WorldExplorer Application Design and Implementation Report

Application Design Overview

WorldExplorer is a Flask-based web application built for interactive exploration of global city and country data. It follows a modular design with Flask Blueprints, Jinja templating, and SQLAlchemy ORM. The system architecture separates models, views, and templates (MVT), promoting scalability and maintainability.

Development and Implementation

The core technologies include Python 3, Flask, SQLAlchemy, Jinja2, Bootstrap 5, and SQLite. The application is structured around Blueprints, and key modules include run.py, models.py, routes.py, and templates for UI rendering. The data_loader.py script loads CSV data into the database. The app provides user-friendly routes for countries, cities, statistics, and search, and includes error handling pages for 404 and 500 errors.

Installation and Setup

1. Clone the repository: git clone https://github.com/yourusername/worldexplorer.git

2. Navigate to the folder: cd worldexplorer

3. Create and activate a virtual environment: python3 -m venv venv && source venv/bin/activate

4. Install dependencies: pip install -r requirements.txt

5. Load data: python data_loader.py

6. Run the app: python run.py and visit http://localhost:5000

Testing and Validation

The app includes basic tests using pytest, covering database models and routing. Testing ensures key functionalities work as intended before deployment.

Deployment

The application is deployed on Render. A Procfile and requirements.txt define the environment and startup command (gunicorn run:app). Render automates builds from GitHub.

The website address is: https://assessment-final-version.onrender.com

Usage Guide

Users can browse countries, view cities, use a search box to locate specific entries, and explore statistics on city populations. The UI is enhanced using Bootstrap.

Future Improvements

Potential enhancements include REST API integration, advanced user features (login, favorites), pagination, PostgreSQL support, and CI/CD pipeline with GitHub Actions.