EduTutor AI – Project Documentation

1.Introduction

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

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2.Project Overview

EduTutor AI is an AI-powered educational assistant that helps students learn concepts and generate quizzes dynamically. It uses **IBM Granite LLM** for natural language understanding and **Gradio** for an interactive web interface. The platform supports:

- Concept explanations with examples
- Quiz generation (multiple choice, true/false, short answer)
- Shareable web interface for easy access

2.Features

- **Concept Explanation:** Users enter a concept, and the AI generates a detailed explanation.
- **Quiz Generation:** Users enter a topic; AI creates 5+ quiz questions with answers.
- **Interactive UI:** Gradio interface with tabs for explanations and quizzes.
- **AI Powered:** Uses Granite foundation model through Hugging Face Transformers.
- **Cross-Platform:** Can be run on CPU or GPU.

3.Tech Stack

- **Frontend & UI:** Gradio
- **AI/ML:** PyTorch, Hugging Face Transformers, IBM Granite LLM
- **Language:** Python 3.10+

4.Project Structure

```
EduTutorAI-Gradio/
  ├ app.py                  # Main Gradio app
  ├ requirements.txt        # Python dependencies
  ├ README.md               # Project documentation
  └ models/                 # (Optional) Pretrained or fine-tuned models
```

5.Installation

1. Clone the repository:

   ```
   git clone https://github.com/username/EduTutorAI-Gradio.git
   cd EduTutorAI-Gradio
   ```

2. Create a virtual environment:

   ```
   python -m venv venv
   source venv/bin/activate   # Linux/macOS
   venv\Scripts\activate      # Windows
   ```

3. Install dependencies:

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

4. Run the app:

   ```
   python app.py
   ```

5. Open the Gradio interface (the terminal will provide a local URL or a shareable link).

6.Usage

- **Concept Explanation:** Enter a topic (e.g., "Machine Learning") → Click “Explain” → Get AI-generated explanation.
- **Quiz Generation:** Enter a topic → Click “Generate Quiz” → Get 5+ questions with answers.

7.Future Improvements

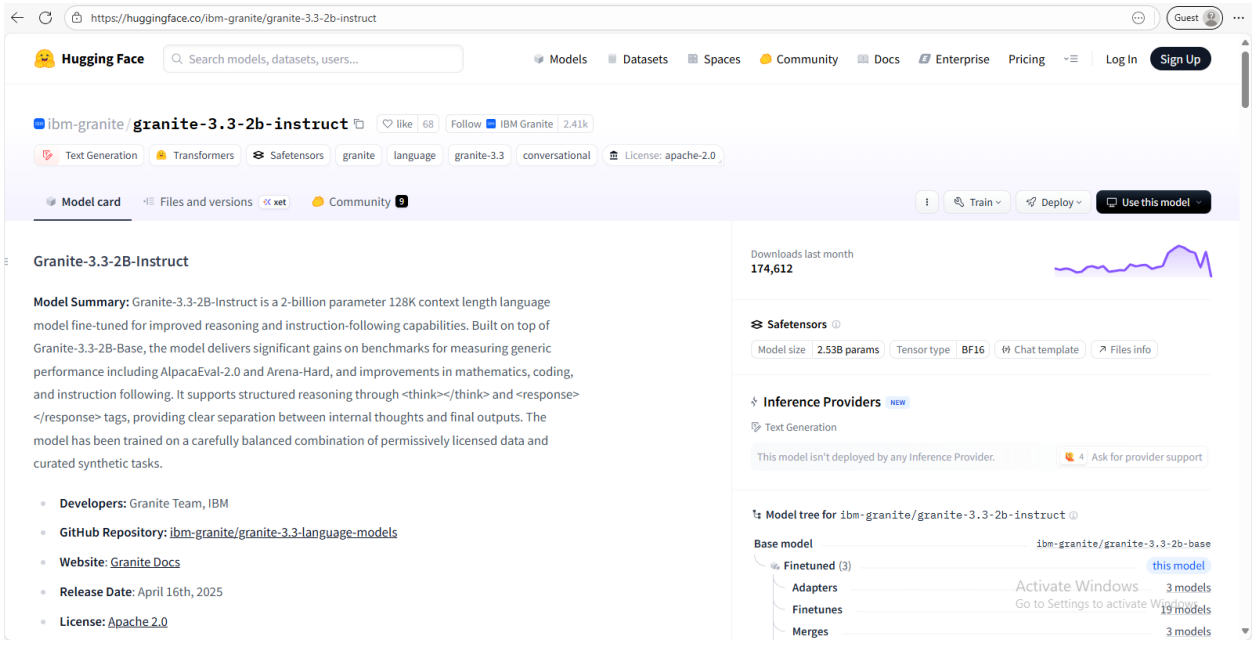
- Integrate with **React frontend** for a full LMS-style platform.
- Connect to a **backend database** to store quizzes and track progress.
- Add **Google Classroom or LMS integration**.
- Implement **adaptive difficulty** based on student performance.

8.Dependencies

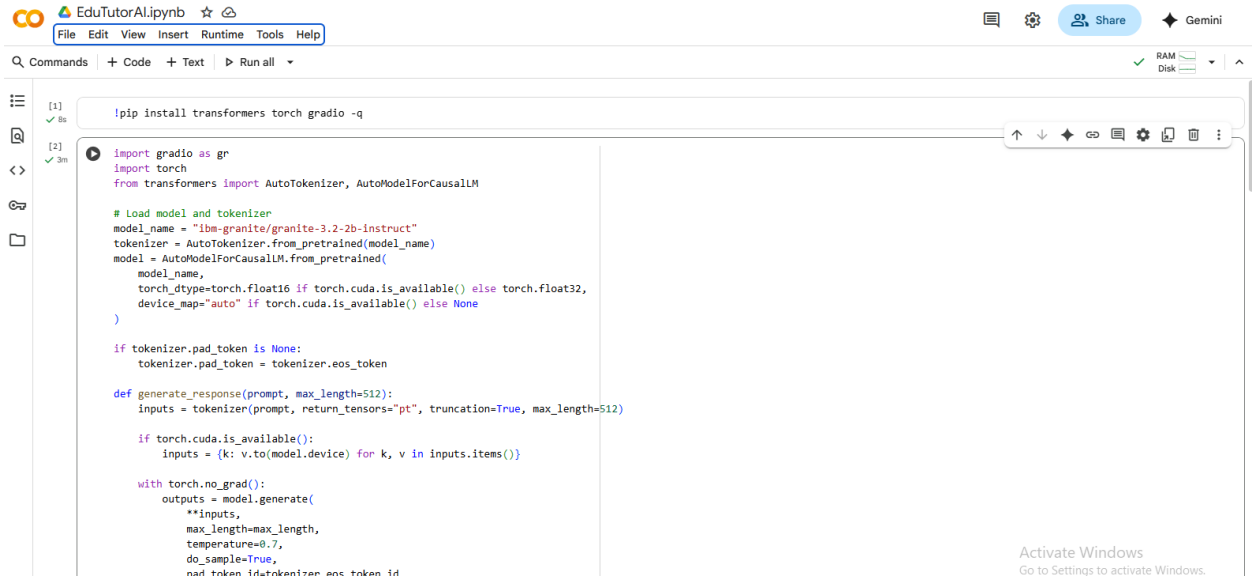
- Python 3.10+
- Gradio
- PyTorch
- Transformers
- IBM Granite LLM

Screenshots :

1.Getting IBM Granite model from Hugging Face

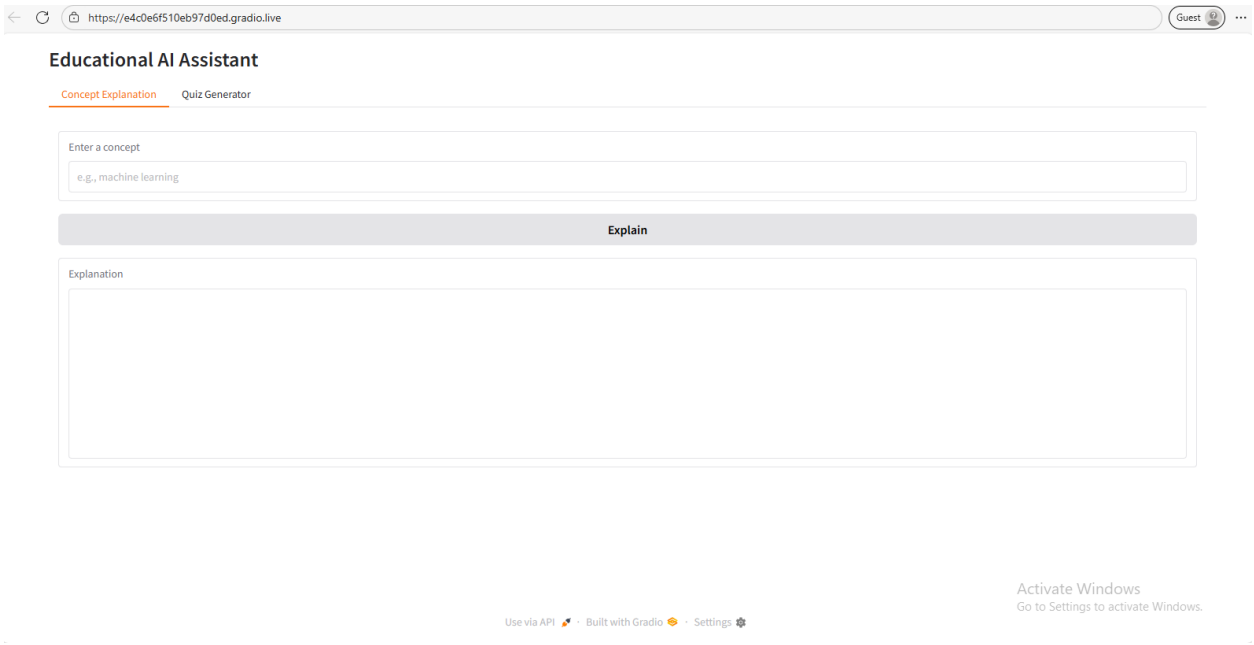


2.Coding in Google Colab

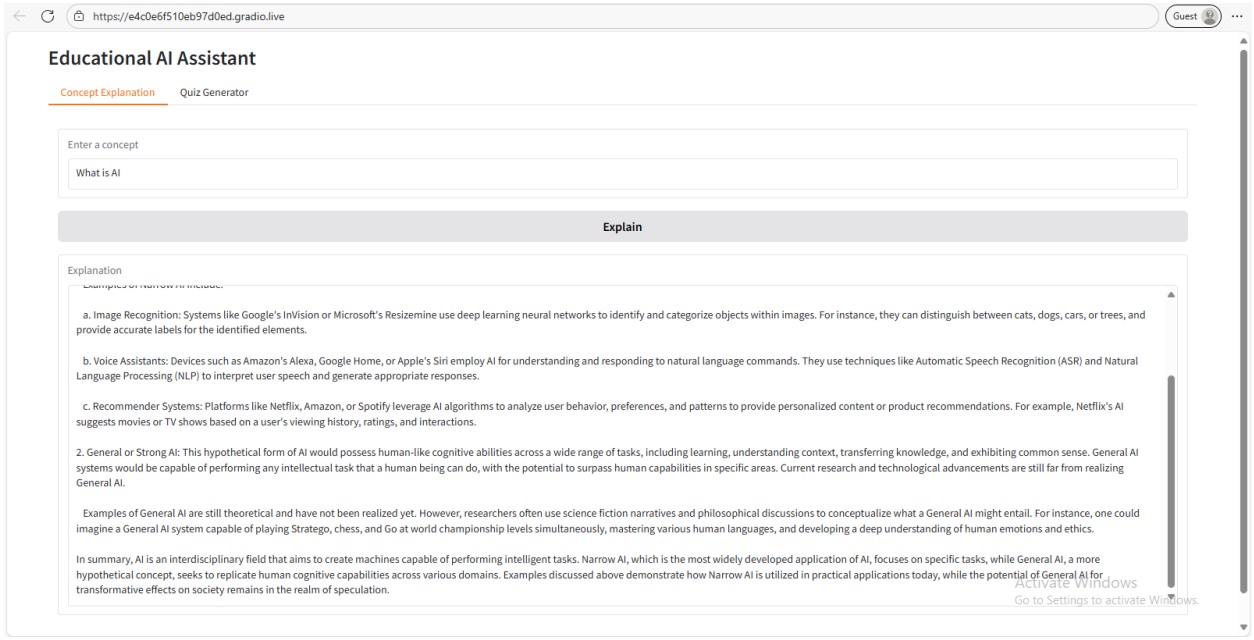


3.Running the code

4.Testing the Public URL



5.Testing concept explanation



6.Testing quiz generation

https://e4c0e6f510eb97d0ed.gradio.live

Guest

Educational AI Assistant

Concept Explanation | Quiz Generator

Enter a topic

chemistry

Generate Quiz

Quiz Questions

B) H2 + O2 -> H2O
C) 2H2 + 2O2 -> 4H2O
D) H2 + O2 -> 2H2O

5. True/False: Photosynthesis is a process primarily driven by chemical reactions, not involving light energy.

ANSWERS:

1. A) H2O

2. True

3. Ion formation in chemistry occurs when a neutral atom gains or loses electrons, resulting in a positively or negatively charged particle known as an ion. For example, a common monatomic ion is the sodium ion (Na+), formed by losing one electron from a neutral sodium atom (Na).

4. D) H2 + O2 -> 2H2O

5. False

Photosynthesis is a process driven by light energy, primarily involving chlorophyll and other pigments in plants, algae, and some bacteria to convert light energy, usually from the sun, into chemical energy in the form of glucose (sugar).