**✅ Comment – Database Schema Implementation & Migration**

**Summary of Work**

The complete relational database schema for the Turkish Diaspora App backend has been successfully implemented and deployed to Supabase.  
All target tables, constraints, and indexes are created via idempotent SQL migration scripts located in Infra/supabase/.

**Implemented Components**

* Created five core tables:
  + locations
  + ai\_logs
  + tasks
  + training\_data
  + category\_icon\_map
* Added all required primary keys, foreign keys, and unique constraints (locations.place\_id).
* Added explicit indexes on:
  + Frequently queried columns: state, category, next\_check\_at
  + Foreign key columns: ai\_logs.location\_id, tasks.location\_id, training\_data.location\_id
* Added Supabase extensions (pgcrypto, btree\_gin, btree\_gist) for UUIDs and index performance.

**Infrastructure**

* All SQL scripts are **idempotent**, meaning they can be safely re-executed without altering existing data or raising duplicate-object errors.
* Scripts are modularized:
  + 000\_extensions.sql → required extensions
  + 001\_tables.sql → table creation
  + 002\_constraints.sql → constraints and foreign keys
  + 003\_indexes.sql → general indexes
  + 004\_fk\_indexes.sql → FK optimization indexes

**Verification & Testing**

1. **Connectivity:**
   * Backend confirmed working via /db/ping → {"db":"ok"}.
   * Database reachable through SSL (with optional local bypass SUPABASE\_SSL\_NO\_VERIFY=1).
2. **Schema Validation:**
   * Queried information\_schema.tables → all five tables present.
   * Queried information\_schema.columns → all expected columns, types, and nullability confirmed.
   * Queried information\_schema.table\_constraints → PKs + UNIQUE(place\_id) verified.
   * Queried pg\_constraint and pg\_indexes → all foreign keys and indexes confirmed.
3. **Idempotency Check:**
   * All migration scripts rerun on a clean and existing Supabase instance without conflicts.
4. **Backend Validation:**
   * FastAPI backend (app/db.py + app/config.py) successfully established and verified connection.
   * Connection tested with SELECT 1 and full schema accessibility.

**Outcome**

* ✅ All tables and constraints are correctly defined.
* ✅ Backend establishes a secure, functional connection.
* ✅ Indexes optimized for query performance.
* ✅ Migration scripts are fully idempotent and production-safe.
* ✅ Supabase schema aligns 1:1 with data model specification.