SOFTWARE REQUIREMENTS SPECIFICATION(SRS)

This is a web based online examination system

SYSTEM OVERVIEW

The system allows:

- Lecturers to create and manage exams
- Students to take exams online
- Automatic grading and result generation
- Identity verification before taking exams using facial recognition
- AI-based proctoring to monitor exams and prevent cheating

TYPES OF USERS

Administrator:

Controls the entire system

The administrator can:

- Create and manage user accounts
- Monitor exam sessions
- View reports and logs
- Manage system settings

Lecturer:

The lecturer sets and manages exams

The lecturer can:

- Create and manage questions
- Schedule exams
- Set exam duration
- View student results
- View proctoring reports

Student:

The student takes the examination

The student can:

- Register and log in
- Verify identity using facial recognition before exams
- Take exams

- View exam results

Registration and Login:
- Users must register with valid details, username and password
- Unauthorized users must not access the system

FACIAL RECOGNITION AUTHENTICATION:
- Students must capture facial image during registration
- Facial data must be stored securely
- Before an exam starts, the system must compare live face with stored face
- If verification fails, exam access must be denied
- The facial recogition is done after the student enters their details and also before the exam.

AI PROCTORING SYSTEM:
The AI model used for this is the CNN Machine learning Model
- Monitor the student's face during exam
- Detect if the student leaves the camera view
- Detect multiple faces on screen
- Detect suspicious head movements or frequent looking away
- Detect camera tampering or webcam disconnection
- Record timestamps of suspicious activities

AI proctoring rules
When to warn, when to flag, when to stop exam
First suspicious activity → Warning
Repeated activity → Flag exam
Extreme activity (multiple faces, camera off for long time) → Auto-submit or lock exam

If suspicious behavior is detected:
- The system must log the activity
- The system may warn the student
- The exam may be flagged for review by the lecturer

Examination Setup
Lecturers must create exams
Exams must include:

- Subject
- Duration
- Total marks
- Exams must be scheduled for a specific time
- Support for objective and short-answer questions

Question Management
- Lecturers must add, edit, and delete questions
- Questions must support multiple-choice format
- Questions must be randomized for each student

Exam Taking Process
- Students must only access exams assigned to them
- Facial recognition must be taken before the exam
- Exams must start only at the scheduled time
- A timer must display remaining exam time
- AI proctoring must run throughout the exam
- Answers must be auto-submitted when time ends

Grading and Results
- Objective questions must be graded automatically
- Results must be calculated instantly
- Results must be stored securely
- Students must view their results after submission
- Lecturers must view all student results

Reports and Logs
The system must generate:
- Exam result reports
- Student performance reports
- AI proctoring logs
- Lecturers must review flagged exam sessions

Tab Lock Feature:
The system shall prevent students from opening other tabs or leaving the exam page. Each attempt triggers a warning; after multiple attempts, the exam is automatically submitted and flagged for review.

Results Analytics:
The system shall display detailed exam analytics including time taken, number of questions passed and failed, individual score, and the average performance of all students. Results shall be shown in a clear breakdown and visualized using charts.

Results Analytics & Performance Reporting

- Individual student result breakdown
- Time taken to complete exam
- Number of questions attempted
- Number of questions passed
- Number of questions failed
- Overall student score
- Class average performance
- Performance comparison across students
- Topic-based performance analysis
- Question difficulty analysis
- Graphical representation of results (charts/graphs)
- Lecturer access to performance reports

Automated Grading & Result Processing

Automatic grading of objective questions
Score calculation
Instant result generation
Secure storage of results
Manual grading support for short answers (if required)

Database & Data Management

- Centralized relational database
- Secure storage of:
- User data
- Facial data

- Exam questions
- Exam results
- Activity logs

Software Requirements
Frontend, React.js
Backend server (Node.js)
Database (MySQL)
AI libraries (OpenCV, Face Recognition, Convolutional Neural Network(CNN), Machine Learning Model)