Software Engineering: Agile Methodology & Full-Stack Development

Guided Project (Scrum)

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1 Introduction

This project is designed to teach professional software development through the **Agile Scrum** methodology. Unlike traditional waterfall development, we will build the application in incremental **Sprints**.

Module Objective

Master the end-to-end development of a web application using Spring Boot (Backend), React (Frontend), and Docker, while respecting Scrum rituals and deliverables.

2 The Scrum Framework

Every team will act as a Scrum Team. The following rituals are mandatory:

- **Product Backlog:** List of all desired features (User Stories).
- **Sprint Planning:** Defining which stories to implement in the next 2 weeks.
- **Sprint Review:** Demonstration of the "Increment" (Working Code).
- **Definition of Done (DoD):** Code compiled, tested, and pushed.

3 Technology Stack

Tech Stack

- **Backend:** Spring Boot (Java), Spring Data JPA, Maven.
- **Frontend:** React.js (Vite), Axios, Vanilla CSS/Tailwind.
- **Persistence:** H2 (Dev) / PostgreSQL (Prod) via Docker.
- **Tooling:** Git, Docker Compose, Postman/Insomnia.

4 7-Week Sprint Roadmap

4.1 Sprint 0: Initialization (Week 1)

- ☐ Environment setup (JDK 17+, Node.js v18+, Docker).
- ☐ Writing the initial Product Backlog.
- ☐ *Tutorial:* `tutos/setup_se.pdf`

4.2 Sprint 1: Core Backend (Weeks 2-3)

- ☐ Spring Boot project initialization.
- ☐ Entities, Repositories, and REST Controllers.
- ☐ *Tutorial:* `tutos/spring_boot_essentials.pdf`

4.3 Sprint 2: Core Frontend (Weeks 4-5)

- ☐ React initialization with Vite.
- ☐ Integration of Axios for API calls.
- ☐ *Tutorial:* `tutos/react_spring_integration.pdf`

4.4 Sprint 3: Persistence & Polish (Weeks 6-7)

- ☐ Database containerization with Docker.
- ☐ Final testing and UI/UX enhancements.
- ☐ *Tutorial:* `tutos/deployment_docker_se.pdf`

5 Evaluation

1. **Agile Rigor (25%):** Maintenance of the Backlog and Story status.
2. **Technical Quality (50%):** Code architecture, Clean Code, and Database design.
3. **Final Increment (25%):** Working prototype and professional demonstration.