

Introduction

Project title : EduTutor AI: Personalized Learning with Generative AI and LMS Integration

Team member :S.Subasree

Team member :M.Kaviya

Team member :T.Abinaya

Team member :A.L.Anupriya

Project Description: EduTutor AI

1. Project Overview

EduTutor AI is an AI-powered personalized study assistant that helps students learn any topic in multiple ways — step-by-step explanations, quick revision notes, visual analogies, real-life examples, quizzes, and challenges. The app uses LLMs (Large Language Models) with a simple Gradio-based UI to provide interactive, customized learning experiences.

2. Purpose

The purpose of EduTutor AI is to make learning more accessible, engaging, and adaptive by using AI to explain concepts in different formats. Students can explore topics in a way that matches their learning style and level of understanding

3. Objectives

Provide step-by-step explanations for complex concepts.

Generate quick revision notes for last-minute studying.

Offer visual analogies and real-life examples for deeper understanding.

Create quiz-style questions for self-assessment.

Challenge students with critical thinking tasks.

Ensure the system is easy to use and requires no technical expertise.

4. Scope

Covers multiple subjects like physics, math, computer science, biology, and general topics.

Supports various learning modes (Explanation, Quiz, Notes, Real-life Application).

Works locally or in the cloud using Gradio.

Can be extended to include speech input/output, user authentication, progress tracking, and multi-language support.

5. Key Features

Multi-mode learning: Step-by-step, notes, analogies, examples, quizzes, challenges.

Random topic generator: Surprise me button picks a concept at random.

AI Creativity Slider: Adjust the response style (concise → creative).

Dropdown selection: Choose learning style easily.

Interactive UI with Gradio.

6. Benefits

Personalizes learning according to student needs.

Saves time by generating instant study material.

Encourages active learning through quizzes and challenges.

Makes difficult topics easier to grasp using analogies and real-world examples.

Can be used for self-study or as a teaching aid.

7. Technology Stack

Frontend / UI: Gradio

Backend / AI Engine: Hugging Face Transformers, PyTorch

Model: IBM Granite (LLM) / AutoModelForCausalLM

Language: Python

Other Libraries: Random, Torch

8. Resource Forecasting (Functionality)

Compute: GPU preferred for faster response, CPU possible with longer wait.

Memory: ~8GB RAM recommended (LLM processing).

Storage: ~2–3 GB (model weights + dependencies).

Users: Lightweight app, good for small-to-medium scale (classrooms, individuals).

9. Architecture

[User Interface (Gradio)]



[EduTutor AI Logic]

- Concept input
- Random concept picker
- Theme selection
- AI creativity slider



[AI Model (HuggingFace Transformers + PyTorch)]



[Response Generator]

10. Setup Instructions

Prerequisites

Python 3.8+

pip (latest version)

GPU with CUDA (optional, recommended)

Installation Process

Clone the project

```
git clone https://github.com/yourusername/edututor-ai.git
```

```
cd edututor-ai
```

Create virtual environment

```
python -m venv venv
```

```
source venv/bin/activate # (Linux/Mac)
```

```
venv\Scripts\activate    # (Windows)
```

Install dependencies

```
pip install -r requirements.txt
```

11. Folder Structure

EduTutor_AI/

| — app.py # Main application file

| — requirements.txt # Dependencies

| — README.md # Documentation

| — models/ # Pretrained models (downloaded automatically)

| — ui/ # UI-related components

| — utils/ # Helper functions

12. Running the Application

`python app.py`

The app will start on `http://127.0.0.1:7860`

Users can enter topics, choose a style, and interact with EduTutor AI.

13. API Documentation

`generate_response(prompt, temperature)` → Returns AI-generated output.

`random_concept()` → Returns a random concept from the predefined list.

`tutor_response(concept, theme, temperature)` → Main logic for handling user requests.

14. Authentication

Current version: No authentication (open access).

Future: Add user login, Google OAuth, and progress tracking.

15. User Interface

Textbox: Enter topic or concept.

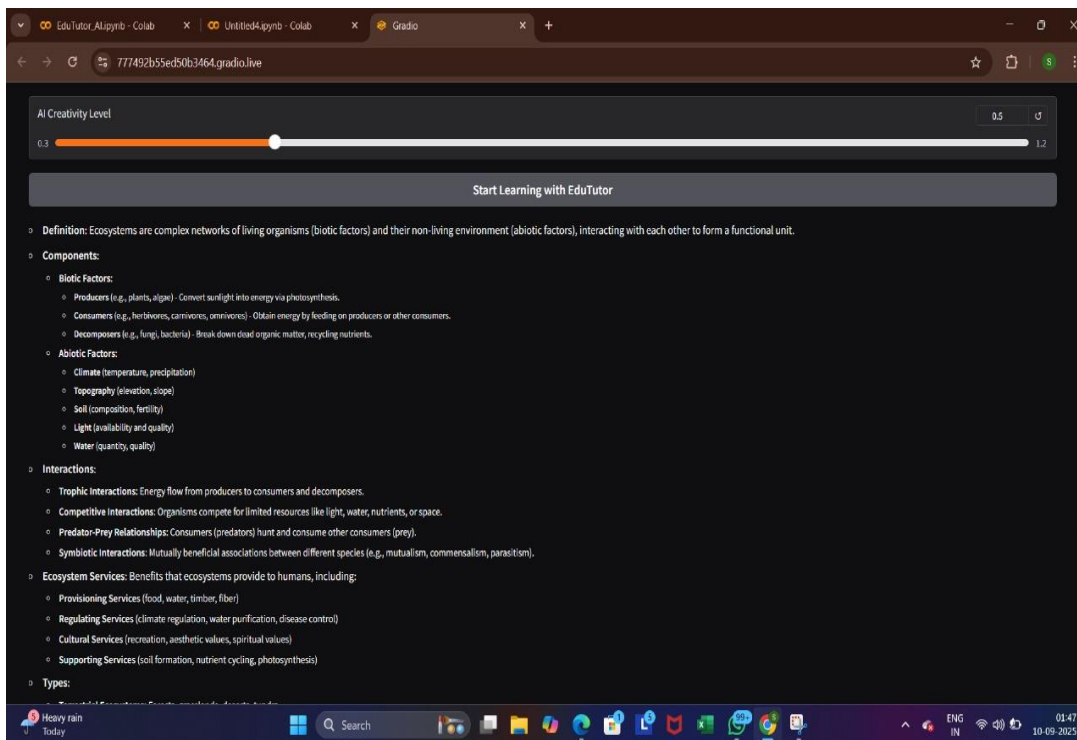
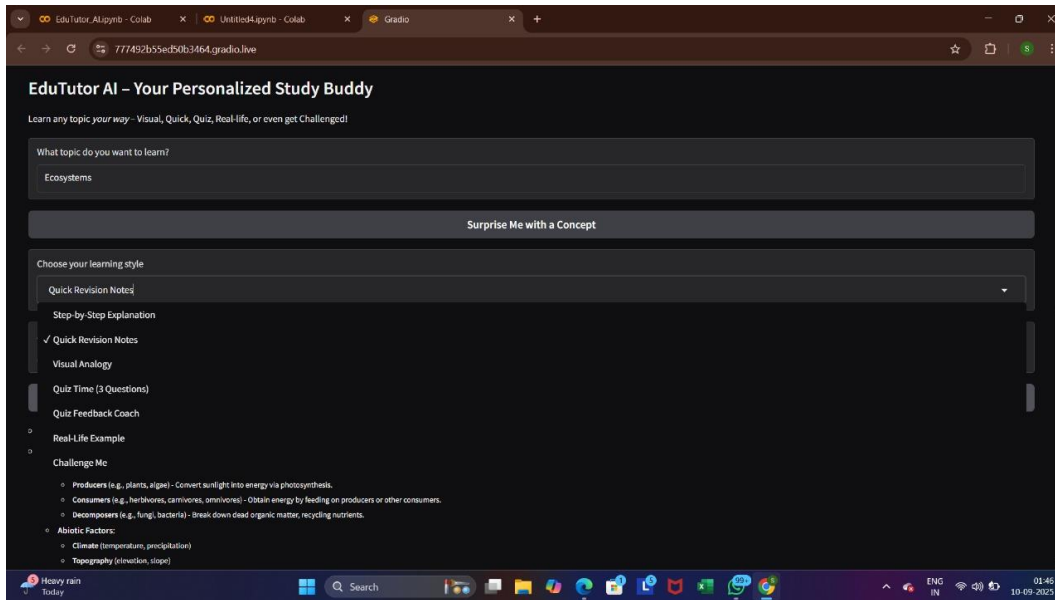
Button: Surprise me with a concept.

Dropdown: Select learning style.

Slider: Adjust creativity level.

Output Box: Displays AI-generated response.

16.screenshot



17. conclusion

EduTutor AI serves as an innovative educational tool that enhances learning by providing personalized guidance, instant feedback, and interactive support for students. It bridges the gap between traditional teaching and modern digital learning, making education more accessible and engaging. With continuous advancements in AI, EduTutor AI has the potential to further transform the way students learn and teachers deliver knowledge in the future.

18. Known Issues

Large model size may cause slow response on CPU.

Limited domain knowledge (depends on model).

No built-in persistence (user progress not saved).

19. Future Enhancements

User dashboard with progress tracking.

Voice input & output for accessibility.

Multi-language support.

Mobile app integration.

Teacher mode with lesson planning.

User authentication & profiles.

Optimized inference with smaller, faster model

