Candidate Technical Exercise

Backend + Dev/ProdOps

Thank you for meeting with me today to discuss your experience and our technical project. We look forward to working with you on this exercise.

Project - Portfolio Data Clearinghouse

We are creating a very simplified version of a data clearinghouse. Each day, possibly several times a day, files are dropped to an ftp server. The files have to be ingested into a relational database and an API sits in front of the database that allows us to access various kinds of data about our accounts. We're particularly interested in a specific compliance rule that does not allow any holding to be over 20% of the account. We will be creating a complete platform with the following key deliverables:

1) Robust unit testing
2) Working code
3) CICD pipeline
4) Observability
5) *very* basic alerting

For this exercise, we will need to deploy a service via GitHub Actions (or similar CICD) that will be able to do the following:

1) Ingest files of two different formats into a single relational database table (of your choice) from an FTP server (or something that at least will allow sftp protocol with SSH key handshakes) you have set up.
2) Provide three different endpoints for the service, via a Python Flask implementation:
    a) GET blotter?date=<query date>
    Returns the data from the reports in a simplified format for the given date
    b) GET positions?date=<query date>
    Returns the percentage of funds by ticker for each account for the given date
    c) GET alarms?date=<query date>
    Returns true for any account that has over 20% of any ticker for the given date
3) Provide the CICD pipeline for the project (prefer github actions with terraform)
4) Provide observability with a smoketest that shows liveness of the endpoints
5) Security: this can be as simple as a preshared API key.
6) "Send" alert: Show an intended service for at least two alerts and the data you would pass.

The exercise is a vignette of the kind of work you would be engaged in at Vest. We don't expect you to have specific knowledge of the markets, so please don't hesitate to reach out if you have any questions as you work through this exercise: apatterson@vestfin.com

Appendix A - Data Examples

Public SSH Key for Vest

```
None
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAINBiRG5vqvdhVxb1wmqnWf9YXVVp4l3qDdBJ8eNGoxWj
```

Trade File Format 1:

```
None
TradeDate,AccountID,Ticker,Quantity,Price,TradeType,SettlementDate
2025-01-15,ACC001,AAPL,100,185.50,BUY,2025-01-17
2025-01-15,ACC001,MSFT,50,420.25,BUY,2025-01-17
2025-01-15,ACC002,GOOGL,75,142.80,BUY,2025-01-17
2025-01-15,ACC002,AAPL,200,185.50,BUY,2025-01-17
2025-01-15,ACC003,TSLA,150,238.45,SELL,2025-01-17
2025-01-15,ACC003,NVDA,80,505.30,BUY,2025-01-17
2025-01-15,ACC001,GOOGL,100,142.80,BUY,2025-01-17
2025-01-15,ACC004,AAPL,500,185.50,BUY,2025-01-17
2025-01-15,ACC004,MSFT,300,420.25,BUY,2025-01-17
2025-01-15,ACC002,NVDA,120,505.30,BUY,2025-01-17
```

Trade File Format 2:

```
None
REPORT_DATE|ACCOUNT_ID|SECURITY_TICKER|SHARES|MARKET_VALUE|SOURCE_SYSTEM
20250115|ACC001|AAPL|100|18550.00|CUSTODIAN_A 20250115|ACC001|MSFT|50|21012.50|CUSTODIAN_A
20250115|ACC001|GOOGL|100|14280.00|CUSTODIAN_A
20250115|ACC002|GOOGL|75|10710.00|CUSTODIAN_B
20250115|ACC002|AAPL|200|37100.00|CUSTODIAN_B
20250115|ACC002|NVDA|120|60636.00|CUSTODIAN_B
20250115|ACC003|TSLA|-150|-35767.50|CUSTODIAN_A
20250115|ACC003|NVDA|80|40424.00|CUSTODIAN_A 20250115|ACC004|AAPL|500|92750.00|CUSTODIAN_C
20250115|ACC004|MSFT|300|126075.00|CUSTODIAN_C
```