CAREER GUIDANCE FOR SECONDARY SCHOOL STUDENTS USING ARTIFICIAL INTELLIGENCE

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ABSTRACT

- *In an era of rapid technological change and diverse career opportunities, secondary students face the challenge of making informed decisions about their future.*
- *This project leverages the capabilities of artificial intelligence (AI) to offer comprehensive career guidance.*
- *Through the analysis of students' academic records, personality traits, interests, extracurricular activities, the system delivers personalized recommendations for career paths, educational institutions, courses, and supplementary resources.*
- *The project's significance lies not only in its ability to empower secondary students but also in its potential to alleviate the burden on educators and career counselors.*
- *Through automation and data-driven insights, the system efficiently supports a large number of students, allowing educational institutions to focus on nurturing individual talents and ambitions.*

PROJECT SCOPE

This project scope provides a broad outline of the major components and considerations for implementing a "Career Guidance for Secondary Students using AI" project. You can further refine and expand this scope based on your specific goals, resources, and constraints. The project aims to leverage artificial intelligence (AI) to provide comprehensive career guidance to secondary students, helping them make informed decisions about their future careers.

LITERATURE SURVEY

S.No	Title	Authors & Year	Approach	Insights
1.	Development of a web-based building profession career portal as a guidance information system for secondary school students.	A. Afolabi, R. Ojelabi, L. Amusan and F. Adefarati, 2017.	Statistical calculation methods aided by the use of Microsoft Excel and Statistical Package for Social Scientists (SPSS).	The study is limited in the testing and validity. The web based career panel developed was not subjected to use by secondary school students.
2.	Impact of artificial intelligence on assessment methods in primary and secondary education: Systematic literature review.	Miguel Martínez-Comesa˜naa,∗, Xurxo Rigueira-Díazb, Ana Larra˜naga- Janeiroc, Javier Martínez-Torresd,e, Iago Ocarranza-Pradof, and Denis Kreibelg, 2023.	Neural networks, Predictive Analytics.	Despite the complexity of AI, this systematic research shows the potential of AI-related tools to improve education, in particular student assessment, at lower levels such as primary or secondary.

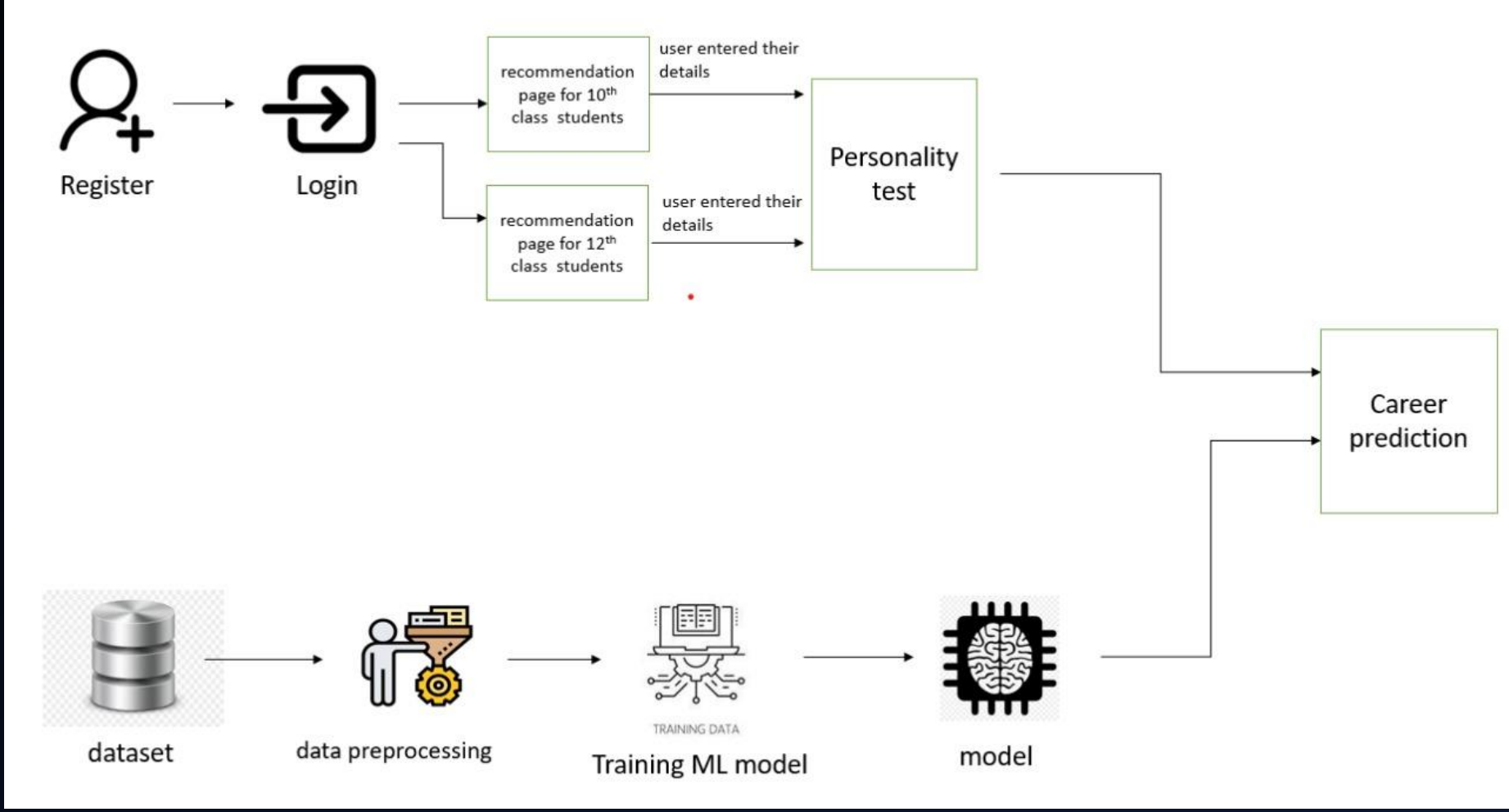
LITERATURE SURVEY

S.No	Title	Authors & Year	Algorithm	Insights
3.	An artificial neural network for exploring the relationship between learning activities and students' performance	Kourosh Borhani, Richard T.K. Wong, 2023.	This system is implemented using a supervised ANN that uses backpropagation.	It had the goal of helping educators by giving them a different set of information based on their students to allow them to better improve their learning environments for the students.
4.	Career Prediction Website using Machine Learning.	M. Rane, S. Kalal, J. Chandegara, T. Kakkad, V. Jain and S. Jagtap, 2023.	Machine learning approaches like Decision trees, KNN algorithm.	It predicts a career or field which the student can pursue as per his interest.
5.	AI-Based Deep Learning Chatbot for Career and Personal Mentorship.	M. Sharma, A. Kumari and Jyotsna, 2023.	Deep learning techniques such as CNN, RNN, etc.	The chat-bot will be used to interact with the student regarding their professional and personal life both, which will solve their issues and doubts based on the questions they have asked.

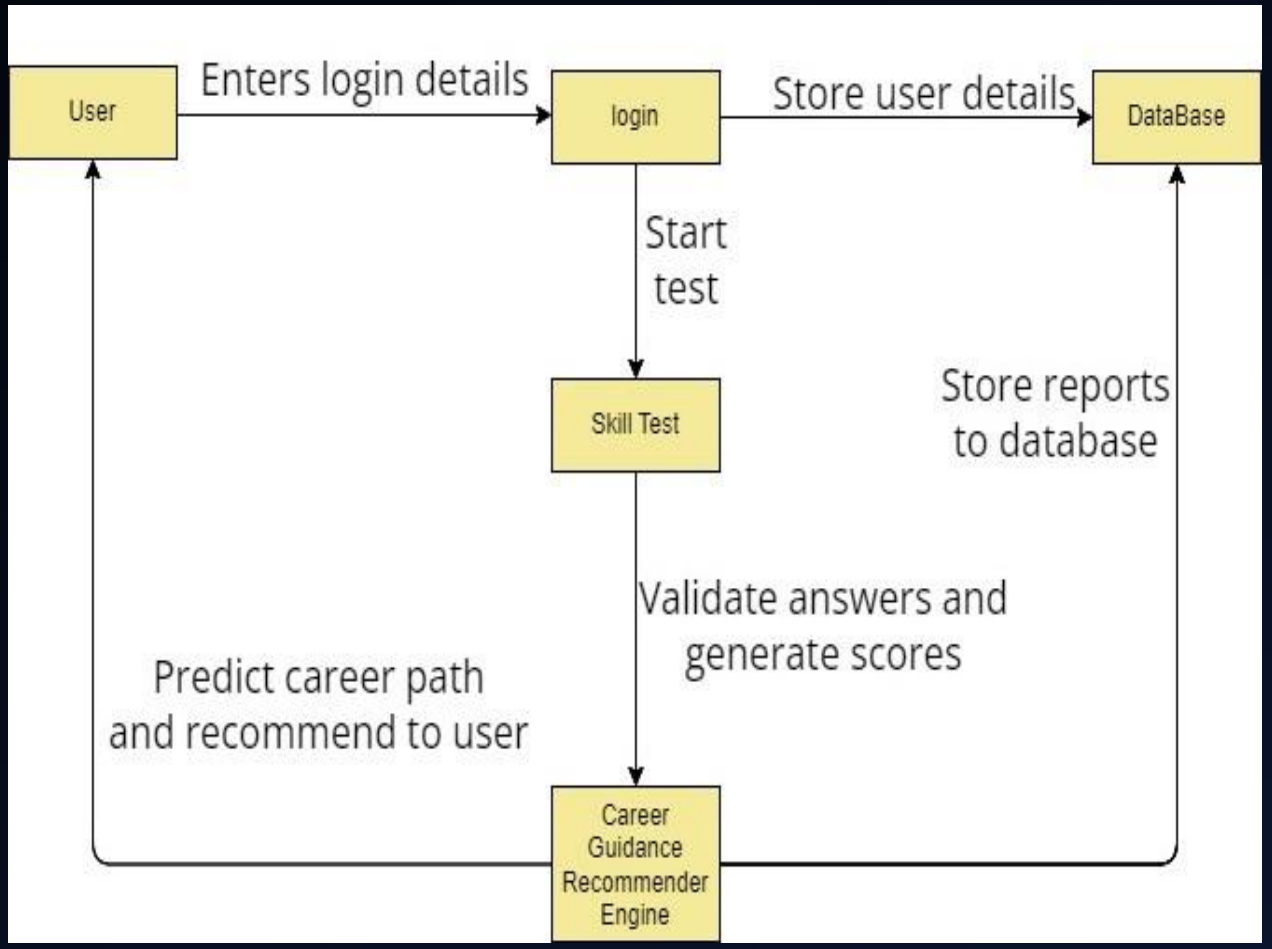
PROPOSED SYSTEM

- *Proposed system involves implementing AI algorithms to provide even more personalized career recommendations.*
- *This could also involve using various Machine learning techniques and it’s optimization algorithms to analyze students' essays, extracurricular activities, and other written content to refine career suggestions.*

ARCHITECTURE DIAGRAM



DATA FLOW DIAGRAM



MODULES DESCRIPTION

1. Data Collection and Preprocessing:

In this module, we collect and preprocess diverse datasets encompassing academic records, personality traits, and extracurricular activities. The data will be refined to ensure compatibility with deep learning algorithms, providing a solid foundation for personalized recommendations.

2. User Login and SignUp:

Prioritizing a user-centric approach, this module emphasizes the design and implementation of an intuitive user interface using Streamlit. Students, educators, and counselors will interact with the system effortlessly, navigating personalized recommendations and insights.

3. Course recommendation page for 10th class students:

Here the user will be provided an interface to enter their 10th marks and other related data to analyze their career outcome.

MODULE DESCRIPTION

4. Course recommendation page for 12th class students:
Here the user will be provided an interface to enter their 12th marks and other related data to analyze their career outcome.

5. Personality test:
Here, we are going to introduce the personality test in both the 10th and 12th course recommendation pages in order to get more insights and personal traits from the user.

6. Machine Learning and Deep Learning Models:
Leveraging state-of-the-art deep learning techniques, this module encompasses the development and implementation of algorithms for analyzing academic performance, personality traits, and interests. Techniques such as neural networks and natural language processing will be employed to extract meaningful insights from the data.

MODULE DESCRIPTION

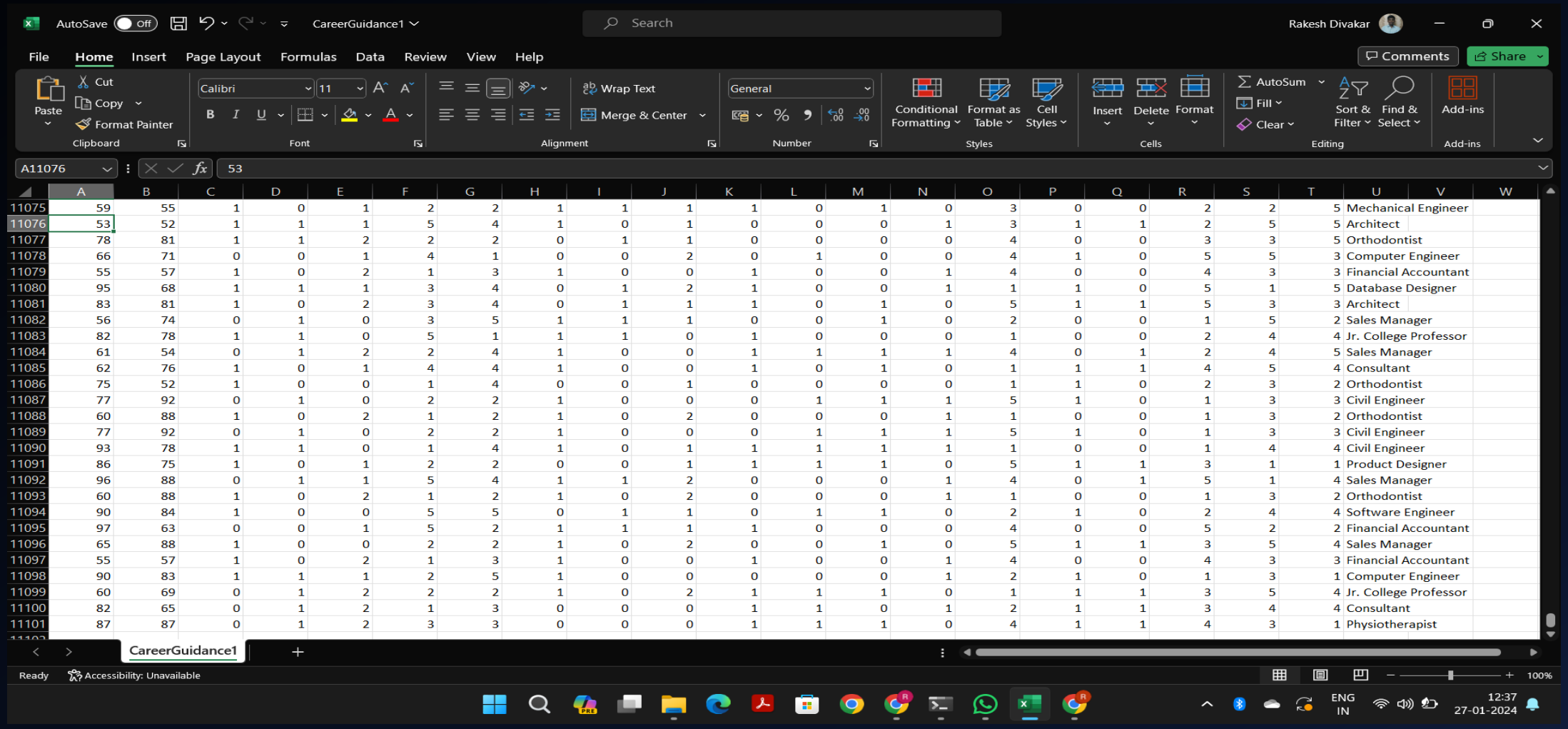
7. Recommendation Engine:

The heart of the project, this module involves the integration of deep learning models to generate personalized career recommendations. The recommendation engine will consider academic records, personality assessments, and extracurricular activities, delivering tailored suggestions for career paths, educational institutions, courses, and supplementary resources.

8. Career Prediction:

Here, we predict the career path of an individual with the help of the data that is entered in the website by the user.

MODULE 1- DATA COLLECTION AND PREPROCESSING



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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
11075	59	55	1	0	1	2	2	1	1	1	1	0	1	0	3	0	0	2	2	5	Mechanical Engineer		
11076	53	52	1	1	1	5	4	1	0	1	0	0	0	1	3	1	1	2	5	5	Architect		
11077	78	81	1	1	2	2	2	0	1	1	0	0	0	0	4	0	0	3	3	5	Orthodontist		
11078	66	71	0	0	1	4	1	0	0	2	0	1	0	0	4	1	0	5	5	3	Computer Engineer		
11079	55	57	1	0	2	1	3	1	0	0	1	0	0	1	4	0	0	4	3	3	Financial Accountant		
11080	95	68	1	1	1	3	4	0	1	2	1	0	0	1	1	1	0	5	1	5	Database Designer		
11081	83	81	1	0	2	3	4	0	1	1	1	0	1	0	5	1	1	5	3	3	Architect		
11082	56	74	0	1	0	3	5	1	1	1	0	0	1	0	2	0	0	1	5	2	Sales Manager		
11083	82	78	1	1	0	5	1	1	1	0	1	0	0	0	1	0	0	2	4	4	Jr. College Professor		
11084	61	54	0	1	2	2	4	1	0	0	1	1	1	1	4	0	1	2	4	5	Sales Manager		
11085	62	76	1	0	1	4	4	1	0	0	1	0	1	0	1	1	1	4	5	4	Consultant		
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11090	93	78	1	1	0	1	4	1	0	1	1	1	1	1	1	0	0	1	4	4	Civil Engineer		
11091	86	75	1	0	1	2	2	0	0	1	1	1	1	0	5	1	1	3	1	1	Product Designer		
11092	96	88	0	1	1	5	4	1	1	2	0	0	0	1	4	0	1	5	1	4	Sales Manager		
11093	60	88	1	0	2	1	2	1	0	2	0	0	0	1	1	0	0	1	3	2	Orthodontist		
11094	90	84	1	0	0	5	5	0	1	1	0	1	1	0	2	1	0	2	4	4	Software Engineer		
11095	97	63	0	0	1	5	2	1	1	1	1	0	0	0	4	0	0	5	2	2	Financial Accountant		
11096	65	88	1	0	0	2	2	1	0	2	0	0	1	0	5	1	1	3	5	4	Sales Manager		
11097	55	57	1	0	2	1	3	1	0	0	1	0	0	1	4	0	0	4	3	3	Financial Accountant		
11098	90	83	1	1	1	2	5	1	0	0	0	0	0	1	2	1	0	1	3	1	Computer Engineer		
11099	60	69	0	1	2	2	2	1	0	2	1	1	1	0	1	1	1	3	5	4	Jr. College Professor		
11100	82	65	0	1	2	1	3	0	0	0	1	1	0	1	2	1	1	3	4	4	Consultant		
11101	87	87	0	1	2	3	3	0	0	0	1	1	1	0	4	1	1	4	3	1	Physiotherapist		

CareerGuidance1

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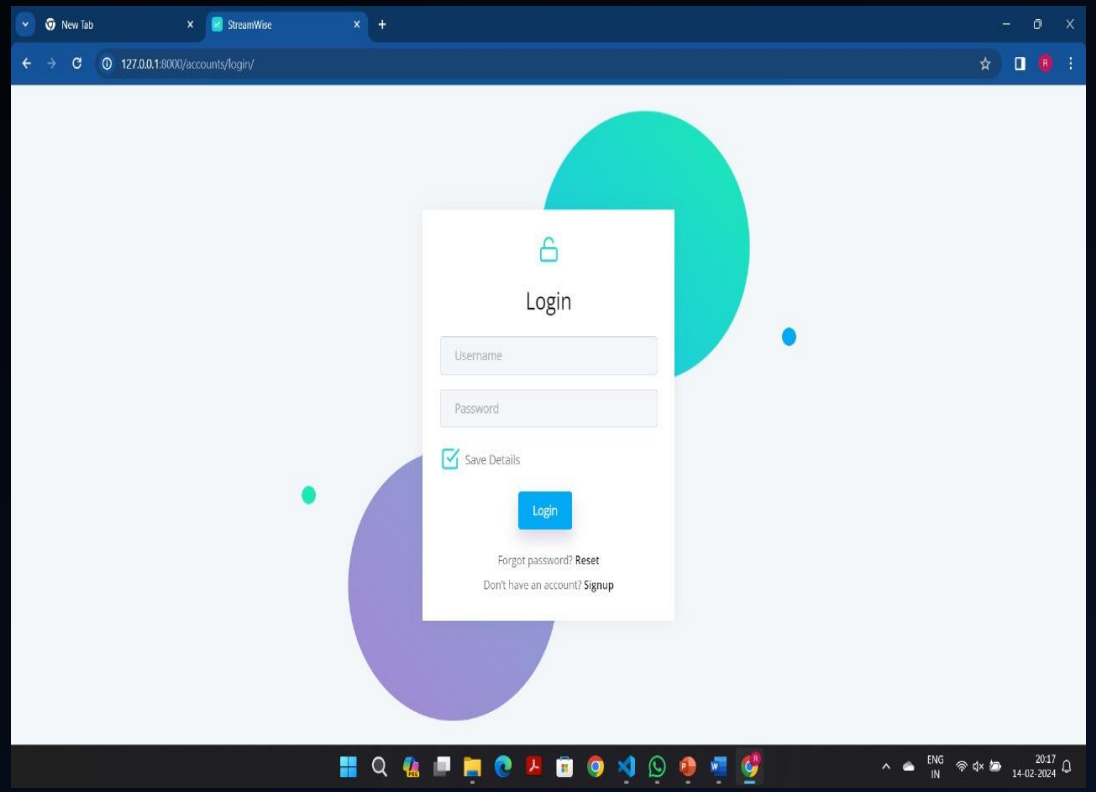
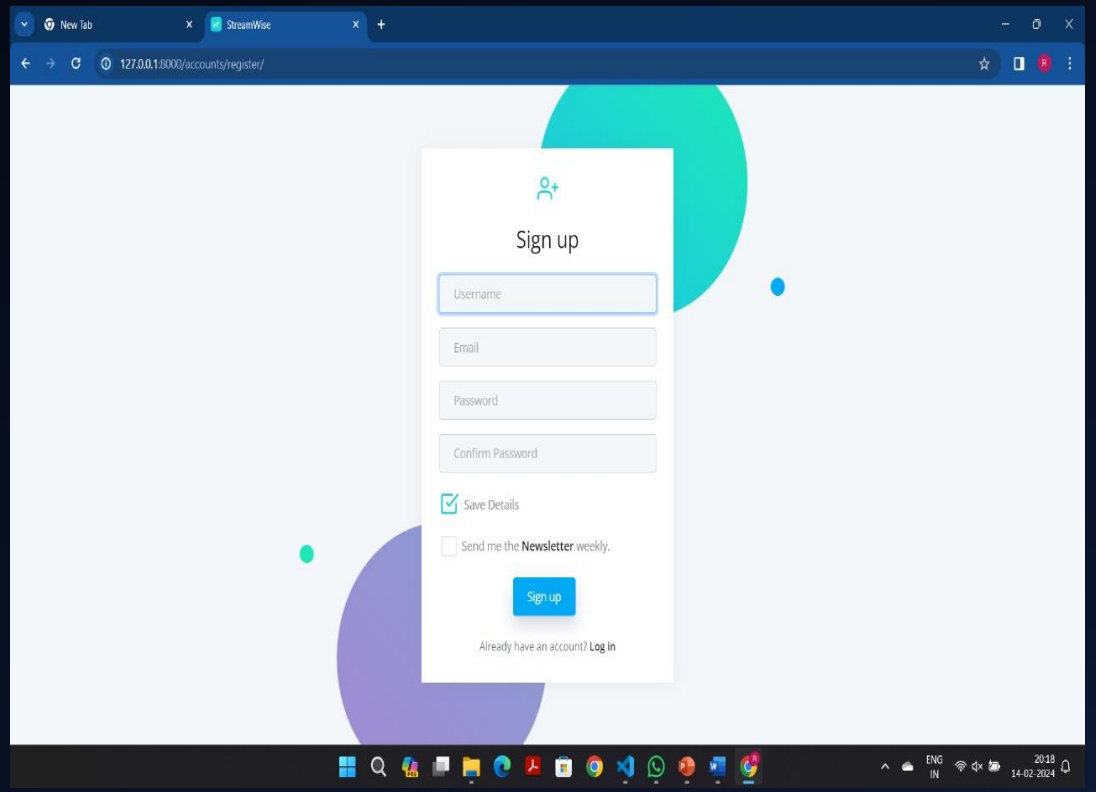
In order to obtain the necessary dataset for our project, we encountered the challenge of unavailability on the internet. Undeterred, we devised a proactive solution by creating our own dataset through Google Forms, engaging with a diverse range of real-time users. Despite our efforts, the initial dataset gathered from Google Forms proved to be insufficient for our needs. To address this limitation, we implemented advanced techniques such as dataset augmentation and bootstrap sampling algorithms. Through these methodologies, we effectively expanded the size of our dataset, ensuring a more robust and comprehensive foundation for our project's analysis and experimentation.

MODULE 2- USER LOGIN AND SIGNUP

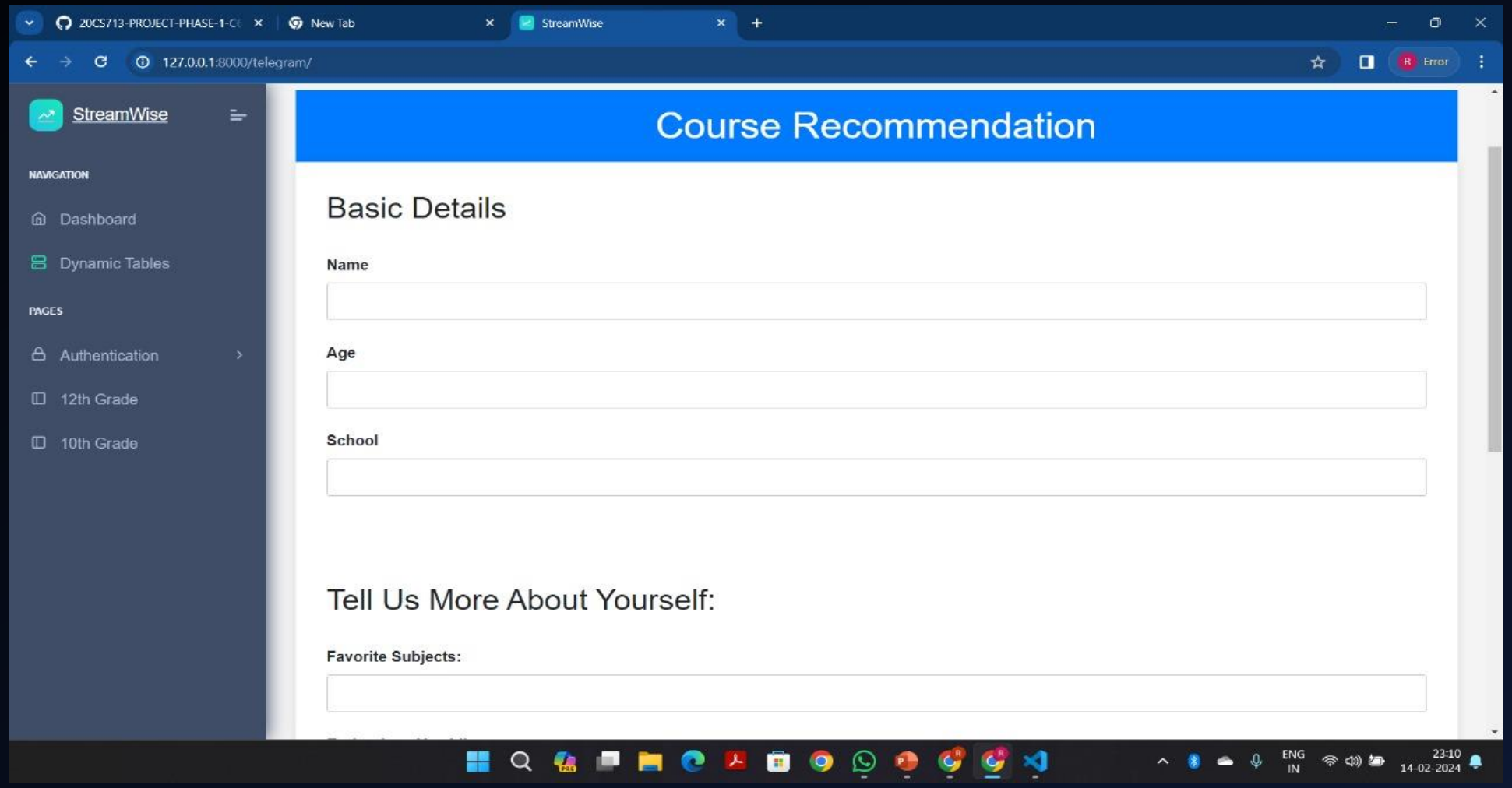




The login page offers a secure entry point into the "Career Guidance for Secondary School Students Using AI" platform. With intuitive design and authentication, it grants access to personalized dashboards for students, educators, and counselors, fostering a seamless experience tailored to individual needs and roles.

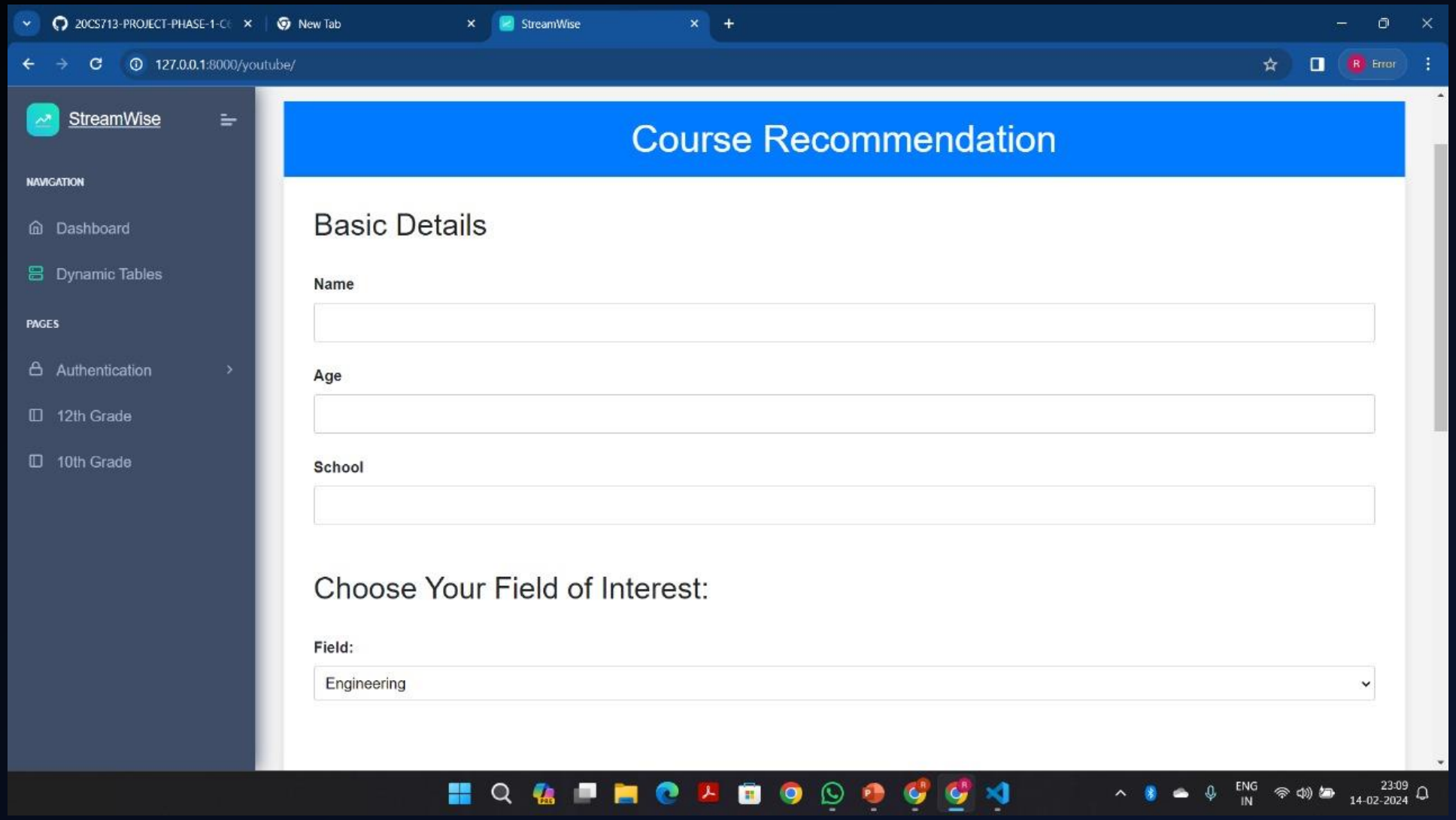
The user registration page for the "Career Guidance for Secondary School Students Using AI" platform provides a straightforward process for individuals to create accounts and access the wealth of resources available. With clear prompts and intuitive form fields, users can easily input their information, including personal details and role-specific preferences. The registration process prioritizes security and data privacy, implementing robust measures such as password encryption and verification protocols. Upon successful registration, users gain entry to personalized features and tools tailored to their roles, empowering them to embark on a journey of informed career exploration and decision-making.

MODULE 3: RECOMMENDATION PAGE FOR 10th CLASS STUDENTS



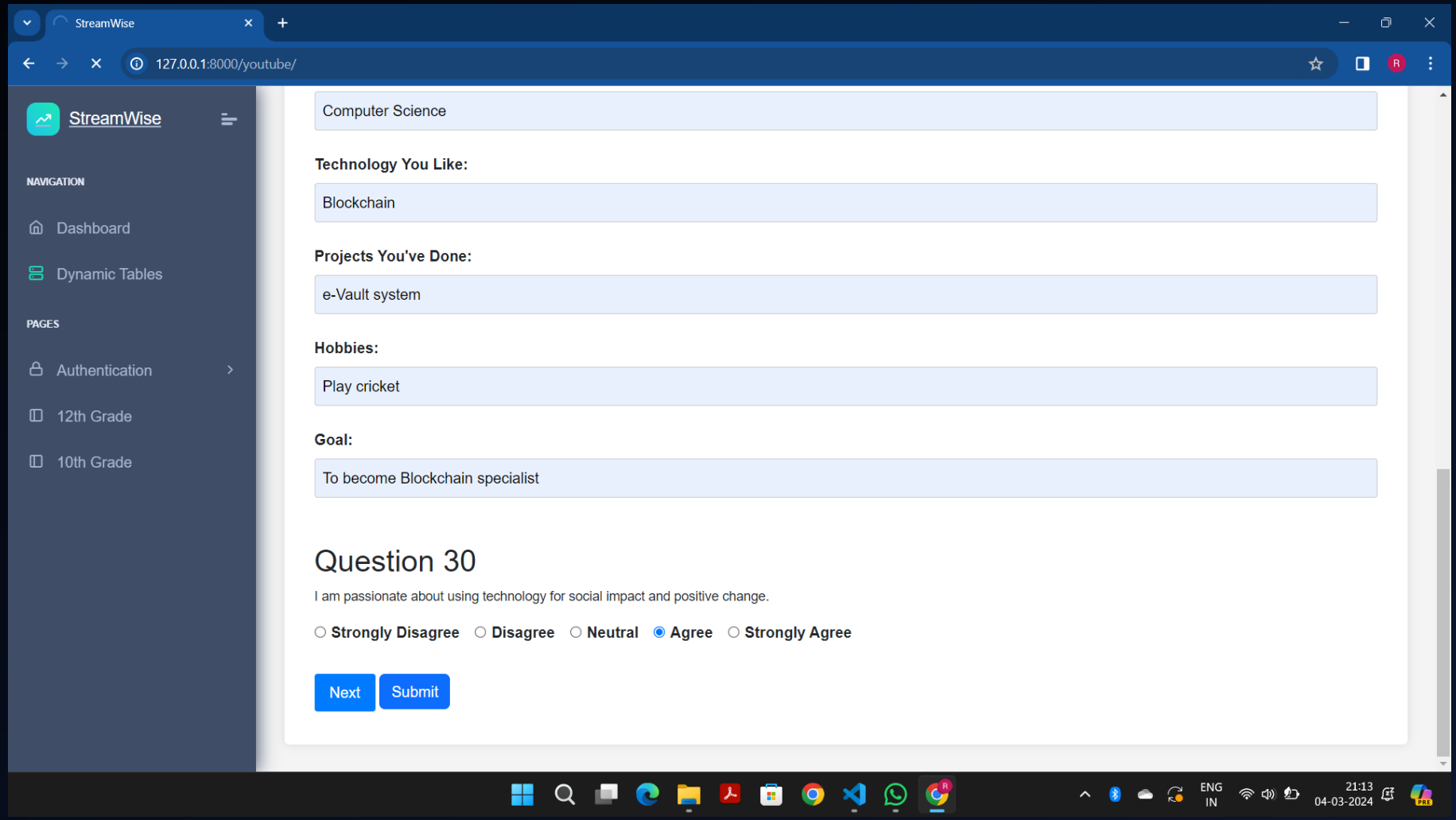
This page primarily caters to students transitioning from their 10th standard, offering a structured platform for comprehensive engagement. Users commence by providing basic demographic information including name, age, and educational institution. Subsequently, they are prompted to furnish additional details pertaining to their aspirations and interests, thereby enriching their profile. Following this, users are encouraged to undertake a personality assessment, facilitating a deeper understanding of their individual traits and inclinations. Leveraging this data, the platform employs sophisticated algorithms to generate personalized career recommendations, thereby empowering users with informed insights as they embark on their professional journey.

MODULE 4: RECOMMENDATION PAGE FOR 12th CLASS STUDENTS



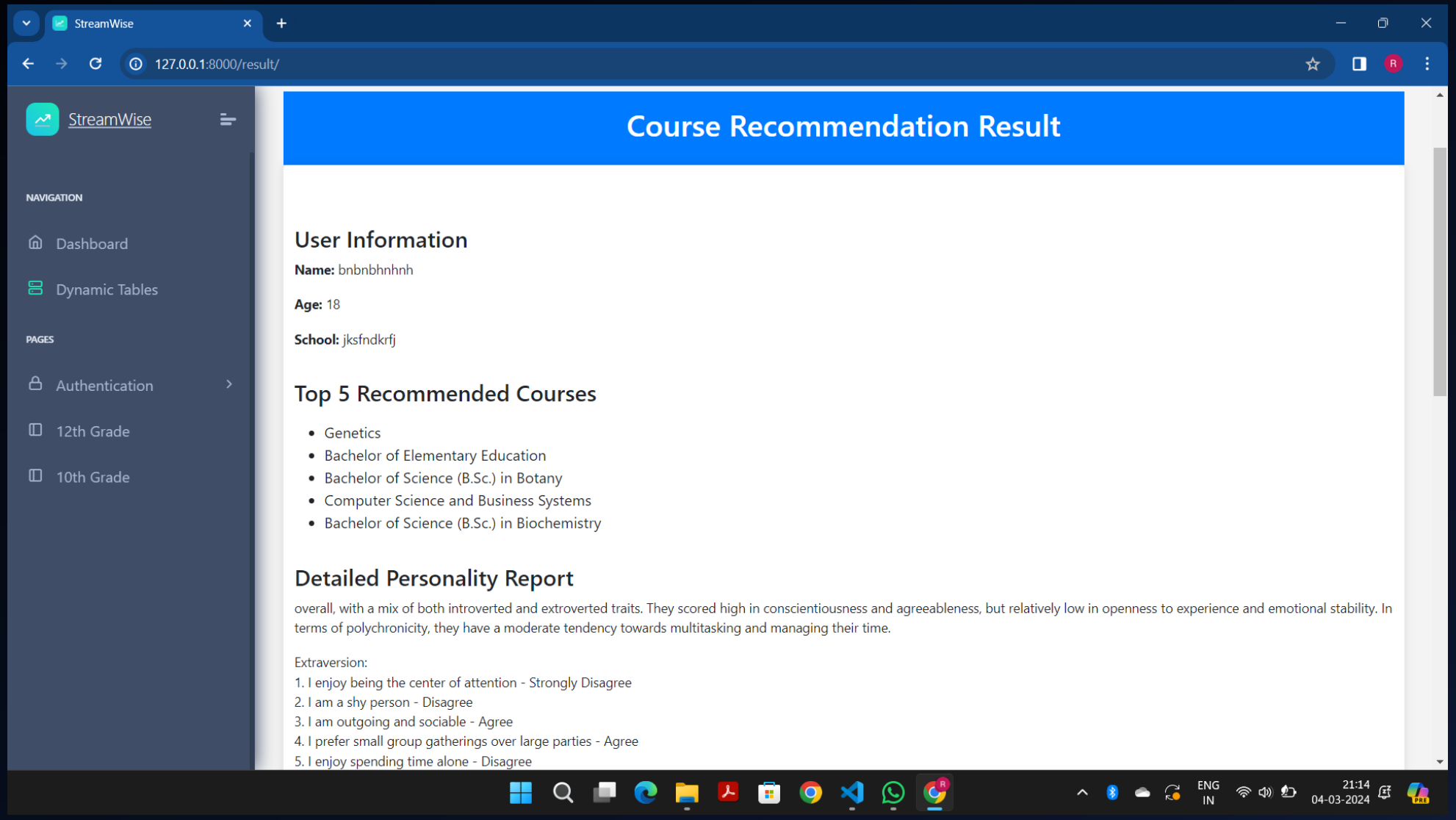
Designed for 12th-grade students, this page serves as a pivotal resource in their academic and career trajectory. Upon entry, users are prompted to furnish essential details such as name, age, school, and field of interest, enriching their profile and enhancing the precision of subsequent recommendations. Additionally, students are encouraged to articulate their aspirations and goals, providing further context for personalized guidance. Following this, individuals engage in a comprehensive personality assessment to deepen their self-awareness. Leveraging this data, the platform employs advanced algorithms to generate tailored career pathways, empowering students with informed insights as they navigate their transition from secondary education to the professional realm.

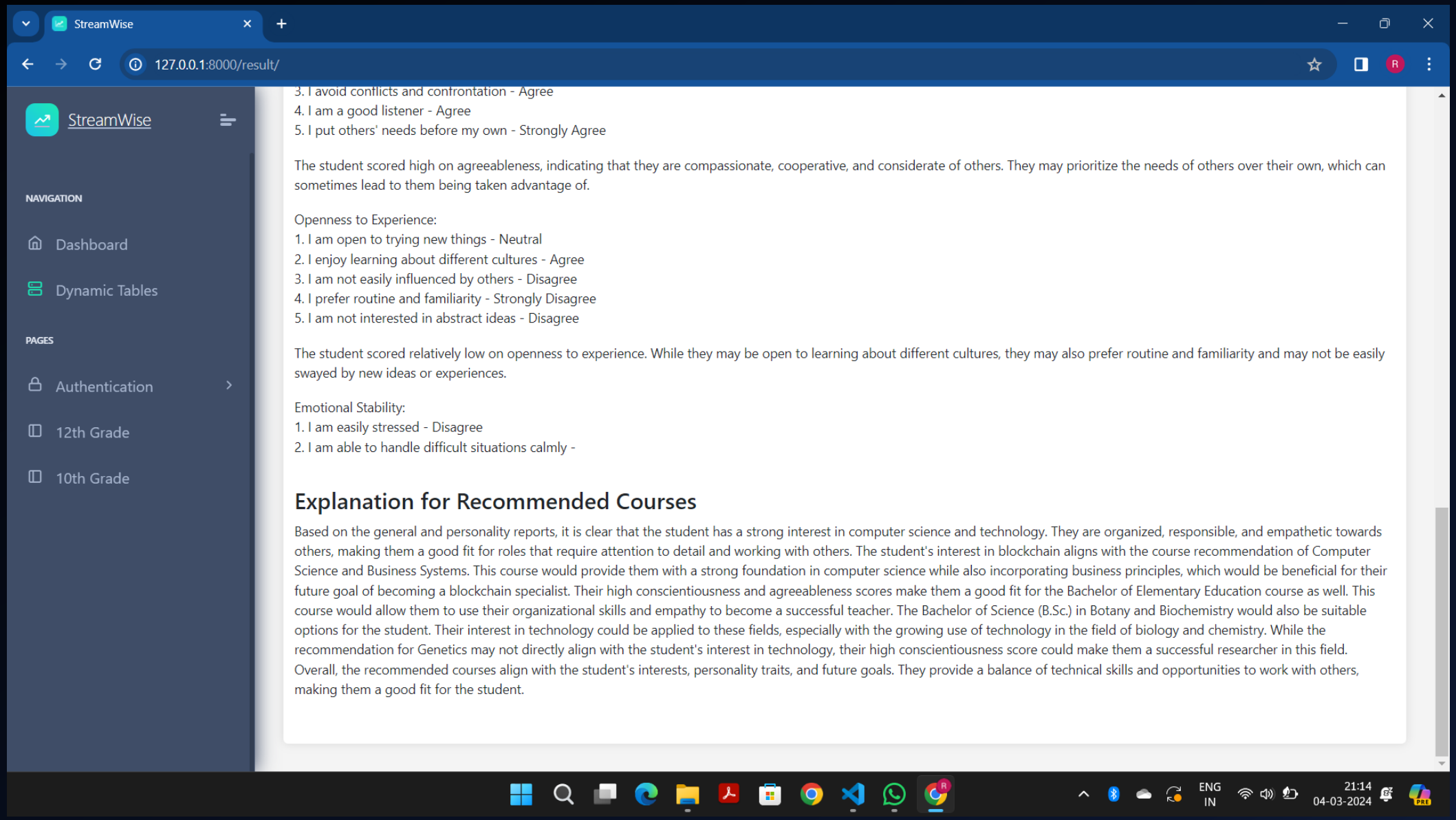
MODULE 5 - PERSONALITY TEST



In this module, we have initiated the personality test in both the recommendation pages. Here, we are going to introduce the personality test in both the 10th and 12th course recommendation pages in order to get more insights and personal traits from the user.

MODULE 6 - CAREER PREDICTION

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StreamWise
NAVIGATION
Dashboard
Dynamic Tables
PAGES
Authentication
12th Grade
10th Grade
3. I avoid conflicts and confrontation - Agree
4. I am a good listener - Agree
5. I put others' needs before my own - Strongly Agree
The student scored high on agreeableness, indicating that they are compassionate, cooperative, and considerate of others. They may prioritize the needs of others over their own, which can sometimes lead to them being taken advantage of.
Openness to Experience:
1. I am open to trying new things - Neutral
2. I enjoy learning about different cultures - Agree
3. I am not easily influenced by others - Disagree
4. I prefer routine and familiarity - Strongly Disagree
5. I am not interested in abstract ideas - Disagree
The student scored relatively low on openness to experience. While they may be open to learning about different cultures, they may also prefer routine and familiarity and may not be easily swayed by new ideas or experiences.
Emotional Stability:
1. I am easily stressed - Disagree
2. I am able to handle difficult situations calmly -
Explanation for Recommended Courses
Based on the general and personality reports, it is clear that the student has a strong interest in computer science and technology. They are organized, responsible, and empathetic towards others, making them a good fit for roles that require attention to detail and working with others. The student's interest in blockchain aligns with the course recommendation of Computer Science and Business Systems. This course would provide them with a strong foundation in computer science while also incorporating business principles, which would be beneficial for their future goal of becoming a blockchain specialist. Their high conscientiousness and agreeableness scores make them a good fit for the Bachelor of Elementary Education course as well. This course would allow them to use their organizational skills and empathy to become a successful teacher. The Bachelor of Science (B.Sc.) in Botany and Biochemistry would also be suitable options for the student. Their interest in technology could be applied to these fields, especially with the growing use of technology in the field of biology and chemistry. While the recommendation for Genetics may not directly align with the student's interest in technology, their high conscientiousness score could make them a successful researcher in this field. Overall, the recommended courses align with the student's interests, personality traits, and future goals. They provide a balance of technical skills and opportunities to work with others, making them a good fit for the student.
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In the sixth module, we have built the recommendation engine to predict the career of the user. The heart of the project, this module involves the integration of deep learning models to generate personalized career recommendations. The recommendation engine will consider academic records, personality assessments, and extracurricular activities, delivering tailored suggestions for career paths, educational institutions, courses, and supplementary resources. Then, we predict the career path of an individual with the help of the data that is entered in the website by the user.

CONCLUSION

- *This project stands as a pioneering advancement in leveraging technology to empower the younger generation throughout their educational and professional trajectories.*
- *By seamlessly integrating artificial intelligence (AI), we have crafted a dynamic and tailored system that goes beyond mere career guidance—it serves as a compass guiding students through the intricate maze of potential career pathways.*
- *Through this initiative, students gain not only valuable insights but also the tools to make informed decisions about their futures, ensuring alignment with their aspirations and aptitudes.*
- *The project illuminates the transformative potential of AI within the realms of education and career development, highlighting the necessity of adapting to the constantly evolving technological landscape.*

CONCLUSION

- *Looking ahead, it is essential to continually refine and expand this initiative, guaranteeing equitable access to its indispensable resources and guidance for all secondary students.*
- *This commitment ensures that every individual, irrespective of background or circumstance, can navigate the complex intersection of careers and education with efficacy and confidence.*
- *Ultimately, this endeavor serves as both a testament to AI's transformative capabilities and a beacon illuminating a brighter future for the youth.*
- *Armed with knowledge, insight, and confidence, courtesy of the symbiotic fusion of technology and human ingenuity, students stand poised to embark upon their professional journeys with optimism and determination.*