

Application Flow

Flow of Execution

1 User Request Handling

- User sends a cycle pricing request (single or bulk) via POST /cycle-pricing/calculate-multiple.
- The request contains cycle part selections along with a requestedDate.

2 Controller Processing (CyclePricingController)

- Validates request data.
- If bulk request, transfer processing to the CyclePricingExecutor.
- Calls PricingService for pricing calculation.

3 Multithreading (CyclePricingExecutor)

- Creates a thread pool (Executor Service)
- Each request is handled by a separate thread using CyclePricingTask.
- Fetches part prices from the MySQL database.

4 Pricing Calculation (PricingService)

- Retrieves prices from the database based on requestedDate.
- Calculates total cost and generates a breakdown (frame, wheels, handlebar, etc.).

5 Response Generation (CyclePricingResponse)

- Creates a JSON response with total price and price breakdown.
- Sends the response back to the user.

Technologies Used

Spring Boot - Backend framework

Spring Data JPA - Database handling

MySQL - Stores price history

Lombok - Reduces boilerplate code

ExecutorService - Manages multithreading

[Flow Diagram of Project](#)

Features

1. Inventory Management

- **Brand Management:**
 - Add, update, and remove bicycle brands
 - Categorize items based on brands
 - Track brand activity status
- **Item Management:**
 - Full CRUD (Create, Read, Update, Delete) functionality
 - Price management with validity periods
 - Real-time search capability
 - Pagination for efficient data handling
 - Brand-based item classification
 - Bulk item operations
 - Price history tracking

2. Cycle Configuration

- **Component Selection:**
 - Brand Selection
 - Frame Material
 - Handlebar Type
 - Seating Options
 - Wheel Types
 - Brake Systems
 - Tyre Options
 - Chain Assembly

3. Price Estimation

- Real-time price calculation
- Component-wise price breakdown
- GST calculation (18%)
- Final price computation
- Save estimates for future reference
- Price validity tracking

4. User Management

- Role-based access control (Admin, Manager, User)
- User registration system
- Secure login functionality
- Saved estimates history
- User profile management

5. Responsive Design

- Mobile-friendly interface

- Responsive navigation
- Adaptive layout for all screen sizes
- Interactive UI elements