Full Stack Development with MERN - Project Documentation

1. Introduction

Project Title: EduTutorAI - Personalized Learning with Generative AI and LMS Integration

Team Members:

- Mohan Rao Majji - Full Stack Developer / Project Lead

- [Add other team members and roles if applicable]

2. Project Overview

Purpose:

EduTutorAI aims to simplify the task of quiz creation for educators by using a generative AI backend. The application provides a minimalist interface for educators to generate subject- and grade-specific quizzes within seconds.

Features:

- AI-generated multiple-choice quizzes

- Responsive single-page UI

- Serverless backend using LLM

- Topic- and grade-specific customization

- Instant answer key generation

3. Architecture

Frontend:

- Built using React and Next.js

- Stateless components, form-based input

- Axios for API calls, Tailwind CSS for styling

Backend:

- Node.js with Express.js logic embedded in Vercel Serverless Functions

- Handles routing and request validation

Database:

- Currently operates without persistent storage

- Future support for MongoDB

4. Setup Instructions

Prerequisites:

- Node.js (v18+), npm/yarn, MongoDB (optional)

Installation:

git   clone

https://github.com/majji2005/-EduTutor-AI-Personalized-Learning-with-Generative-AI-and-LMS-Integ

ration-

cd edututorai-clone

cd client

npm install

cd ../server

npm install

Set environment variables in .env:

OPENAI_API_KEY=your_api_key_here

MONGODB_URI=your_mongo_connection_string (optional)

5. Folder Structure

Client:

- /components - Form and quiz components

- /pages - Main index page with form

- /styles - Tailwind and custom CSS

Server:

- /api/generate - Serverless function for quiz generation

- /utils - AI integration logic

6. Running the Application

Frontend: cd client && npm start

Backend: cd server && npm start (if applicable)

7. API Documentation

POST /api/generate

Request Body:

{ "topic": "Photosynthesis", "grade": "8th", "numQuestions": 5 }

Response:

{ "questions": [{ "question": "...", "options": [...], "answer": "..." }] }

8. Authentication

Current: Not implemented

Planned: JWT, role-based access, session persistence

9. User Interface

- Clean, responsive interface with form input

- AI-generated quiz display

10. Testing

Manual Testing

Planned Tools: Jest, React Testing Library, Postman

11. Screenshots or Demo

Demo: https://v0-edututuorai-clone.vercel.app/

Screenshots to be inserted

12. Known Issues

- Occasional AI inconsistency

- No save/edit functionality

- No multilingual support

13. Future Enhancements

- User auth & dashboard

- Export as PDF/DOCX

- More question types

- Translation features

- Save to DB

End of Document