

Executive Summary – Bakhtiyar Yesbolsyn

What Was Accomplished

- Complete normalized database schema with proper relationships
- Cloud deployment on Render.com with Supabase PostgreSQL
- Automatic schema initialization on first application startup
- All 14 SQL queries functioning correctly (updates, deletes, joins, aggregations, views)
- Full-stack web application with complete CRUD operations for all entities
- Professional responsive UI with Bootstrap 5

Technology Stack

PostgreSQL 15 (Supabase), Python 3, SQLAlchemy 2.0, Flask 3.0, Bootstrap 5, Render.com, Gunicorn, NullPool

Part 1: Database Design

Designed and implemented a normalized relational schema with 7 tables: `users`, `caregiver`, `member`, `address`, `job`, `job_application`, and `appointment`. The schema uses one-to-one relationships (users to caregivers/members) and many-to-many relationships (jobs to caregivers via applications). Foreign key constraints with CASCADE deletes ensure referential integrity. Populated with 10+ realistic records per table, including required test data (Arman Armanov, Amina Aminova, Kabanbay Batyr addresses, "soft-spoken" job requirements).

Part 2: Query Operations

Implemented all 14 required database operations using SQLAlchemy. All queries execute successfully without errors and return expected results.

Part 3: Web Application

Built a Flask-based CRUD application with complete data management for all 5 main entities. Each entity has modal forms for creation/editing, dropdown selections for foreign keys, confirmation prompts for deletions, and responsive Bootstrap 5 interface with navigation between all pages.

Deployment

Full-stack application deployed to Render.com (<https://assignment-3-tkq0.onrender.com>) with Supabase PostgreSQL cloud database. The deployment uses automatic GitHub integration, Python 3.12 runtime, and gunicorn WSGI server. Application is fully functional in production with complete database connectivity.