Project Proposal: Refugee Biodata Verification Application Programming Interface (API) System

1. Problem Statement

The National Social Security Fund (NSSF) of Uganda needs a secure and automated way to verify refugee identities using the Office of the Prime Minister's Biometric Information Management System (BIMS) and Profile Global Registration System (proGres V4). Currently, this process is handled manually through email, which is slow, error-prone, and does not support real-time requests.

This project will create a system that allows NSSF's internal systems to connect directly with OPM's refugee database. This connection will make it easier and faster to check refugee information, improve accuracy, and help operations run more smoothly.

2. Relevance and Real-World Context

This project addresses NSSF's need to open savings accounts for refugees working in Uganda whose employers are sending in their savings. To do this, an interface for verifying refugee identities is required.

- Enabling the verification of refugee details to issue NSSF numbers and extend social security services.

- When refugees return to their home country, their identities can be verified before any money is deposited into their accounts.

The API will comply with Uganda's Data Protection and Privacy Act (2019) and follow all confidentiality rules in the terms of reference. This approach will help keep refugee information safe and secure.

3. Project Scope

In-Scope Activities:

- Develop a RESTful API for refugee biodata verification.

- Create fake, anonymous data to act like OPM's BIMS and proGres V4 databases.

- Implement secure API key-based authentication.

- Design verification logic that returns "match" or "no-match" responses with basic biodata.

Out-of-Scope Activities:

- Direct integration with live OPM databases.

- Biometric (fingerprint or iris) matching.

- Development of a front-end or full-stack web application.

4. Technical Approach and Python Implementation

Primary Technologies and Libraries:

- **FastAPI:** For building high-performance RESTful APIs with automatic OpenAPI.

- **SQLite and SQLAlchemy:** For simple database management and working with data in Python.

- **Pydantic:** For making sure the data sent and received is correct.

- **Uvicorn:** ASGI server for running the API.

- **Python-dotenv:** For safely handling settings and access keys.

Implementation Plan:

Database Design and Setup:

✓ Define SQLite tables for synthetic refugee data (fields: refugee_id, Refugee_Fullname, date_of_birth, nationality, Refugee_Status).
✓ Fill the database with fake, randomly generated records that do not use real names.
✓ Implement a POST /verify-refugee endpoint to
✓ Validate API keys in the header.
✓ Search the database for refugee IDs that match.
✓ Send back clear answers showing if there is a match or not.
✓ Create automatic tests and a simple program to pretend to send requests from NSSF.

5. Expected Outcomes and Deliverables

1. **Functional Prototype:** A working API that accurately simulates refugee biodata verification.

2. **GitHub Repository:** Containing all project components, including:

   o Source code (main.py) and supporting modules.

   o Database schema and data population scripts.

3. **Demo Scripts:** A sample client application to simulate API requests from NSSF's system.

7. Conclusion

This project demonstrates how Python can address a national data-sharing challenge. By building a secure and efficient API for refugee biodata verification, the system supports NSSF's goals and complies with Uganda's laws and guidelines. The prototype can also serve as a foundation for future integration with OPM's live systems.

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