ADVANCED PROGRAMMING

HAIXIA CHAI; WEI ZHAO

ASSESSMENT 3 – WEB PROGRAMMING

WORLD CITIES FLASK WEB APPLICATION

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Cloud Deployment URL: https://world-cities-app.onrender.com

GitHub Repository: https://github.com/durga-0219/world-cities-app , **Readme File**

Design:

The application is built using the Flask framework with a modular structure based on templates, models, and views. It features a visually styled homepage with a dropdown to select countries, dynamic city listings, and country-to-city relational browsing. The UI is styled using Bootstrap 5, ensuring responsiveness and clean navigation — all without any JavaScript.

Development:

- Implemented database models: Country and City, using SQLAlchemy ORM
- Built homepage with country dropdown and city filtering by selected country
- Developed a custom 404 error page for invalid URLs
- Loaded and cleaned open CSV data using pandas and mapped to relational models
- Designed reusable HTML templates using Jinja2 (base.html, index.html, country.html, 404.html)
- Strictly followed no-JavaScript policy in all templates and frontend logic
- Ensured relational integrity between tables (one-to-many: Country → Cities)

Implementation:

- Used Flask, SQLAlchemy, and pandas to build a relational city browser
- Filtered cities by country selection using Jinja2 and backend logic
- Sorted cities by population and displayed using Bootstrap-styled containers
- Handled 404 errors gracefully through a registered error handler
- Ensured modular design using app.py, models.py, and utils.py
- Deployed the application on Render with requirements.txt and runtime.txt (python-3.10.7)

Installation:

git clone https://github.com/durga-0219/world-cities-app.git , **cd world-cities-app**, **python3.10 -m venv venv**, **source venv/bin/activate**, **pip install -r requirements.txt**, **python manage.py migrate**, **python3 app.py**

User & Testing:

- No login required; users can:
- Select a country
- View its cities and population info
- Admin dashboard was not included as per assignment scope
- Tested all major routes (/, /country/<id>) using pytest
- Included 4 test cases for basic route integrity and 404 handling

Deployment:

Deployed on **Render** using Python 3.10.7. Setup included requirements.txt, runtime.txt, and Start Command: python app.py

Summary:

World Cities is a Flask web application for browsing cities grouped by country, using a cleaned open dataset. It includes route-based navigation, proper error handling, and a Bootstrap-only UI with no JavaScript. The project meets all solo assignment requirements and is deployed on Render.