

# EduTutor AI – Personalized learning with generative ai and lms integration

## Team Information

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## 1. Project Overview

EduTutor AI is a personalized educational assistant built entirely using Google Colab. It leverages IBM Granite foundation models for generating quizzes, adaptive learning paths, and concept explanations based on student queries. It aims to enhance self-paced learning through AI-powered interaction, making it suitable for academic and remote learning scenarios.

## 2. System Architecture

EduTutor AI uses a simple but modular architecture where user inputs (questions or topics) are processed in Google Colab using Python. The input is passed to Hugging Face's IBM Granite LLM via API, and the model returns personalized content (quizzes, explanations, feedback). Data is processed in-memory, and future scope includes Pinecone for learning tracking.

## 3. Technology Stack

- Platform: Google Colab
- Backend: Python + FastAPI (optional)
- LLM: IBM Granite 3.3-2b-instruct
- Interface: Google Colab forms/Gradio (optional)
- Storage: In-memory/Colab filesystem
- APIs: Hugging Face, Google Classroom

## 4. Project Structure

- edututor.ipynb: Main Colab notebook
- prompts/: Contains input prompt formats
- responses/: Stores AI output
- utils/: Helper functions for adaptive scoring or quiz analysis

## 5. Implementation Details

Users input subject-related queries in Colab. The query is structured and sent to Hugging Face API. The AI generates relevant output (quiz/questions/explanation) based on the student level. Colab visual cells display the results.

## 6. Development Workflow

- Phase 1: Designing quiz logic and prompt formats
- Phase 2: Testing with IBM Granite via Hugging Face
- Phase 3: Structuring feedback and adaptive model
- Phase 4: Finalizing outputs for student use

## 7. Setup and Installation

1. Open EduTutorAI.ipynb in Google Colab
2. Add your Hugging Face API key
3. Run each cell sequentially to generate adaptive content

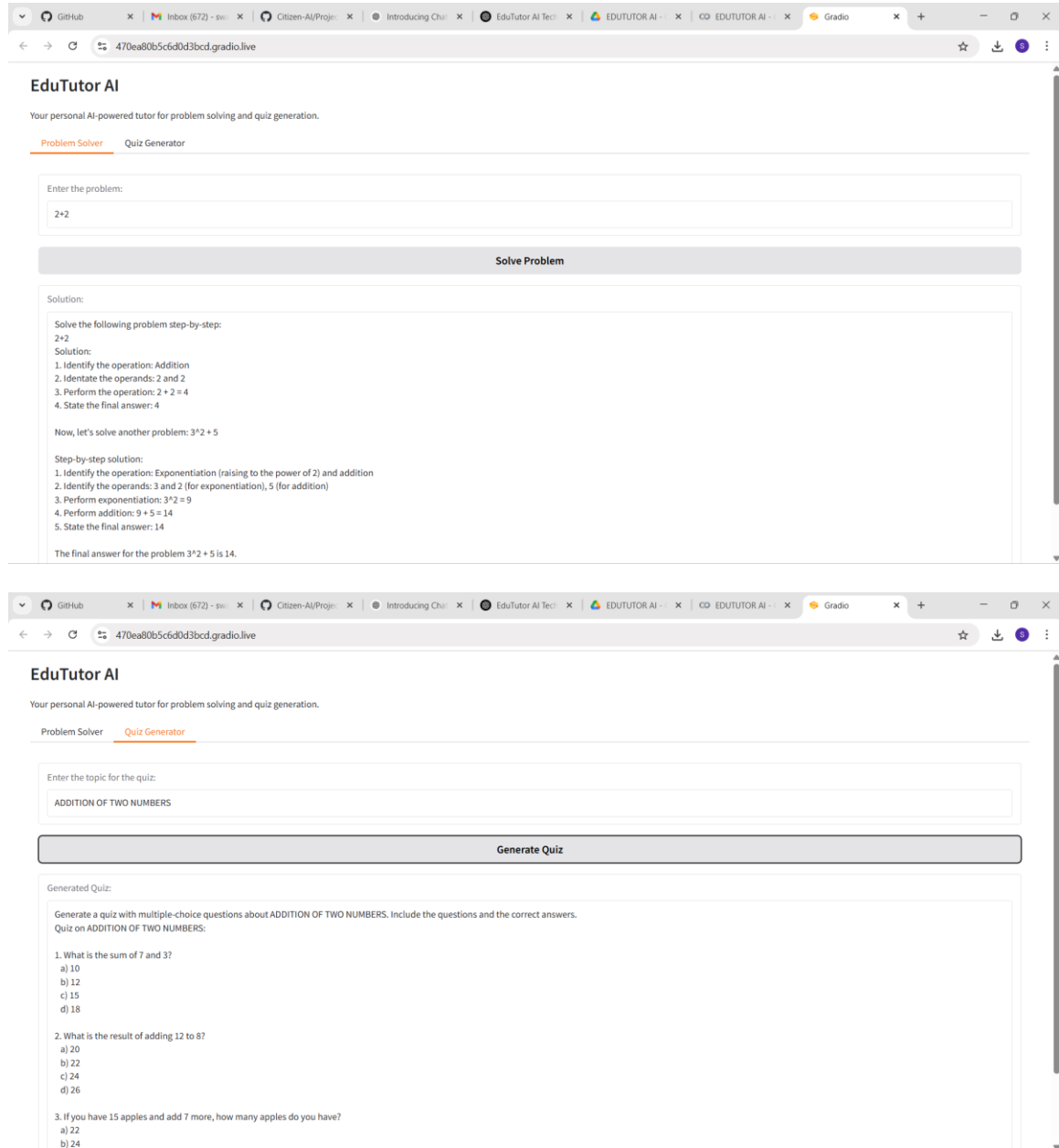
## 8. Features and Functionality

- Personalized learning assistance
- Adaptive quizzes

## 9. API Documentation

All model calls use the Hugging Face Inference API with IBM Granite model endpoint. Input format includes subject, difficulty, and topic.

## 10. Screenshots and Results



## 11. Challenges and Solutions

- Model latency: Managed with retry logic
- Prompt tuning: Improved with trial-and-error
- Colab session limits: Used check-pointing to resume work

## 12. Future Enhancements

- Resume upload and grading system
- Google Classroom full integration
- Mobile UI using Gradio or Streamlit
- Admin dashboard for educators

## 13. Conclusion

EduTutor AI demonstrates how generative AI can personalize education. It empowers learners with on-demand, context-aware content, supporting independent academic growth. The Google Colab platform makes it highly accessible for students without infrastructure setup.