Take-Home Assessment: Full-Stack Engineer – AI on FHIR

Objective:

Evaluate your ability to build and integrate an AI-powered healthcare data querying tool that interfaces with FHIR-compliant systems.

Part 1: Backend & NLP Integration (Python)

Task:
Build a Python-based service that accepts a natural language input (e.g., *"Show me all diabetic patients over 50"*) and converts it into a simulated FHIR API request.

Requirements:

- Use any NLP library (e.g., spaCy, Transformers) to extract intent and entities.
- Simulate a FHIR API request using the Patient and Condition resources.
- Provide example mappings from input text to a FHIR API request.

Deliverable:

- A .py file or Jupyter Notebook with your code and a README explaining how to run it.
- Example input/output for 3-5 queries.

Part 2: Front-End UI (React/Next.js)

Task:
Create a basic UI that allows users to input a natural language query and display simulated FHIR results in a user-friendly format.

Requirements:

- Input field with query auto-complete or suggestions.
- Display data using a chart (e.g., bar or pie) and a table (e.g., for patient name, age, condition).

- Optional: include filters (e.g., by age or diagnosis code).

Deliverable:

- A GitHub repo or zipped folder with your React/Next.js code.
- Screenshots or live link (e.g., Vercel/Netlify) if deployed.

Part 3: Security & Compliance

Task:
Write a short technical document (max 1 page) on how you would ensure the system is HIPAA-compliant and securely handles FHIR data.

Include:

- Authentication/authorization mechanisms (e.g., OAuth 2.0, SMART on FHIR).
- Data privacy and audit logging strategy.
- Role-based access control (RBAC) considerations.

Deliverable:

- A .pdf or .md document outlining your security plan.

Bonus (Optional)

1. Add internationalization support for the front end (multi-language UI).

2. Use Docker to containerize your backend or full app.

Submission

Please submit all deliverables in a zipped folder or a GitHub repository link. Include a short README.md with setup instructions and any notes on what you focused on or would improve with more time.