AI-Powered Resume Matching System

(Using Enhanced\_Chatbot\_DialoGPT)

Project Goals and Topic  
Title of Project: AI-Powered Resume Matching System and Job Market Insights  
  
Project Objectives: This project's main objective is to create an AI-powered platform that improves hiring procedures by evaluating data from the job market and connecting resumes in the best possible way for companies and job seekers. Utilizing cutting-edge machine learning algorithms, the platform generates interview question suggestions, optimizes resumes for better alignment with job requirements, and offers real-time, accurate, and personalized job recommendations. The system seeks to:

* Enhance job matching by using resumes to match applicants with the most appropriate job openings.
* Improve resumes: To increase a candidate's visibility in job searches, offer automated resume upgrades.
* Create customized interview questions: Provide job-specific questions to assist candidates in getting ready for interviews.

Team member contributions:

Member 1: Maheswar Rao Bandi – Collected data, cleaned and transformed the data

Member 2:

Amrutha Perumalla

* AI Model Development:
  + Fine-tune Transformer models (BERT, GPT) for job matching, resume enhancement, and interview prep.
  + Used LoRA to fine-tune in a lightweight manner.
  + Improve the FAISS-based similarity search to provide quick job suggestions.
* Backend Development:
* Building and maintaining a Flask API for AI model integration is known as backend development.
* Manage the job matching, resume scoring, and interview question generating API endpoints.
* Set logging, error-handling, and real-time processing efficiencies into practice.

AI Methodologies Used and Their Importance

* RNN/LSTM/GRU: Enhances context-aware matching by modeling the sequential relationships found in job descriptions and resumes.
* BERT: Used to improve resume optimization and job suggestions through semantic analysis of resumes and job descriptions.
* GPT: Enhanced to automatically improve resumes and increase the visibility of candidates to businesses.
* FAISS: Enables real-time job matching based on embeddings by facilitating quick similarity searches.
* By providing an explanation for AI model decisions in resume scoring and job recommendations, explainability increases confidence.
* NER: Enhances text processing for matching by identifying significant entities such as job titles and companies.
* Transformer Fine-Tuning: Enhances job ranking algorithms to offer tailored job suggestions.

Results, Conclusions, and Difficulties Results:

The system successfully enhanced resumes (82% BLEU score), produced excellent job matching accuracy (87%), and provided helpful interview preparation (78% F1 score).  
Results: While GPT-optimized resumes increased candidate visibility, BERT and FAISS enhanced matching accuracy.

Challenges: Managing missing values, resolving biases, integrating data, and improving model interpretability were the main obstacles. Large amounts of tuning were also necessary to guarantee real-time performance.

Suggestions for further improvements:

* Enhance transformer models further and employ effective fine-tuning methods such as LoRA.
* Explainability: Improve model transparency by visualizing suggestions and choices more effectively.
* Bias Mitigation: Use algorithms that are sensitive to fairness in order to minimize biases, particularly in location and wage data.
* Use a feedback loop to continuously modify the system in response to user interactions. This is known as adaptive learning.
* Extra Sources of Information: To improve suggestions, incorporate more outside data, such as market trends and company evaluations.
* Scalability: Make the system more scalable and more suited to managing big datasets and heavy user traffic.
* Multilingual Support: To increase the system's global reach and market share, include support for multiple languages.

Conclusion:  
The project shows how artificial intelligence (AI) may enhance hiring procedures. Deep learning, natural language processing, and explainability approaches are used to improve resume optimization and job matching. The system offers a strong basis for future developments and scalability in the field of hiring, notwithstanding certain difficulties.

Here are the screen shorts of running model:











