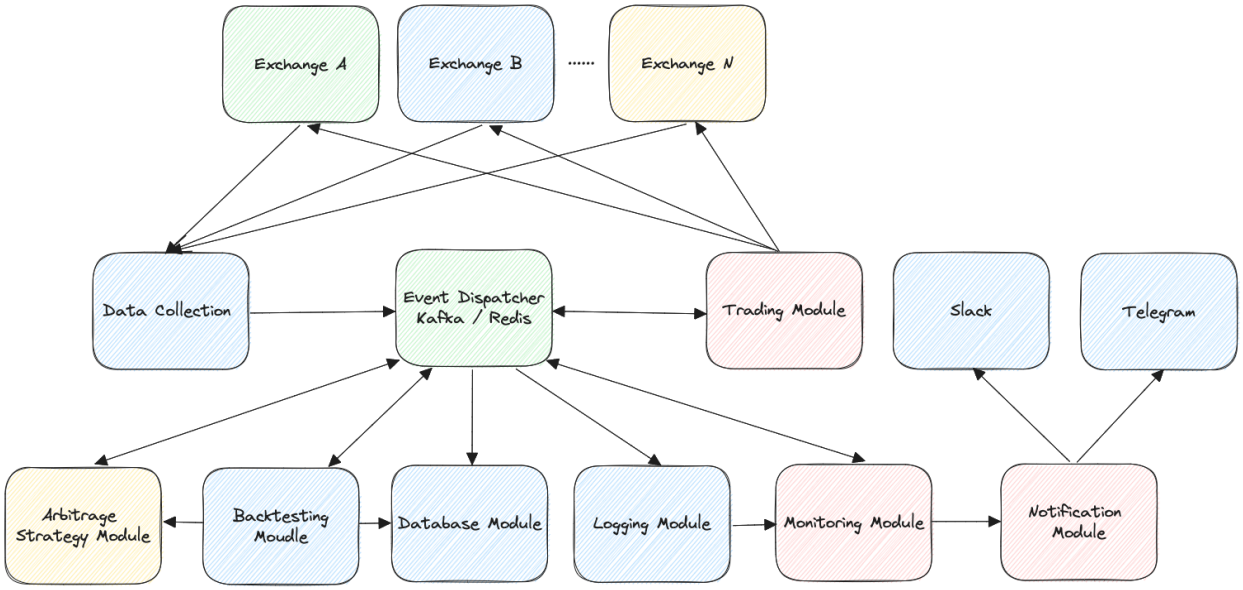
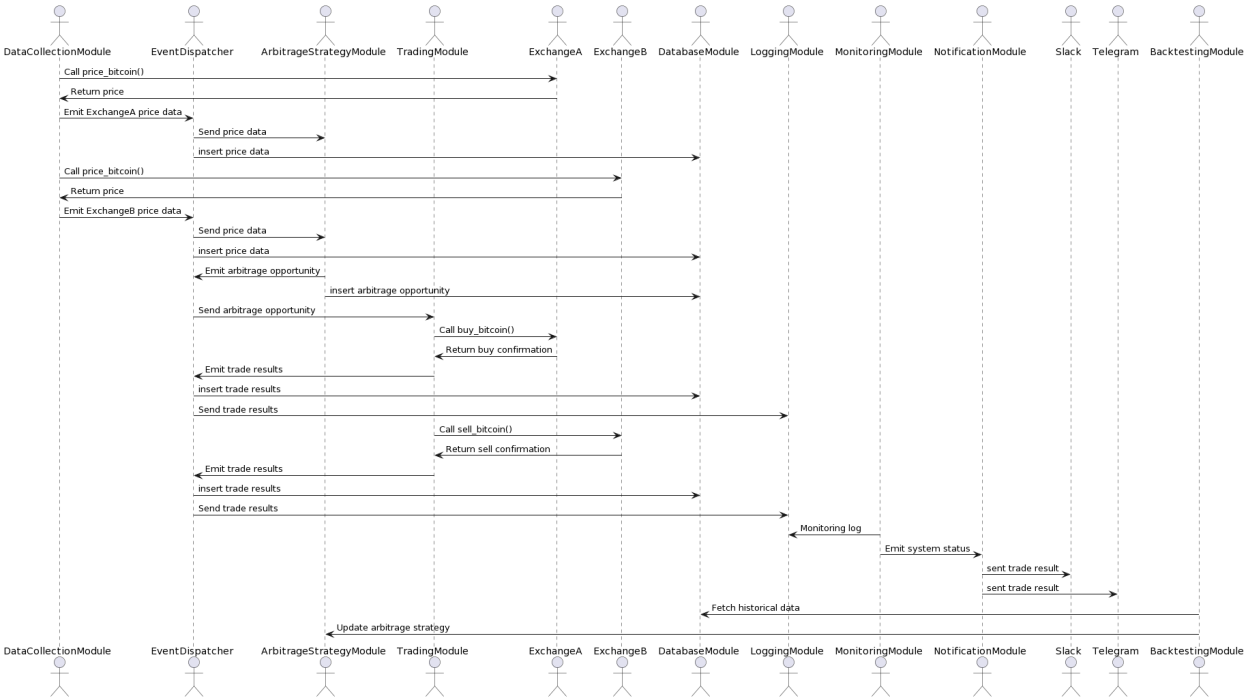
# solution

## System Design




## Module

- **Data Collection Module**: This module is responsible for gathering market data from different exchanges. It interacts with the APIs of each exchange to get the price of Bitcoin at a given timestamp.
- **Event Dispatcher**: The Event Dispatcher acts as a message broker between different modules. It is responsible for receiving data or commands from one module and routing it to the appropriate destination module(s).
- **Arbitrage Strategy Module**: This module takes the price data from different exchanges and makes decisions on whether there's an arbitrage opportunity or not. If there's an arbitrage opportunity, it sends the signal to the Trading Module via the Event Dispatcher.
- **Trading Module**: The Trading Module acts upon the arbitrage opportunities received from the Arbitrage Strategy Module. It interacts with the APIs of the exchanges to execute buy and sell orders.
- **Database Module**: This module is responsible for persisting data such as price information, arbitrage opportunities, and trade records. It ensures that all the important data is stored for further analysis, backtesting or auditing.
- **Backtesting Module**: The Backtesting Module uses historical data to test the effectiveness of arbitrage strategies. After backtesting, it updates the Arbitrage Strategy Module with improved strategies.
- **Monitoring Module**: The Monitoring Module keeps track of the overall system's performance and health. It detects anomalies or issues in the system and signals the Notification Module in case of problems.
- **Logging Module**: This module is responsible for logging all the system activities. The logged information can be used for debugging purposes, for tracking the system's activities, and for analyzing the performance of the system over time.
- **Notification Module**: The Notification Module sends out alerts based on system status or trade events. This could involve sending messages to a Slack or Telegram group or even triggering some other action when certain conditions are met.