Skill-Based Job Role Predictor

Final AI Project Documentation

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Course: Artificial Intelligence

Date: May 12, 2025

1. Project Goal

This project aims to predict a suitable job role based on a user?s input skills using machine learning.

It demonstrates practical use of supervised classification in the context of career guidance.

2. Dataset Description

The dataset includes over 30,000 records of job postings sourced from Kaggle,

specifically containing 'skills' and 'Job Title' fields.

To satisfy the requirement of dataset extension, 10 job listings were simulated from a job portal layout (e.g.

These included realistic titles and skill sets parsed using BeautifulSoup and saved as 'my_custom_data.csv

Examples of manually added entries:

- Python, Django, REST APIs ? Python Backend Developer
- SQL, Excel, Power BI ? Data Analyst
- Agile, Scrum, Jira ? Project Manager

3. AI Technique

- Text vectorization using TF-IDF (1000 features)
- Random Forest Classifier with 100 decision trees
- Train/test split: 80% / 20%

- Libraries: pandas, scikit-learn, Flask, joblib

4. Model Evaluation

The model achieved perfect classification results on the filtered dataset (10 target roles):

- Accuracy: 1.00
- Precision: 1.00
- Recall: 1.00
- F1 Score: 1.00

A confusion matrix is included in the visual presentation (see poster and website).

5. Poster & Web Demo

The poster includes overview, methods, confusion matrix, and conclusions.

Additionally, an interactive website was developed using HTML/CSS (glassmorphism) and Flask, allowing users to enter their own skills and get live role predictions.

6. Implementation Summary

- Model training and evaluation in Python
- Deployment with Flask and local prediction API
- Frontend integrated with JavaScript fetch requests
- Final site packaged with poster and documentation

7. Deliverables

- job_role_predictor.py, train_model.py, parser.py
- my_custom_data.csv, filtered_dataset.csv
- joblib model and vectorizer

- Poster (PDF), README.md, index.html + style.css

- This documentation (PDF)