EduTutor AI – Detailed Project Report
1. Title Page
Project Title:
EduTutor AI – Personalized Learning Assistant
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2. Introduction

In the modern education system, there is an increasing demand for personalized and interactive learning tools that can adapt to the pace and style of each student.
EduTutor AI was developed as a solution to help both students and teachers by automating two major tasks:
1. Explaining complex concepts in a simple, easy-to-understand way
2. Generating quizzes instantly for practice and self-evaluation
Traditional learning requires students to spend hours searching for clear explanations and teachers to manually create assessments. EduTutor AI bridges this gap by leveraging Generative AI to provide instant, accurate, and interactive learning resources.
3. Problem Statement
Students often face the following challenges:
Difficulty understanding complex topics in textbooks
Lack of quick access to examples and practical explanations

Limited availability of question banks for practice
Teachers spending significant time preparing quizzes manually
EduTutor AI solves these problems by offering:
Al-powered explanations for any concept
Automatic quiz generation covering different question formats
Instant feedback through a separate answers section
4. Objectives
The main objectives of EduTutor Al are:
To provide detailed explanations of concepts in simple language
To automatically generate quizzes with multiple question types
To make learning interactive and engaging through a web interface

To minimize teacher workload by automating question creation
To run on free, cloud-based platforms like Google Colab so anyone can access it
5. Scope & Benefits
Scope
Suitable for school, college, and competitive exam preparation
Can be extended to support subject-specific learning modules
Scalable to include progress tracking, performance analytics, and adaptive learning
Benefits
Saves time for both teachers and students
Improves conceptual clarity and retention

Encourages self-paced learning
Accessible from any device with internet

6. Literature Review
Several AI-based learning tools exist, such as ChatGPT, Khan Academy AI, and Google Socratic.
However, EduTutor AI is unique because:
It is open-source and lightweight using IBM Granite 3.2 2B model
It provides custom quiz generation with answers, not just explanations
It is simple to deploy on Google Colab without paid infrastructure

7. Technologies Used

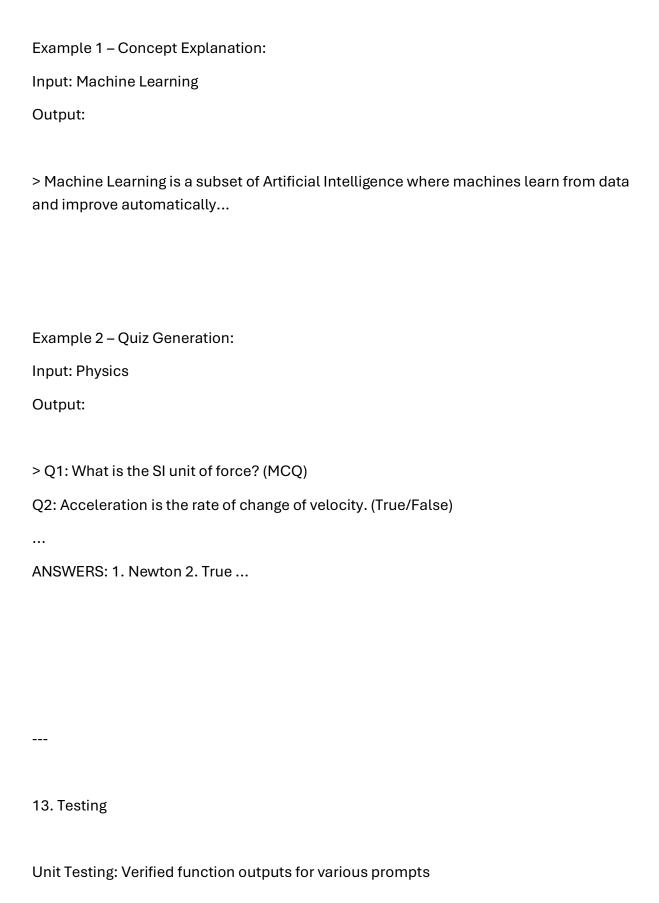
Component	Technology Used
Programming	EPython 3.8+
ML Model	IBM Granite 3.2 2B Instruct
Libraries	Transformers, Torch, Gradio
Deployment	Google Colab (T4 GPU)
Version Cont	
8. System Arc	chitecture
-	
The project co	onsists of Frontend, Backend, and Deployment layers:
Frontend (Gra	adio):
Two tabs: Co	ncept Explanation & Quiz Generator
Accepts user	input and displays output in scrollable text boxes
Backend (Pyt	hon + Granite Model):
Loads IBM Gr	anite model and tokenizer

Processes prompts, generates responses using model.generate()
Deployment:
Runs entirely on Google Colab
Gradio provides a public URL for testing and demonstration
9. Workflow
1. User enters a topic or concept
2. The input is tokenized and sent to IBM Granite model
3. Model generates detailed explanation or quiz

4. Output is displayed in the Gradio interface
5. User can switch between tabs for explanations or quizzes

10. Implementation
Code Explanation
Model Loading: Loads IBM Granite from Hugging Face with GPU acceleration if available
Functions:
concept_explanation(concept) → Generates detailed explanation
quiz_generator(concept) → Creates quiz with answers section
Gradio Interface:
Creates two tabs for user input
Ordated two taba for user input

Launches app with app.launch(share=True) to generate share link
11. User Interface
The UI is minimal and easy to use:
Textbox Input: For topic or concept
Buttons: To generate explanation or quiz
Output Area: Multi-line textboxes showing results
Tabs: Organized navigation for Concept vs Quiz
12. Sample Output



Manual Testing: Checked UI functionality, switching tabs, and input handling
Edge Cases: Tested long inputs, empty inputs, and special characters
14. Results
EduTutor AI successfully:
Generated detailed explanations for multiple topics
Produced diverse quizzes (MCQ, True/False, Short Answer)
Displayed answers separately for easy checking
Ran on Google Colab without errors
15. Future Enhancements

Add PDF export for quizzes
Add voice input and text-to-speech
Introduce score tracking for quizzes
Create subject-specific modules (Math, Physics, Chemistry)
16. Conclusion
EduTutor AI demonstrates how Generative AI can transform education by making learning interactive and personalized.
This project can serve as a foundation for building AI-powered learning platforms that are open-source, scalable, and easy to use