Fullstack Software Engineer Take Home Assignment

Tags Fullstack

Take Home Assignment for Fullstack Software Engineer

You have **1 week** to complete the assignment after receiving it.

This assignment consists of two parts:

- System Design
- Simple Application Implementation

Please create a Github repository with the answers to your solutions. It should have the following directory structure:

- system_design/
  - solution.pdf
- simple_application/
  - {source_code_for_application}

Your solutions for the algorithms questions may be completed in Python, Javascript/Typescript, or Rust. The system design question should be submitted as a PDF file. The Simple Application will need to be written in React and Typescript.

Part 1: System Design

The goal of this question is to evaluate your understanding of application architectures and your ability to communicate your critical thoughts on the architecture. No implementation is necessary, but please include a diagram of your system, which can be hand-drawn or using software like Figma Jam or Excalidraw.

Problem: Design a simple trading bot that arbitrages Bitcoin prices across different centralized exchanges.

- You may assume simple arbitrage, i.e. Exchange A has a price of $10,000 per BTC while Exchange B has a price of $9,000 per BTC.
- You may assume centralized exchanges have the following API endpoints:
  - `(POST method) buy_bitcoin(price, amount)` : Buys `amount` of BTC at `price`
  - `(POST method) sell_bitcoin(price, amount)`: Sells `amount` of BTC at `price`
  - `(GET method) price_bitcoin(timestamp)`: Gets the price of BTC in USD at the UNIX `timestamp`
- You may assume that there are no fees, costs, or currency conversions for trading.

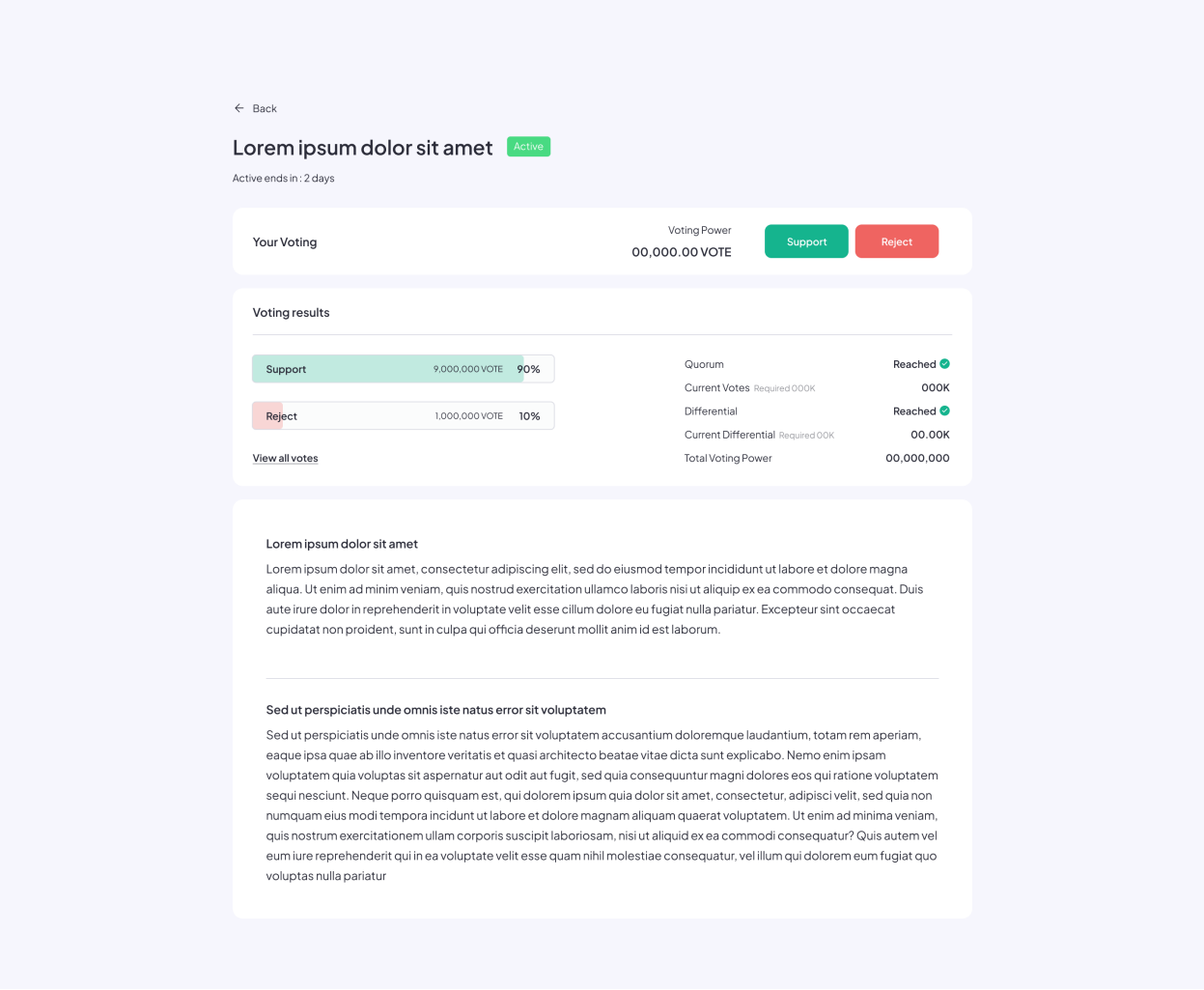
Delivarables:

- Diagram of your system, hand-drawn or using software like Figma Jam or Excalidraw.
- Discuss your design choices and trade-offs. The goal of this system design question is to evaluate your ability to design a simple trading bot that can take advantage of arbitrage opportunities across multiple centralized exchanges.

Part 2: Simple Frontend Implementation

Problem: Static Single Page View Implementation

Your goal is to implement a simple static interface for a single page view that looks like the below image.



The link to the design on Figma is below for your reference. You should reference the Figma design to see the dimensions and sizing of the UI components.

https://www.figma.com/file/dHRb3kqDrYJEVxAIoPRn2h/Fulllstack_Interview?type=design&node-id=0%3A1&t=hkaKm1Y2hIrHgXdj-1

You must use Next.js and React to implement this. Apart from these requirements, you are free to use any software, packages, etc. to achieve the implementation. Buttons do not need to have functionality.

Deliverables

- Github repo link of the Next.js + React project that implements the simple interface as shown above.
- You should implement as closely to the design as possible.