

NOVA PROJECT

Complete Project Specification

Intelligent Study-Coaching Platform

Symfony 6.4 + JavaFX Development Guide

Team Size: 6 Developers

Project Overview

This document provides the complete specification for the NOVA intelligent study-coaching platform with integrated gamification, library management, AI features, and social learning capabilities.

Module Development Order

1. Module 1: Users, Roles & Authentication (Foundation)
2. Module 2: Gamification & Rewards (Games, XP, Tokens)
3. Module 3: Library Management (Books & Loans)
4. Module 4: Study Sessions & Energy Management (includes Courses & Enrollment)
5. Module 5: Quiz System (Questions & Choices)
6. Module 6: Social Features (Posts & Comments)

Module 1: Users, Roles & Authentication

Assigned to: Oussama

Priority: CRITICAL - Foundation Module

Entity 1: User

Field	Details
id	Primary Key, auto-increment
email	Unique, required, string
password	Hashed, required, string
username	Unique, required, string
role	ENUM: STUDENT, TUTOR, ADMIN
isActive	Boolean, default: true

createdAt	Timestamp
updatedAt	Timestamp

Entity 2: StudentProfile

Field	Details
id	Primary Key, auto-increment
userId	Foreign Key → User, unique
firstName	String, required
lastName	String, required
bio	Text, nullable
university	String, nullable
major	String, nullable
academicLevel	ENUM: BACHELOR, MASTER, PHD
profilePicture	String (URL), nullable
interests	JSON array

Entity 3: TutorProfile

Field	Details
id	Primary Key, auto-increment
userId	Foreign Key → User, unique
firstName	String, required
lastName	String, required
bio	Text, nullable
expertise	JSON array
qualifications	Text, nullable
yearsOfExperience	Integer
hourlyRate	Decimal, nullable
isAvailable	Boolean, default: true

profilePicture	String (URL), nullable
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Module 2: Gamification & Rewards

Assigned to: Nouha

Priority: HIGH - Core motivation system

Entity 1: Game

Field	Details
id	Primary Key, auto-increment
name	String, required, unique
description	Text, required
type	ENUM: PUZZLE, MEMORY, TRIVIA, ARCADE
difficulty	ENUM: EASY, MEDIUM, HARD
tokenCost	Integer, default: 0 (free games)
rewardTokens	Integer - tokens earned on completion
rewardXP	Integer - XP earned on completion
isActive	Boolean, default: true
createdBy	Foreign Key → User (admin)
createdAt	Timestamp

Entity 2: Reward

Field	Details
id	Primary Key, auto-increment
name	String, required
description	Text
type	ENUM: BADGE, ACHIEVEMENT, BONUS_XP, BONUS_TOKENS
value	Integer - XP or token value
requirement	Text - condition to unlock
icon	String (URL), nullable

isActive	Boolean, default: true
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Module 3: Library Management

Assigned to: Wassim

Priority: MEDIUM - Resource management

Entity 1: Book

Field	Details
id	Primary Key, auto-increment
title	String, required
author	String, required
isbn	String, unique, nullable
publisher	String, nullable
publishedYear	Integer
category	ENUM: TEXTBOOK, REFERENCE, FICTION, NON_FICTION
description	Text, nullable
coverImage	String (URL), nullable
pdfUrl	String (URL), nullable
totalCopies	Integer, default: 1
availableCopies	Integer, default: 1
isActive	Boolean, default: true

Entity 2: Loan

Field	Details
id	Primary Key, auto-increment
bookId	Foreign Key → Book
userId	Foreign Key → User
loanDate	Date, required
dueDate	Date, required

returnDate	Date, nullable
status	ENUM: ACTIVE, RETURNED, OVERDUE
lateFee	Decimal, default: 0.00
notes	Text, nullable

Module 4: Study Sessions & Energy Management

Assigned to: Acil

Priority: HIGH - Study tracking and course management

Note: This module includes Courses & Enrollment as part of study sessions

Part A: Courses & Enrollment

Entity 1: PersonalCourse

Field	Details
id	Primary Key, auto-increment
userId	Foreign Key → User
courseName	String, required
description	Text
difficulty	ENUM: BEGINNER, INTERMEDIATE, ADVANCED
estimatedDuration	Integer (hours)
progress	Integer (percentage 0-100)
status	ENUM: NOT_STARTED, IN_PROGRESS, COMPLETED
createdAt	Timestamp

Entity 2: TutorCourse

Field	Details
id	Primary Key, auto-increment
tutorId	Foreign Key → User
title	String, required
description	Text

difficulty	ENUM: BEGINNER, INTERMEDIATE, ADVANCED
category	String (Math, Science, Programming, etc.)
duration	Integer (hours)
maxStudents	Integer, nullable
isPublished	Boolean, default: false
createdAt	Timestamp

Entity 3: Enrollment

Field	Details
id	Primary Key, auto-increment
studentId	Foreign Key → User
tutorCourseId	Foreign Key → TutorCourse
status	ENUM: PENDING, APPROVED, REJECTED, ACTIVE, COMPLETED
progress	Integer (percentage 0-100)
enrolledAt	Timestamp
completedAt	Timestamp, nullable
constraints	Unique: studentId + tutorCourseId

Part B: Study Sessions & Energy

Entity 4: StudySession

Field	Details
id	Primary Key, auto-increment
userId	Foreign Key → User
personalCourseId	Foreign Key → PersonalCourse, nullable
duration	Integer (minutes)
energyConsumed	Integer
xpEarned	Integer

tokensEarned	Integer
focusQuality	ENUM: LOW, MEDIUM, HIGH
notes	Text, nullable
startedAt	Timestamp
completedAt	Timestamp

Entity 5: EnergyState

Field	Details
id	Primary Key, auto-increment
userId	Foreign Key → User, unique
currentEnergy	Integer (0-100)
maxEnergy	Integer, default: 100
fatigueLevel	Integer (0-100)
burnoutRisk	ENUM: LOW, MODERATE, HIGH, CRITICAL
lastRegeneration	Timestamp
updatedAt	Timestamp

Entity 6: StudyPlan

Field	Details
id	Primary Key, auto-increment
userId	Foreign Key → User
personalCourseId	Foreign Key → PersonalCourse, nullable
title	String
scheduledDate	Date
scheduledTime	Time
plannedDuration	Integer (minutes)
status	ENUM: SCHEDULED, COMPLETED, MISSED, CANCELLED
reminder	Boolean, default: false

createdAt	Timestamp
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Module 5: Quiz System

Assigned to: Said

Priority: MEDIUM - Assessment and evaluation

Entity 1: Question

Field	Details
id	Primary Key, auto-increment
courseld	Foreign Key → TutorCourse, nullable
questionText	Text, required
questionType	ENUM: MULTIPLE_CHOICE, TRUE_FALSE, SHORT_ANSWER
points	Integer, default: 1
difficulty	ENUM: EASY, MEDIUM, HARD
explanation	Text, nullable - explanation of correct answer
imageUrl	String (URL), nullable
createdBy	Foreign Key → User (tutor)
createdAt	Timestamp

Entity 2: Choice

Field	Details
id	Primary Key, auto-increment
questionId	Foreign Key → Question
choiceText	Text, required
isCorrect	Boolean, default: false
orderIndex	Integer - display order
imageUrl	String (URL), nullable

Module 6: Social Features

Assigned to: Oumayma

Priority: MEDIUM - Community engagement

Entity 1: Post

Field	Details
id	Primary Key, auto-increment
userId	Foreign Key → User
title	String, required
content	Text, required
category	ENUM: DISCUSSION, QUESTION, ANNOUNCEMENT, RESOURCE
tags	JSON array, nullable
views	Integer, default: 0
upvotes	Integer, default: 0
isPinned	Boolean, default: false
isLocked	Boolean, default: false
createdAt	Timestamp
updatedAt	Timestamp

Entity 2: Comment

Field	Details
id	Primary Key, auto-increment
postId	Foreign Key → Post
userId	Foreign Key → User
content	Text, required
parentCommentId	Foreign Key → Comment (nested replies), nullable
upvotes	Integer, default: 0
isEdited	Boolean, default: false
createdAt	Timestamp

updatedAt	Timestamp
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Workload Distribution Summary

Developer	Module	Entities	Main Tables
Oussama	Users & Auth	3 CRUDs	User, StudentProfile, TutorProfile
Nouha	Gamification	2 CRUDs	Game, Reward
Wassim	Library	2 CRUDs	Book, Loan
Acil	Study Sessions & Energy (includes Courses)	6 CRUDs	PersonalCourse, TutorCourse, Enrollment, StudySession, EnergyState, StudyPlan
Said	Quiz System	2 CRUDs	Question, Choice
Oumayma	Social Features	2 CRUDs	Post, Comment

END OF PROJECT SPECIFICATION