

Basic URL Shortener Web Application using Flask and SQLite

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Introduction

In today's digital world, sharing links has become a routine task. Many websites generate long URLs which are inconvenient to share via email, messaging apps, or social media. This is where URL shorteners become extremely useful. A URL shortener is a tool that converts a long URL into a shorter, more manageable version.

Objectives of the Project:

1. To shorten long URLs for easy sharing.
2. To save and manage previously shortened URLs for reference.
3. To create a user-friendly web application using modern web technologies.

Real-World Examples:

Some popular URL shortening services include:

- **Bit.ly**
- **TinyURL.com**
- **Rebrandly**

Frontend

- **HTML (HyperText Markup Language)**

Used to structure the content of web pages, including input forms for URLs, buttons, and links to history pages.

- **CSS (Cascading Style Sheets)**

Provides styling for the web pages, such as colors, fonts, spacing, and layout.

Example: making the home page look clean and readable.

- **Bootstrap**

A popular CSS framework that helps create **responsive and professional-looking web pages** quickly. In this project,

Bootstrap is used to: ◦ Style the form inputs and buttons ◦

Make the table on the history page look clean ◦ Ensure the pages work well on different screen sizes

Backend

- **Python**

A versatile programming language used for the backend logic.

Handles URL shortening, validation, and redirecting.

- **Flask**

A lightweight Python web framework used to build web applications.

It allows creating routes (pages) such as / (Home) and /history (History page), and connecting them with the backend logic.

Database

- **SQLite**

A lightweight, file-based relational database used to store:

- Original URLs
- Shortened URLs

- **SQLAlchemy (ORM)**

An Object Relational Mapper (ORM) for Python, which allows **interacting with the database using Python objects instead of SQL queries.**

Benefits include:

- Easy database management
- Less chance of SQL errors
- Cleaner code

Other Technologies

- **JavaScript**

Used to implement the **copy-to-clipboard feature**, allowing users to click a button to copy the shortened URL instantly.

- **Browser / Chrome / Edge**

Used to run and test the web application.

Features Implemented

1. **Home Page** ◦ Input field to enter the URL to be shortened.
 - **URL Validation:** Ensures that the entered URL is in the correct format (must contain a . and proper structure).
 - **Shortened URL Generation:** Generates a unique 6character short code for the URL.
 - **Copy-to-Clipboard Button:** Allows users to copy the shortened URL with a single click.
 - **Error Handling:** If an invalid URL is entered, an error message is displayed.
2. **History Page** ◦ Displays a table of all previously shortened URLs. ◦ **Original URL** and **Short URL** columns are shown. ◦ Clicking on a short URL redirects the user to the original URL.
 - Navigation link back to the Home page for convenience.

URLshortener_Advanced/

```
├── app.py      # Main Flask application
├── models.py   # User and URL database models
├── urls.db     # SQLite database
├── templates/
|   ├── home.html # URL shortening page
|   ├── history.html # User-specific history
|   ├── login.html # Login page
|   └── signup.html # Signup page
```

└— static

Opens SignUp page(Make Account)

|

V

Opens Login Page

|

V

User opens Home Page

|

V

Enters URL → Clicks Shorten

|

V

Validation (Check format)

|

V

Short code generated → Saved in Database

|

V

Shortened URL displayed

|

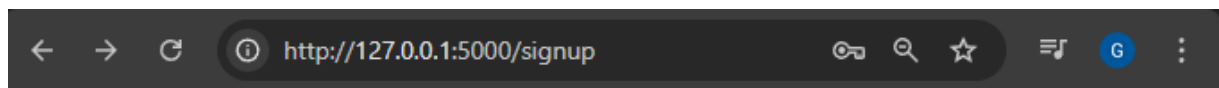
V

User can copy URL OR visit /history

|

V

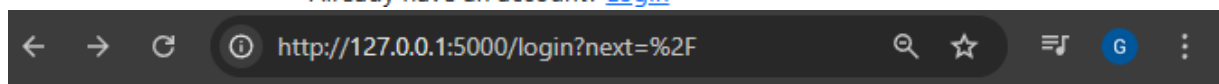
History Page shows all URLs



Create Account

Signup

Already have an account? [Login](#)



Login

Login

Don't have an account? [Signup](#)



Basic URL Shortener

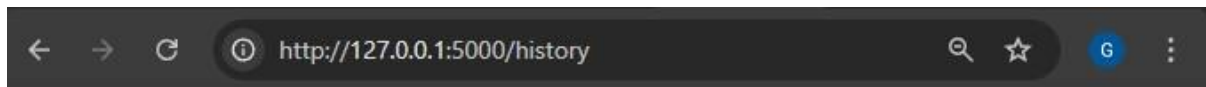
[View History](#)



Basic URL Shortener

Short URL:

[View History](#)



URL History

Original URL	Short URL
https://Google.com	http://127.0.0.1:5000/sTHBwE

[Go Back](#)