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Career Prediction System

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Abstract

Machine learning algorithms have recently demonstrated considerable potential in predic ing career pathways based on unique qualities and traits. In this study, we offer a career prediction system that examines an individual's qualities and characteristics, such as their school level, work experixence, and skills, using machine learning algorithms. To train the machine learning algorithms, we employed a dataset of individuals from various backgrounds and sectors. The system predicts a per- son's career path using a variety of methods .The accuracy of these algorithms has also been examinedin order to identify which one yields the greatest outcomes.

Career Expectation Framework could be a web-based application that makes a difference clients to decide the foremost appropriate career way for them based on their abilities, interface, and identity characteristics. This framework employments machine learning calculations to analyze client infor- mation and give personalized career proposals. In this paper, we show a point by point portrayal of the framework engineering, the machine learning calculations utilized, and the assessment comes about.

Introduction

Making accurate judgements regarding one's professional path requires the essential work of career prediction. An individual's job path is influenced by a variety of variables, including their educational background, abilities, hobbies, and personality qualities. It is now feasible to forecast career prospects based on individual traits and features thanks to growing data availability and machine learning algo-rithms.In this study, we offer a career prediction system that examines a person's features and traits using machine learning techniques. Based on an individual's school level, job experience, talents, and hobbies, the system seeks to forecast their career path. To train the machine learning algorithms, we employed a dataset of individuals from various backgrounds and sectors.

Choosing a career way could be a vital choice that can affect a person's whole life. It is basic to select a career that matches one's aptitudes, interface, and identity characteristics. Be that as it may, with so numerous career choices available, it can be challenging to decide the foremost reasonable career way. The Career Expectation Framework is planned to assist clients make this choice by giving personalized career proposals.

Methodology

We gathered information from a variety of sources, including social networking sites and online em- ployment boards. We gathered information on people's educational background, professional back- ground, skill set, and interests. The data was then preprocessed, with extraneous characteristics re- moved and missing values handled. Then, we divided the data into training and testing sets, using 80% of the training set and 20% of the testing set.

System Architecture

The Career Prediction System is a web-based application that allows users to input their skills, inter-ests, and personality traits. The system then analyzes this data using machine learning algorithm andprovides personalized career recommendations. The system architecture is divided into three main components: the front-end, the back-end, and the machine learning engine.

The front-end is responsible for user interaction and input. It is designed to be user-friendly, with a simple and intuitive interface that guides users through the process of inputting their data.

The back-end is responsible for data storage and retrieval. It stores user data and provides it to themachine learning engine for analysis. The back-end is also responsible for generating personalized career recommendations based on the analysis results.

The machine learning engine is responsible for analyzing user data and providing career recommendations. It is trained using a large dataset of career information and uses machine learning algorithm to analyze user data and provide personalized recommendations.

Machine Learning Algorithms

We have implemented a Random Forest model for a career prediction system, here are some additional details about the algorithm:

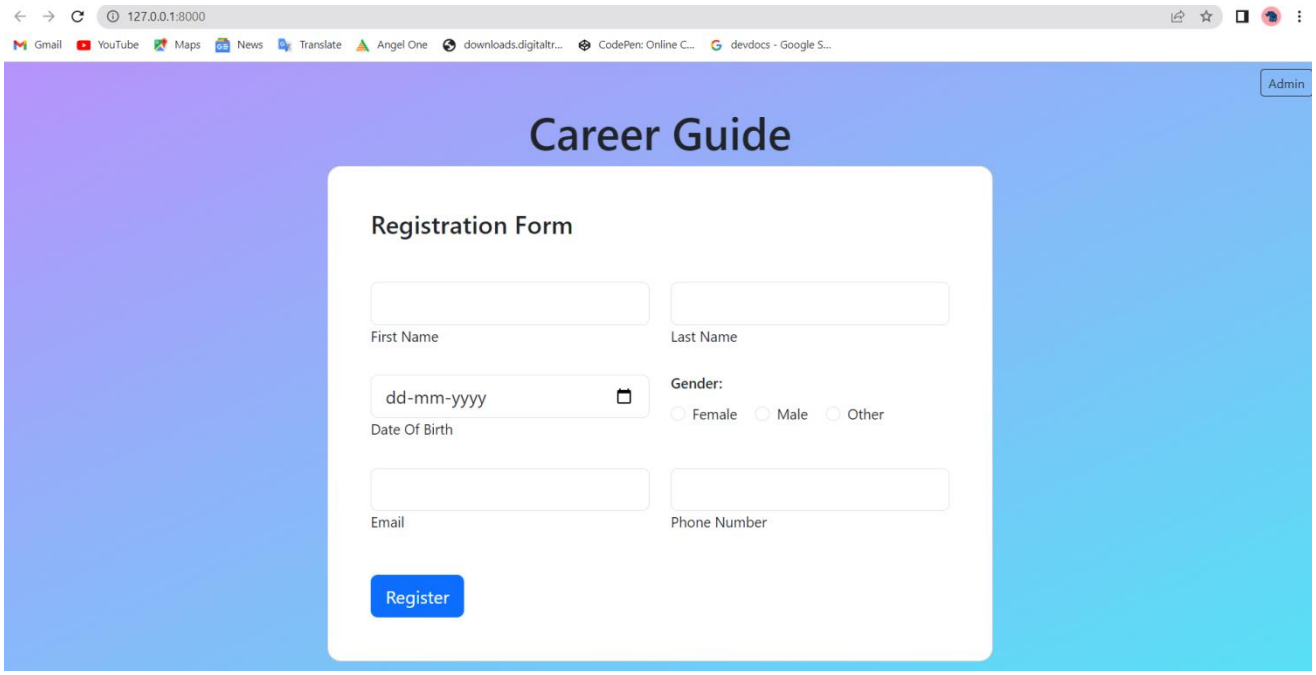
1. **Training the Random Forest**: Random Forest is an ensemble learning method that combines multiple decision trees. The number of decision trees in the forest is a hyperparameter that needs to be set. Each decision tree is trained on a randomly sampled subset of the training data, known as the bootstrap sample. At each node of the decision tree, a random subset of features is considered for splitting.
2. **Decision Tree Construction**: Each decision tree in the Random Forest is constructed using an algorithm such as CART (Classification and Regression Trees). The decision tree recursively splits the data based on feature values to create a tree-like structure. The splits are determined by maximizing information gain (for classification) or minimizing impurity (for regression) at each node.
3. **Voting or Averaging**: For classification tasks, each decision tree in the Random Forest independently predicts the class label. The class with the majority of votes among the decision trees is considered as the final prediction. In case of regression tasks, the Random Forest predicts the average or mean of the individual decision tree predictions.
4. **Handling Categorical Features**: Random Forest can handle categorical features by using techniques like one-hot encoding or label encoding to represent them as numerical values. The random feature selection process in Random Forest ensures that different decision trees consider different subsets of features, providing flexibility in handling categorical data.
5. **Feature Importance**: Random Forest can provide an estimate of feature importance, which indicates the relative importance of each feature in making predictions. The feature importance is calculated based on

how much the accuracy of the model decreases when a particular feature is randomly permuted.

6. **Model Evaluation**: Random Forest models are evaluated using various performance metrics depending on the task, such as accuracy, precision, recall, F1 score, mean squared error, etc. Evaluation can be done using techniques like cross-validation to assess the model's performance on unseen data. It's important to note that the implementation details of the Random Forest algorithm may vary depending on the specific machine learning library or framework you are using. The above details provide a general overview of the Random Forest algorithm and its usage in career prediction systems.

Results

The Career Prediction System was assessed using a set of user data and compared to human career advisors. The results of the assessment showed that the system was able to provide individualized career recommendations that were comparable to those provided by human's career counselors. The system was also able to provide recommendations in a less time-consuming and cost-effective manner.



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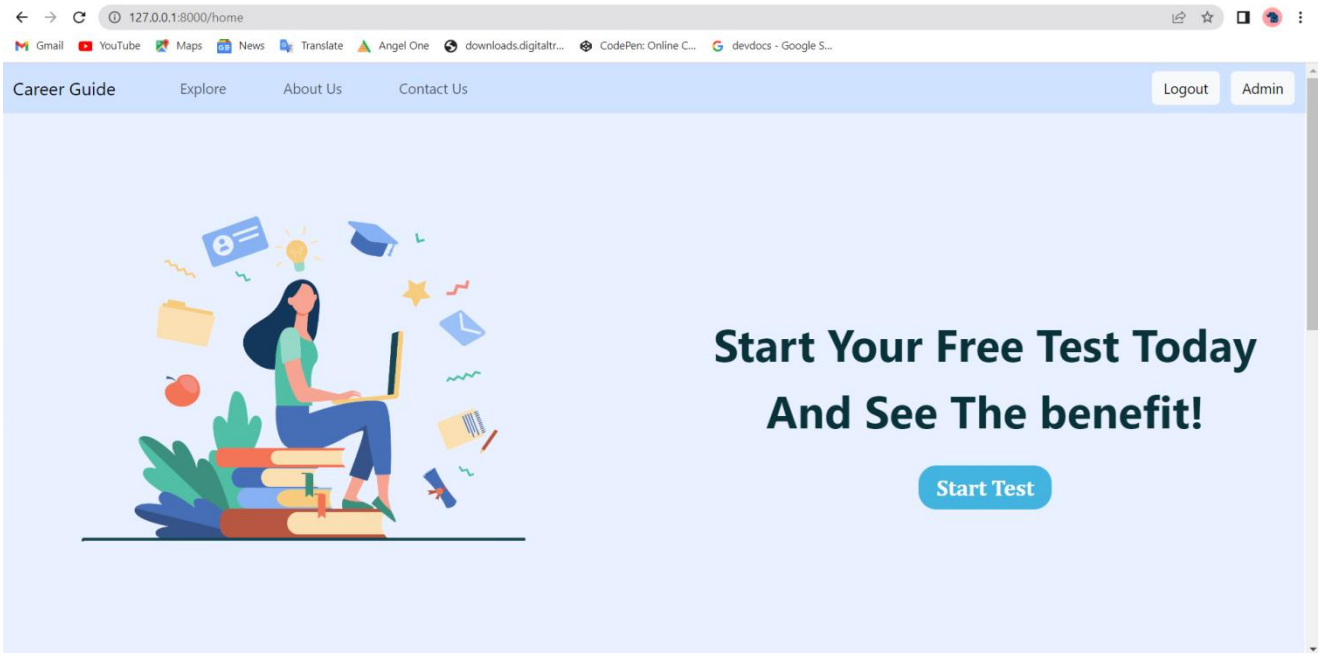

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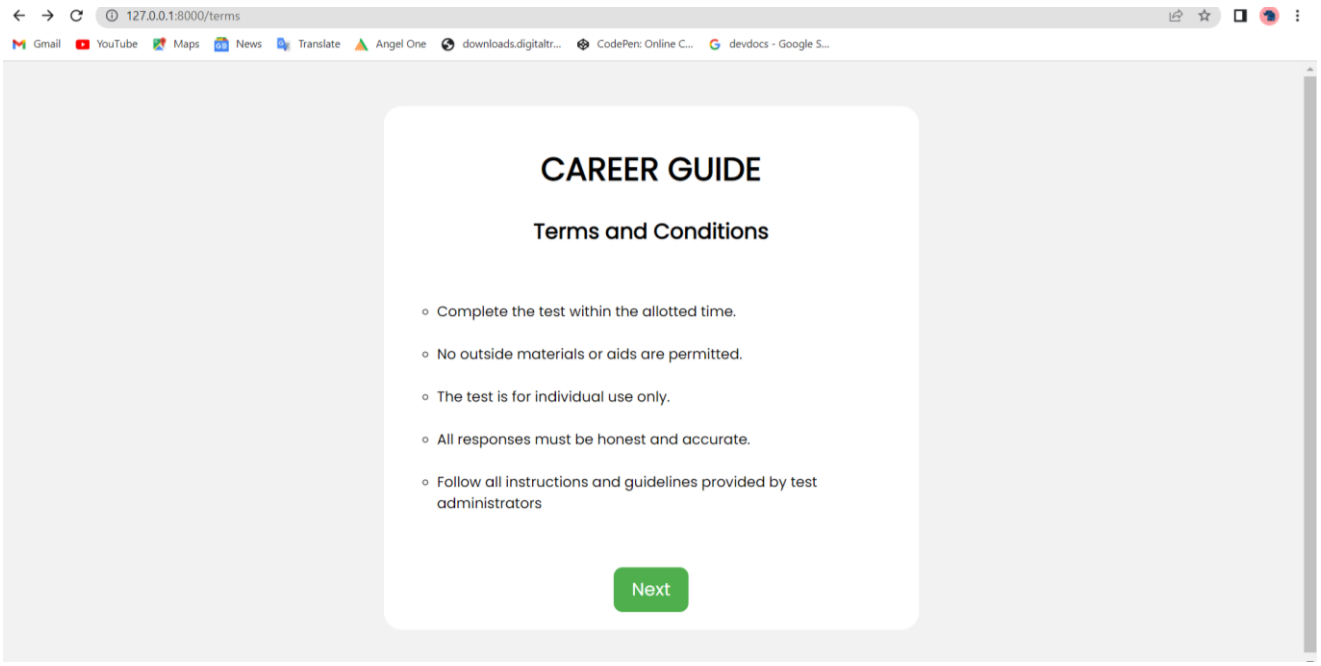

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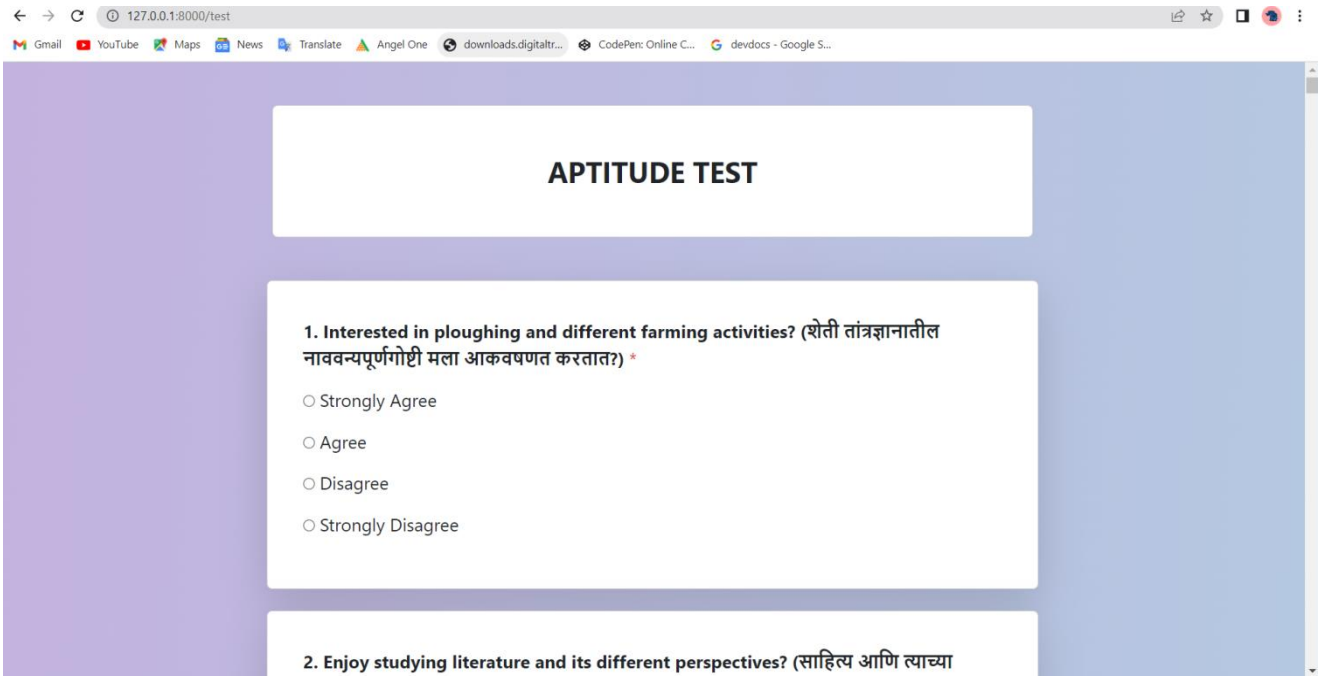

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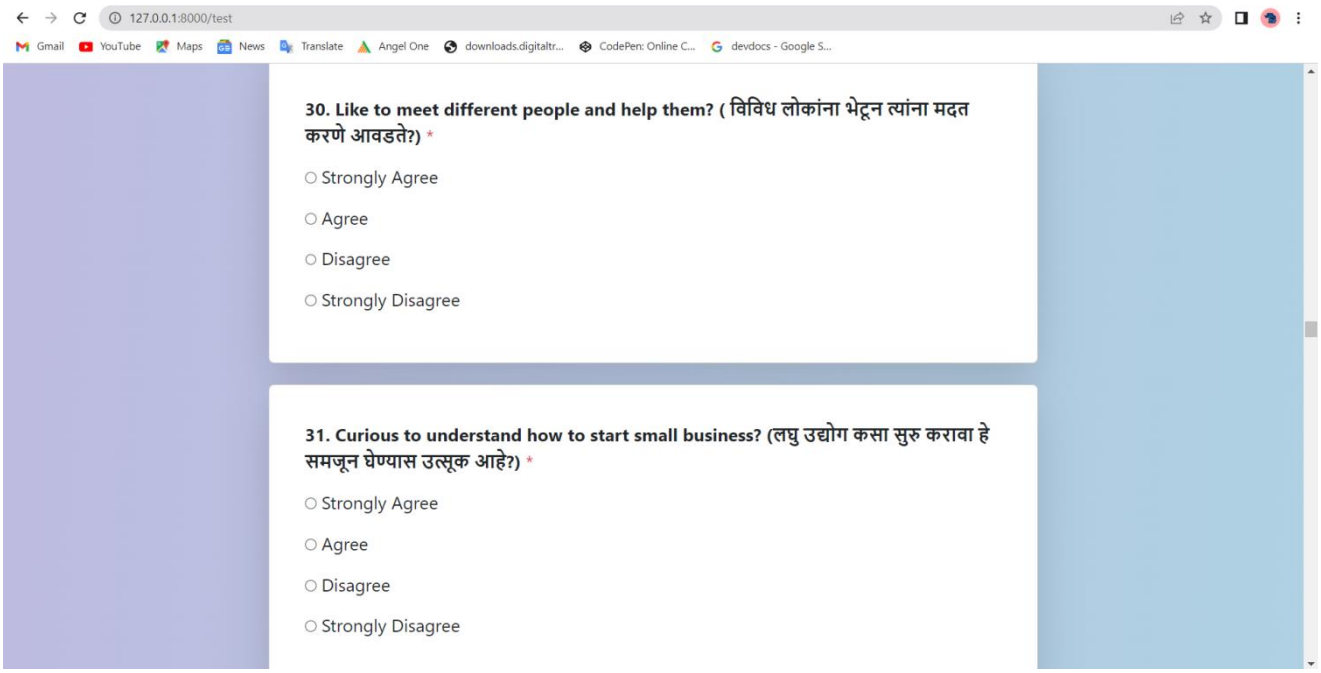

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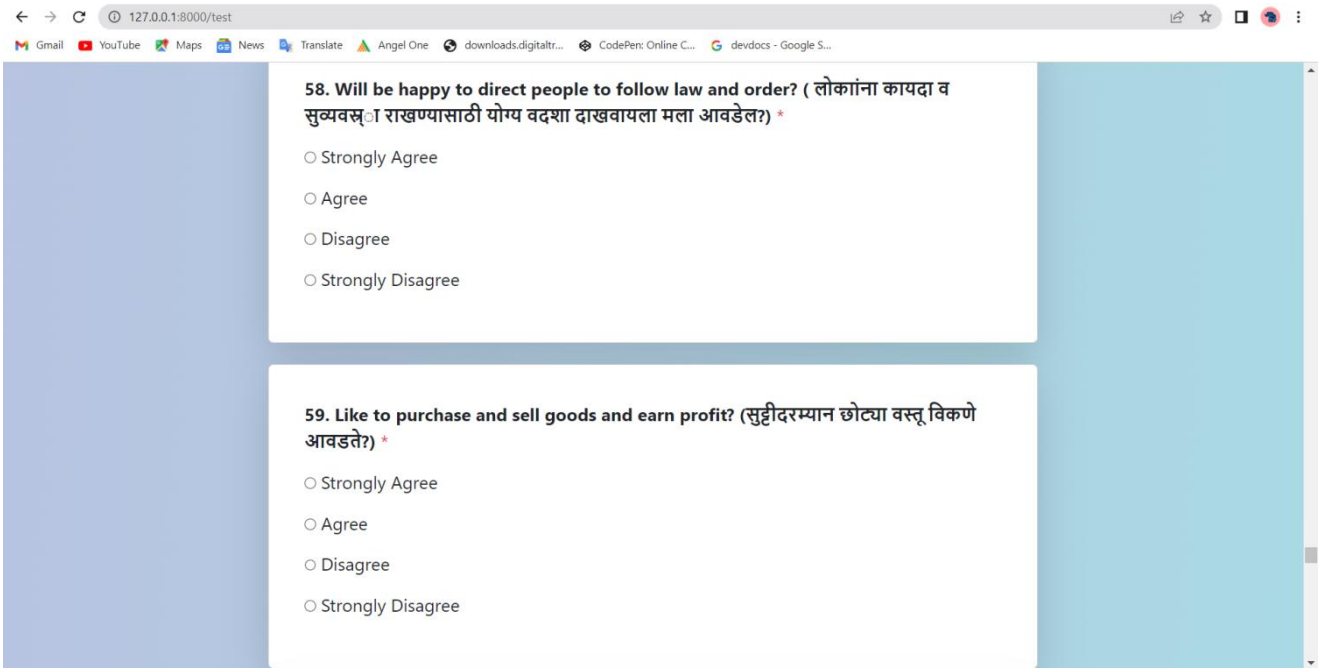

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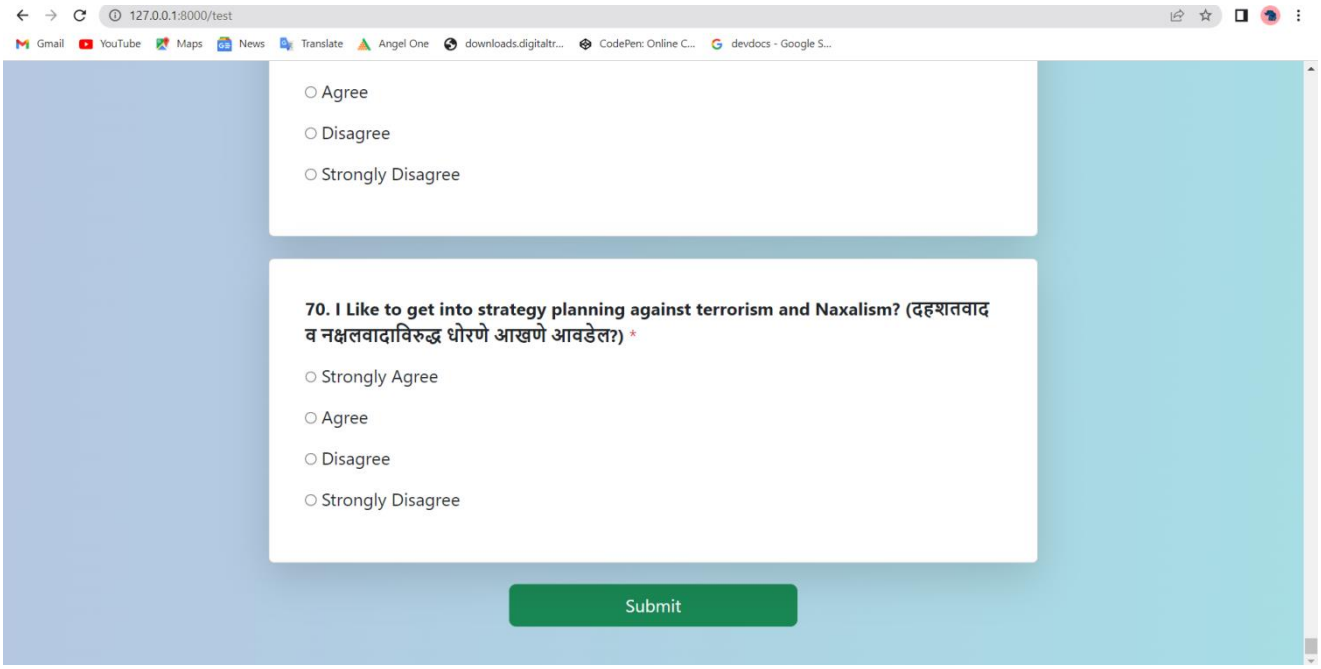

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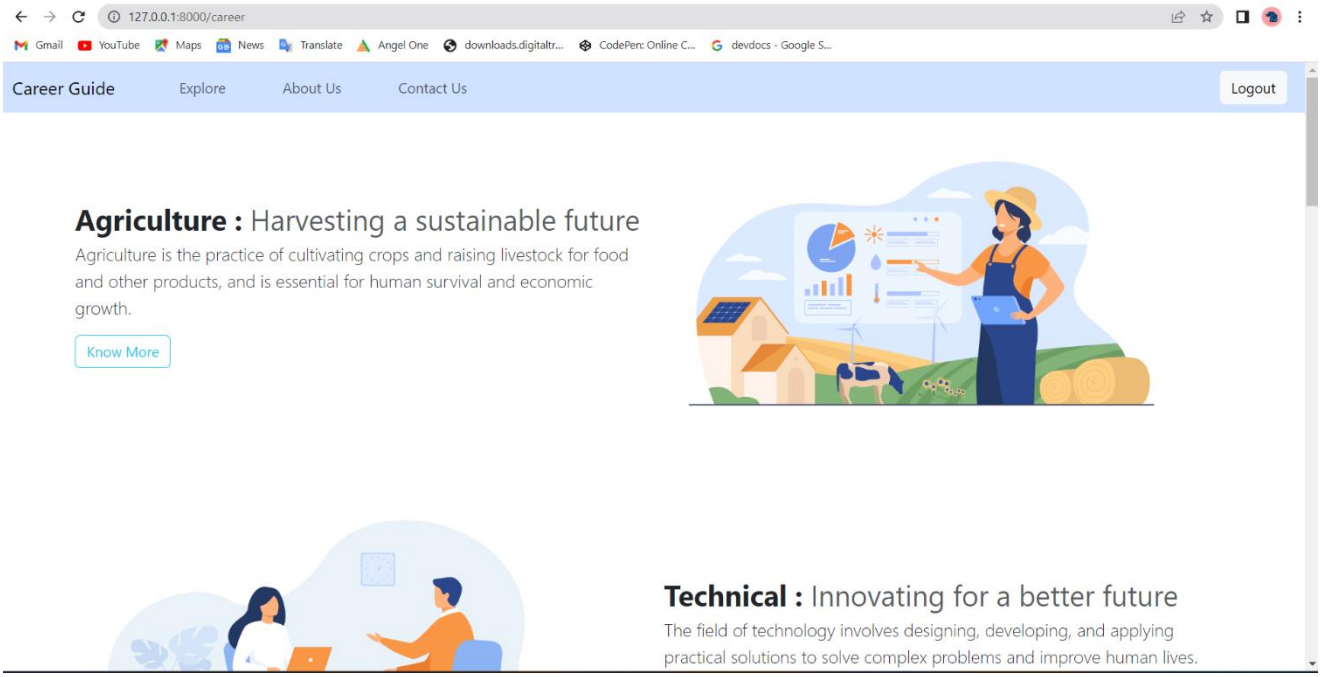

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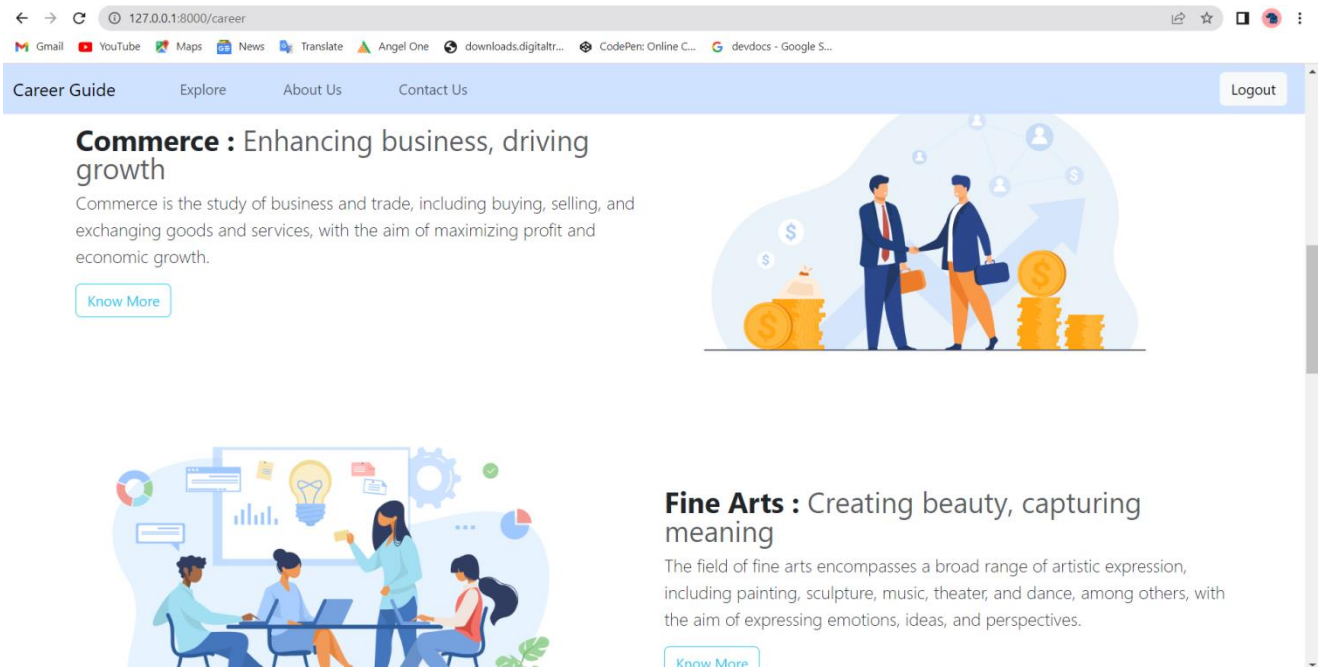

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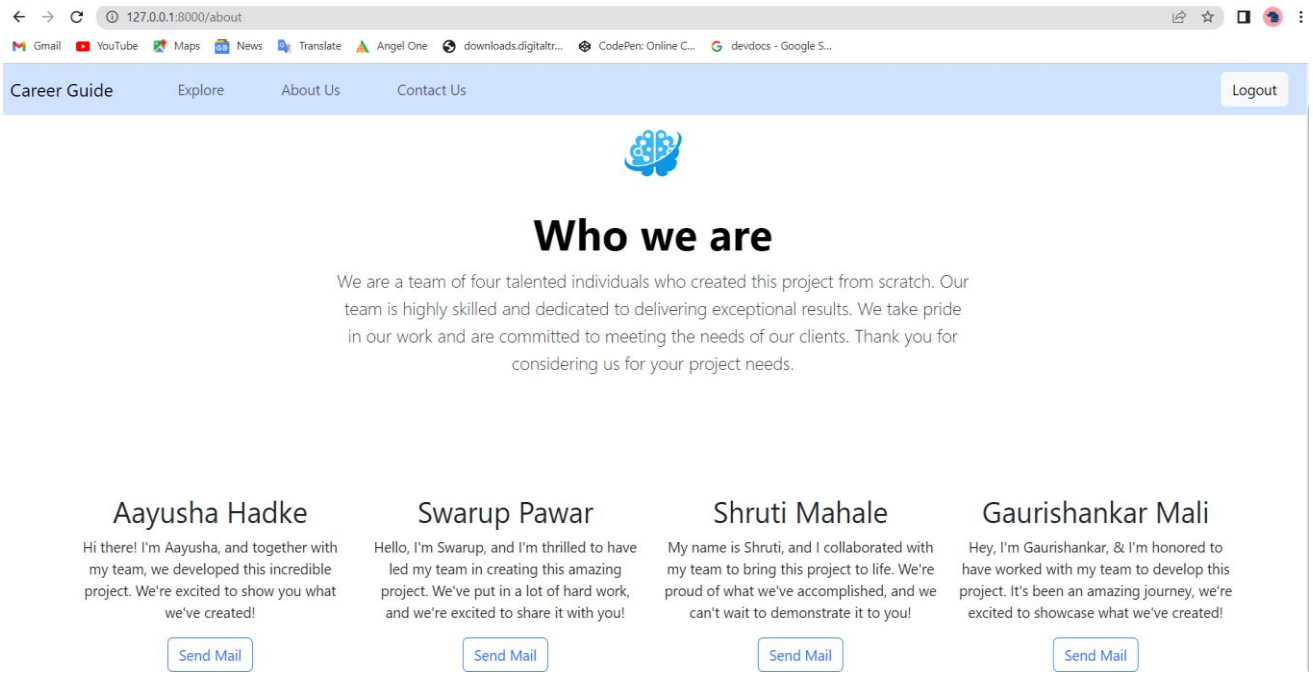
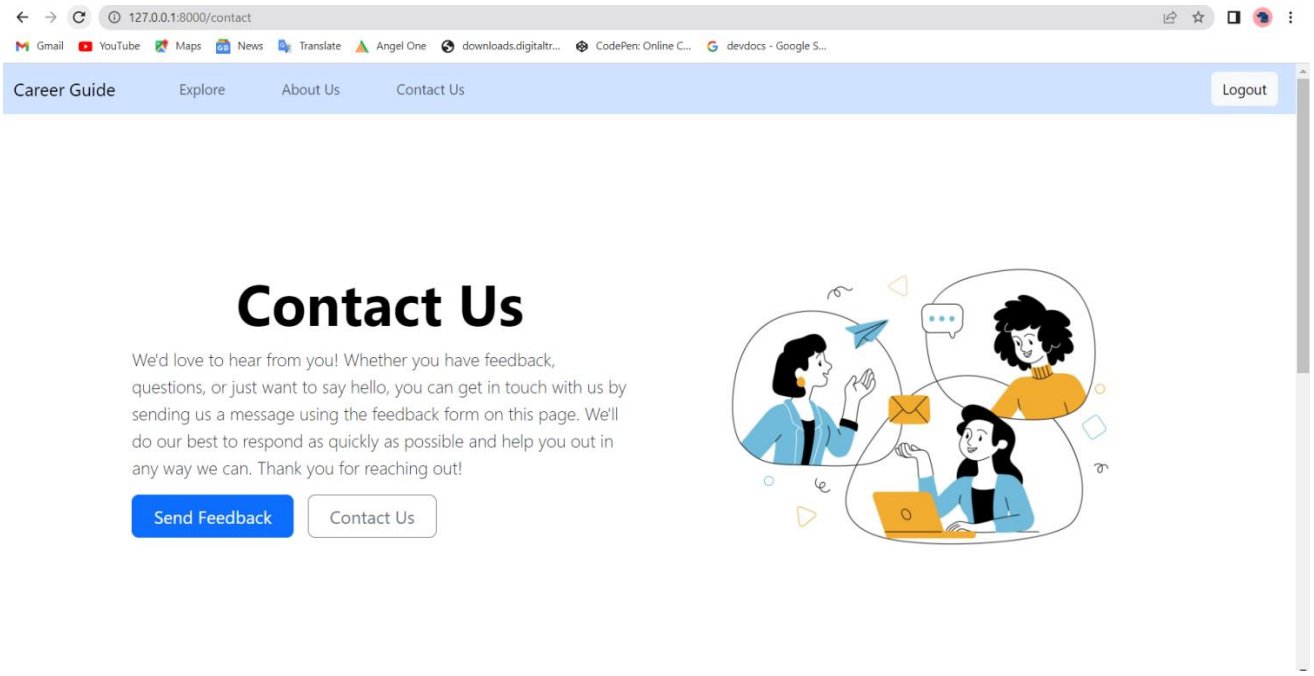


About Us Page



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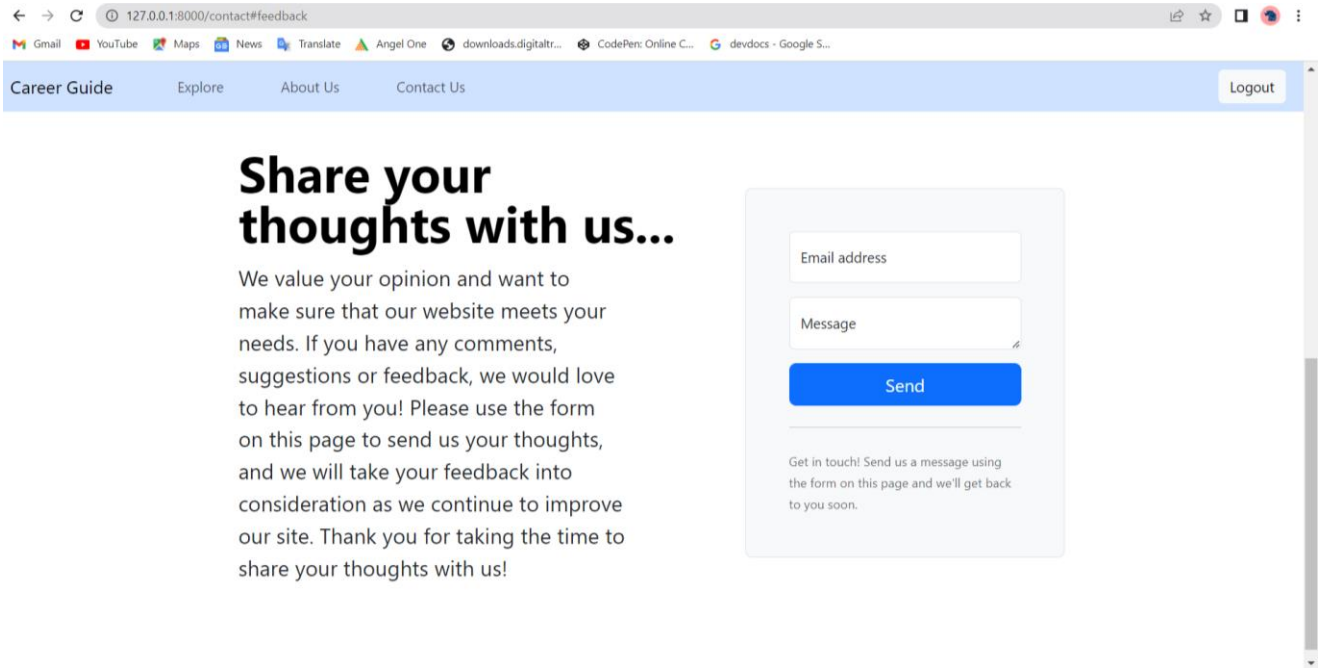

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Conclusion

In this research paper, we introduced a career prediction system that uses machine learning algorithms to analyze individual attributes and characteristics. Our experimental results show that the random forest algorithm provides the highest accuracy in predicting career paths. The system can be used byindividuals to make informed decisions about their career path and by employers to identify suitable candidates. Future work may focus on adding attributes and features to the system to improve the accuracy of predictions.

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