



ONLINE CAREER COUNSELLOR SYSTEM BASED ON ARTIFICIAL INTELLIGENCE

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Abstract: Passing out of school is a big time for students. Many students nowadays are facing problems in deciding their career. First time they will have to make a life-changing choice. As the students are going through their academics, they need to realize their capabilities and check their areas of interest so that they will decide which career is best suited for them. This Online Career Guidance System aims to provide an overview of the Artificial Intelligence techniques that we used to predict the performance of the student and also be the helpful and useful starting point for this confusing phase. This system will help nowadays youth to decide which career path is best for their future that brings out the best results if they choose that prescribed career. This will help in improving the performance of the student and also motivate their interest so that they will be focused on their targeted career. This system is based on a test that a student has to perform and depend on the answers that are provided by the student, it will generate a summarized result. The main aim of this system is to provide an overview of the Artificial Intelligence techniques that we used to predict the performance of the student. This system will also be focusing on the way we are using prediction algorithms to identify attributes in student data. Using this system proved to be beneficial for the students, Educational Institutions and educators also.

IndexTerms – RECOMMENDATION SYSTEM, FLASK, LOGISTIC REGRESSION.

1. INTRODUCTION

Choosing a career is also one of the important tasks of today's generation as the world is getting more technical. This issues mostly happens with the students that what their interest lies in. Every parent wants to see their children engineer or doctor but nobody asks what the child interested for, also the parents are worried about the future of their child, so this software helps both student and their parents. It helps the student to know where his/her actual interest lies in, which subject he has to choose that provides the best result of his future. This Online Career Guidance System aim is to provide an overview of the Artificial Intelligence techniques that we used to predict the performance of the student and also be the helpful and useful starting point for this confusing phase. This system will help nowadays youth to decide which career path is best for their future that brings out the best results if they choose that prescribed career. This will help in improving the performance of the student and also motivate their interest so that they will be focused on their targeted career. This system is basically for the students from 10th to 12th standard who are confused about what career they want in future and what career they will choose so that it would be beneficial for their future. This system is based on a test that a student has to perform. Once the student will answer these questions, then depend on the answers that are provided by the student, it will generate a summarized result. this system will also be focusing on the way we are using prediction algorithms to identify attributes in student data. Using this system proved to be beneficial for the students, Educational Institutions and educators also.

2. LITERATURE SURVEY:

Vignesh S, Shivani Priyanka C el. [1] In the system, they have designed and developed a web-based application for a career guidance system which provides suitable recommendations for a candidate in choosing an appropriate department. This computerized career counselling system is used to predict the suitable department for an individual based on their skills assessed by an objective test. If one completes their online assessment which we have created in our system, then automatically they will end up in choosing an appropriate course which will also reduce the failure rate by choosing a wrong career path.

Divya Manoj Bhnushali1, Prashant Itankar2 el. [2] This system is not only compromises of chatbot but also an intelligent engine which delivers best career choices on the data of industry leading professional and with the help of AI applications system will perform accurately and at high performance. This system will be helpful to very individual seeking career guidance. This research paper concludes that this career counsellor system with AI is a boon for upcoming and today's world.

Kartikey Joshi School of Computing Science & Engineering et. al. [3] The system consists of the basic intelligence career counselling, career counselling solutions management, auxiliary decision-making, information management, evaluation management and so on. The system can obtain the relevant information automatically from visitors, determine their professional problems and then propose some solutions and recommendations.

Sana Thamke, Ashlesha Talankar, Vaishnavi Wadhale, Snehal Baghile, Tanuj Manekar et. al. [4] This system is plagued with the following problems: few numbers of human counsellors, unavailability of a counsellor in a good number of colleges, few number of counsellors attending to students during college hours and the office of a counsellor in colleges are so unpopular that students hardly meet them for career counselling.

Firdosh sayyed¹, Ronak Sanghani², Abhishek Vora³, Nikita Lemos⁴ et. al. [5] Machine learning practices can commit by offering help to students for selecting the correct educational domain to shape their vocation. The proposed system has proposed an education decision support system model, which comprises the components i.e. user interface, inference engine, and knowledge base. Our model support machine learning type strategies to give a knowledge revelation design, in this way it likewise incorporates the knowledge of a few domain experts.

3. PROBLEM STATEMENT:

From above discussion in literature survey, we identify the problem statement of our project which is “Online career counsellor system Based on Artificial Intelligence” in this project we have designed and developed a web-based application for a career guidance system which provides suitable recommendations for a candidate in choosing an appropriate career. Every child at secondary level (grades 8 to 12) needs to have access to the existing choices for career to enable them to make study choices What subjects will lead to what career paths, what are the Higher Educational Institutions for study for pursuing such studies, most important which field or course is beneficial for me etc. how to access them etc. are important information for making such choices Sometimes children like to chat about their fears regarding their choices. They will need access to a counsellor either through chatbot or any other AI-based solution an App based comprehensive solution is required encompassing all these issues.”

4. BLOCK DIAGRAM

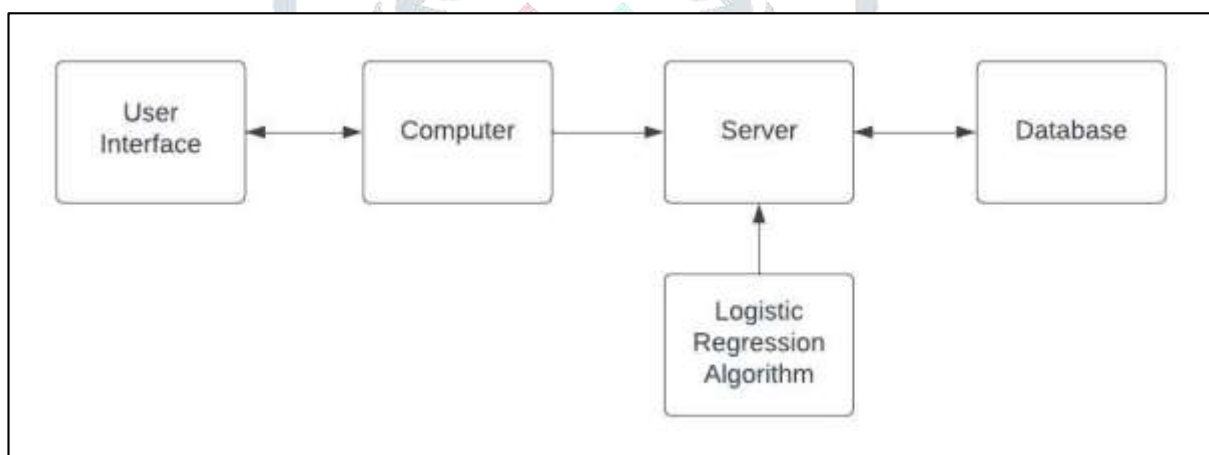


fig 1. block diagram of proposed system

Server: Server loads the web page from the browser, then sends the response to the browser and accepts the requests from browser. server fetches the data from database which is already stored in it.

Computer: It is related to computing the Analysis using the AI and Algorithms. It sends data to AI and receives processed results from them. After processing the data Displays it on the browser.

User Interface (UI): It displays the Login Form and Account registration and all the information related to User.

Artificial Intelligence (AI): AI, or Artificial Intelligence, is a field of computer science that focuses on creating intelligent machines capable of simulating human-like intelligence. It involves developing algorithms and models that enable computers to learn from data, reason, make decisions, and perform tasks autonomously.

Machine Learning (ML): machine learning is a field of study and application that focuses on developing algorithms and models that enable computers to learn from data and make predictions or decisions without being explicitly programmed. It involves training models on labeled data, extracting patterns and relationships, and using them to make accurate predictions or classify new data. ML finds applications in various domains, including image recognition, natural language processing, recommendation systems, and autonomous vehicles. Its goal is to enable machines to learn and improve from experience, leading to more efficient and intelligent systems.

Algorithm: We have used the “Logistic Regression algorithm” to predict the suitable course with respect to the performance of the candidate. logistic regression is a machine learning algorithm computes a sum of the input features and calculates the logistic of the result.

Database: A database is an organized collection of structured information, or data, typically stored electronically in a computer system. For this project we have used MySQL database system to store the data. Databases are useful for storing information categorically. The data in a MySQL database are stored in tables, which is a collection of related data, and it consists of columns & rows.

5. FLOW CHART OF THE SYSTEM

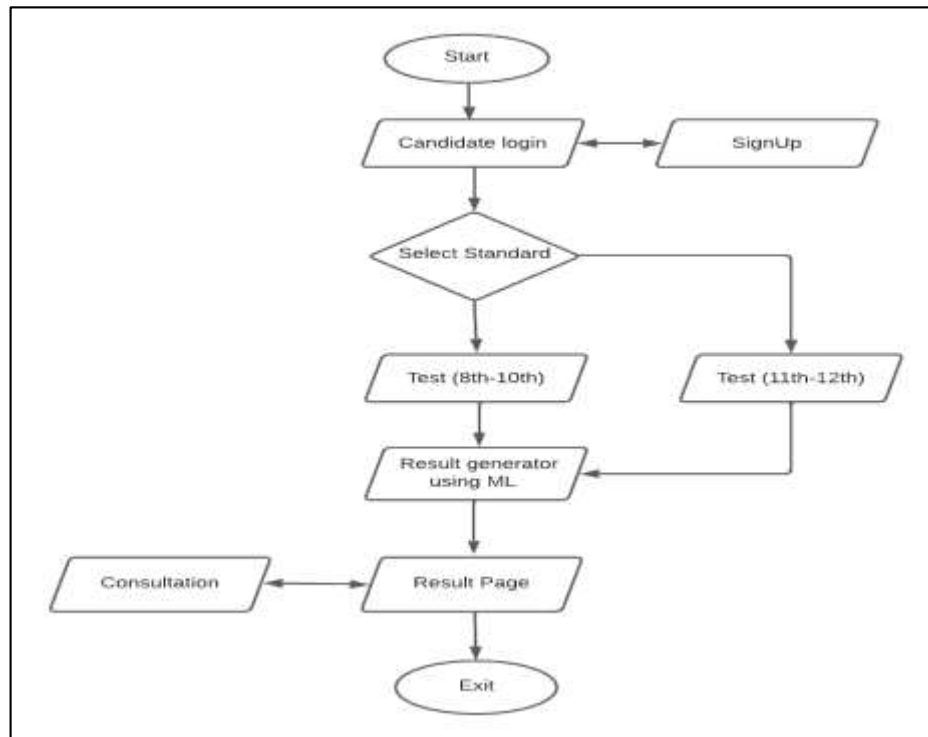


fig 2. flow chart of the system

1. Start the program.
2. Display the homepage of the website.
3. Wait for the user to perform an action (e.g., sign up, log in).
4. If the user chooses to sign up:
 - a. Display the sign-up page.
 - b. Gather user input for registration details (e.g., name, email, password).
 - c. Validate the input and check for any errors.
 - d. If the input is valid, create a new user account and store the information.
 - e. Display a success message and redirect the user to the login page.
 - f. If there are any errors, display appropriate error messages and allow the user to correct them.
5. If the user chooses to log in:
 - a. Display the login page.
 - b. Gather user input for login credentials (e.g., email and password).
 - c. Verify the credentials against the stored user accounts.
 - d. If the credentials are correct, grant access to the user and redirect them to their dashboard.
 - e. If the credentials are incorrect or not found, display an error message and allow the user to retry or reset their password.
6. If the user selects a test (e.g., 10th or 12th-grade test):
 - a. Display the selected test page.
 - b. Present the test questions one by one.

- c. Gather user answers for each question.
 - d. Repeat steps b and c until all questions are answered.
 - e. Calculate the test score using the logistic regression algorithm or any other relevant algorithm.
 - f. Store the test results for the user.
7. Display the test results to the user.
 - a. Provide information on the user's performance in the test.
 - b. Show career path recommendations based on the test results.
 8. Provide options for the user to explore further.
 - a. Display additional resources or links related to their recommended career paths.
 - b. Allow the user to navigate back to the homepage or other sections of the website.
 9. Repeat steps 3-8 as long as the user continues to interact with the website.
 10. End the program.

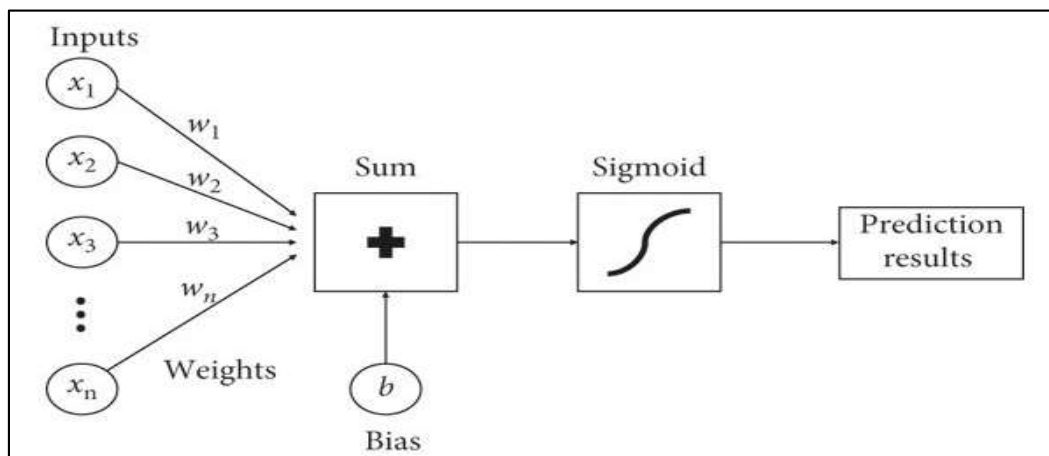


fig 3. flow of logistic regression algorithm

1. Initialize the weights: Start by assigning initial weights to each feature or predictor variable. These weights represent the coefficients that will be adjusted during the learning process.
2. Calculate the weighted sum: For each training example, calculate the weighted sum of the feature values multiplied by their corresponding weights. This can be done by taking the dot product of the feature vector and the weight vector.
3. Apply the activation function: Pass the weighted sum through an activation function, typically the sigmoid function, to obtain the predicted probability of the positive class. The sigmoid function maps the weighted sum to a value between 0 and 1, representing the probability of belonging to the positive class.
4. Calculate the loss: Compare the predicted probability with the actual class label of the training example to calculate the loss or error. Commonly used loss functions for logistic regression include the binary cross-entropy loss or the negative log-likelihood.
5. Update the weights: Adjust the weights using an optimization algorithm, such as gradient descent or stochastic gradient descent, to minimize the loss function. This involves taking the derivative of the loss function with respect to each weight and updating the weights in the opposite direction of the gradient.
6. Repeat steps 2-5: Iterate through the training examples, recalculating the weighted sum, applying the activation function, calculating the loss, and updating the weights. This process is repeated for a specified number of iterations or until convergence criteria are met.
7. Make predictions: Once the weights have been learned, they can be used to make predictions on new, unseen examples. Calculate the weighted sum for each example, apply the activation function, and classify the examples based on a predefined threshold (usually 0.5 for binary classification).
8. Evaluate the model: Assess the performance of the logistic regression model using evaluation metrics such as accuracy, precision, recall, and F1 score. This step helps determine how well the model generalizes to unseen data and whether any further adjustments or improvements are needed.

6. IMPLEMENTED WORK

Web Framework: The project is built using the Flask web framework, which provides a foundation for handling HTTP requests, rendering templates, and managing routes. Flask allows you to develop web applications in Python efficiently.

Database: MySQL is used as the database management system for storing student information, including name, email, username, and password. The mysql.connector module is used to establish a connection with the database and perform CRUD (Create, Read, Update, Delete) operations.

Front-End: HTML and CSS are used for designing and styling the web pages. Flask's render_template function is used to render these templates dynamically.

User Authentication: The project includes a sign-up and login functionality for users. When a user signs up, their information is stored in the MySQL database. The login functionality verifies the user's credentials by querying the database and redirecting them to the appropriate page.

Test Modules: The project includes two tests, one for 10th-grade students and another for 12th-grade students. Each test is implemented as a separate Flask route. The questions and correct answers for each test are stored in separate lists (maths10ans, eng10ans, etc.).

Test Scoring: When a student submits a test, their answers are compared with the correct answers using conditional statements. The score for each section (maths, English, science, logic) is calculated by counting the number of correct answers. The scores are then passed to the PredictPath function for career path prediction.

Career Path Prediction: The PredictPath function uses logistic regression algorithm (assumed to be implemented in the predict.py module) to predict the career path based on the scores obtained in the test. The predicted career path is displayed to the student as a result.

Result Display: The predicted career path is rendered in the result templates (result10.html and result12.html) using Flask's render_template function.

Additional Pages: The project also includes additional pages such as "Career Paths" and "Consultation" which provide extra details about different career paths and consultation services.

Deployment: The project is currently configured to run on a local development server. For deployment.

7. RESULT

The system can provide students with personalized career recommendations based on their test performance and interests, helping them make informed decisions about their future paths.

7.1 HOME PAGE:

This is the home page of our career guide web app. On the right side of that home page contains four menu options (buttons) Home, About Us, sign Up and Login. After clicking on that option user can go on that pages. To start this web app click on the Get started on home page.

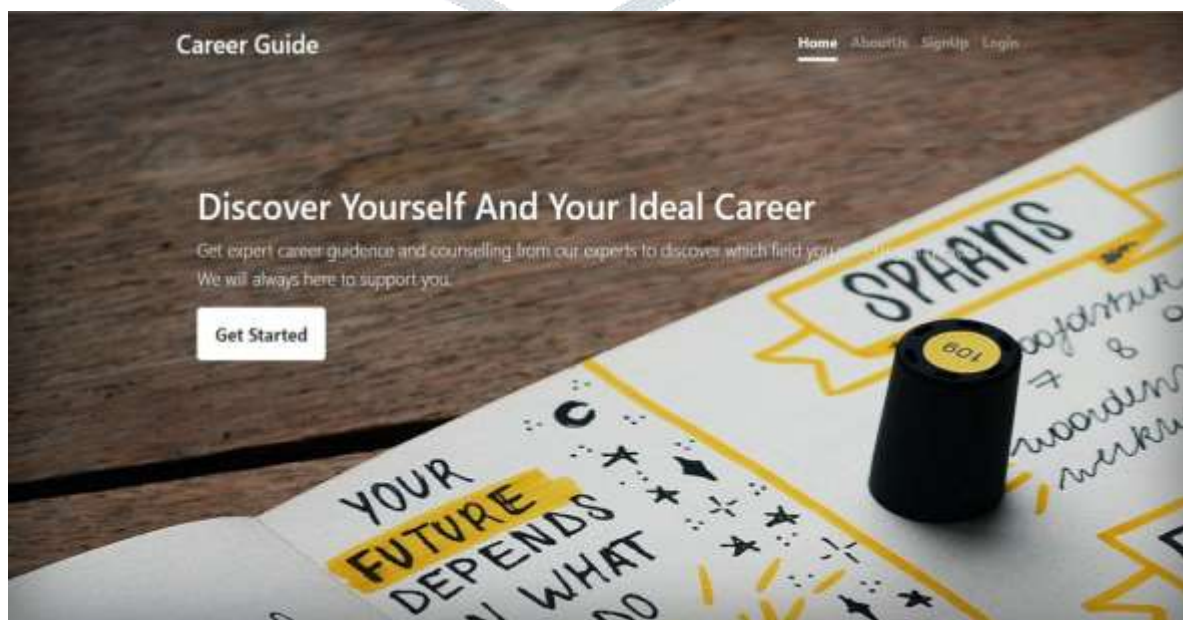


fig.7.1 home page

7.2 SIGN UP PAGE:

If the candidate is new then he has to sign up before get started. For sign up candidate has to enter the same name, Email ID and create username and password. After clicking on registration, the registration will be done.

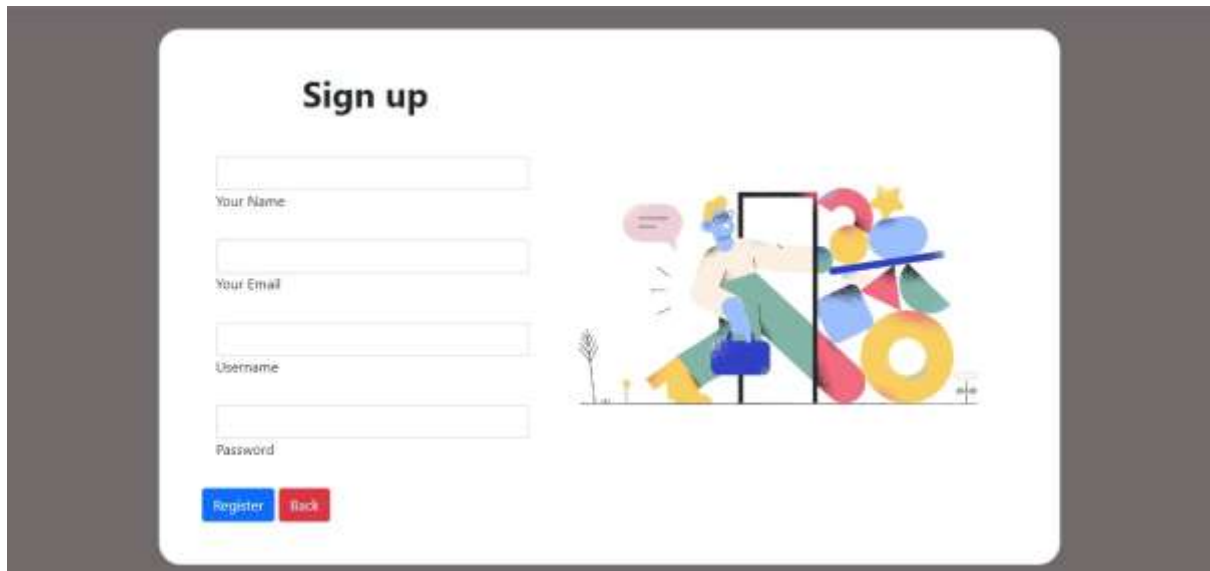
A screenshot of a web application's sign-up page. The page has a white background with a dark grey border. At the top center, the text "Sign up" is displayed in a bold, black font. Below this, there are four input fields stacked vertically, each with a label to its left: "Your Name", "Your Email", "Username", and "Password". At the bottom left of the form area, there are two buttons: a blue "Register" button and a red "Back" button. To the right of the input fields, there is a colorful illustration of a person with a blue face and green body, holding a blue bag and standing next to a large, colorful number "2".

fig 7.2 sign up page

7.3 LOGIN PAGE:

After getting started candidate login page will be displayed. Students can login to the system by entering Email ID and Password.

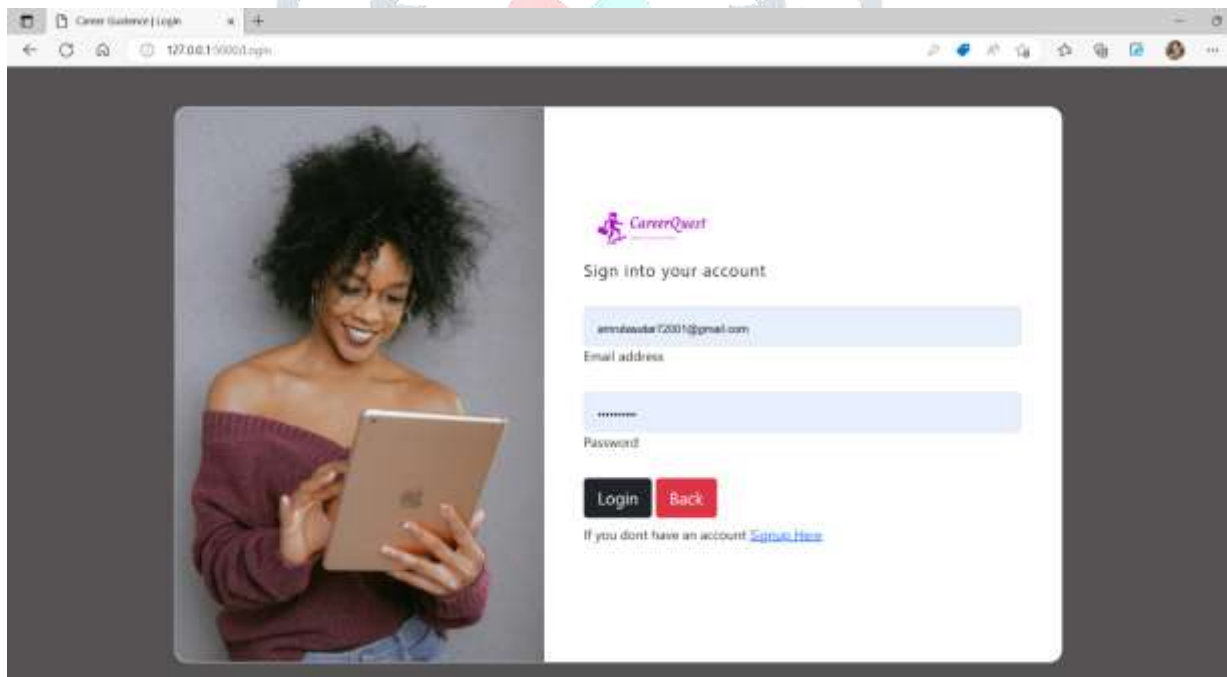
A screenshot of a web browser displaying the login page. The browser's address bar shows "127.0.0.1:9000/login". The page features a dark grey background. On the left side, there is a photograph of a smiling woman with dark curly hair, wearing a maroon off-the-shoulder top, holding a tablet. On the right side, there is a white login form. At the top of the form is the "CareerQuest" logo, which consists of a purple icon and the text "CareerQuest". Below the logo, the text "Sign into your account" is displayed. There are two input fields: "Email address" with the value "amrtaakshita72001@gmail.com" and "Password" with masked characters. At the bottom of the form, there are two buttons: a black "Login" button and a red "Back" button. Below the buttons, there is a link that says "If you dont have an account [Sign up Here](#)".

fig 7.3. login page.

7.4 CAREER PAGE:

After login, this welcome window will appear. On the right side of the user, there is an option of career in the upper corner, where there is information about available careers in short. A separate question paper has been created for students of 8th to 10th and a separate question paper for 11th to 12th. Quiz will start on continue.

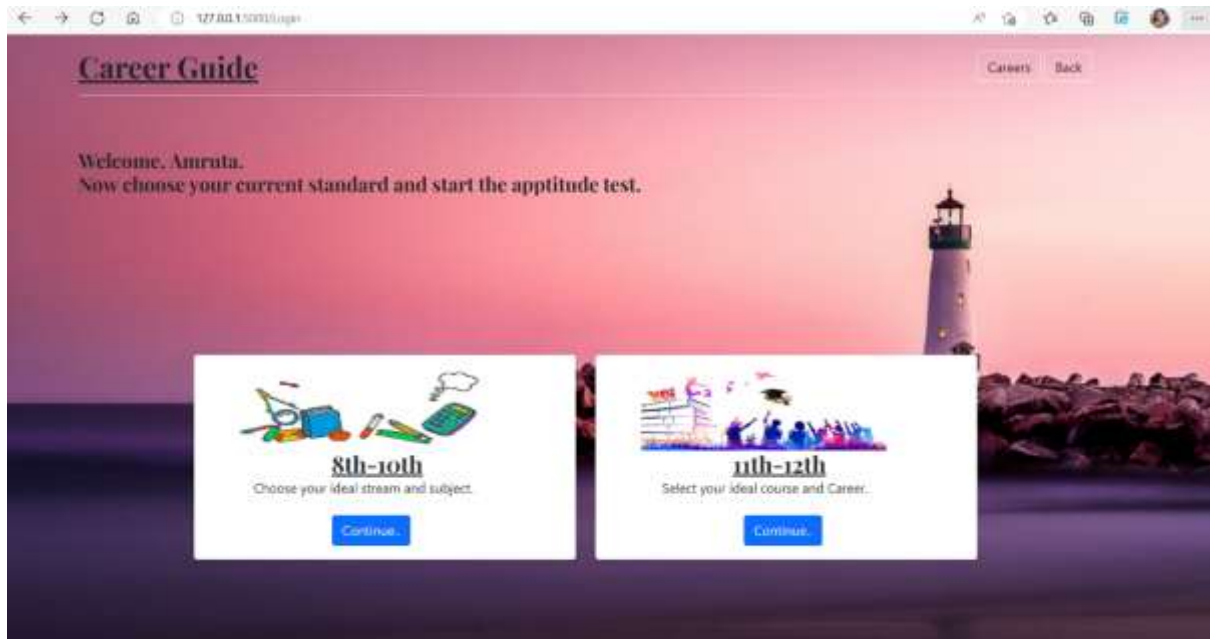


fig.7.4 career guide

7.5 QUESTION PAPER:

After clicking on start the quiz button. The question paper will display on this page. Here user have to choose appropriate answers to the questions. And then click on submit button to submit that question paper.

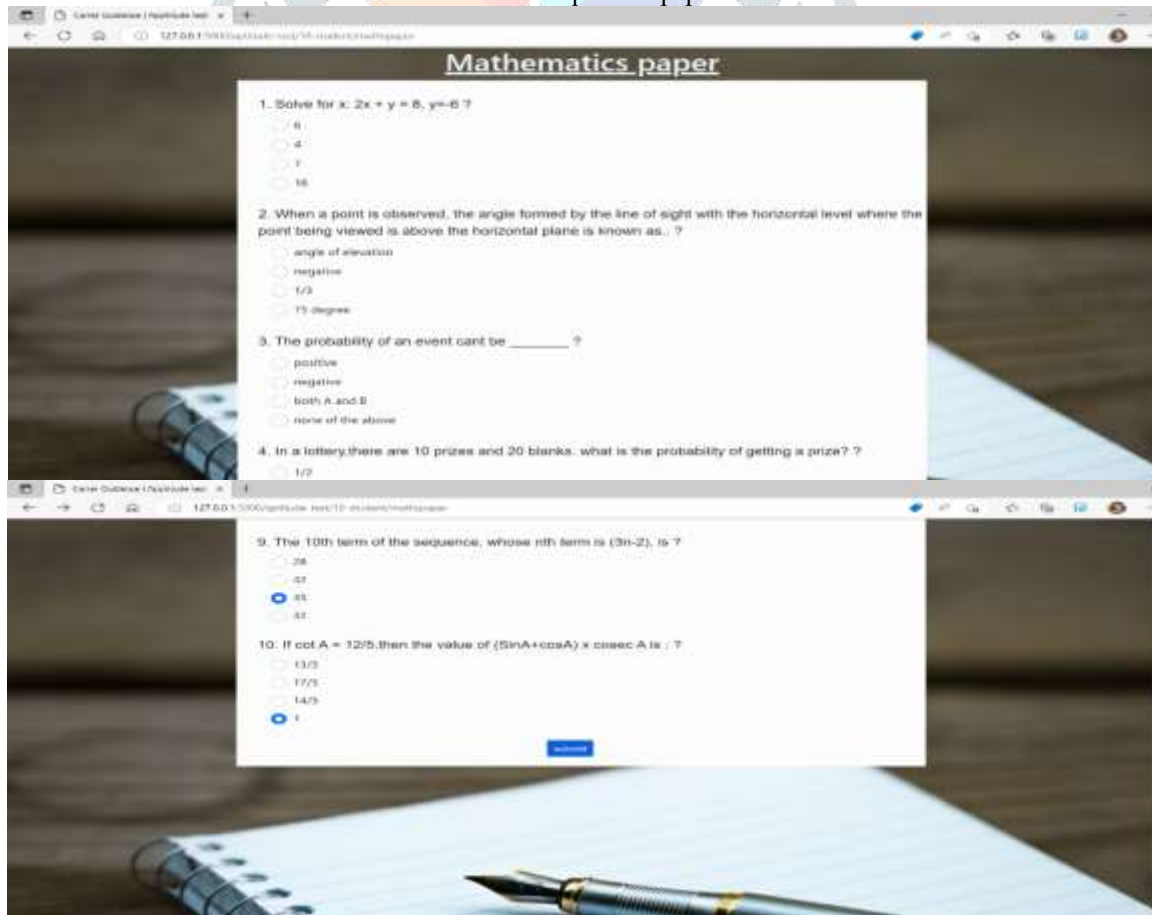


fig.7.5 question paper

7.6 RESULT:

After submitting the quiz, for career suitable course recommendation will be made with the help of logistic regression algorithm by considering the marks obtained by the candidate.

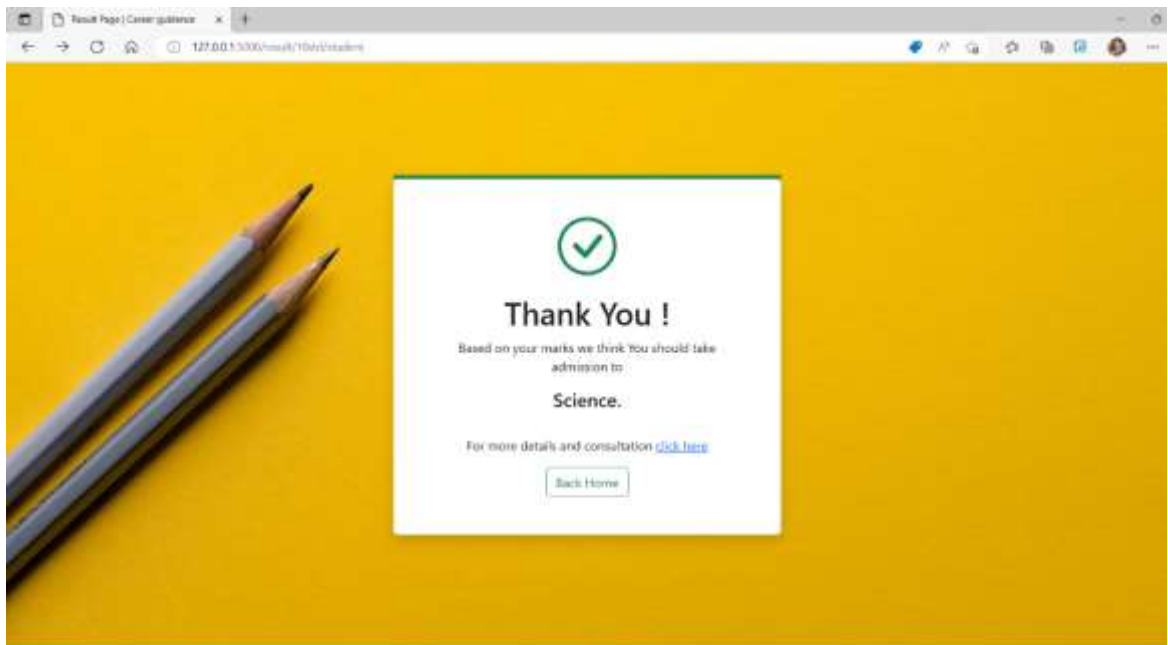


fig.7.6.a result pages

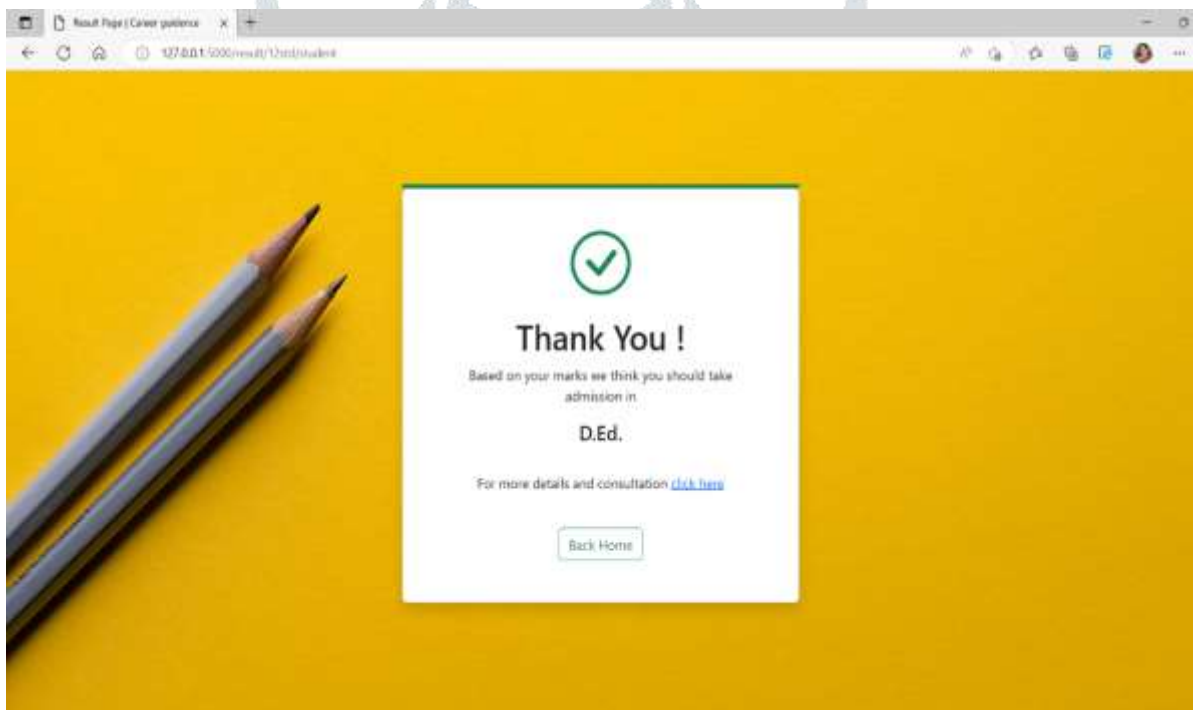


fig.7.6. b result pages

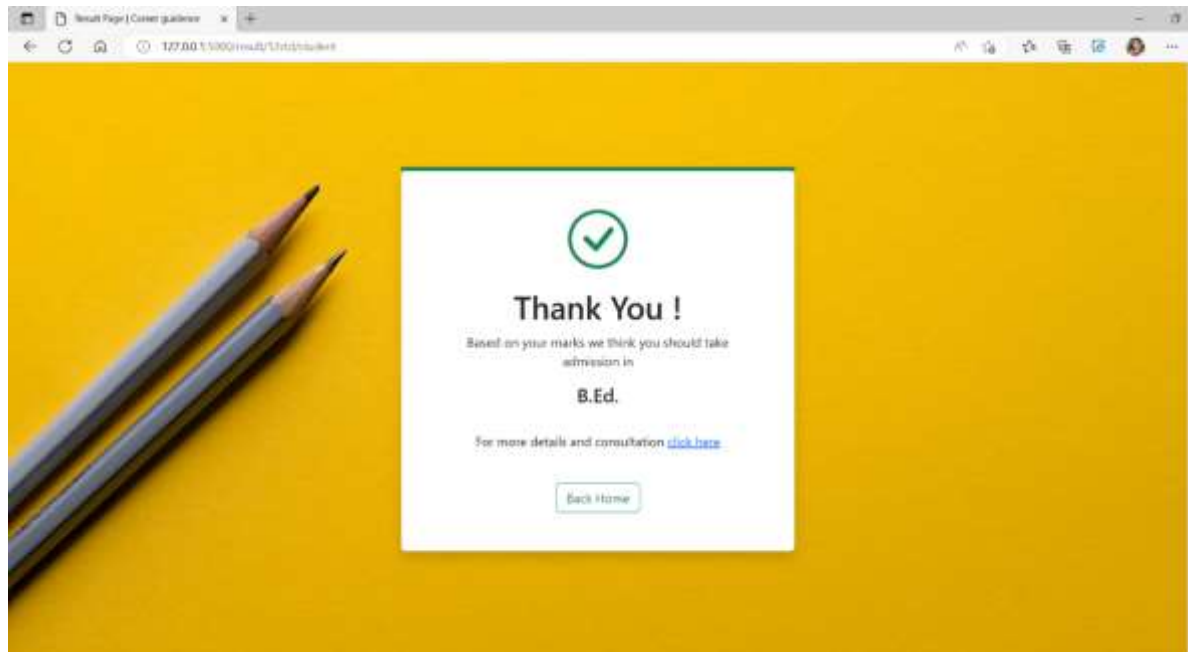


fig.7.6.c result pages

7.7 CONSULTATION:

for getting more information there are some details of consultants on this page.

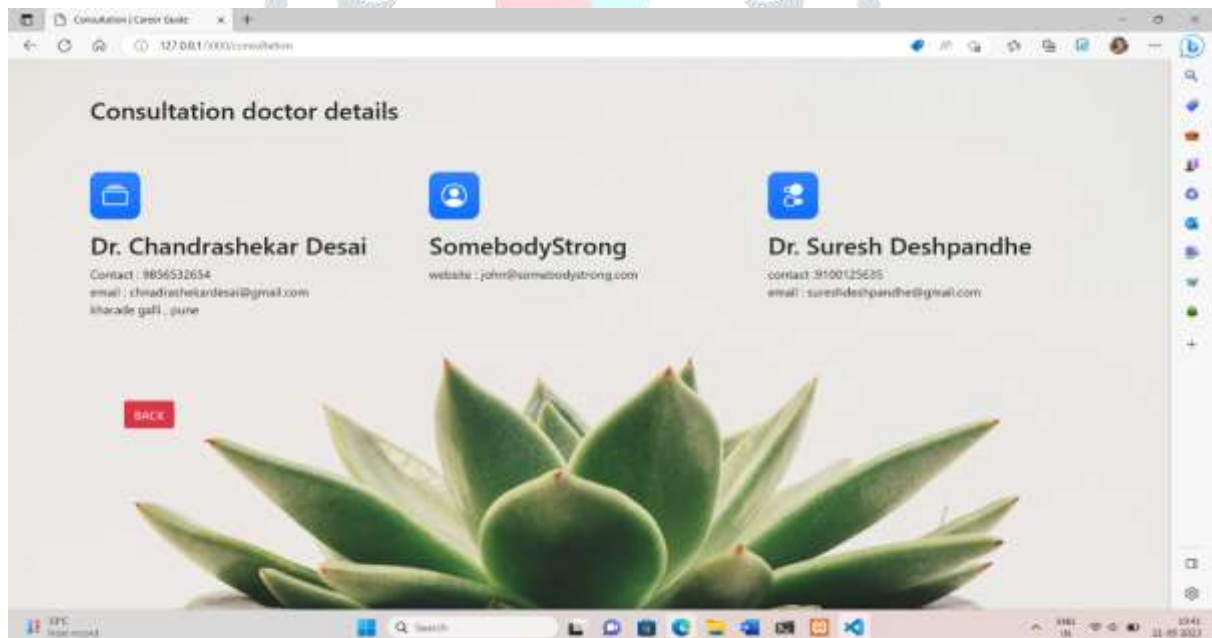


fig.7.7 consultation page

8 CONCLUSION

In the system, we have designed and developed a web-based application for a career guidance system which recommend suitable path for a candidate in choosing an interested career. The recommendation provided in the proposed system is more accurate than the existing career guidance system. The developed career guidance system utilizing Flask, HTML/CSS, XAMPP, and the logistic regression algorithm offers an effective and user-friendly platform for students to explore career options, assess their abilities, and make informed decisions. We have used the Logistic Regression algorithm for the project. We have split the dataset into the Training set, on which the Logistic Regression model will be trained and the Test set, on which the trained model will be applied to classify the results. The % accuracy of the model is 70%. In the near future, the framework's accuracy rate will be enhanced and additional features will be used for recommending a suitable course.

9 REFERENCE

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- [5] Firdosh sayyed¹, Ronak Sanghani², Abhishek Vora³, Nikita Lemos⁴ AI based Career Guidance 1Student, Dept. of Information Technology, Xavier Institute of Engineering, Maharashtra, India

