JSPM's
Rajarshi Shahu College of Engineering, Tathawade, Pune
(An Empower Autonomous Institute under Savitribai Phule Pune University)

# Department of Computer Science and Business Systems
# Artificial Intelligence Mini Project
# AY-2025-26

**Title of Project:** AI Quiz Generator (Frontend + Gemini API Integration)

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# Introduction

**Objective of the Project:**

- To automate quiz generation using AI (Gemini API).
- To build a responsive frontend for interactive quiz display.
- To validate user inputs and handle API responses efficiently.
- To integrate a backend API that generates topic-based MCQs in real time.

**Scope:**

- The system can be used by teachers, students, and e-learning platforms to generate instant quizzes on any topic and difficulty level.
- It demonstrates effective **frontend-backend-AI integration**, emphasizing clean UI and real-time content generation.

**Mapping With SDG Goal: SDG 4 – Quality Education**

- Enhances learning accessibility and personalization by enabling quick, AI-generated practice quizzes for learners.

**Key Features:**

- Form inputs: topic, difficulty, number of questions.
- API call to /generate-quiz (POST method).
- Dynamic quiz rendering with A/B/C/D options.
- Real-time answer feedback (green = correct, red = incorrect).

# Algorithm Used

**Chosen Algorithm:** Gemini API (Generative AI Model)

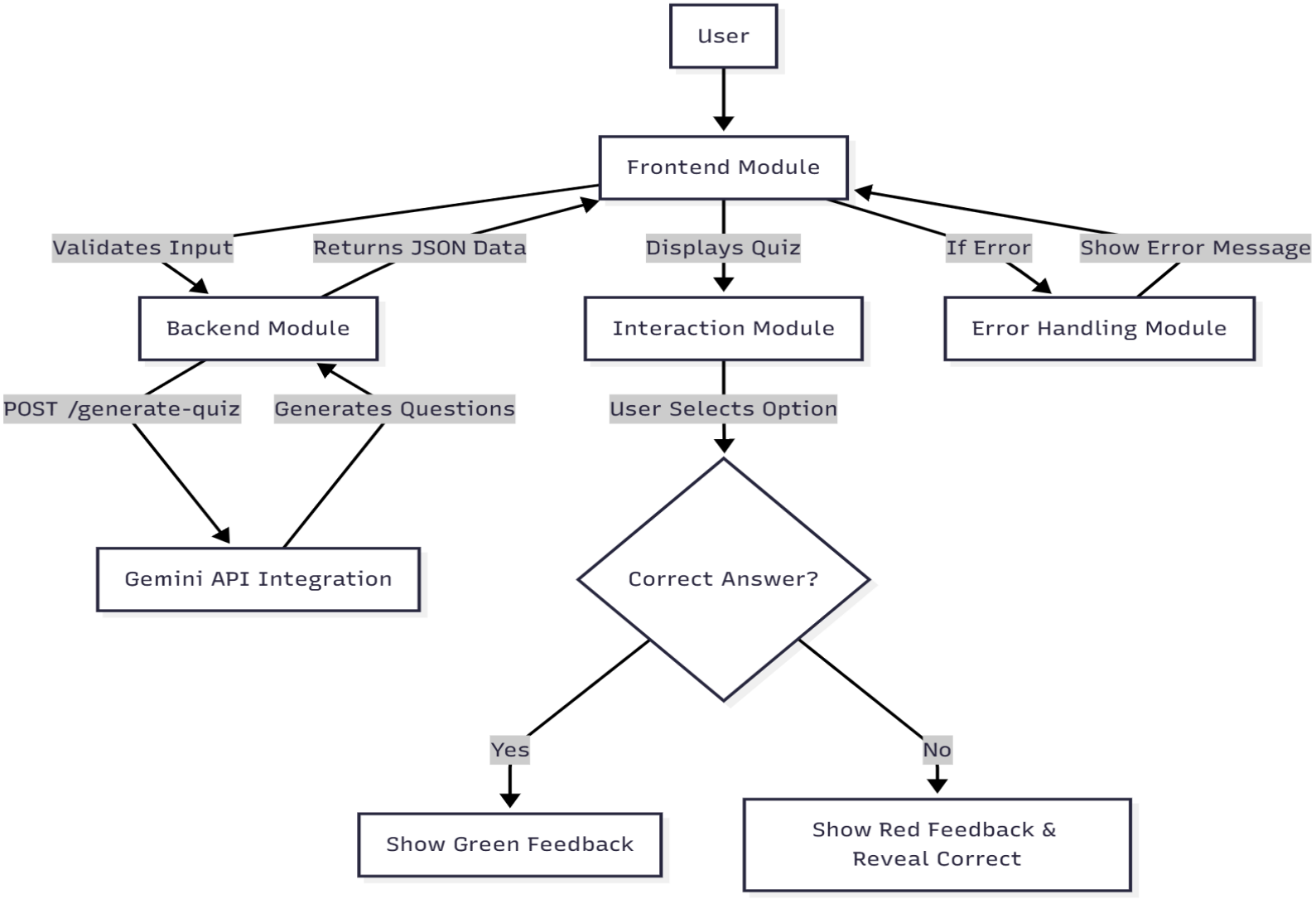
**Reason for Selection:**

- Generates relevant and topic-specific multiple-choice questions automatically.
- Allows control over difficulty level and number of questions through prompts.

**Advantages:**

- Produces accurate, diverse quiz questions efficiently.
- Easily integrates with any backend via REST API for flexible use.
- Reduces manual effort in quiz design and content generation.

# Module


User
Frontend Module
Validates Input
Returns JSON Data
Displays Quiz
If Error
Show Error Message
Backend Module
Interaction Module
Error Handling Module
POST /generate-quiz
Generates Questions
User Selects Option
Gemini API Integration
Correct Answer?
Yes
No
Show Green Feedback
Show Red Feedback &
Reveal Correct

# Methodology & Results

**Methodology:**

1. **Problem analysis:** Identified the need for an automated quiz generation system to reduce manual effort and ensure topic-based control.

1. **Algorithm design & coding:**
   - Designed the frontend using HTML, CSS, and JavaScript.
   - Integrated the backend API with **Gemini** for AI-driven question generation.
   - Implemented validation, API communication, and dynamic rendering logic.

2. **Testing & validation:**
   - Verified input handling and API responses.
   - Tested with various topics and difficulty levels to ensure accuracy.

**Results & Conclusion:**

- Successfully generated **topic-specific quizzes dynamically** using Gemini API.
- Achieved **efficient communication** between frontend, backend, and AI model.

# References


- **W3Schools** – HTML, CSS, and JavaScript basics for frontend design.
- **MDN Web Docs** – Fetch API, DOM manipulation, and JavaScript event handling.
- **Gemini API Documentation** – Google AI Studio (for quiz generation using generative AI).