Software Requirements Specification (SRS)

Project: Peer-to-Peer Tutoring Scheduler
Version: 1.0
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1. Introduction

1.1 Purpose

This document defines the Software Requirements Specification (SRS) for the **Peer-to-Peer Tutoring Scheduler**.
The system enables students to offer tutoring slots and peers to book one-on-one sessions.
This SRS outlines functional and non-functional requirements, interfaces, security considerations, and verification criteria.

1.2 Scope

The system provides a **calendar-based booking platform** where tutors can create slots and students can reserve them.
It includes:

- Slot creation and management
- Real-time conflict resolution
- Email reminders and notifications
- Admin dashboard for oversight

Excludes: external video-conferencing platform integration (though links may be shared).

1.3 Audience

- **Students:** End users booking tutoring sessions
- **Tutors:** Students offering time slots
- **Administrators:** Monitor and manage system use
- **Developers/QA:** Build, test, and maintain system

1.4 Definitions

- **Slot:** Predefined tutoring time interval.
- **Booking Conflict:** Occurs when multiple students request the same slot.
- **Reminder Job:** Automated background task sending notifications.

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2. Overall Description

2.1 Product Perspective

The scheduler is a **web-based application** with a calendar UI, backend scheduling engine, and email integration.

2.2 Major Product Functions

- User login & profile management
- Tutor slot creation/editing
- Calendar browsing and booking
- Conflict resolution
- Automated reminders & cancellation notifications
- Admin usage reporting

2.3 User Roles and Characteristics

- **Student:** Books sessions; basic web skills
- **Tutor:** Creates slots; moderate technical ability
- **Admin:** Oversees operations; requires dashboard and logs

2.4 Operating Environment

- Supported Browsers: Chrome, Firefox, Edge
- Backend: Node.js / Python / Java
- Database: MySQL / PostgreSQL
- Email Service: SMTP/SendGrid

2.5 Constraints

- Requires stable internet connection
- Relies on external email delivery services
- Must support 1000+ concurrent users

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3. External Interface Requirements

3.1 User Interfaces

- **Calendar UI** (month/week/day view)
- **Mobile-friendly responsive design**
- **Accessibility support** (high contrast, keyboard navigation)

3.2 Hardware Interfaces

- None (cloud-based system)

3.3 Software Interfaces

- Database for slot storage
- Email API for reminders
- OAuth2/SSO for login

3.4 Communications

- REST APIs over **HTTPS (TLS 1.2+)**
- Email notifications via SMTP

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4. System Features (Functional Requirements)

REQ ID	REQUIREMENT	CATEGORY	PRIORITY	Acceptance criteria / Measurement
P2P-F-001	Tutors can create and edit tutoring slots	Functional	High	Slots saved and displayed in calendar
P2P-F-002	Display available slots in calendar UI	Functional	High	Calendar shows tutor availability
P2P-F-003	Prevent double-booking of slots	Functional	High	System rejects overlapping bookings
P2P-F-004	Send email confirmation on booking	Functional	High	Student receives email within 1 min
P2P-F-005	Allow students to cancel bookings	Functional	Medium	Canceled slot becomes available again

P2P-F-006	Notify tutors of new bookings	Functional	High	Tutor receives email notification
P2P-F-007	Support recurring slots	Functional	Medium	Tutor can define weekly slots
P2P-F-008	Allow search by tutor/subject/time	Functional	Medium	Results match search filters
P2P-F-009	Enforce booking limits per student	Functional	Medium	Student cannot exceed limit
P2P-F-010	Tutors can view/export schedules	Functional	Medium	Export file generated correctly
P2P-F-011	Maintain booking history	Functional	High	Past bookings accessible
P2P-F-012	Auto-cancel expired/unused slots	Functional	Medium	Expired slots removed automatically
P2P-F-013	Provide conflict resolution mechanism	Functional	High	Admin resolves conflicts successfully
P2P-F-014	Admin manages users and slots	Functional	High	Admin CRUD operations work

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5. Non-Functional Requirements

5.1 NFRs (at least 5)

REQ ID	REQUIREMENT	CATEGORY	PRIORITY	Acceptance criteria / Measurement
P2P-NF-001	Response time ≤ 3s for 95% requests	Performance	High	Measured load test results
P2P-NF-002	System availability ≥ 99.5% per semester	Reliability	High	Uptime monitoring reports

P2P-NF-003	Support 1000 concurrent users	Scalability	High	Load testing with 1000 users
P2P-NF-004	Encrypt sensitive data with TLS 1.2+	Security	High	Security audit compliance
P2P-NF-005	Accessibility (WCAG 2.1 AA compliance)	Usability	Medium	Accessibility audit results

5.2 Security

5.2.1 Security Objectives

Objective ID	Security Objective
SO-1	Ensure confidentiality of student/tutor data.
SO-2	Prevent unauthorized access to booking system.

5.2.2 Security Requirements

Req ID	Requirement (shall...)	Type	Priority	Acceptance Criteria / Test Case Ref
P2P-SR001	All communication shall use TLS 1.2+ encryption.	Security	High	Verified via penetration testing.
P2P-SR002	The system shall require authentication for booking/slot creation.	Security	High	Unauthorized access rejected.
P2P-SR003	The system shall log all booking and cancellation activities.	Security	High	Audit logs available for admin.
P2P-SR004	The system shall enforce role-based access control (student/tutor/admin).	Security	High	Access permissions verified.
P2P-SR005	The system shall store passwords securely (hashed & salted).	Security	Medium	Password audit shows secure storage.

6. Quality Attributes & Acceptance Tests

- All high-priority FRs and NFRs tested and passed.
- Load testing must validate 1000 concurrent users.
- Emails delivered within 5 minutes.
- Accessibility audit passed (WCAG 2.1 AA).

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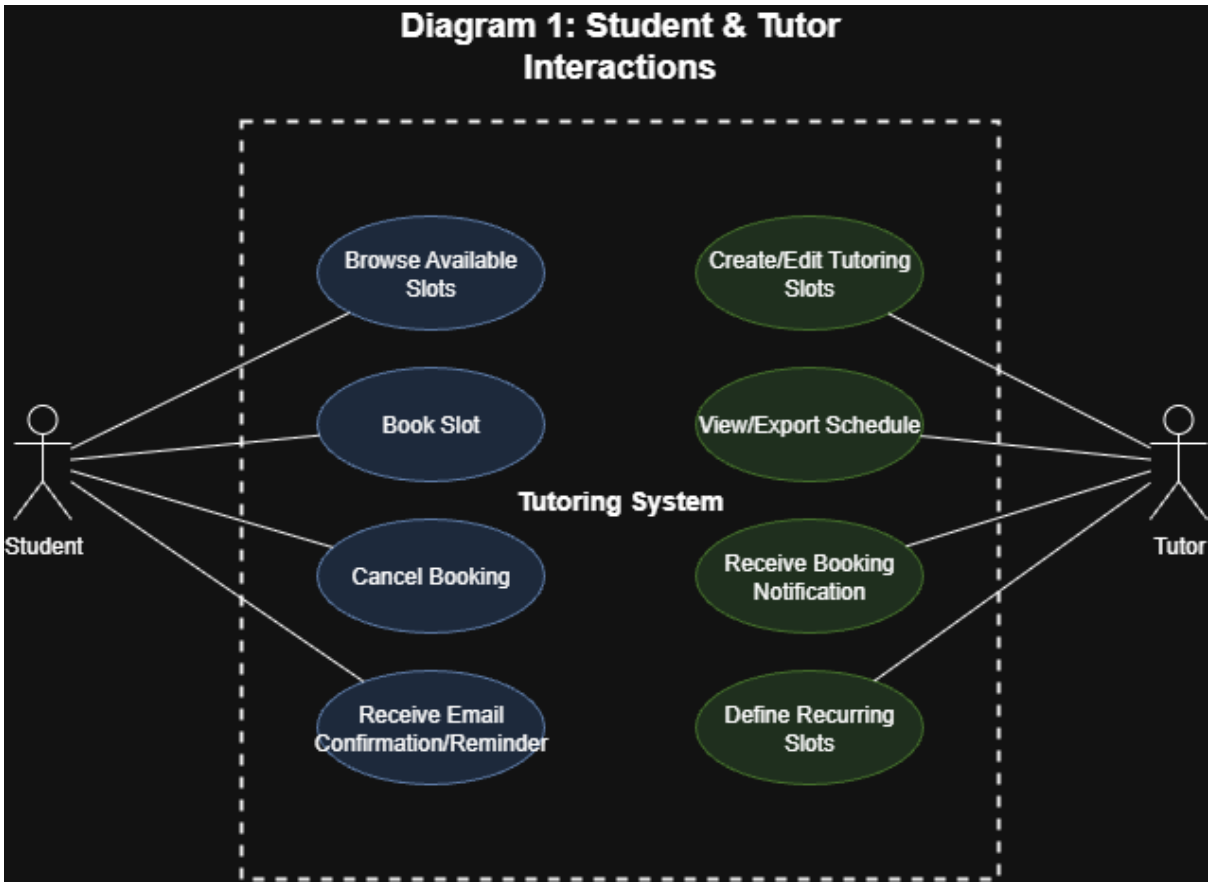
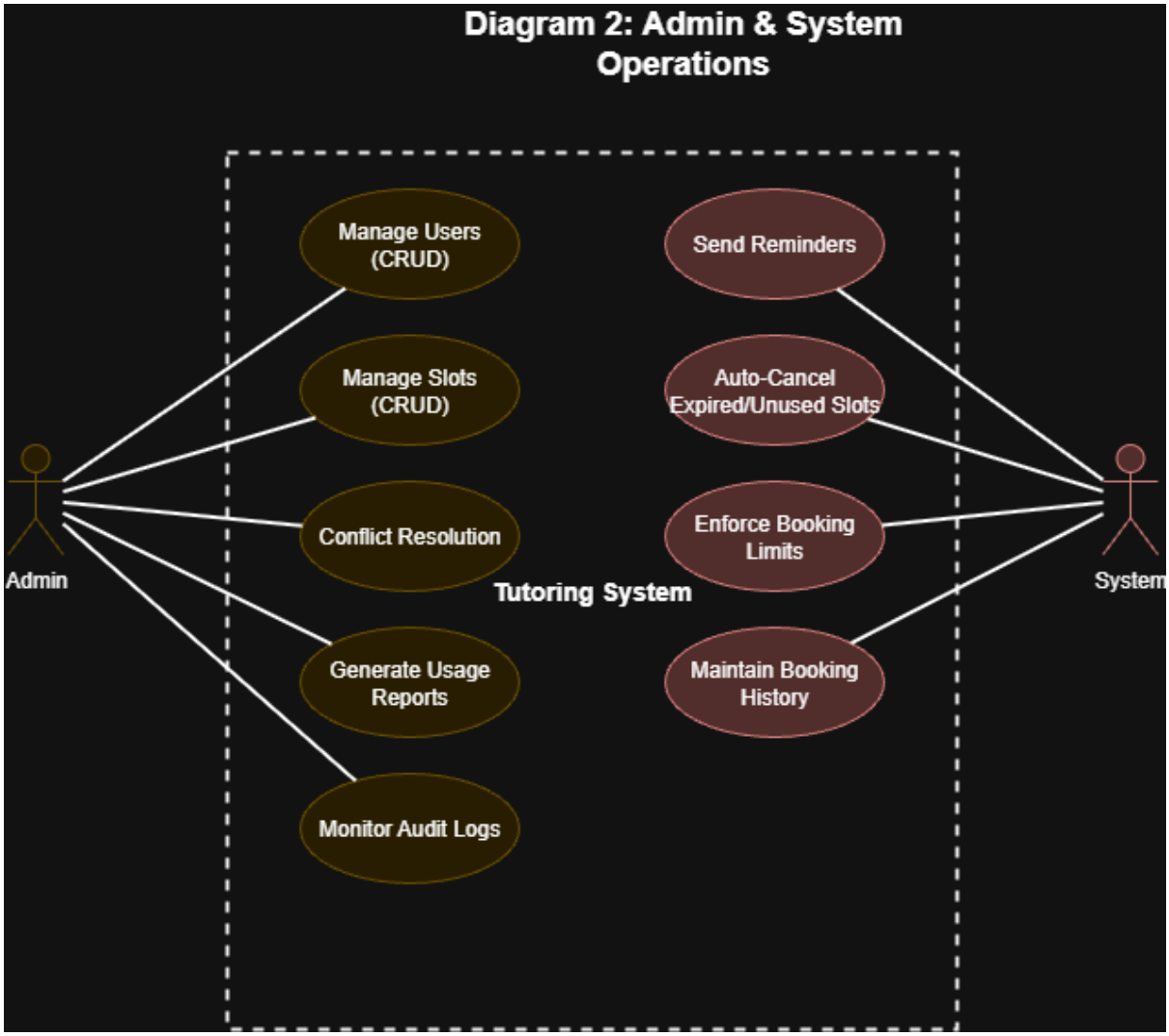
7. UML Use-Case Diagram





Req ID	Requirement Short	Section Ref	Module	Test Case(s)	Status
P2P-F001	Slot Creation	4.1	SlotManager	TC-SLOT-01	N
P2P-F003	Double-booking prevention	4.1	BookingEngine	TC-BOOK-02	N
P2P-NF001	Response Time	5	Performance Test	TC-PERF-01	N
P2P-SR002	Authentication	5.2	AuthModule	TC-SEC-01	N