

# Problem Statement - URL Shortener Application

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## Scenario:

A company named "QuickShort" wants to develop a URL Shortener Application to provide users with the ability to shorten long URLs, track their usage, and manage them efficiently. Here's a breakdown of how the app will work:

## User Flow:

### Registration/Login:

- A user named John registers and logs in to the application.

### Shorten a URL:

- John pastes a URL (e.g., <https://www.example.com/very/long/url/that/is/hard/to/share>) into the app's input field.
- He clicks "Shorten," and the app generates a short URL (e.g., <https://quick.sh/abc123>).

### View Analytics:

- John shares the short URL with his audience.
- He checks the analytics and sees:
  - Total clicks: 150
  - Countries: USA (100), UK (30), India (20)
  - Devices: Mobile (120), Desktop (30)

### Manage URL:

- John edits the short URL alias to <https://quick.sh/mycampaign> for branding.
- He sets the URL to expire in 30 days.

#### 2. Guest Flow:

- A guest user pastes a long URL into the app.
- The app generates a short URL (e.g., <https://quick.sh/xyz789>), but the guest cannot view detailed analytics or manage URLs without an account.

## Functional Features

### 1. User Authentication and Authorization

- Registered users can log in to create, view, and manage their shortened URLs.
- Guest users can create a limited number of URLs without an account but cannot access additional features like analytics or URL management.

### 2. URL Shortening

- Users can input a long URL and generate a short, unique URL.
- Option to set custom aliases for short URLs.

### 3. Redirection

- Shortened URLs redirect to the original long URL when accessed.

### 4. Analytics Tracking

- Track the number of clicks for each short URL.
- Display click data, including:
  - Total clicks.
  - Date created.
  - Last accessed date.
  - Geographic location and device type.

### 5. URL Management

- Users can view a list of their shortened URLs.
- Options to edit, delete, or regenerate short URLs.
- Ability to set expiration dates for URLs.

### 6. Search and Filters

- Allow users to search for specific URLs or filter their list by date, click count, or status (e.g., active, expired).

## Sample Scenarios

#### 1. Shorten and Manage URLs:

- A user creates a shortened URL, checks its analytics after a week, and deletes it after it expires.

#### 2. Guest User Experience:

- A guest user shortens a URL, shares it with others, and uses it for a short-term event.

#### 3. Analytics Use Case:

- A user tracks click-through rates for a marketing campaign using the URL analytics dashboard.