URL Shortener Web Application using Flask

Introduction
The rapid growth of web applications has increased the use of long URLs, which are difficult to share and manage. A URL shortener converts long web addresses into shorter and user-friendly links. This project focuses on designing and developing a URL Shortener Web Application using Python Flask. The application allows users to shorten URLs and redirect them efficiently.

Objectives
- To shorten long URLs
- To store URLs in a database
- To validate user input URLs
- To redirect users using shortened URLs

Technologies Used
Frontend: HTML, CSS, Bootstrap
Backend: Python Flask
Database: SQLite
ORM: SQLAlchemy

System Architecture
The application follows a client-server architecture where users interact through a web browser. The Flask backend handles requests, processes URLs, and stores data in the SQLite database.

Implementation Details
Flask routes are used to handle URL input and redirection. A random alphanumeric string is generated for each URL. SQLAlchemy ORM manages database operations efficiently.

Results
The system successfully shortens URLs and redirects users correctly. Invalid URLs are rejected using validation checks.

Conclusion and Future Scope
The project meets its objectives by providing an efficient URL shortening service. Future enhancements include user authentication, analytics, and custom URL support.