Documentation for Crypto Verse Dashboard

Table of Contents

5. **User Interface Design** o

Sidebar Navigation o Main

Content o   Stat Cards

o   Tables o

Crypto

List/Grid

6. **API Integration** o Fetching

Data from Coin Gecko API o

Handling API Data

7. **JavaScript Functions**

o   Fetching Cryptocurrency Data o

Populating the UI with Data o

Updating Stats and Graphs o

Search and Filtering

Functionality

8. **Styling & Layout**

o   General Styling

Principles o   Sidebar

Design o   Main Content

Styling o   Chart & Table

Styling

9. **Responsive Design** ○ Making the

   Dashboard Mobile-Friendly

10. **Error Handling and Data Validation**

    ○ Handling API Errors ○ Handling User Input

    Errors

11. **Security Considerations**

    - ○ API Security
    - ○ User Input Validation

12. **Performance**

    Optimization ○

       Caching Data ○

       Optimizing API Calls

13. **Testing**

    - ○ Testing Overview

    - ○ Functional Testing

14. **Future   Improvements**   ○

    Enhancing   User   Experience   ○

    Adding More Cryptocurrencies ○

    Real-time Price Updates

15. **Conclusion** o

    Summar

y

   o   Project Outcome

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1. Introduction

Overview

The **Crypto Verse Dashboard** is an interactive and dynamic web application designed to provide users with up-to-date cryptocurrency data. It showcases real-time market information, including the top-performing cryptocurrencies, price changes, market capitalization, and other relevant statistics. The dashboard is designed with an easy-to-use interface, featuring a sidebar navigation, search functionality, and interactive charts.

Project Purpose

The main purpose of the project is to provide users with an efficient way of tracking cryptocurrency performance across various coins and tokens. The goal is to present live data, including price fluctuations, market capitalizations, volume, and historical trends, all while offering a clean and intuitive user experience.

GitHub Repository Link:

LINK: https://github.com/22H343/jana343_cryptocurrency

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2. Technologies Used

Front-End Technologies

1. **HTML** – Structure of the web pages.
2. **CSS** – Styling for the web pages. CSS Flexbox and Grid are used for layout.
3. **JavaScript** – For dynamic content updates, fetching data from APIs, and updating the UI.
4. **Chart.js** – A popular JavaScript library for creating interactive charts.
5. **Font Awesome** – For the icons in the sidebar.

Libraries and Tools

1. **Coin Gecko API** – The Coin Gecko API is used to fetch real-time cryptocurrency data. 2. **Fetch API** – For making HTTP requests to retrieve data from external sources.

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3. Project Structure

File Structure

```
/Crypto Verse
├── index.html        // Main HTML file for the dashboard page
├── login.html        // Login page (if applicable)
├── CSS/
│   └── styles.css     // Custom CSS file for styling the page
├── js/
│   └── script.js      // JavaScript file for fetching data and populating the dashboard
```

```
└── assets/
    └── logo.png      // Logo for the application
```

Key Files Overview

- **index.html**: Contains the structure of the main dashboard interface.
- **styles.css**: Defines the visual design of the application, including layout, colors, fonts, and responsiveness.
- **script.js**: Handles data fetching, UI population, and user interaction logic. •
     logo.png: The logo used in the sidebar for the branding of Crypto Verse.

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4. Features

Dashboard Overview

- **Sidebar Navigation**: Contains links to various pages or sections (e.g., Dashboard, Market Trends, etc.).
- **Real-Time Cryptocurrency Data**: Displays live information such as current prices, market cap, volume, and 24-hour price changes.
- **Search Functionality**: Allows users to search for a specific cryptocurrency by name.
- **Data Visualization**: Includes charts such as line charts, bar charts, and pie charts to represent cryptocurrency trends.
- **Top 10 Cryptocurrencies**: Displays a grid layout of the top 10 cryptocurrencies by market performance.

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5. User Interface Design

Sidebar Navigation

The sidebar is designed to be fixed on the left side of the screen. It includes:

- Branding with the application's name.
- Navigation links to different sections of the dashboard.
- A logout button to navigate the user out of the system.

Main Content

The main content area is dynamically populated with:

- **Stat Cards**: Displaying information such as BTC price, market cap, volume, and 24h change.
- **Top Cryptos Grid**: A grid displaying the top 10 cryptocurrencies with their logo, name, and price change percentage.
- **Crypto Table**: A table listing cryptocurrencies with their names, prices, and price change.

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6. API Integration

Fetching Data from Coin Gecko API

The Coin Gecko API is used to fetch live market data on cryptocurrencies:

```
async function fetchCryptoData () {
    const response = await
fetch('https://api.coingecko.com/api/v3/coins/markets?vs_currency=usd'
    ); const data = await response. json (); all Data = data; return data;
}
```

Handling API Data

Once the data is fetched, it is processed and displayed across the dashboard:

- **Updating Stats**: Key statistics like BTC price, market cap, and 24h change is updated dynamically.
- **Populating the Top 10 Cryptocurrencies Grid**: The data is filtered to show the top 10 cryptocurrencies.
- **Populating the Crypto Table**: A table with cryptocurrency names, prices, and price changes is populated.

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7. JavaScript Functions

Fetching Cryptocurrency Data

The function fetchCryptoData () makes an API call to retrieve market data and returns the response as a JSON object.

Populating the UI with Data

The function populateTopCryptos(data) and populate Table(data) dynamically update the UI with the latest cryptocurrency data.

Search and Filtering Functionality

A search bar is implemented using an input event listener:

```
searchInput.addEventListener('input', (e) => {
  const query = e. target.value;  filter
  Data(query);
});
```

It allows users to filter the cryptocurrency list based on their search query.

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8. Styling & Layout

The layout is designed using a combination of Flexbox and Grid to ensure responsiveness and flexibility. The sidebar is fixed, and the main content area is responsive to the screen size. Card hover effects are applied for interactivity.

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9. Responsive Design

The design adapts to different screen sizes using CSS media queries. The layout changes when viewed on mobile or tablet devices to provide a smooth experience.

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10. Error Handling and Data Validation
Handling API Errors

If the API call fails, an error message is displayed, and the user is informed of the issue. The application handles cases where no data is returned from the API.

Handling User Input Errors

Search input is validated to ensure that only valid characters are used in the query. Additionally, the dashboard provides appropriate feedback if no results are found.

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11. Security Considerations

- **API Security**: The application does not handle sensitive information like user data, making it inherently secure. However, security measures should be taken when dealing with authentication and authorization.

- **Input Validation**: Proper input validation is applied to prevent malicious characters from being processed in the search input.

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12. Performance Optimization

To improve performance:

- **Data Caching**: Data is cached in memory to reduce repeated API calls.
- **Optimized API Calls**: Data is fetched at regular intervals (every 60 seconds) to ensure the dashboard remains up-to-date without overwhelming the API.

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13. Testing

Testing is conducted using:
- **Manual Testing**: Testing all features to ensure they work as expected.
- **Functional Testing**: Ensuring the functionality of each feature, including fetching and displaying data, chart rendering, and filtering.

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14. Future Improvements

Future enhancements may include:

- **Enhanced Charts**: More detailed and customizable charts.
- **Real-Time Price Updates**: Implementing Web Sockets to push real-time price updates instead of periodic polling. • **User Authentication**: Adding authentication for user-specific dashboards.

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15. Conclusion

The **Crypto Verse Dashboard** provides a real-time and interactive interface for tracking cryptocurrency prices and trends. With features like search, real-time data updates, and chart visualizations, it offers users an efficient tool for staying updated on the cryptocurrency market.