TERMINAL APP

CryptoTracker

Manage a portfolio of digital assets

What Is CryptoTracker?

CryptoTracker is designed for people who buy and sell decentralised digital assets... or 'cryptocurrency'.

In this MVP release, the user can create a portfolio of cryptos from the top 100 assets listed on CoinMarketCap.com and get real time price data to track their portfolio value.

Target Audience: Who is it for?

Cryptocurrency portfolio applications have existed for for several years.

There are online services that offer this, however most people are not comfortable entering their investments into an unknown website or cloud based service. They prefer anonymity. Many users rely on manually updated Excel spreadsheets.

This app aims to offer a better crypto tracking solution that is local and private, with real time pricing data and other metrics. It was designed to be simple, fast, easy to use and light weight. It requires Ruby and runs on Windows, Mac and Linux systems.

What Functionality Does it Provide?

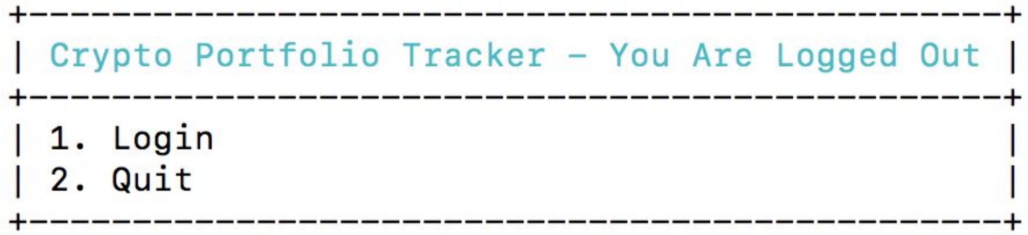
Users can:

- View their portfolio (cached and live pricing)
- Add and remove crypto assets from their portfolio
- Get help

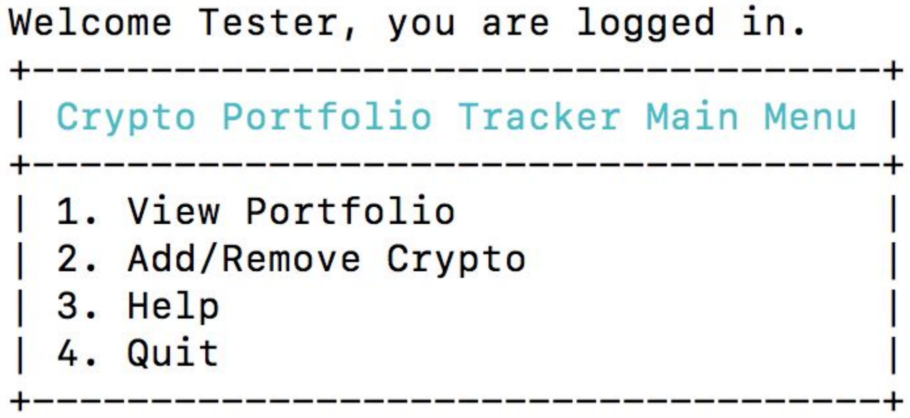
Admin can:

View users, Add users, Deactivate Users

Screenshots of CryptoTracker

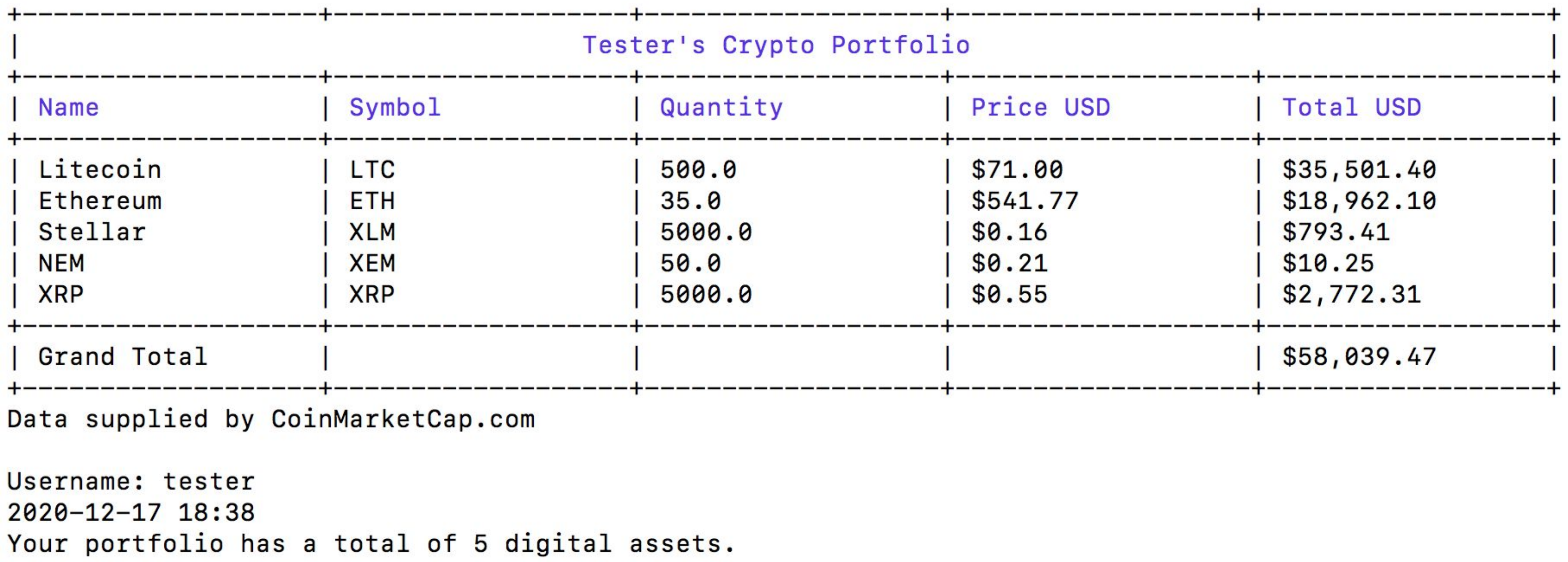


```
+---------------------------------------------+
| Crypto Portfolio Tracker - You Are Logged Out |
+---------------------------------------------+
| 1. Login                                     |
| 2. Quit                                      |
+---------------------------------------------+
```



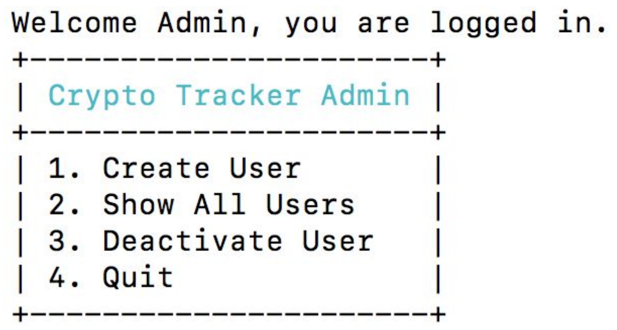
```
Welcome Tester, you are logged in.
+-------------------------------------+
| Crypto Portfolio Tracker Main Menu |
+-------------------------------------+
| 1. View Portfolio                  |
| 2. Add/Remove Crypto               |
| 3. Help                            |
| 4. Quit                            |
+-------------------------------------+
```

Screenshots of CryptoTracker

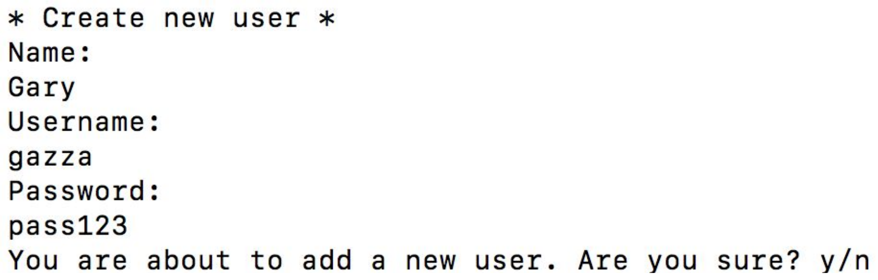


```
+-------------------+-------------------+-------------------+-------------------+-------------------+
|                                     Tester's Crypto Portfolio                                    |
+-------------------+-------------------+-------------------+-------------------+-------------------+
| Name              | Symbol            | Quantity          | Price USD         | Total USD         |
+-------------------+-------------------+-------------------+-------------------+-------------------+
| Litecoin          | LTC               | 500.0             | $71.00            | $35,501.40        |
| Ethereum          | ETH               | 35.0              | $541.77           | $18,962.10        |
| Stellar           | XLM               | 5000.0            | $0.16             | $793.41           |
| NEM               | XEM               | 50.0              | $0.21             | $10.25            |
| XRP               | XRP               | 5000.0            | $0.55             | $2,772.31         |
+-------------------+-------------------+-------------------+-------------------+-------------------+
| Grand Total       |                   |                   |                   | $58,039.47        |
+-------------------+-------------------+-------------------+-------------------+-------------------+
Data supplied by CoinMarketCap.com

Username: tester
2020-12-17 18:38
Your portfolio has a total of 5 digital assets.
```

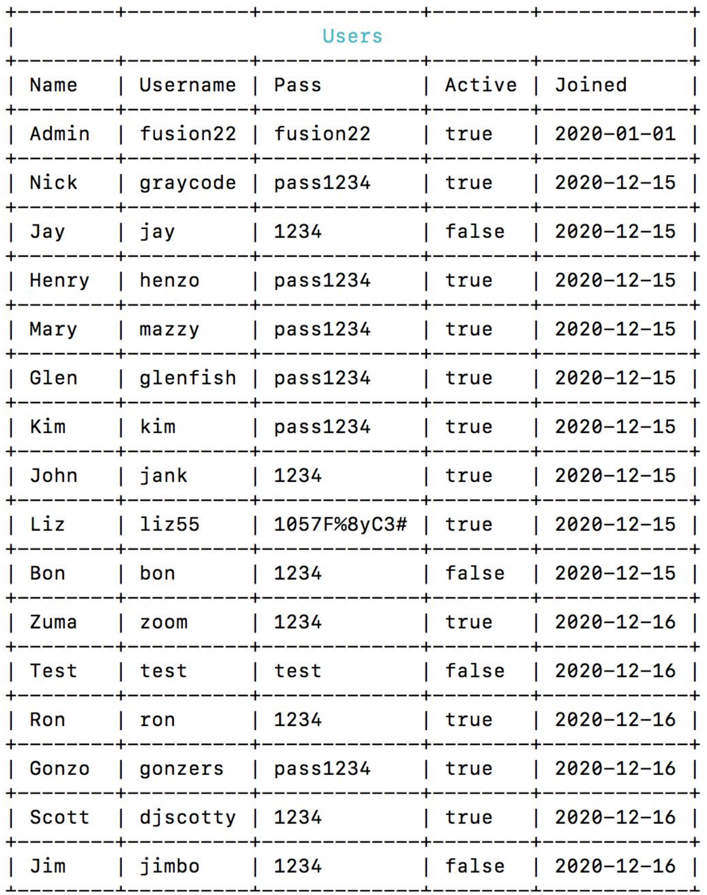
Screenshots of CryptoTracker



```
Welcome Admin, you are logged in.
+----------------------+
| Crypto Tracker Admin |
+----------------------+
| 1. Create User       |
| 2. Show All Users    |
| 3. Deactivate User   |
| 4. Quit              |
+----------------------+
```

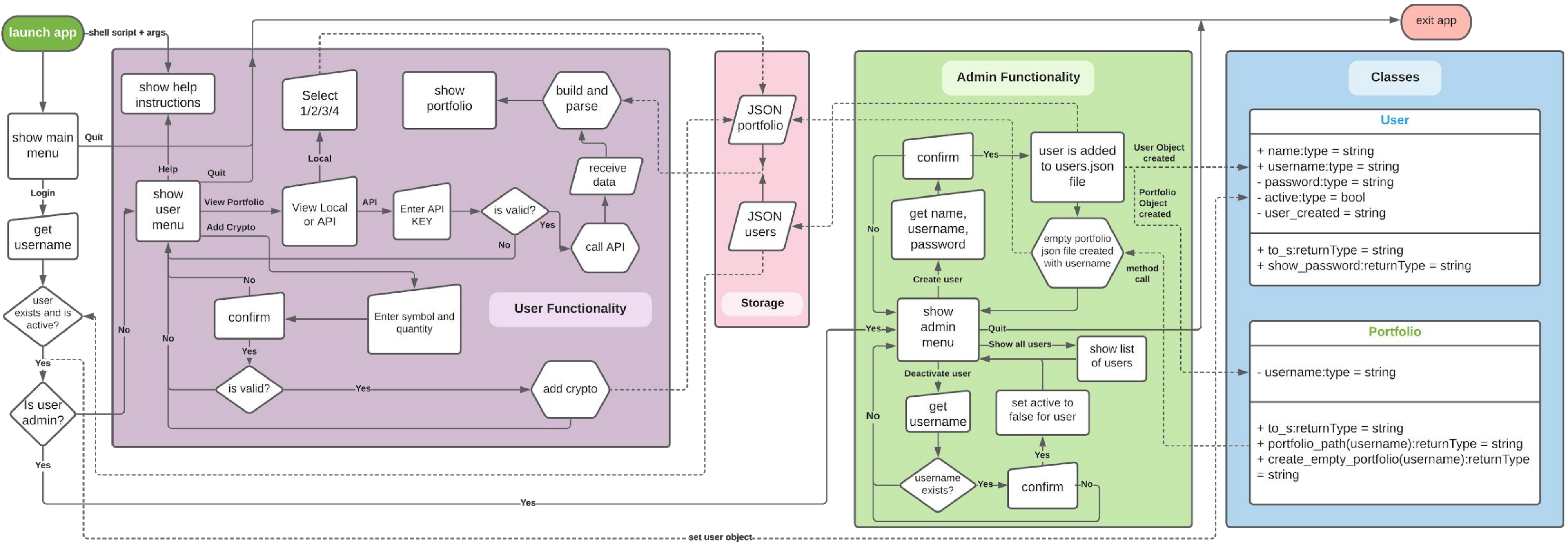


```
* Create new user *
Name:
Gary
Username:
gazza
Password:
pass123
You are about to add a new user. Are you sure? y/n
```



```
+--------+----------+-------------+--------+------------+
|                         Users                          |
+--------+----------+-------------+--------+------------+
| Name   | Username | Pass        | Active | Joined     |
+--------+----------+-------------+--------+------------+
| Admin  | fusion22 | fusion22    | true   | 2020-01-01 |
+--------+----------+-------------+--------+------------+
| Nick   | graycode | pass1234    | true   | 2020-12-15 |
+--------+----------+-------------+--------+------------+
| Jay    | jay      | 1234        | false  | 2020-12-15 |
+--------+----------+-------------+--------+------------+
| Henry  | henzo    | pass1234    | true   | 2020-12-15 |
+--------+----------+-------------+--------+------------+
| Mary   | mazzy    | pass1234    | true   | 2020-12-15 |
+--------+----------+-------------+--------+------------+
| Glen   | glenfish | pass1234    | true   | 2020-12-15 |
+--------+----------+-------------+--------+------------+
| Kim    | kim      | pass1234    | true   | 2020-12-15 |
+--------+----------+-------------+--------+------------+
| John   | jank     | 1234        | true   | 2020-12-15 |
+--------+----------+-------------+--------+------------+
| Liz    | liz55    | 1057F%8yC3# | true   | 2020-12-15 |
+--------+----------+-------------+--------+------------+
| Bon    | bon      | 1234        | false  | 2020-12-15 |
+--------+----------+-------------+--------+------------+
| Zuma   | zoom     | 1234        | true   | 2020-12-16 |
+--------+----------+-------------+--------+------------+
| Test   | test     | test        | false  | 2020-12-16 |
+--------+----------+-------------+--------+------------+
| Ron    | ron      | 1234        | true   | 2020-12-16 |
+--------+----------+-------------+--------+------------+
| Gonzo  | gonzers  | pass1234    | true   | 2020-12-16 |
+--------+----------+-------------+--------+------------+
| Scott  | djscotty | 1234        | true   | 2020-12-16 |
+--------+----------+-------------+--------+------------+
| Jim    | jimbo    | 1234        | false  | 2020-12-16 |
+--------+----------+-------------+--------+------------+
```

Flow Control



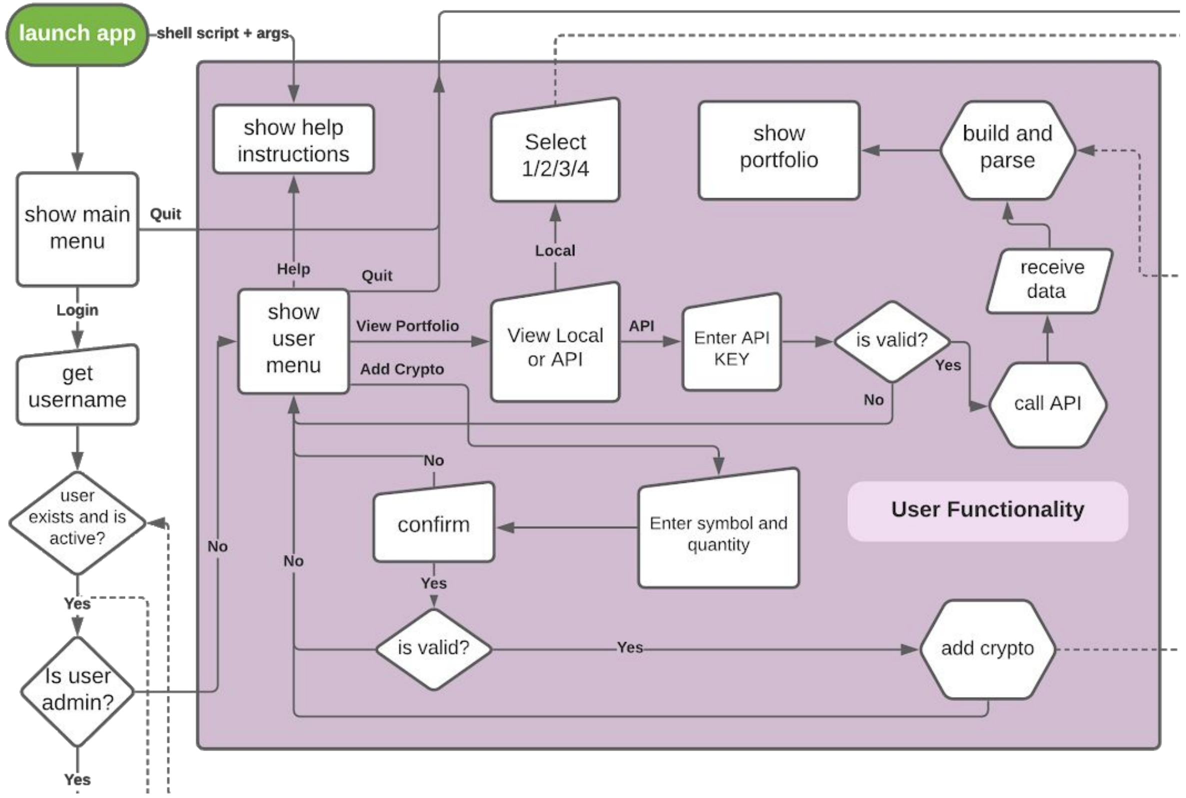
Flow Control: Users

User

Portfolio Management

View Portfolio

- Name
- Symbol
- Quantity
- Price
- Value
- Grand Total

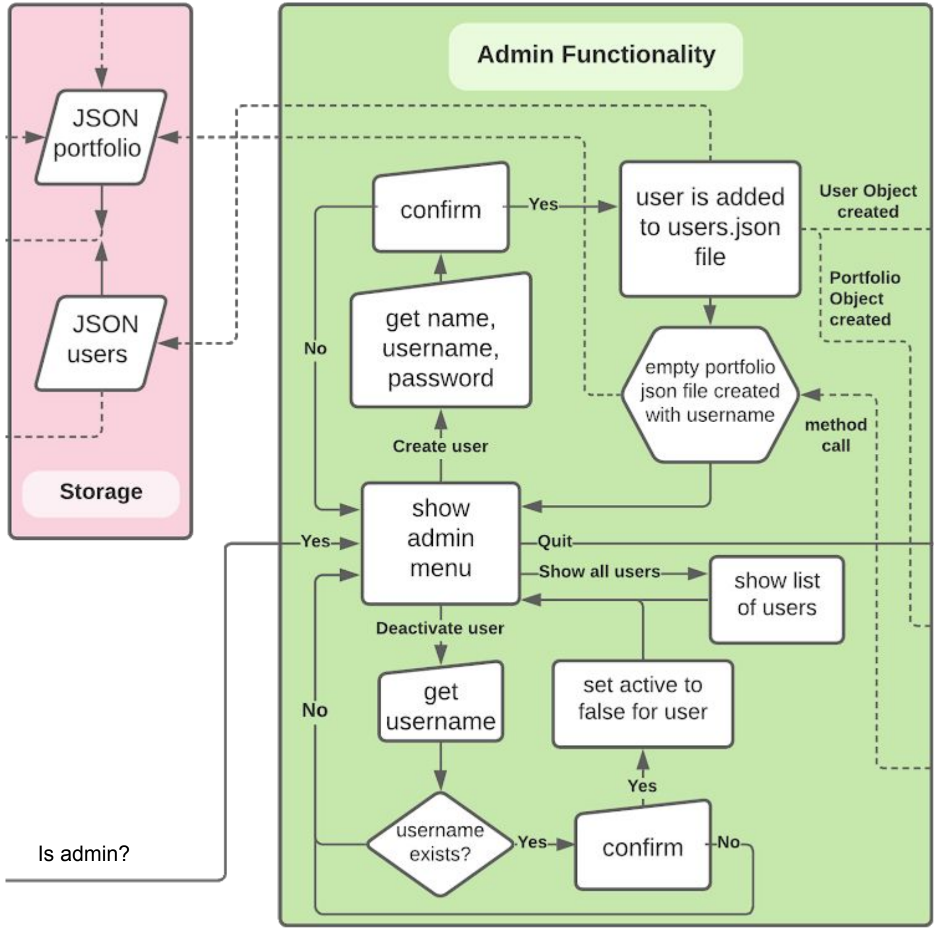


Flow Control: Users

Admin

Handles user creation and management

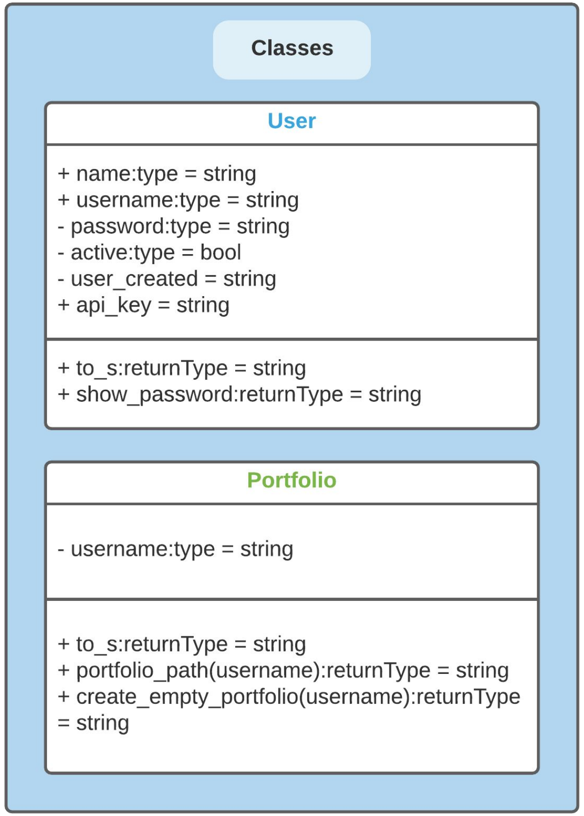
Interacts with JSON storage and menu



Classes & UML

User class used for user object attributes handling for the session

Portfolio class used to setting up a new portfolio



Classes

User

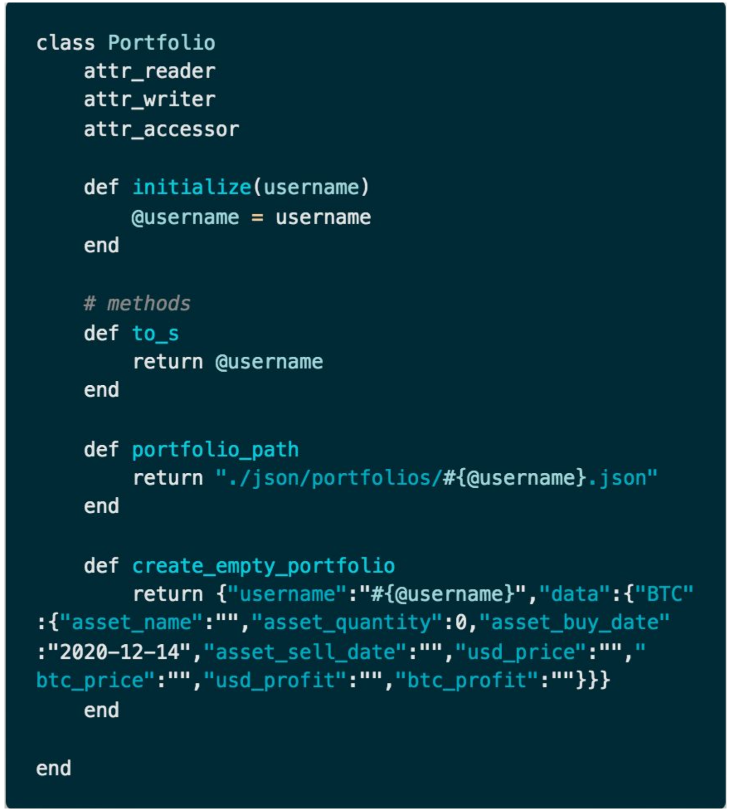
+ name:type = string
+ username:type = string
- password:type = string
- active:type = bool
- user_created = string
+ api_key = string

+ to_s:returnType = string
+ show_password:returnType = string

Portfolio

- username:type = string

+ to_s:returnType = string
+ portfolio_path(username):returnType = string
+ create_empty_portfolio(username):returnType = string



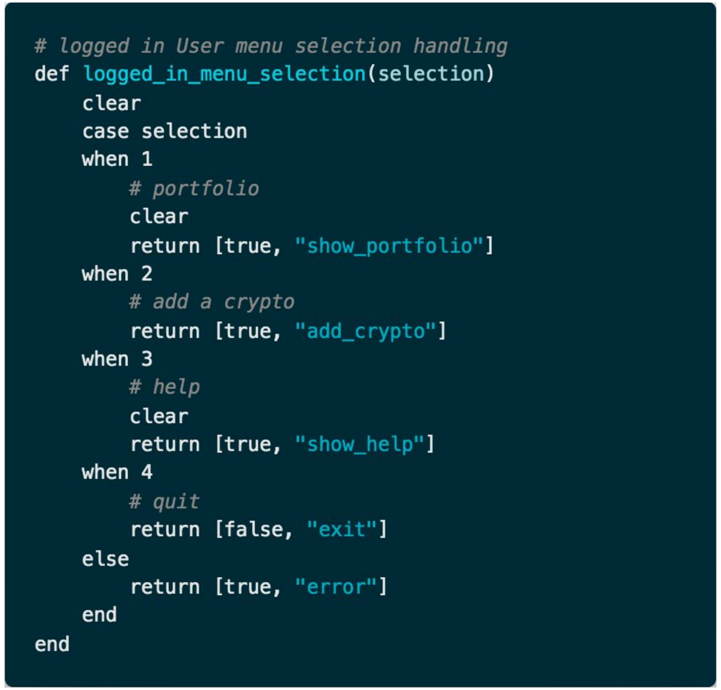
```
class Portfolio
    attr_reader
    attr_writer
    attr_accessor

    def initialize(username)
        @username = username
    end

    # methods
    def to_s
        return @username
    end

    def portfolio_path
        return "./json/portfolios/#{@username}.json"
    end

    def create_empty_portfolio
        return {"username":"#{@username}","data":{"BTC"
:{"asset_name":"","asset_quantity":0,"asset_buy_date"
:"2020-12-14","asset_sell_date":"","usd_price":"","
btc_price":"","usd_profit":"","btc_profit":""}}}
    end

end
```

Variables & Structure

The while and if loops in the main file managed menu display and login state and called the menu file for handling user menu selections.

This enabled me to keep the code fairly readable and high level in both these files.

An array was returned from each menu selection which included the login state, the current menu action and any additional class objects such as the logged in user.



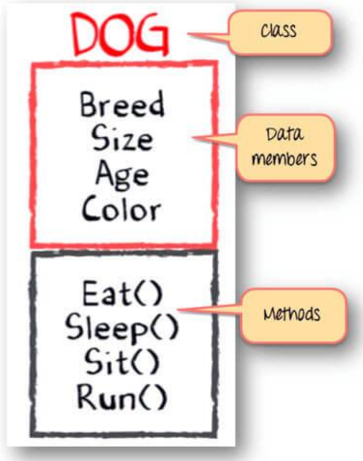
```
# logged in User menu selection handling
def logged_in_menu_selection(selection)
    clear
    case selection
    when 1
        # portfolio
        clear
        return [true, "show_portfolio"]
    when 2
        # add a crypto
        return [true, "add_crypto"]
    when 3
        # help
        clear
        return [true, "show_help"]
    when 4
        # quit
        return [false, "exit"]
    else
        return [true, "error"]
    end
end
```

This way I was able to make the *user object* available globally by passing it around to various methods. Attributes were made available either through attr readers or class methods.

Classes

The User class is called when a new user is created by an Admin account. This makes the user's data available for that session. A Portfolio object is also created with the username, which calls a class method that builds the user's empty portfolio for the first time. This essentially creates the json structure with BTC (Bitcoin) as the only asset, with a quantity of 0. Only the Admin user can create new accounts.

Each time a user logs in, the user object is created with the data from the users.json file, for that given user. At this point, there is no functionality that requires the Portfolio object to be initialised, but it will likely be used in this way for future versions of the app. The user object allows attributes to be used throughout the running session.



Application Programming Interface

The API key is stored in a text file which is read by a method. This file is excluded from the repo to for security reasons. A user of the app would need to create their own free account with CoinMarketCap.com and get a fresh API key to use for their instance of the software.

Cryptocurrency data for portfolios are stored in unique files with the username of the user. Eg username.json

Four API calls for cryptocurrency data were stored locally for testing in the api_cached directory. You will see this in the demo.

API data for cached files was limited to 100 of the top crypto/assets as listed on CoinMarketCap.com. That list can and does change. The full list for testing appears below. For the purposes of the MVP, portfolio assets have been limited to this list.

BTC,ETH,XRP,USDT,BCH,LTC,LINK,ADA,DOT,BNB,XLM,USDC,BSV,EOS,XMR,WBTC,TRX,XEM,XTZ,LEO,FIL,CRO,NEO,DAI,VET,REV,ATOM,AAVE,DASH,WAVES,HT,MIOTA,UNI,ZEC,ETC,YFI,THETA,BUSD,COMP,CEL,MKR,SNX,OMG,DOGE,UMA,KSM,FTT,ONT,ZIL,ALGO,SUSHI,OKB,BTT,BAT,TUSD,RENBTC,DCR,NEXO,ZRX,DGB,PAX,HUSD,AVAX,REN,QTUM,HBAR,AMPL,ICX,ABBC,CELO,LRC,EGLD,HEDG,STX,LUNA,KNC,RSR,REP,EWT,LSK,OCEAN,BTG,SC,QNT,RUNE,CVT,NANO,BAND,MANA,ZB,NMR,ENJ,ANT,MAID,SNT,CHSB,XVG,NXM,RVN

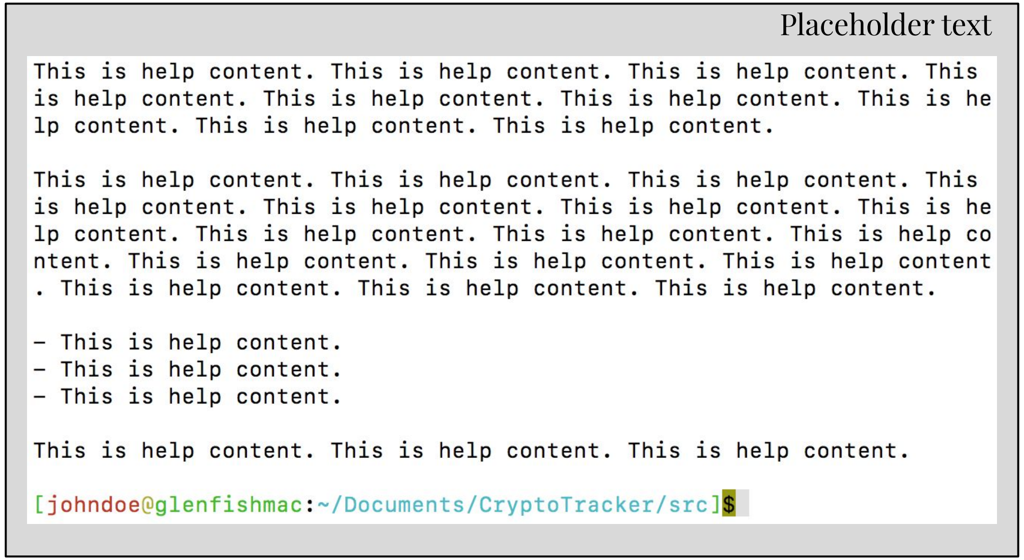
Code: Shell Script flags

crypto.sh will run the app, which points to main.rb

As of this time, the '-h' flag is available to display help information when run via the shell script or directly.

Any of these will show help to a non logged in user:

```
crypto.sh -h
crypto.sh --h
crypto.sh -help
crypto.sh --help
ruby main.rb -h
ruby main.rb --h
ruby main.rb -help
ruby main.rb --help
```



```
This is help content. This is help content. This is help content. This
is help content. This is help content. This is help content. This is he
lp content. This is help content. This is help content.

This is help content. This is help content. This is help content. This
is help content. This is help content. This is help content. This is he
lp content. This is help content. This is help content. This is help co
ntent. This is help content. This is help content. This is help content
. This is help content. This is help content. This is help content.

- This is help content.
- This is help content.
- This is help content.

This is help content. This is help content. This is help content.

[johndoe@glenfishmac:~/Documents/CryptoTracker/src]$
```

Additional flags for version and install info will be made available.

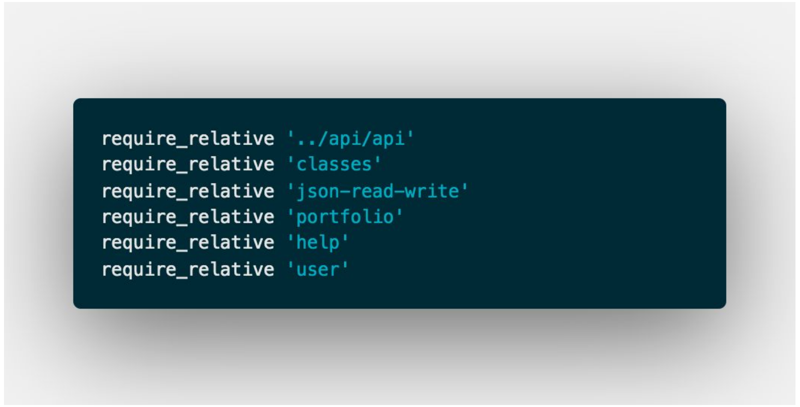
DRY Code

Methods were broken up into logical groupings for portfolio and user operations and those files included in menu, which was in turn required in main.

Other methods such as json handling, api methods and help were put in their own files.

The Portfolio and User classes were both added to the classes.rb file

One users.json file contains all the user credentials.



```
require_relative '../api/api'
require_relative 'classes'
require_relative 'json-read-write'
require_relative 'portfolio'
require_relative 'help'
require_relative 'user'
```

Error Handling

The decision was made to minimise the amount of onscreen error messaging. Where possible and where tested thus far, validation errors have been handled with rescue and rescue retry.

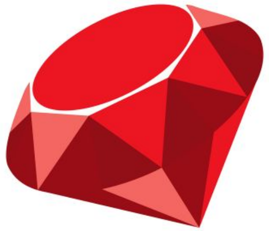
Invalid menu choices re-display the previous menu. In this way, it’s easy and quick to navigate and the user doesn't get hung up if a mistake is made. Any valid but unintended menu selections can easily be exited when presented with a confirmation prompt.

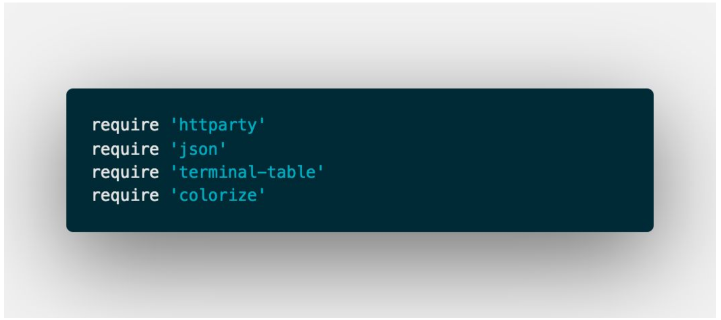
If a live API call is made for an incorrect API KEY, an specific error message is displayed to alert the user.

Ruby Gems

The following gems are used:

httparty	handles API requests
json	handles writing and reading
terminal-table	displays data in a table structure in the terminal
colorize	adds colour to text





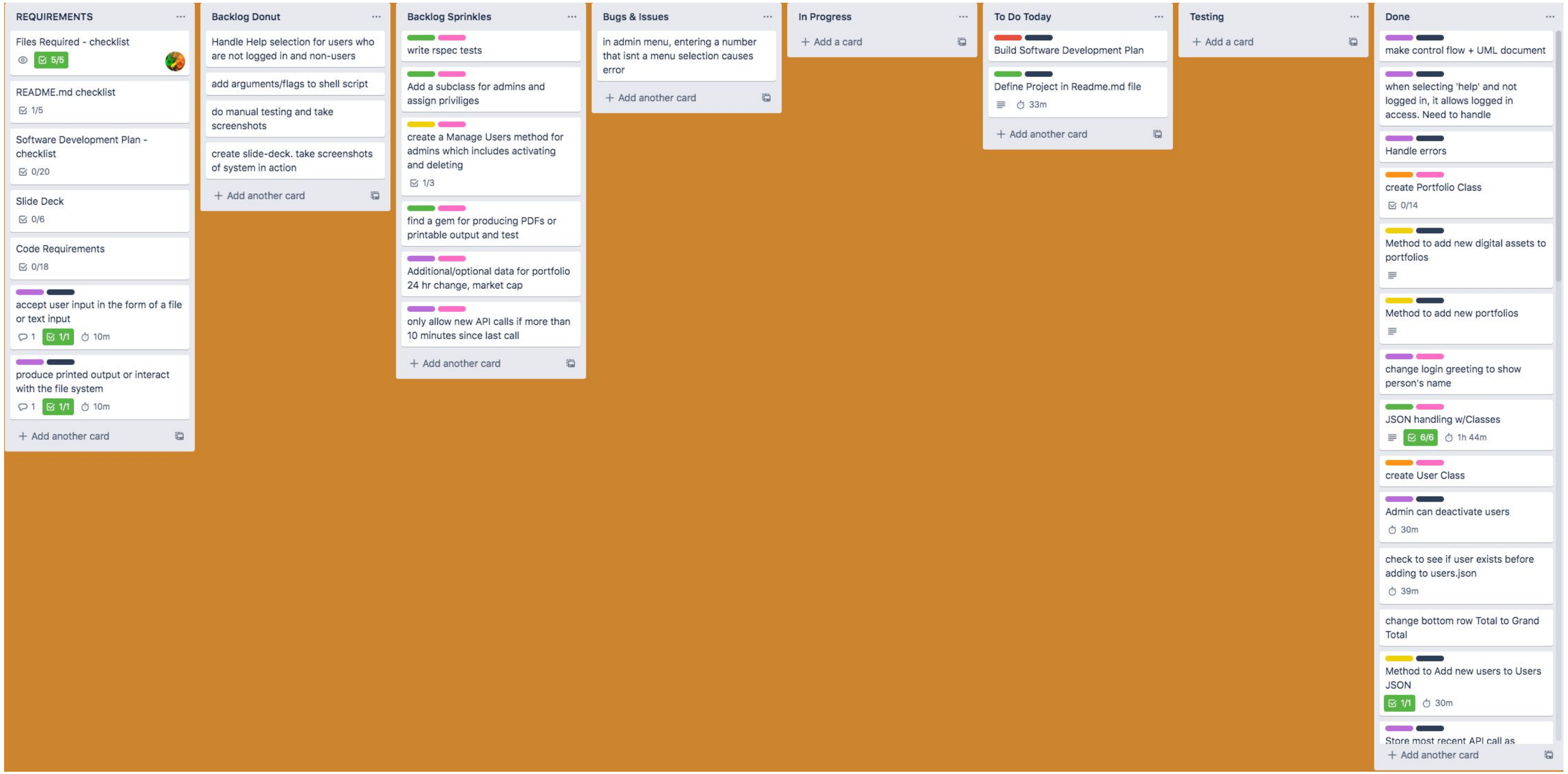
```ruby
require 'httparty'
require 'json'
require 'terminal-table'
require 'colorize'
```

Github

Github was used for the project from the file structure through to the finished MVP.

Everything was coded on 'main' branch, with the exception of code cleanup which was done on 'refactoring' and then merged locally.

Trello Project Management



REQUIREMENTS

- Files Required - checklist — 5/5
- README.md checklist — 1/5
- Software Development Plan - checklist — 0/20
- Slide Deck — 0/6
- Code Requirements — 0/18
- accept user input in the form of a file or text input — 1, 1/1, 10m
- produce printed output or interact with the file system — 1, 1/1, 10m
- Add another card

Backlog Donut

- Handle Help selection for users who are not logged in and non-users
- add arguments/flags to shell script
- do manual testing and take screenshots
- create slide-deck. take screenshots of system in action
- Add another card

Backlog Sprinkles

- write rspec tests
- Add a subclass for admins and assign priviliges
- create a Manage Users method for admins which includes activating and deleting — 1/3
- find a gem for producing PDFs or printable output and test
- Additional/optional data for portfolio 24 hr change, market cap
- only allow new API calls if more than 10 minutes since last call
- Add another card

Bugs & Issues

- in admin menu, entering a number that isnt a menu selection causes error
- Add another card

In Progress

- Add a card

To Do Today

- Build Software Development Plan
- Define Project in Readme.md file — 33m
- Add another card

Testing

- Add a card

Done

- make control flow + UML document
- when selecting 'help' and not logged in, it allows logged in access. Need to handle
- Handle errors
- create Portfolio Class — 0/14
- Method to add new digital assets to portfolios
- Method to add new portfolios
- change login greeting to show person's name
- JSON handling w/Classes — 6/6, 1h 44m
- create User Class
- Admin can deactivate users — 30m
- check to see if user exists before adding to users.json — 39m
- change bottom row Total to Grand Total
- Method to Add new users to Users JSON — 1/1, 30m
- Store most recent API call as
- Add another card

Development Issues

I initially had decided to store the data in a JSON format instead of a database or CSV, as I knew of a ruby gem for handling for them.

I decided to store just the current user object data in a class object for the logged in user.

Making these attributes accessible to my methods was an issue in some cases, but once I decided to have the menu selection handling pass back an array instead of a single value, I was able to store these at the main level and pass the user object as needed in the method calls. I could access the attributes of the user object anywhere I needed them in the app.

Ethical Issues

Privacy of user data, especially financial information and investments is critical to users. At this stage of development, CryptoTracker is currently a working proof of concept.

The API key and user credentials are currently stored unencrypted in text and JSON files.

It is intended that password handling and secure storage and authentication is added in the next sprint.

CryptoTracker Live Presentation

If you want to follow along with the demo and see
real-time market prices reflected in the app, go to:

CoinMarketCap.com

CoinMarketCap