Backend-Focused Learning Roadmap (Spring Boot)

Step 1: Role-Based Access Control (RBAC)

Learn Spring Security basics, method-level authorization, and secure controllers/services.
- Add roles: ADMIN, USER, MANAGER

- Restrict access to endpoints based on role

- Use @PreAuthorize, @Secured, or SecurityConfig

Step 2: Task Assignment Between Users

Learn JPA relationships, complex domain modeling, and handling current logged-in user.
- One user can assign a task to another user

- A user can view only their tasks

- Admin can view all tasks

Step 3: REST API for Task Management

Expose backend logic via API, use DTOs, and handle JSON.
- REST endpoints for tasks: create, update, delete, assign

- Use DTOs to avoid exposing entities directly

- Exception handling with @ControllerAdvice

Step 4: Scheduled Email Reminders

Learn Spring Scheduler, JavaMailSender, and cron expressions.
- Daily job to check tasks due in 24h

- Send email reminders with Thymeleaf templates

Step 5: Export Reports (PDF / CSV)

Practice generating files server-side.
- Export tasks as PDF or CSV

- Filters for completed tasks

Step 6: Advanced Filtering & Search API

Learn Spring Data JPA custom queries and pagination.
- Filter tasks by status, due date, priority, assignee

- Add pagination and sorting to REST API

Step 7: Soft Deletes (Logical Deletion)

Avoid actual deletion in database; mark tasks deleted instead.
- Add deleted boolean flag to tasks

- Filter out deleted tasks in queries

Step 8: Integration & Unit Testing

Learn to test backend services and controllers.
- Unit tests for services

- Integration tests with MockMvc

- Database tests with H2

Step 9 (Optional): REST Authentication with JWT

Learn stateless authentication used in APIs and microservices.
- Replace session login with JWT

- Protect endpoints using tokens

Step 10 (Optional): Microservice Split

Learn to decouple services and build scalable architecture.
- Split into User Service & Task Service

- Communicate via REST or RabbitMQ

Summary Roadmap Chart

Step	Feature	Main Concepts
1	RBAC	Spring Security, Authorization
2	Task Assignment	JPA Relationships, Authenticated User
3	REST API	Controllers, DTOs, REST Best Practices
4	Email Reminders	Spring Scheduler, Email Integration
5	Export Reports	File generation (PDF/CSV)
6	Filtering/Search	JPA Queries, Pagination
7	Soft Delete	Entity filtering, Logical deletion
8	Testing	Unit, Integration Testing
9	JWT Auth (optional)	Stateless security
10	Microservices (optional)	Modularization, Service communication