**Documentation: AI-Powered Job Search Assistant**

**Project Overview**

This project is an AI-powered job search assistant that helps users find relevant job listings based on their skills, experience, and location. Instead of manually searching through thousands of job postings, the system uses natural language processing to understand job descriptions and user queries, retrieving the best matches efficiently.

**Technologies Used**

The project is built using Python and several key technologies. It uses the Hugging Face Datasets library to fetch job descriptions. Sentence-BERT is used to generate embeddings for both job descriptions and user queries. FAISS, a similarity search tool developed by Facebook, is used to store embeddings and quickly retrieve the most relevant job listings. Gradio is used to create an interactive user interface that allows users to input their job preferences and receive relevant job recommendations.

**Implementation Steps**

**Data Extraction**

The job descriptions are loaded from a Hugging Face dataset called cnamuangtoun/resume-job-description-fit. These job descriptions are extracted and stored for further processing.

**Embedding Generation**

The job descriptions are converted into numerical representations, called embeddings, using a pre-trained Sentence-BERT model. This allows the system to understand the meaning of job descriptions in a way that can be compared with user queries.

**Storing Embeddings with FAISS**

The generated embeddings are stored in FAISS, a high-speed search index. FAISS allows for quick retrieval of relevant job descriptions based on how similar they are to the user's search query.

**Query Processing and Job Matching**

When a user enters a job search query, the system processes it by converting it into an embedding using Sentence-BERT. This embedding is then compared with the job description embeddings stored in FAISS. The system retrieves the most similar job listings and ranks them based on relevance.

**Interactive UI with Gradio**

A Gradio-based user interface is built to make the job search process simple and interactive. Users enter their job preferences, and the system instantly displays the best-matching job descriptions.

**Demo Flow**

A user enters a job query, such as "I have three years of experience in Python and SQL and am looking for a job in New York." The system processes this input and converts it into an embedding. FAISS then searches for similar job postings, retrieves the best matches, and displays the results in the Gradio interface.

**Future Improvements**

The project can be improved by integrating live job listings from platforms like LinkedIn and Indeed to provide real-time job openings. Personalization can be enhanced by learning from user preferences and job search history. Generative AI can also be incorporated to better understand and process user queries.

**Summary**

This project demonstrates how AI can simplify job searching, making it faster and more efficient. Instead of manually filtering through job boards, users can simply enter their skills and experience to receive personalized job recommendations instantly. The system leverages natural language processing and similarity search to match users with the best job opportunities.