Project Title: AI Resume & Portfolio Builder using Machine Learning and Generative AI

Internship: AICTE–Edunet Foundation AIML Internship
Technology: Python, NLP, Machine Learning, Generative AI
Developed by: Sourabh Prajapat
Duration: 6 Weeks

🔹 ABSTRACT

This project presents an AI-powered Resume and Portfolio Builder that helps students analyze their resume skills and identify suitable job roles. The system uses Natural Language Processing (NLP) and Machine Learning techniques to match resume skills with predefined job roles using cosine similarity. Additionally, Generative AI is integrated to automatically generate professional resume summaries based on user skills and target job roles. The application is implemented as a Python-based web application using Streamlit, providing an interactive and user-friendly interface. This project aims to improve students' employability by offering intelligent career guidance.

🔹 INTRODUCTION

In today's competitive job market, students often struggle to understand which job roles best match their skills and how to present themselves professionally. Traditional resume builders lack intelligence and personalization. Artificial Intelligence and Machine Learning can help bridge this gap by analyzing skill sets, recommending suitable roles, and generating professional resume content. This project leverages AI techniques to build an intelligent resume analysis system.

🔹 PROBLEM STATEMENT

Students face difficulty in:

- Identifying suitable job roles based on their skills
- Understanding skill gaps for targeted roles
- Writing professional resume summaries

There is a need for an AI-based system that can automatically analyze resumes and provide intelligent recommendations.

🔹 OBJECTIVES

- To analyse resume skills using NLP techniques
- To match resumes with suitable job roles using Machine Learning
- To provide skill improvement suggestions
- To generate AI-powered professional resume summaries
- To develop an interactive web application using Python

🔹 DATASET DESCRIPTION

A custom dataset was created containing:

- **Skills:** Technical skills required for different roles
- **Job Roles:** ML Engineer, Frontend Developer, Backend Developer, AI Engineer, Data Analyst

The dataset is stored in CSV format and used for similarity matching.

🔹 METHODOLOGY

1. Data collection and preprocessing
2. Text vectorization using TF-IDF
3. Similarity computation using cosine similarity
4. Role prediction based on highest similarity score
5. Resume strength evaluation
6. Generative AI-based resume summary generation
7. Deployment using Streamlit

🔹 MACHINE LEARNING & NLP TECHNIQUES USED

- TF-IDF Vectorization
- Cosine Similarity
- Natural Language Processing
- Rule-based classification
- Generative AI (Gemini API)

🔹 SYSTEM ARCHITECTURE

User Input → NLP Processing → ML Similarity Matching →
Job Role Prediction → Skill Suggestion →
Generative AI Resume Summary → Output via Web App

🔹 RESULTS & OUTPUT

- Successfully predicts the most suitable job role
- Displays match percentage
- Suggests skill improvements
- Generates professional AI resume summaries
- Provides a clean and interactive web interface

🔹 Google Colab

Google Colab Notebook Link:

https://colab.research.google.com/drive/1jKJWLe_r_slyjIq39_g26qmvpPHqU7wo?usp=sharing

🔹 CONCLUSION

The AI Resume & Portfolio Builder successfully demonstrates the application of AI, NLP, and Generative AI in solving real-world career guidance problems. The system provides intelligent job role recommendations and professional resume summaries, making it highly useful for students and job seekers. This project meets industry requirements and enhances employability.