Stock Market Analysis Web Application for the Macedonian Stock Exchange

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1. Project description

The aim of this project focuses on building web application for analyzing historical daily stock market data from the Macedonian Stock Exchange. This project enables a modular and efficient pipeline for data processing, using specialized filters that transform raw stock data into a structured format. The main aim is to create a reliable, up to date database that stores at least 10 years of stock data.

The background of the application has 3 filters:

1. Retrieval Filter: The first filter automatically retrieves a list of all issuers from the Macedonian Stock Exchange website, extracting company names and codes. This filter ensures that only relevant issuers are included, providing a clean starting dataset.

2. Data Check Filter: This filter checks the database for the last available data entry for each issuer. It determines whether there are gaps in the data and identifies the last recorded date.

3. Missing Data Fill Filter: Based on the last recorded date for each issuer, this filter retrieves any missing data between that date and the present. For new issuers, the filter retrieves data for the past 10 years. After fetching the data, this filter standardizes date formats and applies consistent decimal notations to prices, using a comma for thousands and a period for decimals. Standardizing date formats and applies consistent decimal notations to prices, using a comma for thousands and a period for decimals.

The filters work together to provide users with a well-organized and reliable stock data repository. This structure also allows for easy integration of new filters if additional data transformations or sources are added in the future.

2. Requirements Specification

- **Functional Requirements**:

    - The system will use the Retrieval Filter to automatically access the Macedonian Stock Exchange website and extract a list of all relevant issuers, including company names and codes. This ensures that only the necessary issuers are included in the dataset.
    - The Data Check Filter will verify the database for each issuer, identifying the last available data entry date. This filter detects any gaps and determines whether an update is needed, ensuring the data is complete.
    - The Missing Data Fill Filter will retrieve any missing stock data for each issuer, based on the date provided by the Data Check Filter. For new issuers, it will gather data for the last 10 years. This filter also handles data formatting,

including date standardization and price formatting with appropriate delimiters (comma for thousands and period for decimals).

- Before data is stored, each filter will apply consistent date and price formatting to maintain data uniformity across the database. Dates will have a standardized format, and prices will be formatted.

- The system will support scheduled updates, enabling automatic daily checks for new stock data. This ensures that the latest stock information is consistently added to the database without manual intervention.

- The application's pipeline is designed to allow the easy addition of new filters, enabling future data transformations or data source integrations without restructuring the entire system.

- **Non-Functional Requirements:**

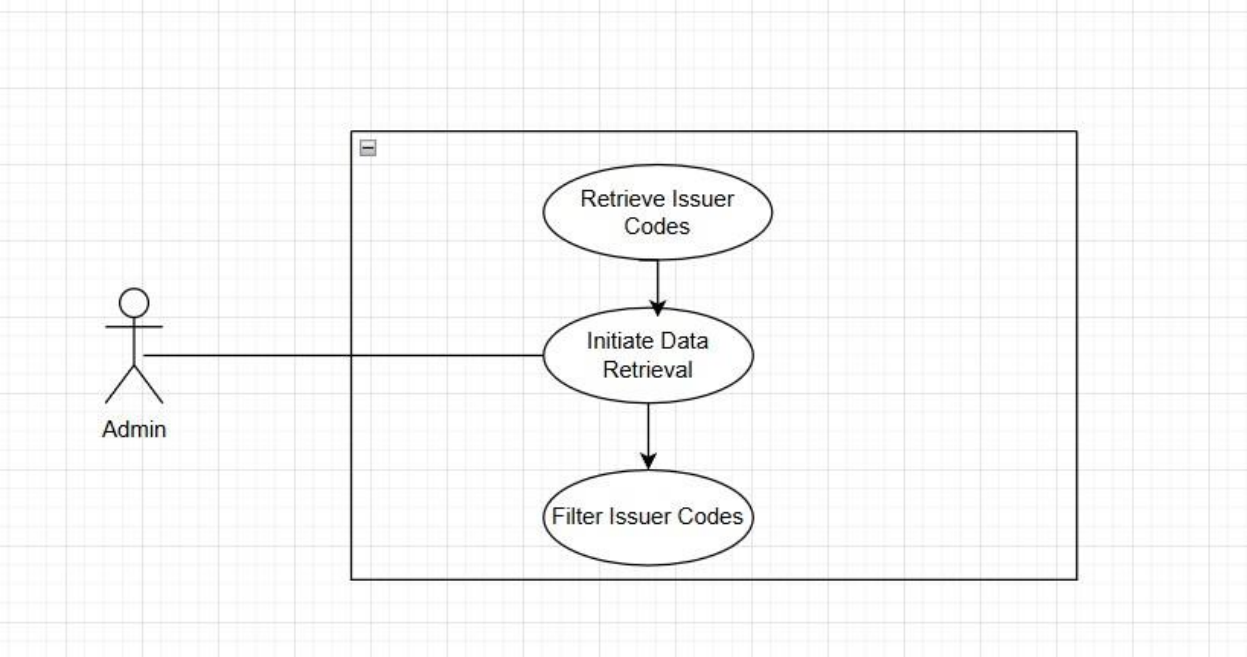
  - Low Maintenance: The application should require minimal manual maintenance. Any necessary updates, such as adjustments to data processing filters or database schema changes.

  - Scalability: The application will be able to handle increasing numbers of issuers and daily data entries without a decrease in performance, as the Macedonian Stock Exchange grows, the system will update additional issuers, allowing it to scale with market demands.

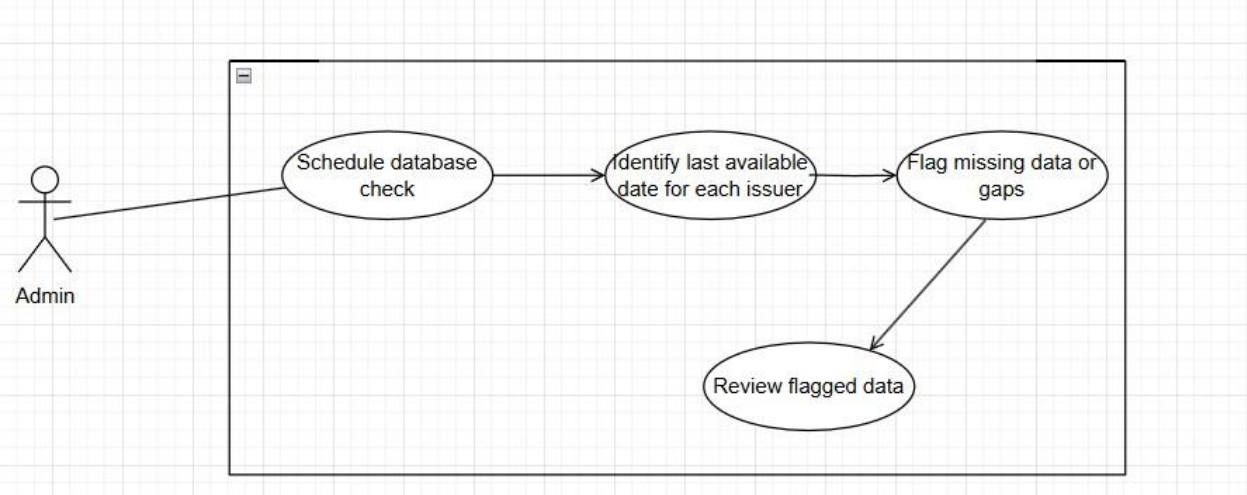
  - Reliability: The system will consistently fetch and update data without errors or data loss, daily updates to ensure the system is dependable and that users can trust its output for historical analysis.

3. User Scenarios

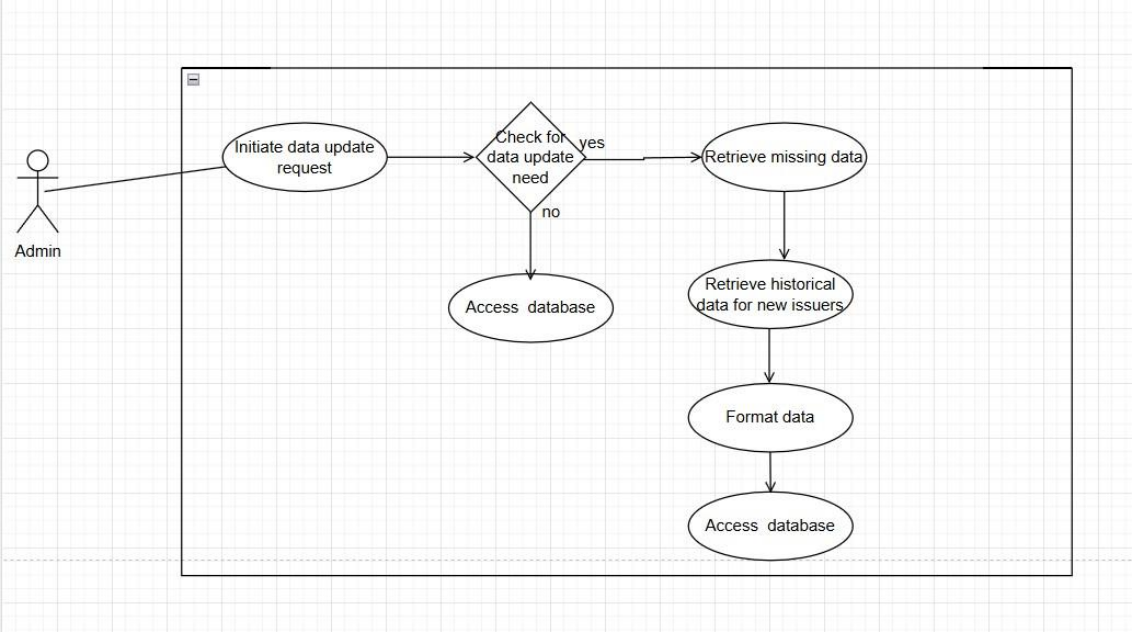
- Retrieval of Issuers:
Retrieving updated issuer data from the Macedonian Stock Exchange website, filters out irrelevant codes, and ensures only valid issuer codes are included in the system.



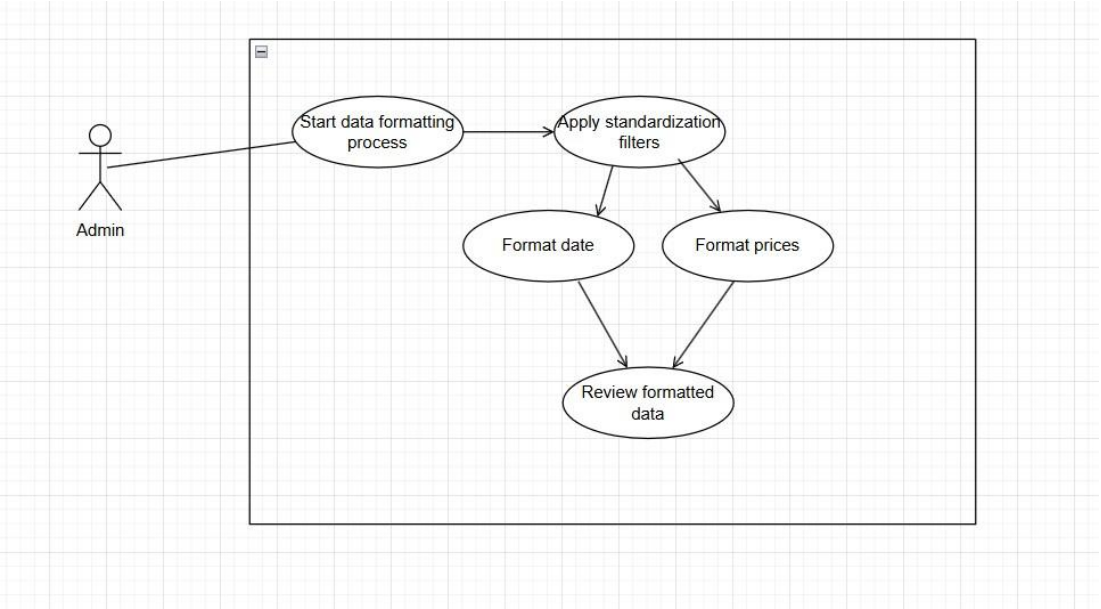
- **Database Data Check**:
Schedule a check for the database to identify any gaps or missing issuer data, ensuring all required data is present and up-to-date.



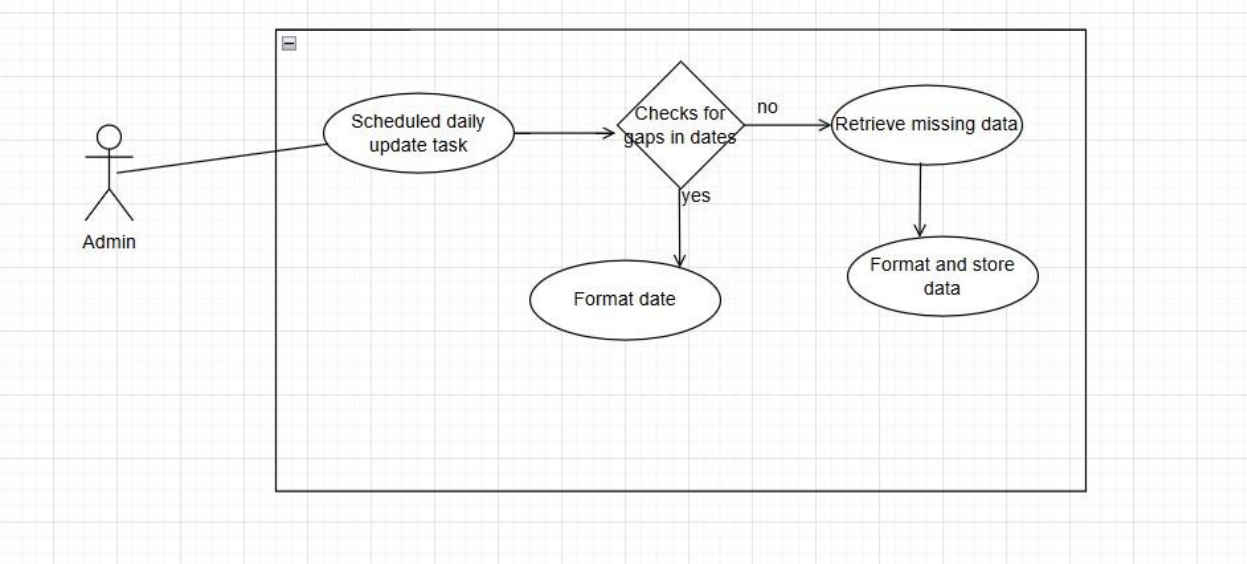
- Fetching and Filling Missing Data:
Updating missing stock data, including retrieving the last 10 years of data for new issuers and formatting the data to ensure completeness and readability.



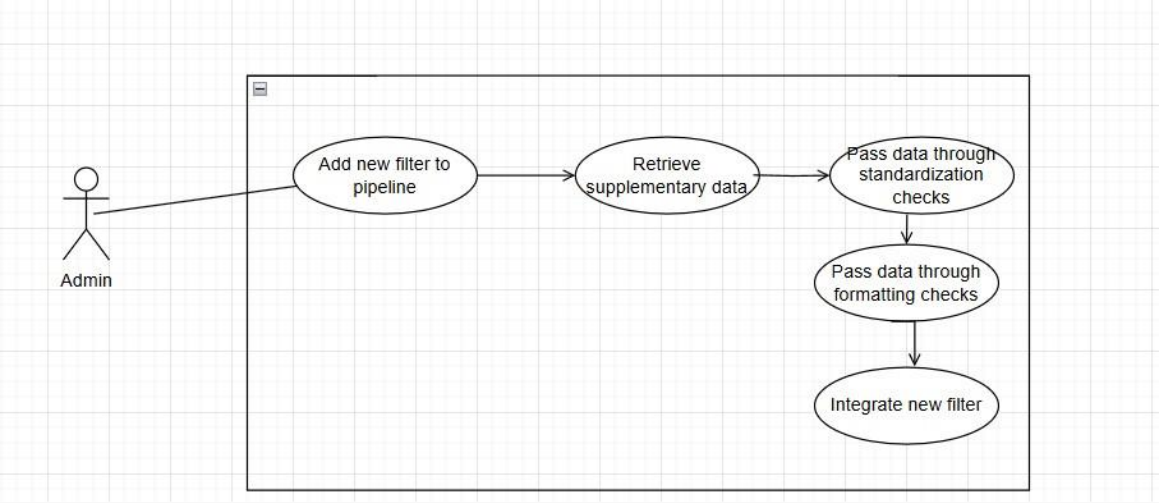
-**Data Formatting and Standardization**:
Ensuring that all stored stock data follows consistent formatting, including standardized date and price formats, for compatibility with analytical tools.



- **Automated Daily Update**:
Automatically updating with the latest stock data on a daily schedule, ensuring that all gaps in data are filled and the data is formatted correctly for analysis.



- **Modularity for Filter Addition**:
Adding new filter to the existing data pipeline to integrate supplementary stock information from a new source, ensuring compatibility and consistency with existing data.



8. Technology Stack

- Python libraries.

9. GitHub Repository

-https://github.com/gjDime/DAS-Homeworks