FairFree Backend – Developer Specifications

1. Technology Stack

- Language: Java 17
- Framework: Spring Boot
- Security: Spring Security + JWT
- Persistence: Spring Data JPA (Hibernate)
- Database: Relational DB (PostgreSQL or compatible)
- Object Storage: AWS S3
- Email: SMTP (JavaMailSender)
- Build Tool: Maven

2. Architecture

The backend follows a layered architecture:
- Controller layer: REST API endpoints
- Service layer: business logic
- Repository layer: database access
- Security layer: JWT-based authentication
- Background jobs: scheduled tasks

3. Authentication & Security

Authentication is based on JWT tokens.

Key components:
- AuthController: handles user registration and login
- JwtService: issues and validates JWT tokens
- JwtAuthenticationFilter: validates JWT on incoming requests
- UserDetailsServiceImpl: loads user details for Spring Security

4. User Management

Users are registered with email and password.
Passwords are hashed using BCrypt.
Each user is assigned a default ROLE_USER.

Endpoints:
- GET /api/v1/users/me
- GET /api/v1/users/{id}

5. Item Management

Items represent resources shared on the platform.

Features:

- Create item with images
- Claim item
- Approve / decline claim (by owner)
- Cancel claim (by claimer)
- Automatic expiration handling

Images are uploaded to AWS S3 via FileService.

6. Feed
The feed provides item listings for users.

Supported views:
- for_you
- following

Feed logic is implemented via FeedService and FeedRepository.
Social interactions (likes, comments, shares) are NOT implemented.

7. Notifications
Notifications are generated for:
- Item claim events
- Item expiration reminders

Notifications are:
- Stored in database
- Sent via email (SMTP)

Push notifications and SMS are NOT implemented.

8. Background Jobs
BackgroundWorker is a scheduled component.

Responsibilities:
- Periodically check for expiring items
- Mark items as expired
- Send reminder notifications to item owners

9. Persistence Layer
Spring Data JPA repositories are used:
- UserRepository
- RoleRepository
- ItemRepository
- ImageItemRepository
- ClaimRepository

- FeedRepository
- NotificationRepository

All repositories connect to a single relational database.

10. Non-Implemented / Out-of-Scope Features
- Chat / Messaging
- WebSocket / Realtime
- Search service
- Admin dashboard
- Analytics
- OAuth social login
- Push notifications
- SMS notifications
- Follow / Like / Comment features

11. Summary
This DevSpecs reflects the real, production-ready scope of the FairFree backend. It prioritizes core functionality and can serve as the baseline for future extensions.