AI-Powered Resume Screening & Semantic Job Matching Platform

Project Overview
This project focuses on building an AI-powered system that automates resume screening and matches resumes with job descriptions using Natural Language Processing (NLP) and Machine Learning. The system extracts meaningful information from resumes and ranks candidates based on relevance.

Key Features
- Resume parsing (PDF/DOCX)
- NLP-based skill extraction
- Semantic job–resume matching
- Hybrid similarity scoring
- Interactive results dashboard

Rationale & Market Relevance
Manual resume screening is time-consuming and inconsistent. This project addresses the problem by introducing AI-driven semantic matching, reducing bias and improving efficiency. Unlike traditional keyword-based systems, this solution understands contextual meaning.

Workflow & Methodology
The system uses a hybrid NLP approach combining TF-IDF and sentence embeddings. Text data is cleaned, vectorized, and compared using cosine similarity to generate ranked results.
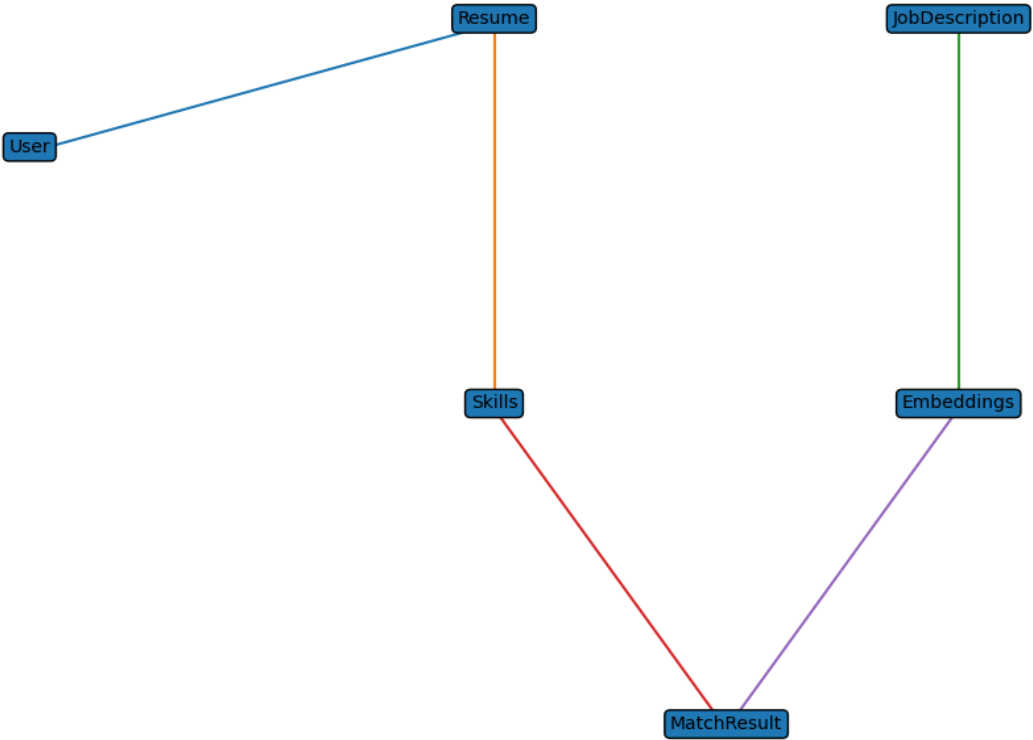
Technologies Used
- Python
- spaCy, NLTK
- Sentence-Transformers (MiniLM)
- Scikit-learn
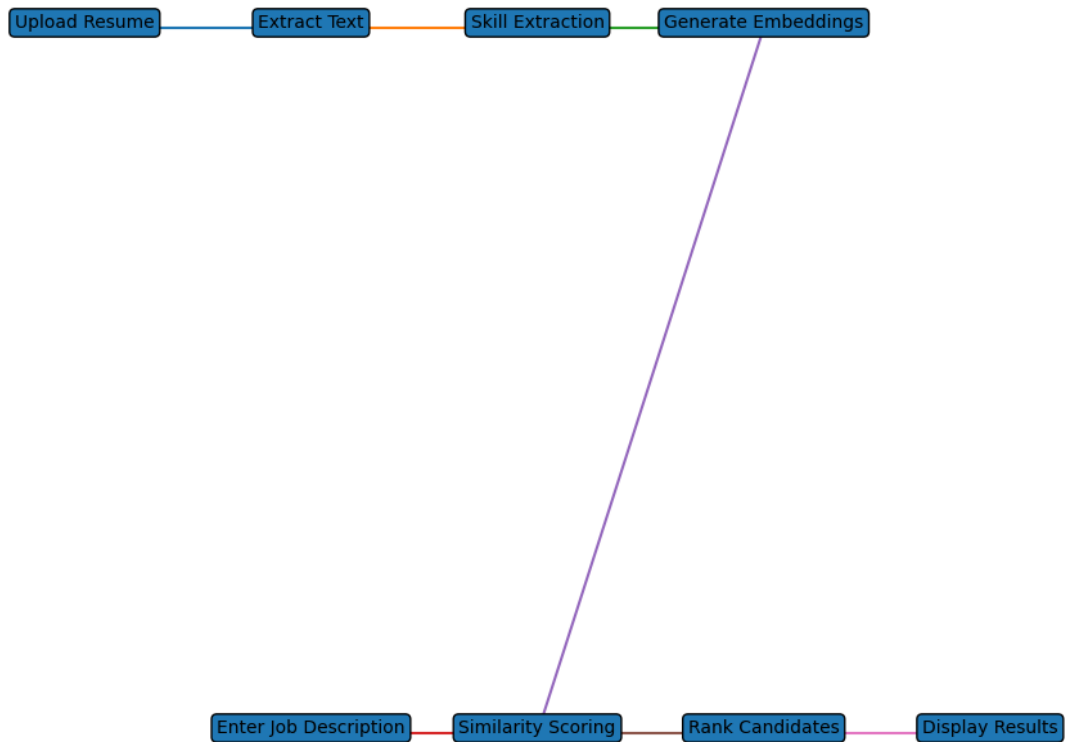- Streamlit
- SQLite / PostgreSQL

Matching Methodology
The final matching score is calculated using a weighted hybrid model:
TF-IDF Similarity (40%), Semantic Embedding Similarity (50%), and Skill Overlap (10%). This
balances keyword relevance with contextual understanding.

Entity Relationship Diagram (ERD)

System Workflow

Upload Resume — Extract Text — Skill Extraction — Generate Embeddings — Enter Job Description — Similarity Scoring — Rank Candidates — Display Results

Conclusion

This project demonstrates an intermediate-to-advanced application of AI and NLP in recruitment. It showcases real-world applicability, explainability, and strong technical foundations suitable for academic evaluation.