is updating historic values of the portfolio based on data for each held ticker from external API, so merging SQL and external API data through calculations.



RS Sprint 2 21 Jul – 8 Aug (3 issues) 3 0 0 Start sprint

✓	RS-9 DB	PROGRAM		TO DO	KM
✓	RS-10 Core	PROGRAM		TO DO	KM
✓	RS-11 API	PROGRAM	3	TO DO	KM

Children issues of Core:



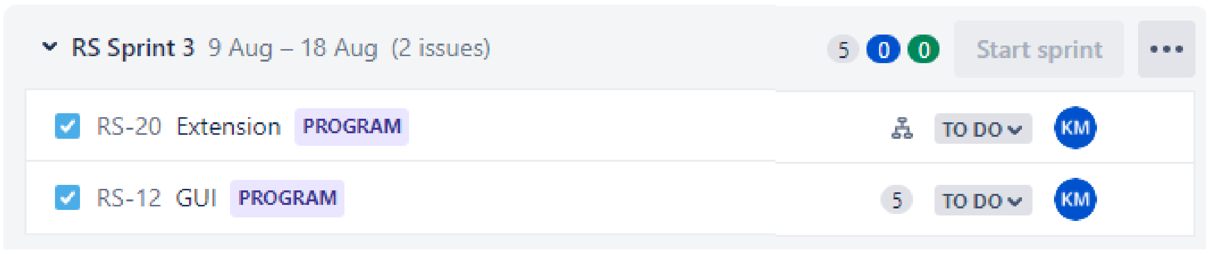
Child issues — Order by — 0% Done

RS-29	init connect to database	1	KM	TO DO
RS-28	fc update	3	KM	TO DO
RS-23	load/withdraw money ...	1	KM	TO DO
RS-27	more portfolios / start ...	1	KM	TO DO
RS-22	fc close portfolio	2	KM	TO DO
RS-24	buy stock	2	KM	TO DO
RS-26	portfolio value overview	3	KM	TO DO
RS-25	fc check any stock	3	KM	TO DO

Sprint 3

Graphic user interface is made using tkinter. With almost 400 lines of code it proved to be a much bigger piece of work than originally planned. Apart from one option in the menu all other options require interaction with the user and therefore following functions called by buttons. Great focus was given to safeguard the program against any user error.

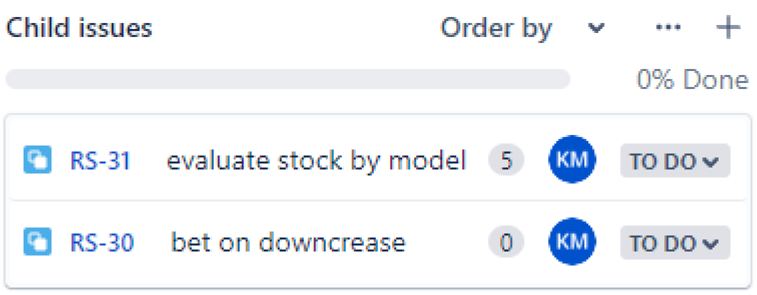
The delay led to reevaluation of sprint and moving extensions, which had MOSCOW value Could and Won't back to backlog. Hopefully in future new version of Rise & Shine will appear, where the functionality of stock being assessed by machine learning model will be available.



RS Sprint 3 9 Aug – 18 Aug (2 issues) 5 0 0 Start sprint •••

✓	RS-20	Extension	PROGRAM	TO DO	KM
✓	RS-12	GUI	PROGRAM	5 TO DO	KM

Children issues of Extension:



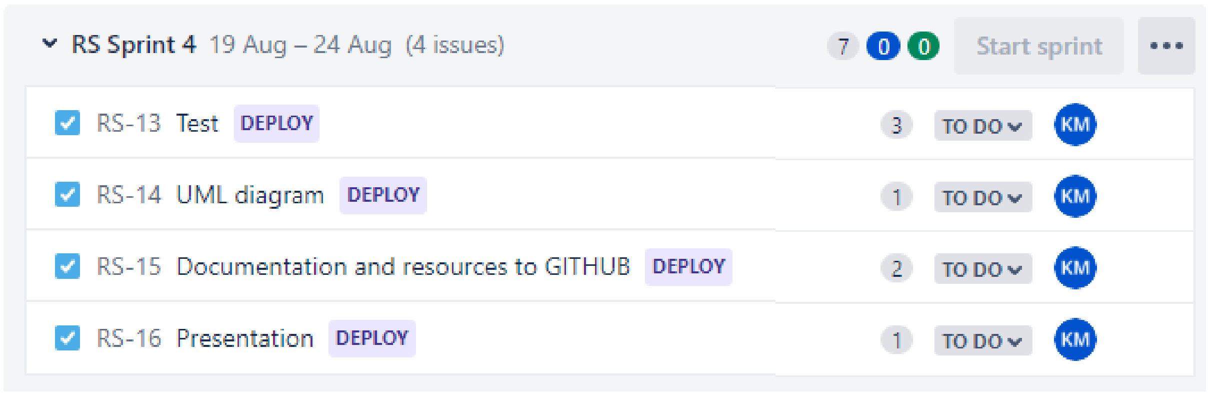
Child issues — Order by — 0% Done

RS-31	evaluate stock by model	5	KM	TO DO
RS-30	bet on downcrease	0	KM	TO DO

Sprint 4

Testing was done alongside the development, but after all parts finished tests were run again. Some issues occurred as small changes were made throughout the older code in terms of shaping it to the needs of GUI.
New SQL demo data was created as well.

SQL diagram was created and two UML diagrams from initial documentation were used in this document. As well, this document will be used at the final presentation of the project, together with the live presentation of the application.



RS Sprint 4 19 Aug – 24 Aug (4 issues) 7 0 0 Start sprint

✓	RS-13	Test	DEPLOY	3	TO DO	KM
✓	RS-14	UML diagram	DEPLOY	1	TO DO	KM
✓	RS-15	Documentation and resources to GITHUB	DEPLOY	2	TO DO	KM
✓	RS-16	Presentation	DEPLOY	1	TO DO	KM

Final words

This project took around 100 hours of screen time, where at least half of the time was used for learning and researching the solution. Test and fail was the most used method, there was no time for posting questions to online forums and waiting for any answer.

Where I started with basic knowledge of Python, minimum knowledge of optional modules and zero knowledge of tkinter, I am very proud of the result. This project took me completely from procedural programming (I was very comfortable with :-) to object oriented programming. I thank Code First Girls for the challenge, it was a tough one, therefore great!

Plan for the future is to come with a new release which will include data science tools for evaluating stocks. Then it can have that nice dodgy label "We don't hold any responsibility upon results you receive" :-)