# AI-Based Career Path Predictor Using Machine Learning

**Submitted by**

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## 1. Objective

The goal of this project is to build an AI model that predicts the best career path for a student based on academic scores, skills, and interest area using machine learning techniques.

## 2. Tools & Technologies Used

- Python
- Pandas, Scikit-learn
- Random Forest Classifier
- Streamlit (Web App)
- CSV File Handling
- VS Code / Jupyter Notebook

## 3. Dataset Used

- Records: 1600 (Clean and Balanced)
- Features: Interest Area, Skills, 10th %, 12th %, UG %, Career Path
- Dataset Name: career_data_large.csv

## 4. Model Architecture

- Data Cleaning and Skill Encoding
- Label Encoding for interest area and output
- Combined all features for training

- Used RandomForestClassifier for multi-class prediction

**5. Web Application (UI)**

A front-end was built using Streamlit where users enter marks, interest area, and skills. The app returns a predicted career path using the trained model.

**6. Results & Accuracy**

- The trained model achieved 100% accuracy on the cleaned dataset
- Realistic predictions were validated with test inputs
- Output was displayed through a user-friendly web interface

**7. Learnings & Takeaways**

- Learned end-to-end AI pipeline: data collection, preprocessing, model training, and UIdevelopment
- Improved confidence in AI tools and Python libraries
- Understood how machine learning can be applied to real-world problems

**8. Conclusion**

This project enhanced my understanding of AI development and gave me hands-on experience in solving a real-world problem using ML and Python.

**9. Key Python Code (Simplified)** # Load and preprocess data df = pd.read_csv("career_data_large.csv") df['Skills'] = df['Skills'].apply(lambda x: [skill.strip() for skill in x.split(',')]) mlb = MultiLabelBinarizer() skills_encoded = pd.DataFrame(mlb.fit_transform(df['Skills']), columns=mlb.classes_) le_interest = LabelEncoder() df['Interest_Encoded'] = le_interest.fit_transform(df['Interest Area']) X = pd.concat([df[['10th %', '12th %', 'UG %', 'Interest_Encoded']], skills_encoded], axis=1) le_target = LabelEncoder() y = le_target.fit_transform(df['Career Path'])

# Train model model =

RandomForestClassifier()

model.fit(X, y)

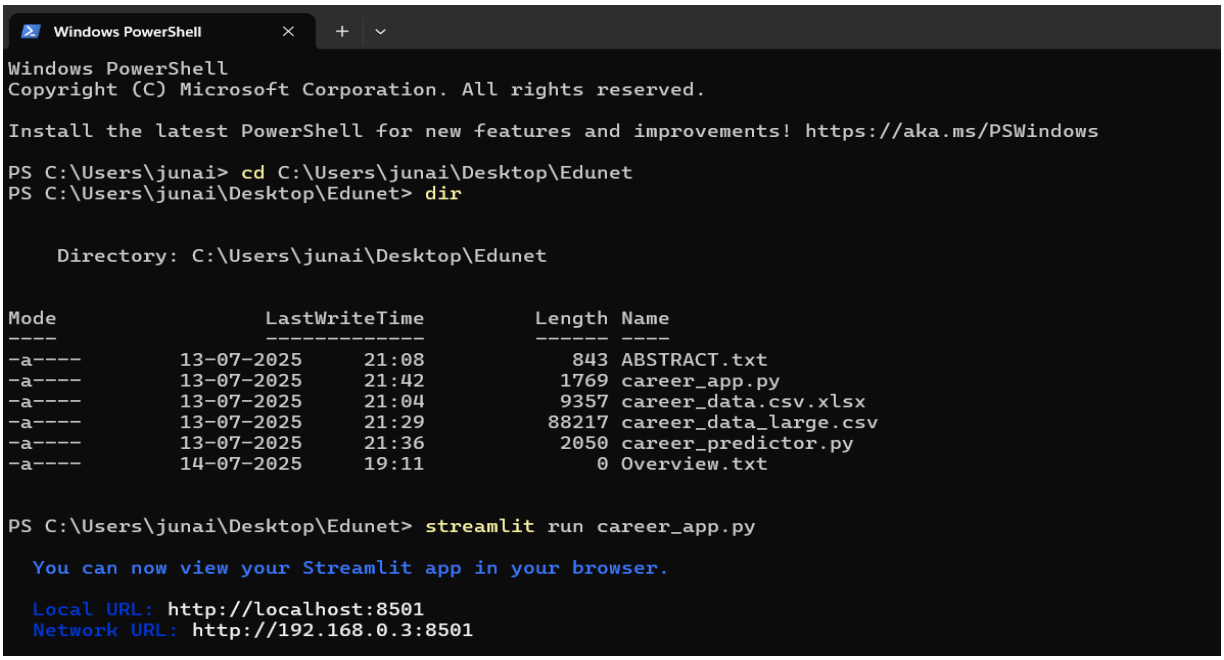
# Predict def

predict_career(input_data):

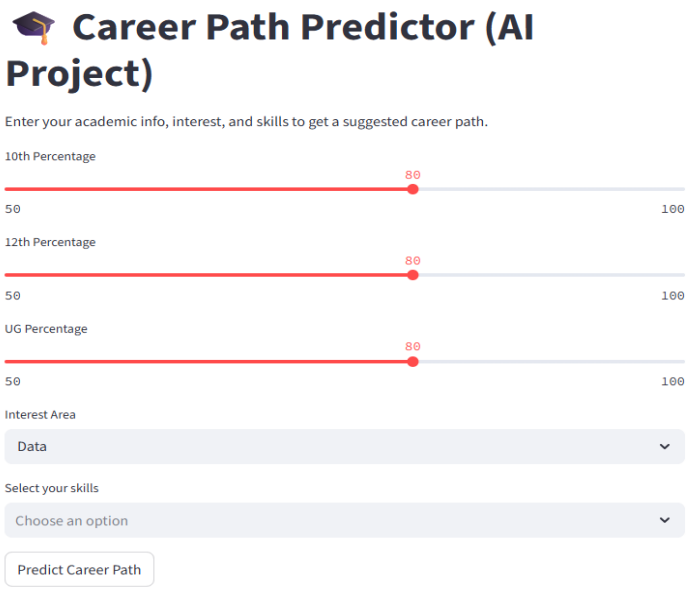
interest_encoded = le_interest.transform([input_data['Interest Area']])[0] skill_vector = [1 if skill in input_data['Skills'] else 0 for skill in mlb.classes_] features = [input_data['10th %'], input_data['12th %'], input_data['UG %'], interest_encoded] + skill_vector return le_target.inverse_transform(model.predict([features]))[0]

**10. Screenshots**

Terminal Screenshot: ( Files in the Folder & Run Streamlit)



Before Entering the Data -User Interface (**Career Path Predictor**)




After Entering the Data -User Interface (**Career Path Predictor**)