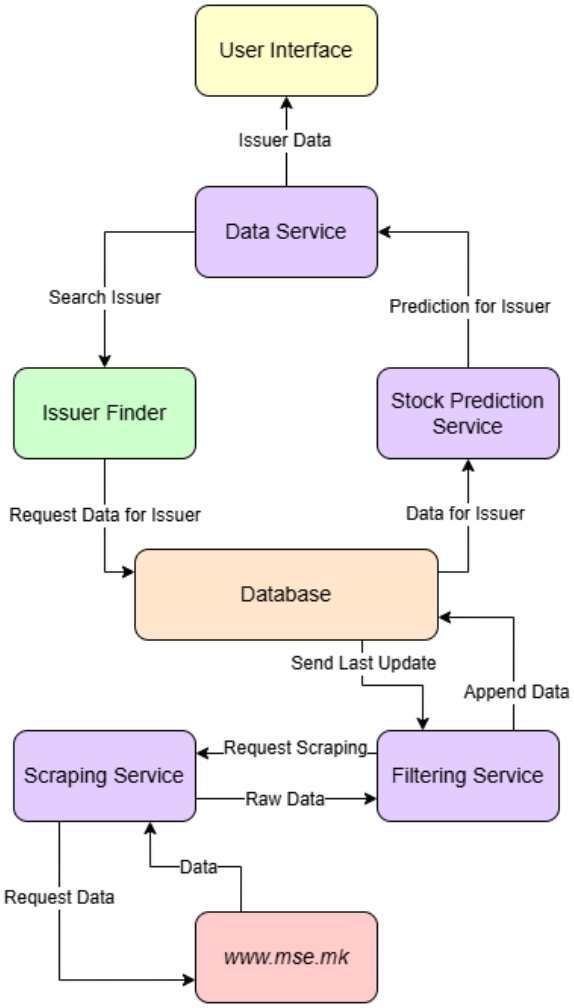
Conceptual Architecture

Components and Data Flow

The provided conceptual architecture defines the high-level design and interactions between the core components of the stock market analysis application. This architecture is structured to ensure that the data flow from the stock market source to the end user is efficient, accurate, and transparent. The application focuses on modular components to handle data acquisition, processing, prediction, and presentation.



Components and Their Roles

1. **User Interface:**
    - Role: Acts as the primary interaction point for users.
    - Functionality:

        - Allows users to search for issuers.
        - Displays data and predictions for the selected issuers.
        - Sends requests to and receives responses from the Data Service.

2. **Data Service:**
    - Role: Serves as the central coordinator, managing user requests and interactions with other components.
    - Functionality:
        - Processes requests for issuer data or predictions.
        - Relays search queries to the Issuer Finder.
        - Fetches predictions from the Stock Prediction Service.
        - Retrieves and updates data from the Database.
3. **Issuer Finder:**
    - Role: Handles search operations for issuers within the database.
    - Functionality:
        - Responds to user queries by identifying the issuer in the database.
        - Requests relevant data for the selected issuer from the Database.
4. **Stock Prediction Service:**
    - Role: Generates predictions for stock performance using historical and live data.
    - Functionality:
        - Retrieves issuer data from the Database.
        - Uses advanced prediction models to produce trends and forecasts.
        - Sends the predictions back to the Data Service for presentation in the User Interface.
5. **Database:**
    - Role: Central repository for storing and managing historical and current stock data.

- Functionality:
    - Provides issuer data to other components, such as the Issuer Finder and Stock Prediction Service.
    - Sends the last update information to the Scraping Service to identify missing or new data.
    - Appends newly formatted and filtered data.

6. **Scraping Service:**
    - Role: Automates the extraction of raw stock market data from the Macedonian Stock Exchange website (www.mse.mk).
    - Functionality:
        - Fetches raw data from the source based on requests from the Database.
        - Sends the raw data to the Filtering Service for processing.
7. **Filtering Service:**
    - Role: Cleans, formats, and processes the raw data fetched by the Scraping Service.
    - Functionality:
        - Removes unnecessary or malformed data.
        - Converts raw data into a consistent, structured format.
        - Sends the formatted data back to the Database for storage and further use.
8. **Source Website (www.mse.mk):**
    - Role: The origin of the stock market data.
    - Functionality: Provides real-time and historical stock data for issuers.

Data Flow

1. **User Interaction:**
    - The user sends a search or prediction request via the User Interface.

- The Data Service processes the request and interacts with other components (e.g., Issuer Finder, Stock Prediction Service) to fetch and process the data.

2. **Issuer Search:**
    - The Issuer Finder queries the Database to retrieve issuer details and historical data.
3. **Prediction Generation:**
    - The Stock Prediction Service retrieves data from the Database, applies predictive models, and sends the results to the Data Service.
4. **Data Acquisition:**
    - The Database identifies missing or outdated data and requests an update from the Scraping Service.
5. **Data Processing:**
    - The Scraping Service extracts raw data from www.mse.mk.
    - The Filtering Service cleans and formats the raw data.
    - The filtered data is stored in the Database for future use.
6. **Response to User:**
    - The Data Service combines the data or predictions and sends the results to the User Interface.