

Investment Portfolio Dashboard

Project 3 UTOR-VIRT-DATA-PT-06-2023-U-LOLC-MWTH(B)

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The Topic: Finance



Motivation

Building dashboards is a very relevant skill in Investment Management. Both Clients and Portfolio Managers are using dashboards to track portfolio performance.

We took this opportunity to do the process from scratch, starting with extracting the data, making decisions like a portfolio manager would, and building an easy-to-follow dashboard for the clients.



The Dataset

The data is sourced directly from Yahoo Finance using the "[yahoo_fin.stock_info](#)" Python library. This allows real-time access and historical financial data for securities.

Pimco Active Bond Exchange-Traded Fund (BOND)

```
etf_info['BOND']
```

	ticker_symbol	close_price	dividend	trading_volume	daily_return	dividend_return	total_return
2012-03-02	BOND	69.966324	0.0	331600	0.350151	0.0	0.350151
2012-03-05	BOND	69.959328	0.0	237800	-0.009999	0.0	-0.009999
2012-03-06	BOND	70.273254	0.0	176500	0.448727	0.0	0.448727
2012-03-07	BOND	70.370888	0.0	182600	0.138934	0.0	0.138934
2012-03-08	BOND	70.817253	0.0	323000	0.634304	0.0	0.634304
...
2023-09-22	BOND	88.730003	0.0	113900	0.327907	0.0	0.327907
2023-09-25	BOND	88.050003	0.0	116100	-0.766370	0.0	-0.766370
2023-09-26	BOND	87.949997	0.0	182400	-0.113579	0.0	-0.113579
2023-09-27	BOND	87.730003	0.0	500500	-0.250135	0.0	-0.250135
2023-09-28	BOND	87.970001	0.0	148363	0.273564	0.0	0.273564



The Idea

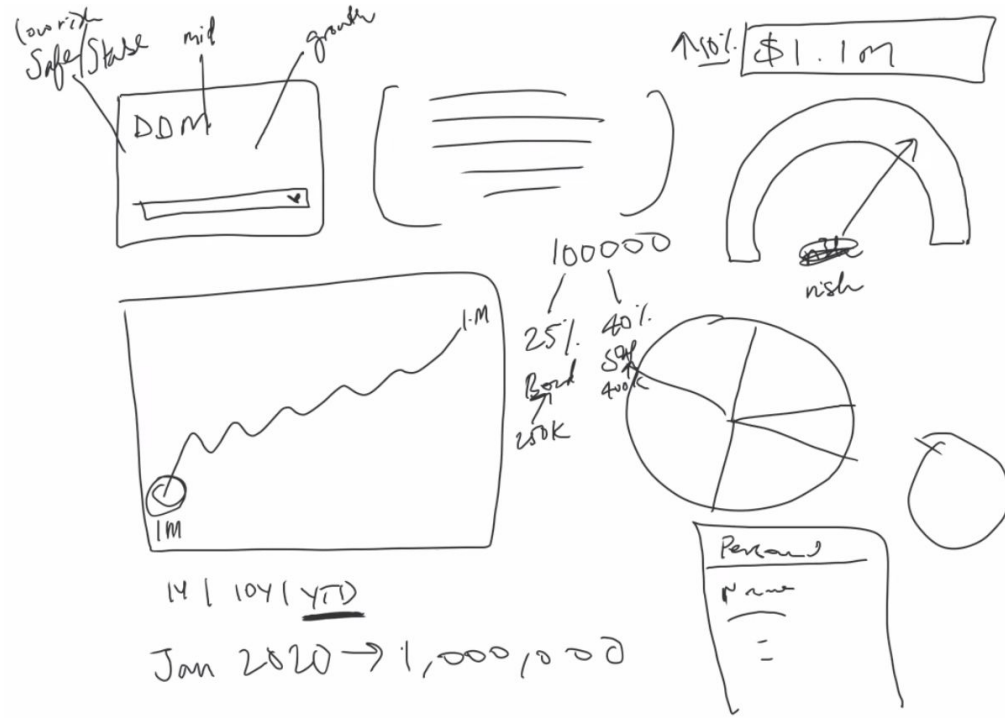
- Develop a comprehensive investment portfolio dashboard.
- Three portfolio options: Low-risk, medium-risk, and high-risk.
- Five pre-selected exchange-traded funds (ETFs).
- Portfolio Allocation is guided by a collection of statistical and quantitative models, and technical knowledge.

GOAL: Provide optimized investment strategies for each portfolio option.



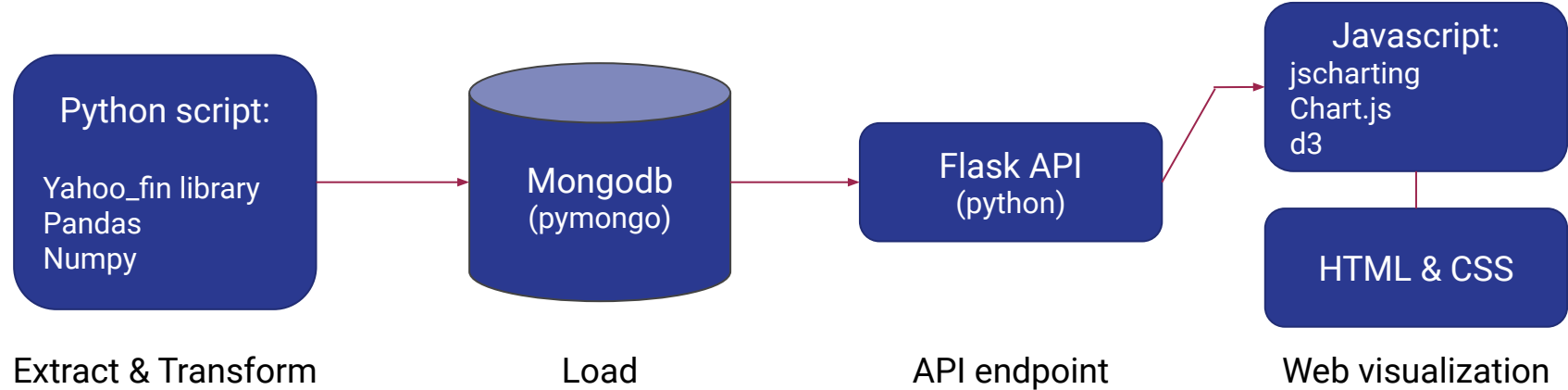
Dashboard Features

- Portfolio Selection
- ETF Information
- Current Portfolio Value
- Historical Performance
- Portfolio Breakdown



Sketch of our ideation process

Technologies



Technologies



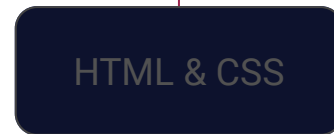
Extract & Transform



Load



API endpoint



Web visualization



We used python for Extract, Transform & Analyze

Data Extraction:

- Utilized yahoo_fin.stock_info library in Python.
- Chose 5 ETFs:
 - BOND, SPY, VGK, VONG, SCHE
- Extracted daily price, dividend, and analyst data for selected ETFs.

Data Transformation:

- Calculating values to get data that is relevant for our app or for analysis.

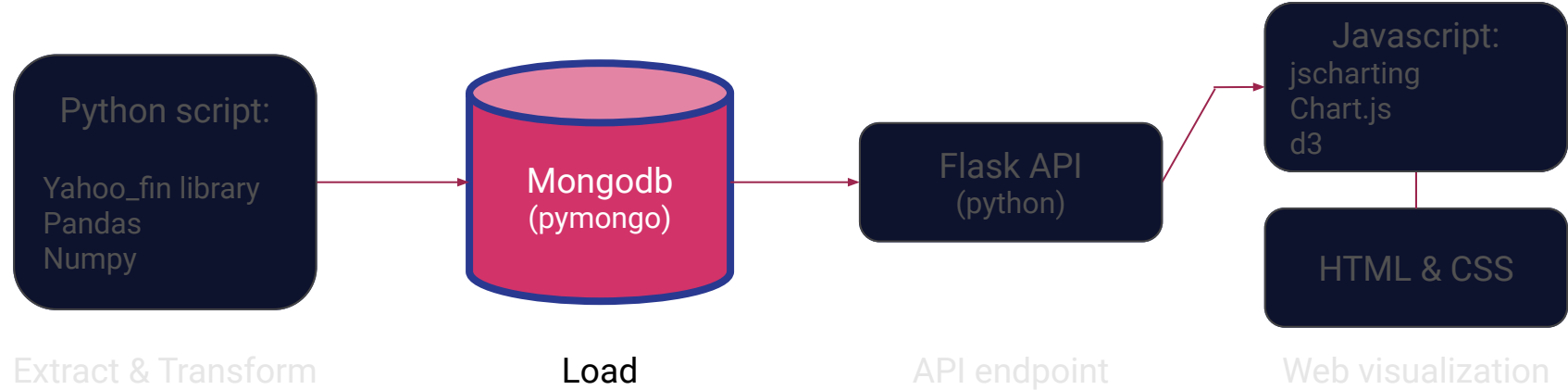




Data Analysis :

- There are several methods that can be used to determine the weights, in this project, we will be conducting the following analyses:
 - **Maximum-return & Minimum-variance portfolio**
 - **Monte Carlo Simulation**
 - **Mean-Variance Optimization**
 - **Hierarchical Risk Parity (HRP) portfolio**
 - **Mean Conditional Value at Risk (mCVAR)**

Technologies



MongoDB

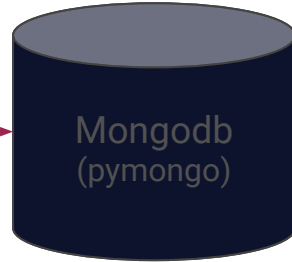
- Used MongoDB to store and retrieve data
- Unlike traditional SQL databases, which use structured tables and fixed schemas, MongoDB uses a document-oriented data model.
- Why we choose MongoDB over SQL database servers:
 - Flexibility
 - Easy Growth
 - Speed



Technologies



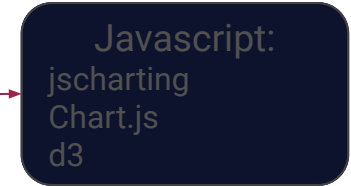
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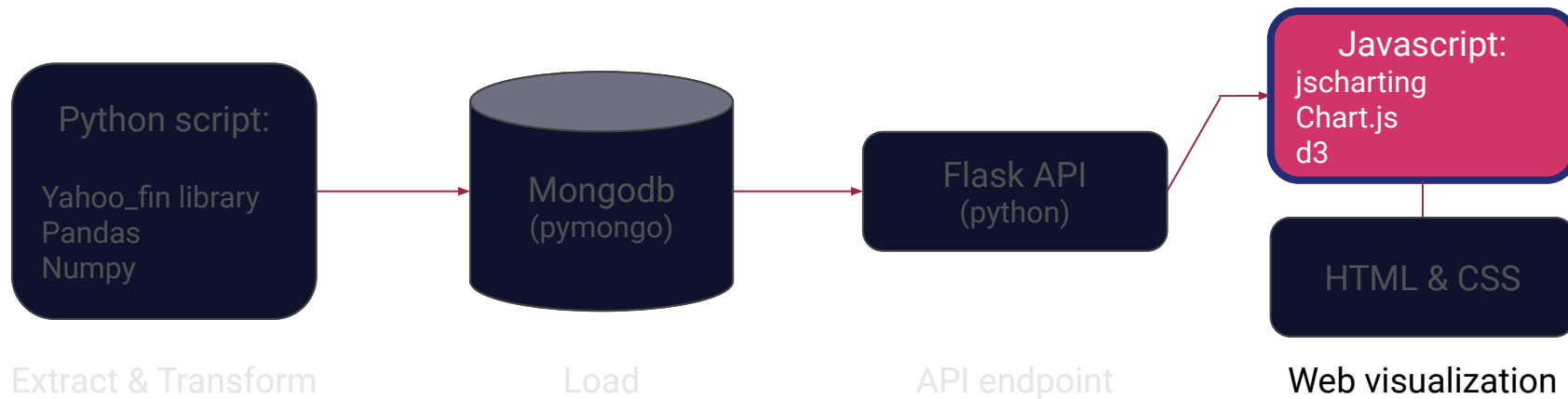
FlaskAPI



- Flask API connects the front end (Javascript/ HTML/CSS) and the back end (Python/ MongoDB) of a web application.
- SocketXP is used to associate a public domain with our hosted API. This allows access to our team on the internet using a user-friendly and publicly accessible web address.



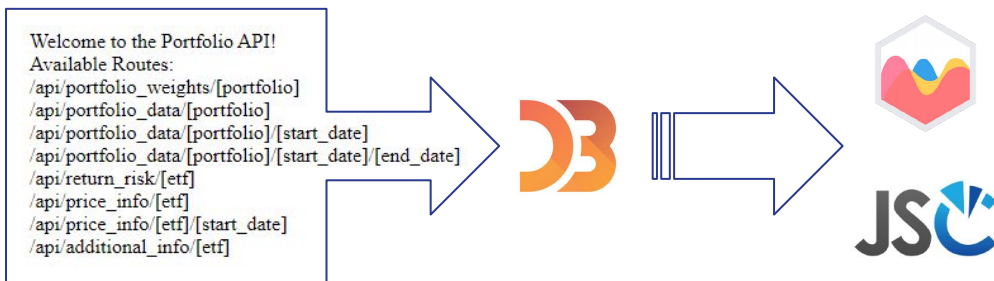
Technologies



Javascript



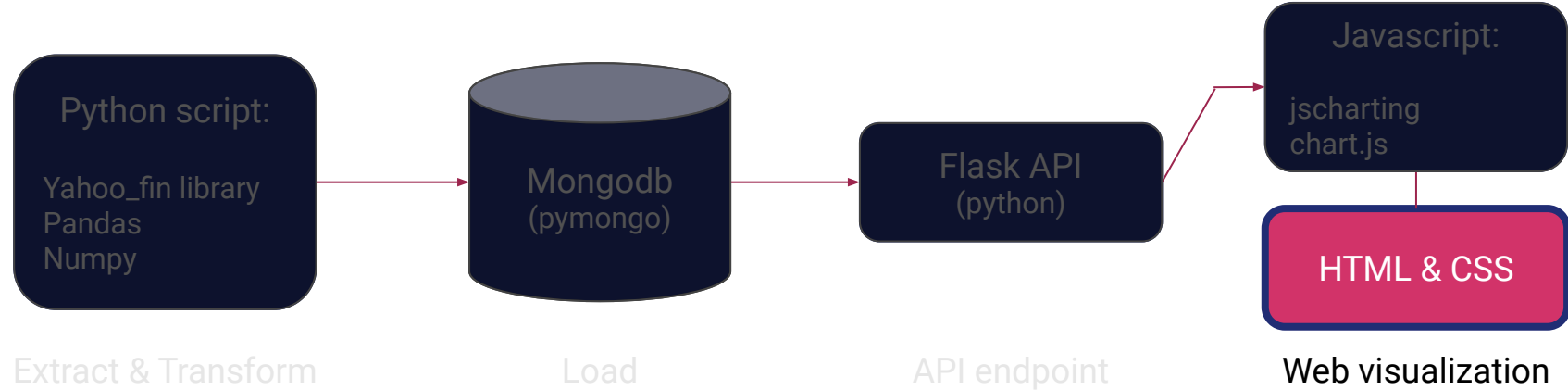
Libraries used: Chart.js, JSCharting, D3



References:

1. <https://www.chartjs.org/docs/latest/>
2. <https://jscharting.com/editor/#name=CircularMarker.htm>
3. <https://www.youtube.com/watch?v=RG-weA9HUrq&t=94s>

Technologies



HTML & CSS

HTML and CSS to create the semantic structure for the application

A few interesting features of the dashboard include:

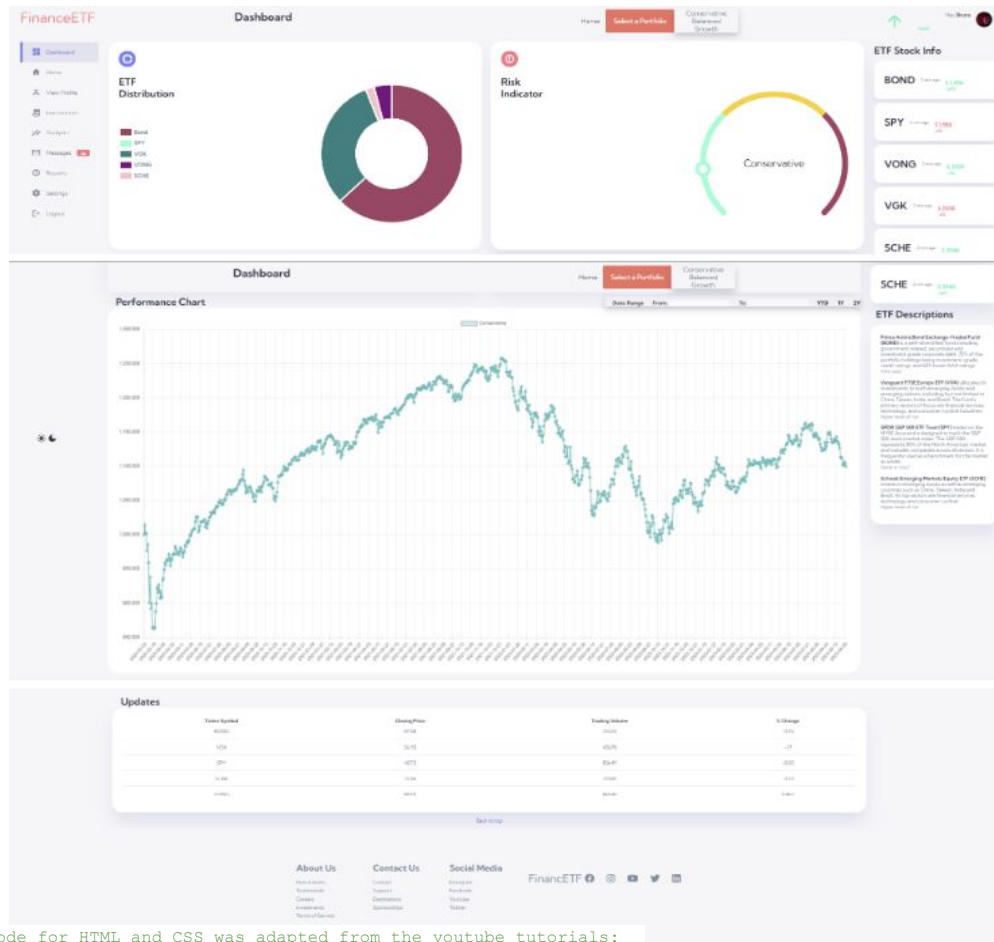
- Theme-toggler: Dark and night mode
- Device friendly: The styling modifies with device
- Calendar tabs
- Portfolios drop-down list that updates all the display according to the selected portfolio
- Table at the end to summarize recent updates about the ETFs
- Panel on the right displaying ETF summary that redirects to the respective ETF portfolio page

*Code for HTML and CSS was adapted from the youtube tutorials:

<https://www.youtube.com/watch?v=FazgJVnrVuI&t=22s>

and <https://www.youtube.com/watch?v=BOF79TAIkYQ>

and modified to meet the requirements of the dashboard.



Website Preview

*Code for HTML and CSS was adapted from the youtube tutorials:

<https://www.youtube.com/watch?v=FazqJVnrVuI&t=22s> and <https://www.youtube.com/watch?v=BOF79TAiKYO> and modified to meet the requirements of the dashboard.

Demo!

Website Link: <https://dspataru.github.io/finance-dashboard/>

GitHub Repo Link: <https://github.com/dspataru/DV-project-three-group-five>



Questions?





Thank you!

Division of Work:

