Edututor ai-Technology stack

Date: 26 June 2025
Team ID: LTVIP2025TMID34185

Project Name: Edututor ai
Maximum Marks: 4 Marks

Technical Architecture Components

S.No	Component	Description	Technology
1	User Interface	Web dashboard and student portal	React.js, Gradio (optional prototyping)
2	LMS Integration	Sync with Google Classroom	Google Classroom API
3	AI Models	Quiz generation, adaptation, evaluation	IBM Watsonx, IBM Granite LLM
4	Diagnostic Engine	Entry-level test generation for learner baseline	IBM Watsonx
5	Vector Search Engine	Embedding-based topic insights	Pinecone DB
6	Backend Logic	Quiz delivery, scoring, analytics	Python (Flask/FastAPI)
7	Database	Store quizzes, student scores, content metadata	PostgreSQL or MongoDB
8	Real-Time Feedback	Immediate scoring and suggestions	Flask + Socket.IO or Firebase RTDB
9	Authentication	User access and roles	OAuth 2.0 (Google), Firebase Auth (alt)
10	Analytics Dashboard	Performance tracking for teachers	Chart.js/D3.js + React.js

S.No	Component	Description	Technology
11	Infrastructure	Modular, scalable deployment	Docker, Kubernetes on IBM Cloud or GCP

⚙ **Application Characteristics**

S.No	Characteristic	Description	Technology
1	Modular Architecture	Independent modules for AI, LMS, dashboard	Microservices, REST APIs
2	Scalability	Handles high traffic during peak student logins	Kubernetes + Load Balancer
3	Real-Time Capabilities	Push feedback and updates instantly	WebSockets / Firebase RTDB
4	Personalization Engine	Adaptive learning based on quiz history	AI-driven logic from IBM Watsonx
5	Performance Monitoring	Uptime and usage analytics	Prometheus + Grafana (opt)
6	Security & Privacy	Role-based access, encrypted data	JWT, TLS, AES-256