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

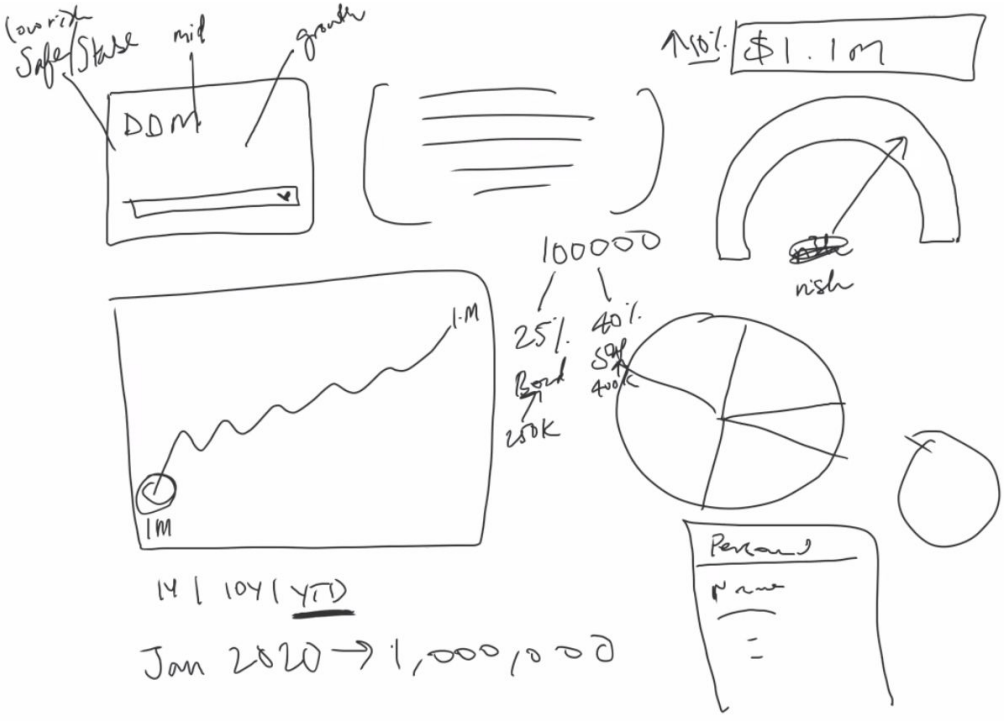
The Idea

- 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.

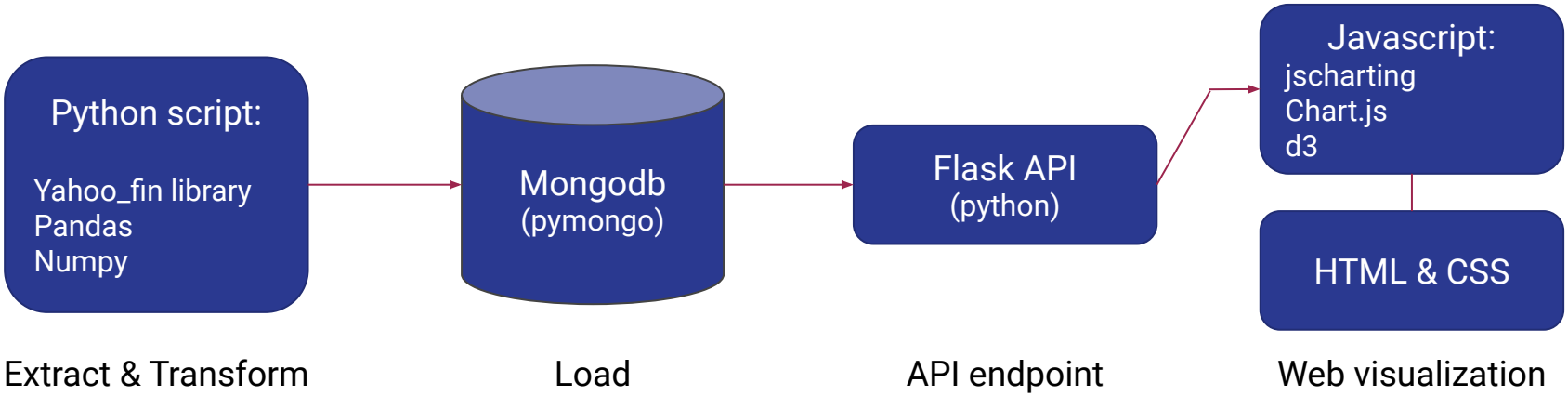
Dashboard Features

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

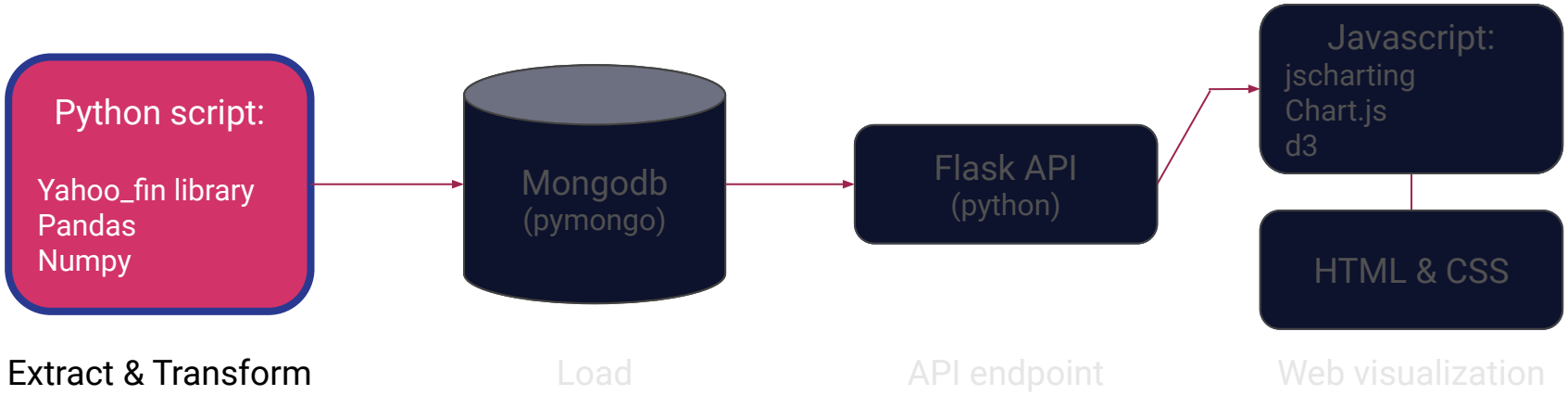


Sketch of our ideation process

Technologies



Technologies



Extract & Transform

Load

API endpoint

Web visualization

Python 

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:

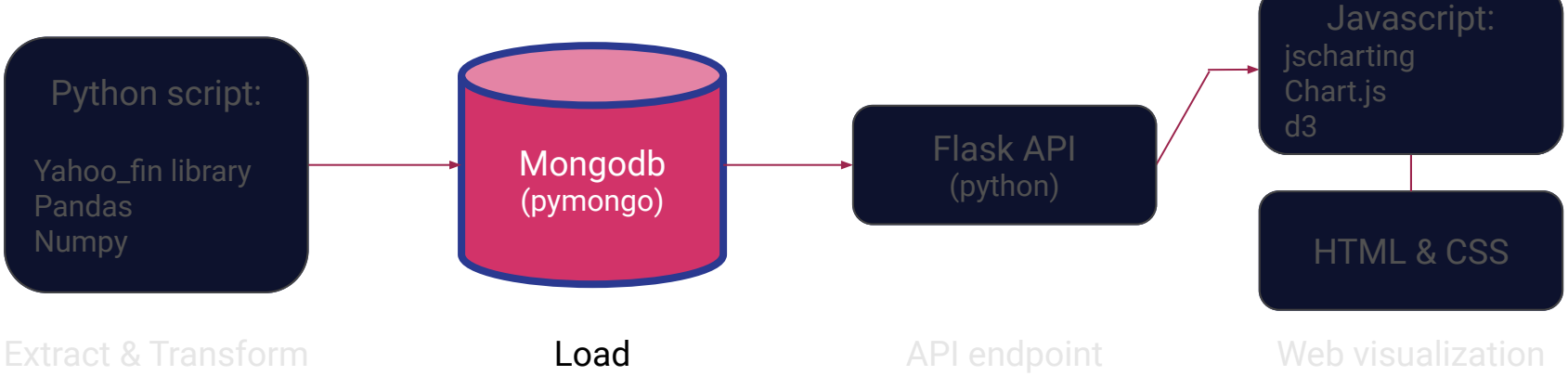
- Calculating values to get data that is relevant for our app or for analysis.

Python 

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**

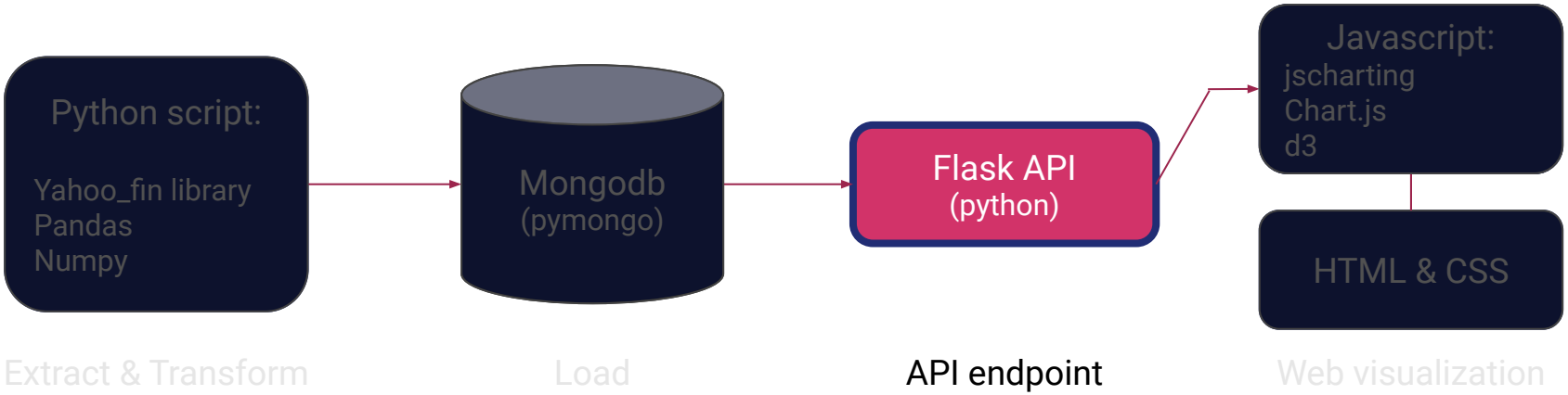
Technologies



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

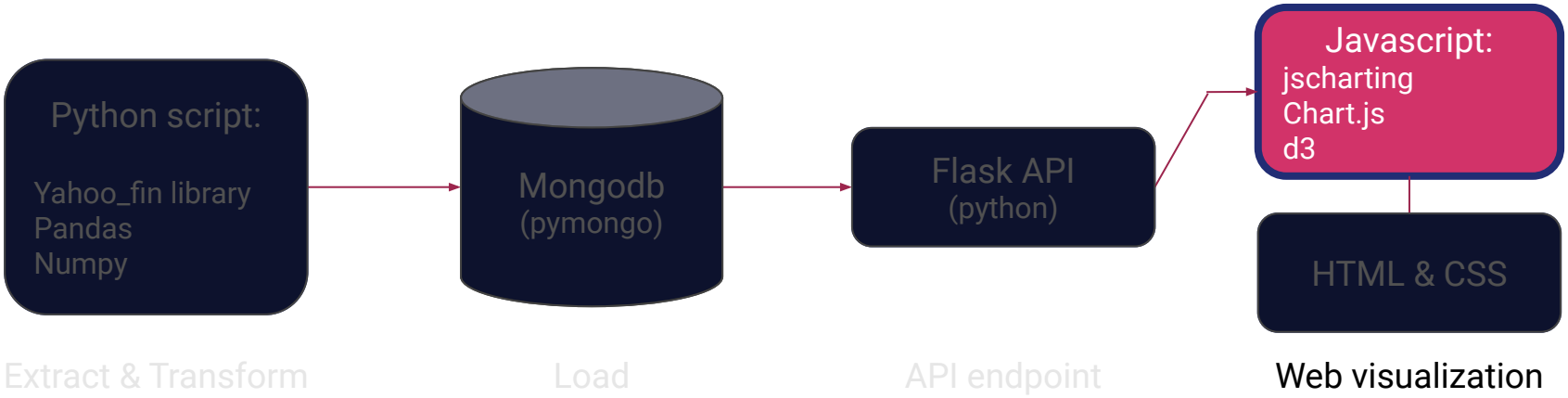
Technologies



FlaskAPI

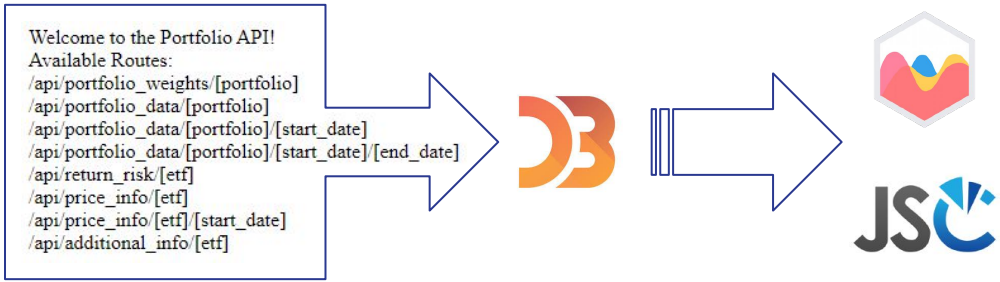
- Flask API connects the front end (Javascript/ HTML/CSS) and the back end (Python/ MongoDB) of a web application.
- SocketXP is used to associate a public domain with our hosted API. This allows access to our team on the internet using a user-friendly and publicly accessible web address.

Technologies



Javascript

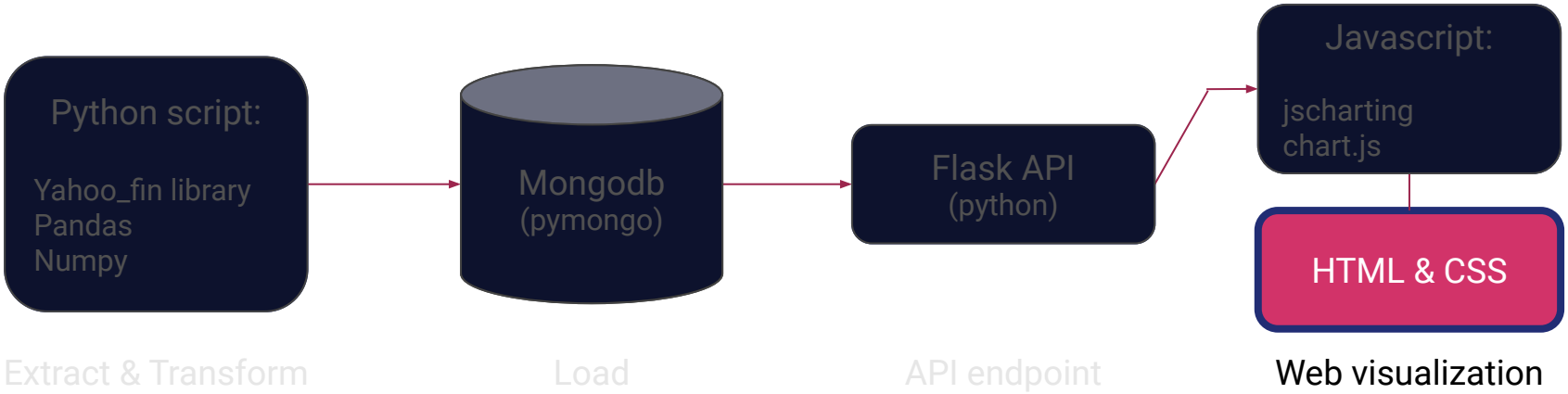
Libraries used: Chart.js, JSCharting, D3



References:

1. https://www.chartjs.org/docs/latest/
2. https://jscharting.com/editor/#name=CircularMarker.htm
3. https://www.youtube.com/watch?v=RG-weA9HUrg&t=94s

Technologies



HTML & CSS

In our project, we leveraged HTML and CSS to create a visually appealing and interactive user interface.

HTML (Hypertext Markup Language)

We used HTML to create the semantic structure of our web application.

Key HTML components used:

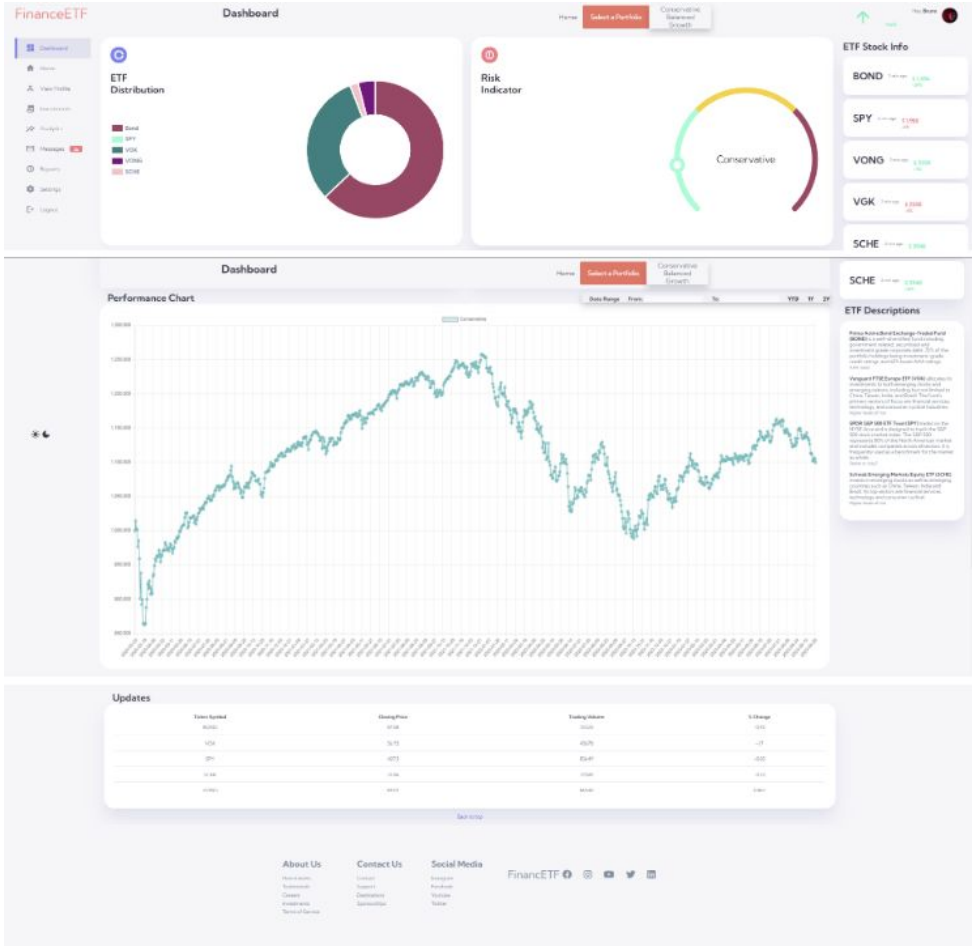
- Page was divided into three sections, to accommodate all the data
- Different panel were created to hold different display items
- Links: <a> tags for navigation and linking to other pages.

CSS (Cascading Style Sheets)

We utilized CSS to enhance the visual appeal and user experience.

Key CSS features used:

- Selectors: Targeting HTML elements for styling.
- Properties: Defining attributes like colors, fonts, margins, and padding.
- Animations and Transitions: Adding visualizations for better user experience

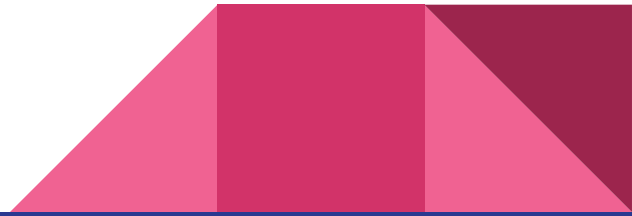


Website Preview

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: