Project Specification Document (PSD)

Project Title:

URL Shortener Microservice (Single-File Version)

Objective:

To build a backend microservice that allows users to shorten long URLs, redirect to them using custom shortcodes, and track their usage statistics. The service also supports authentication, logging, and expiry of URLs.

Technologies Used:

- Node.js

- Express.js

- MongoDB Atlas

- Mongoose

Single File: app.js

All logic is contained within app.js for simplicity.

Required NPM Modules:

- express

- mongoose

- dotenv (optional)

- nodemon (for development, optional)

Install with:

npm install express mongoose dotenv

Authentication:

- Bearer Token

- Header Required:

Authorization: Bearer 12345

Middleware:

- Logger Middleware: Logs every request with timestamp and method

- Auth Middleware: Validates bearer token from headers

MongoDB Schema:

```
{
  originalUrl: String,

  shortCode: { type: String, unique: true },

  createdAt: Date,

  expiresAt: Date,

  hitCount: Number
}
```

API Endpoints:

1. Create Short URL

POST /shorturls

Headers:

  - Authorization: Bearer 12345

  - Content-Type: application/json

Body:

```
{

  "url": "https://example.com",

  "validity": 60,

  "shortcode": "ex123"

}
```

Response:

```
{

  "shortlink": "http://localhost:3000/shorturls/go/ex123",

  "expiry": "2025-07-09T08:30:00.000Z"

}
```

2. Redirect to Original URL

GET /shorturls/go/:shortCode

Redirects to the original long URL

3. Get URL Statistics

GET /shorturls/:shortCode

Header: Authorization: Bearer 12345

Response:

```
{

  "originalUrl": "https://example.com",

  "createdAt": "2025-07-09T07:00:00.000Z",

  "expiresAt": "2025-07-09T08:30:00.000Z",

  "hitCount": 3

}
```

Example MongoDB Atlas URI:

```
const MONGO_URI =
"mongodb+srv://<username>:<password>@cluster0.mongodb.net/urlshortener?retryWrites=true&w
=majority"
```

Notes:

- Validity is in minutes.

- shortcode is optional (generated randomly if not given).

- Expired URLs return a 404 error.

- Authentication is required for creation and stats endpoints.

Testing Tool:

- Postman or Thunder Client

Sample Big URL:

https://www.example.com/products/electronics/mobile-phones/smartphones/samsung-galaxy-s24-ult
ra-5g-256gb?utm_source=google&utm_medium=cpc&utm_campaign=summer_sale_2025&utm_ter
m=samsung+galaxy+phones&utm_content=ad_copy_3&ref=affiliate123&session_id=gh67asf89gha
s768gha9sdf78asf

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