Niagara College Toronto

Computer Programming

Project Prototype 2

Client: Marc Belaiche

Organization: Guhuza

Date: 2024/10/17

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Furthermore, we extend our special appreciation to Guhuza and Marc Belaiche for entrusting us with the responsibility of developing a quiz-based web/application for their hiring process. Their collaboration has been invaluable in helping us understand real-world industry needs and challenges. We would also like to acknowledge with much appreciation the crucial role of the academic staff at Niagara College, who gave us permission to use all required equipment and necessary materials to complete the project. Lastly, we are thankful to our peers, family, and everyone who contributed their insights and feedback, which helped shape the direction of this project.

Abstract

The Guhuza Job-Seeking Game aims to revolutionize the job-seeking and hiring process by integrating skill-based quizzes tailored to specific industries, such as IT, Sales and Marketing, Hospitality, and Medical and Healthcare. This web-based game will provide users with realistic interview preparation by simulating job-related tasks and scenarios. By engaging users in interactive quizzes, the platform enhances learning outcomes, builds confidence, and fosters continuous professional development. Key features include real-time feedback, competitive modes, and personalized challenges that reflect current industry practices. This project will create a dynamic ecosystem where job seekers can sharpen their skills, gain valuable insights, and connect with potential employers in a unique, engaging way.

Introduction

In today's evolving job market, technology is reshaping how individuals navigate their job search. With increasing competition, job seekers need more than traditional preparation—they need opportunities to stand out by showcasing their skills effectively. Enter the **Guhuza Skill Master**, an innovative solution designed to meet these modern challenges. This web-based platform bridges the gap between candidates and employers by offering an engaging, interactive experience where job seekers can enhance their skills through industry-specific quizzes and real-time challenges. By turning job preparation into a game, Skill Master makes the often stressful job hunt more enjoyable and productive, helping candidates sharpen their skills in areas like IT, Sales & Marketing, Hospitality, and Healthcare through tailored quizzes that simulate real-world tasks. For employers, the platform provides a dynamic, real-time assessment of candidates' abilities, offering clearer insights into a candidate's readiness through interactive challenges, personalized feedback, and competitive skill-based tasks. By observing how candidates perform in realistic scenarios, recruiters can identify top talent more efficiently than with traditional methods. What sets **SkillMaster** apart is its holistic approach, combining skill-building, interview prep, and job-matching into a seamless platform, reducing the need for multiple tools. It fosters continuous learning and engagement, offering users personalized challenges, real-time feedback, and competitive modes where they can test their skills against peers. Ultimately, SkillMaster redefines hiring by making it more interactive and enjoyable, aligning perfectly with the needs of modern job seekers and employers.

The Project prototype 2, a web-based industry-specific quiz for interview preparation, aims to fulfill the planned design and prototyping segment. The prototype section of the web app, also known as wireframes, is specifically focused here. The overall goal for the project is to build a web-based game where users can play quizzes related to different industries and have their interview prepared in the form of a quiz. The objective for prototype 2 remains to complete the basic design of the app.

From the feedback on prototype-1, we learned to mention our client, Guhuza, in the company

details section. Here is the improvised section in tabular form.

Members	Roles	Responsibilities	Expertise
Client: Marc Belaiche **Organization: Guhuza**	Job-Seeking Platform	Providing the project requirements and acting as the primary stakeholder for the Guhuza Job-Seeking Game with Strong Network Effects project.	Industry knowledge, job-seeking platform expertise
Akash Pandey	Back End Developer	Building the server-side logic, managing the database, creating APIs for front-end interaction.	MySQL database management, server-side development
Sujit Gole Tamang	Front End Developer	Developing the user interface with HTML and JavaScript, ensuring a responsive and user-friendly experience.	HTML, CSS, basic JavaScript, UX/UI design
Manraj Kaur	Data Analyst	Analyzing data from the MySQL database to provide insights and support decision-making.	MySQL, data querying, data visualization
Sugam Kandel	Testing and Deployment Specialist	Testing the application, ensuring quality, managing the deployment process to production.	Manual testing, basic automated testing with Java frameworks, deployment
Bibek Basnet	Project Manager	Overseeing project timelines, coordinating team activities, ensuring project milestones are met.	Agile, Scrum methodologies, communication, risk management, resource allocation

Content:

1. Functionality and Front-End Design Overview

This document outlines the functionality of the proposed web-based industry-specific quiz for interview preparation. The primary feature is the quiz-based format that helps users prepare for interviews by answering questions relevant to their industry. The quizzes are designed to simulate real-world interview scenarios, offering a structured and engaging way for users to enhance their preparation. The front-end design includes responsive layouts, intuitive navigation, and a clean UI, ensuring users can easily access and participate in quizzes. The design focuses on simplicity and ease of use, allowing quick quiz play and smooth transitions between sections.

Cross-Platform Compatibility

The platform has developed for mobile devices, allowing users to access quizzes on the go. This will increase accessibility and convenience, encouraging more frequent practice sessions.

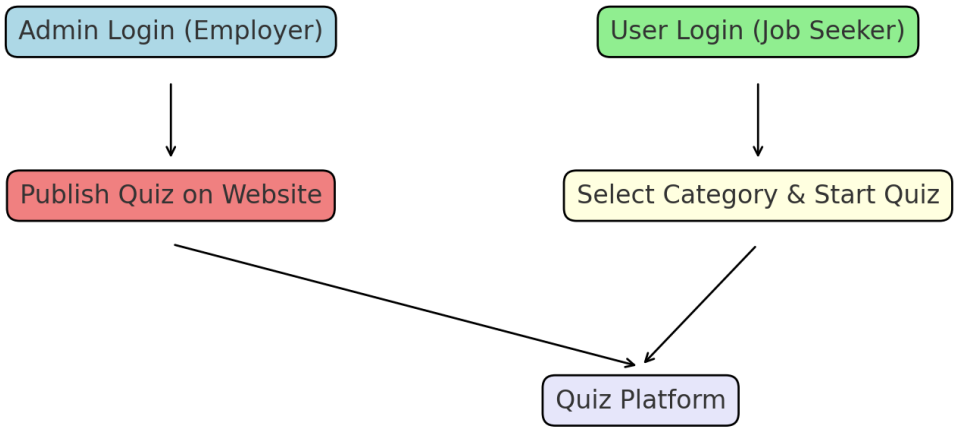
2. Game Mechanism

Quiz logic

The app features two types of users: Admins (employers) and Users (job seekers). Below is a breakdown of the roles and key functionalities for each user type:

Role	Description	Key Actions
Employer	Employers who create and publish quizzes for job seekers.	Create, categorize, and publish quizzes.
JobSeeker	Individuals preparing for interviews through quizzes.	Select quizzes, participate, and view results.

Game Function: Admin and User Interaction Flow



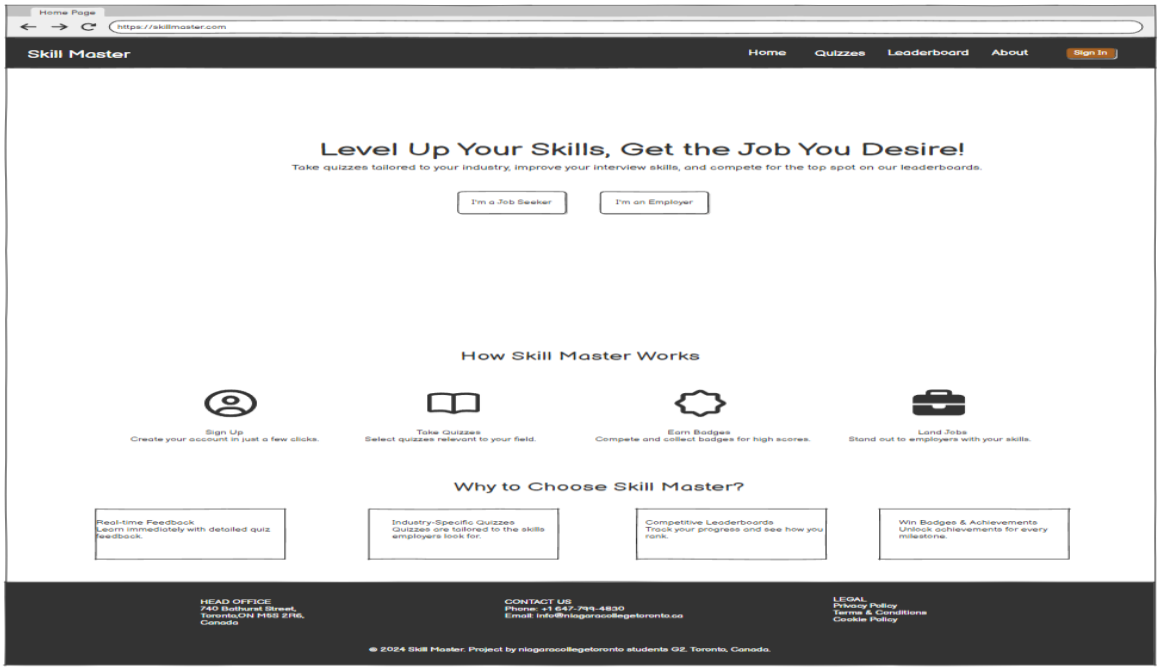
3. Leaderboard Logic for the Quiz Application

In the Guhuza Skill Master quiz platform, the leaderboard ranks users based on their quiz performance. After a user completes a quiz, their answers are evaluated, and their score is calculated. This score is then saved in the database along with the user's information.

Once the score is recorded, the system updates the leaderboard to reflect the user's performance. Users are ranked based on their individual quiz scores, and the leaderboard dynamically adjusts after each quiz is completed. The highest score appears at the top, with lower scores following in rank.

This process motivates users to perform well in quizzes, as their rank on the leaderboard is visible and competitive.

Wireframes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Sign In
Level Up Your Skills, Get the Job You Desire!
Take quizzes tailored to your industry, improve your interview skills, and compete for the top spot on our leaderboards.
I'm a Job Seeker
I'm an Employer
How Skill Master Works
Sign Up
Create your account in just a few clicks.
Take Quizzes
Select quizzes relevant to your field.
Earn Badges
Compete and collect badges for high scores.
Land Jobs
Stand out to employers with your skills.
Why to Choose Skill Master?
Real-time Feedback
Learn immediately with detailed quiz feedback.
Industry-Specific Quizzes
Quizzes are tailored to the skills employers look for.
Competitive Leaderboards
Track your progress and see how you rank.
Win Badges & Achievements
Unlock achievements for every milestone.
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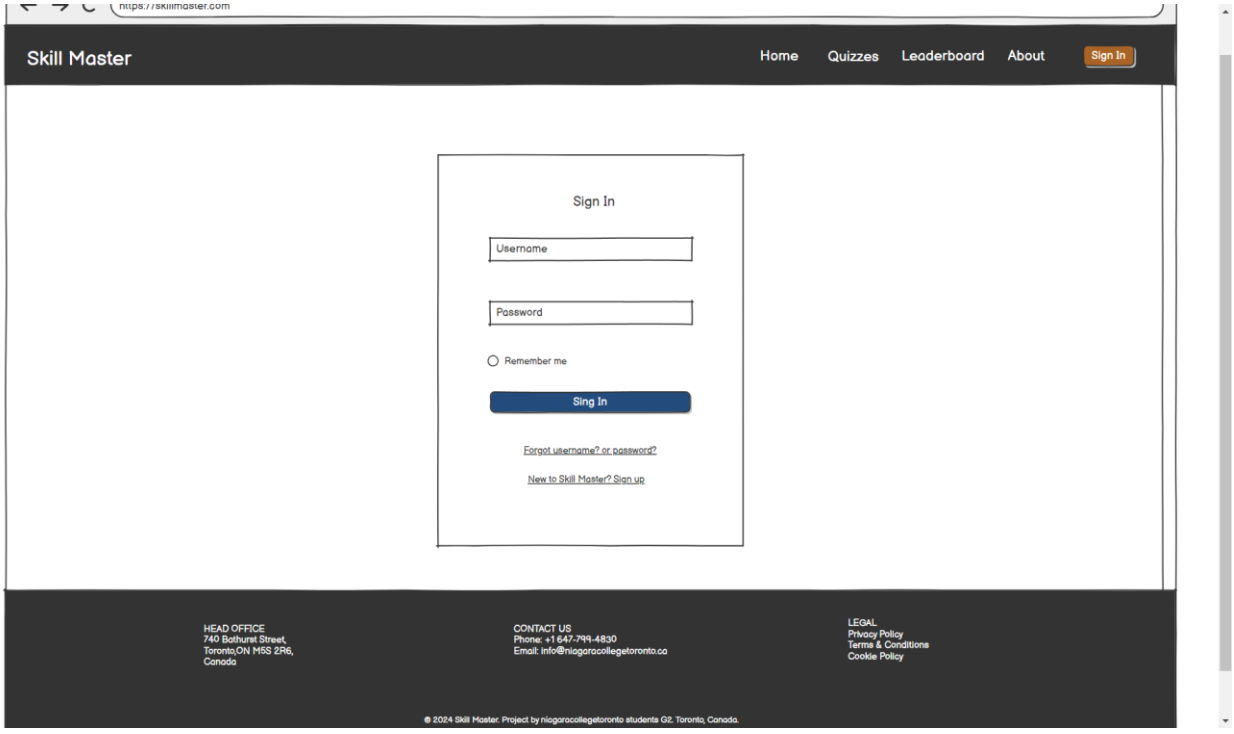
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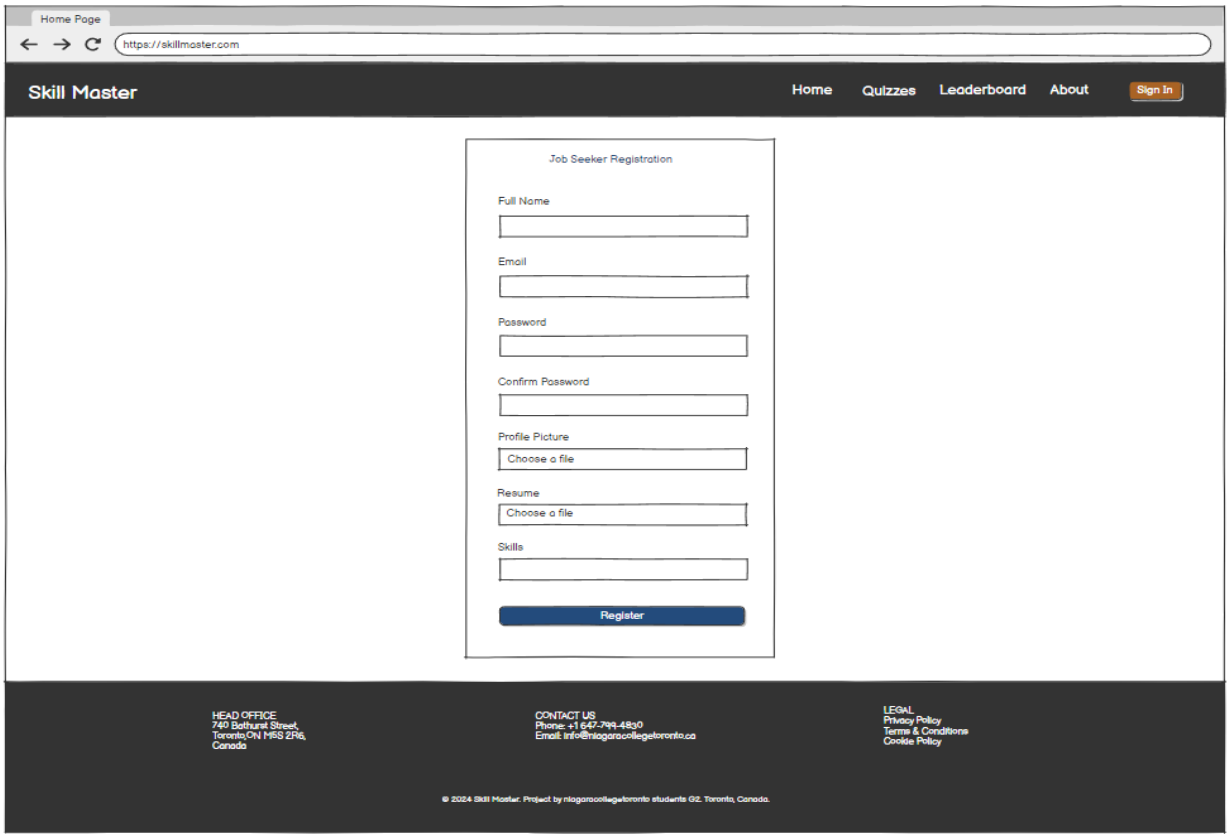
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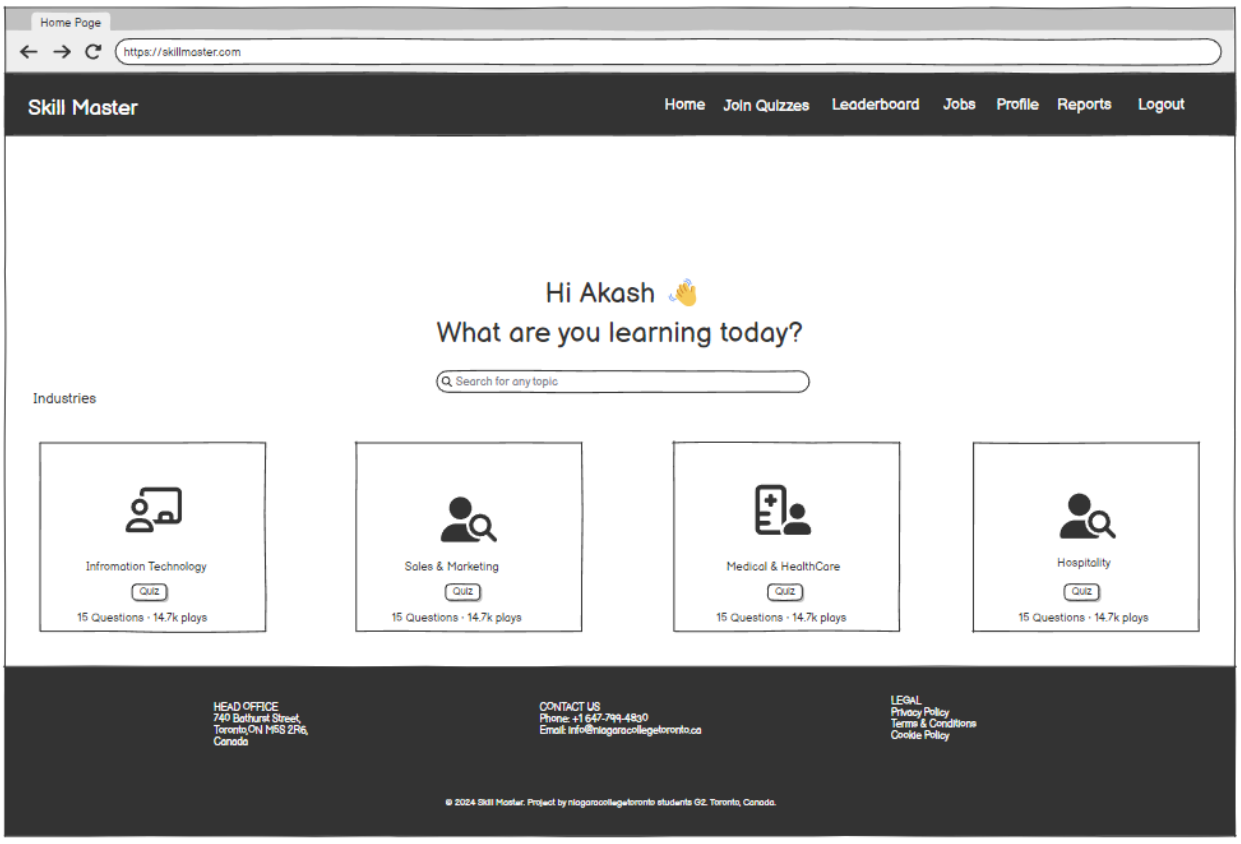
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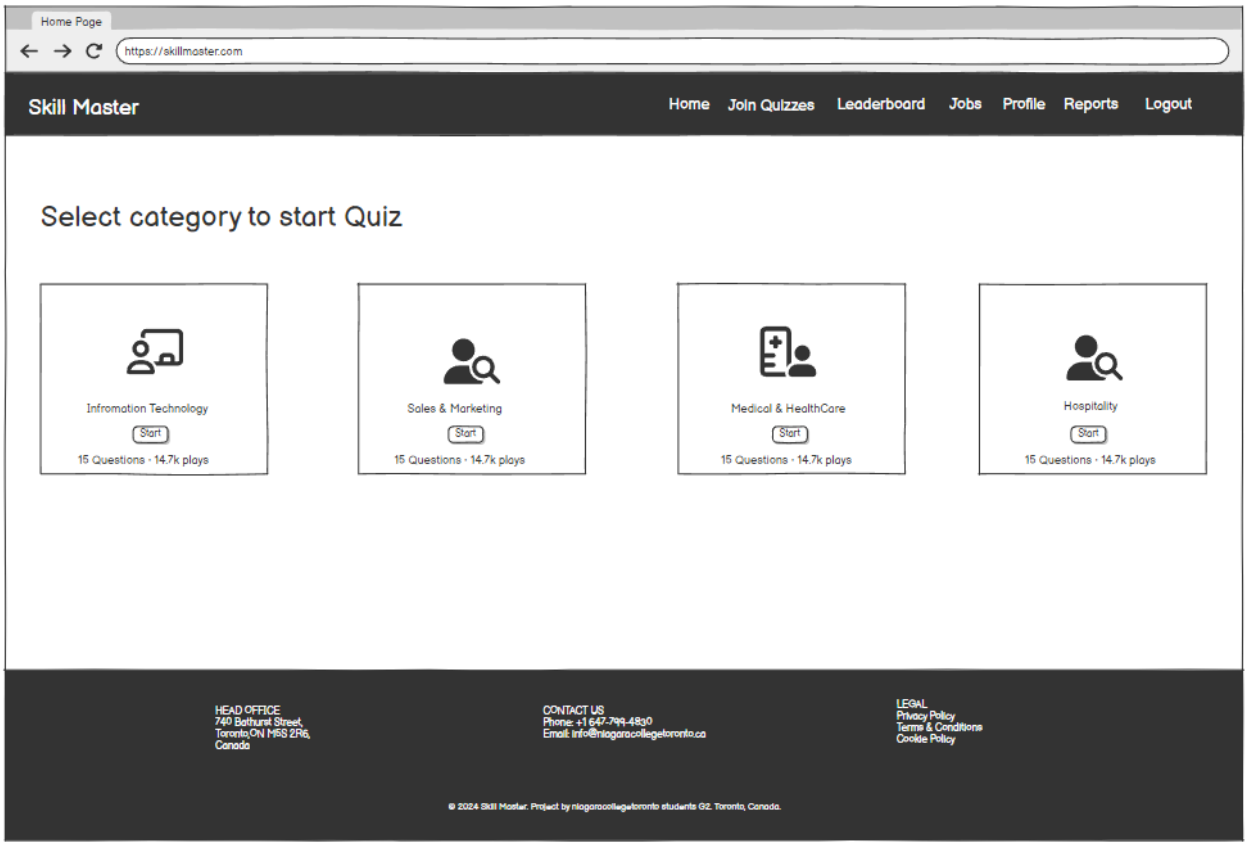
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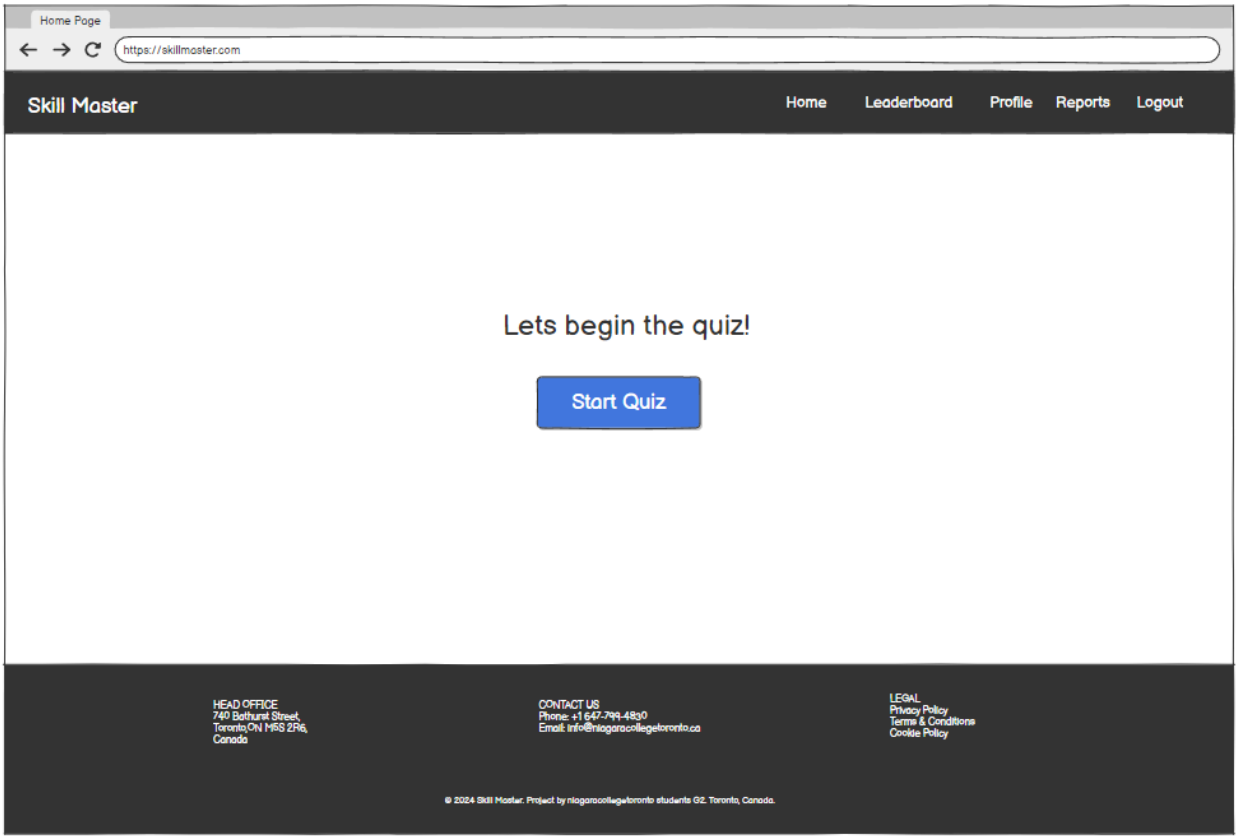
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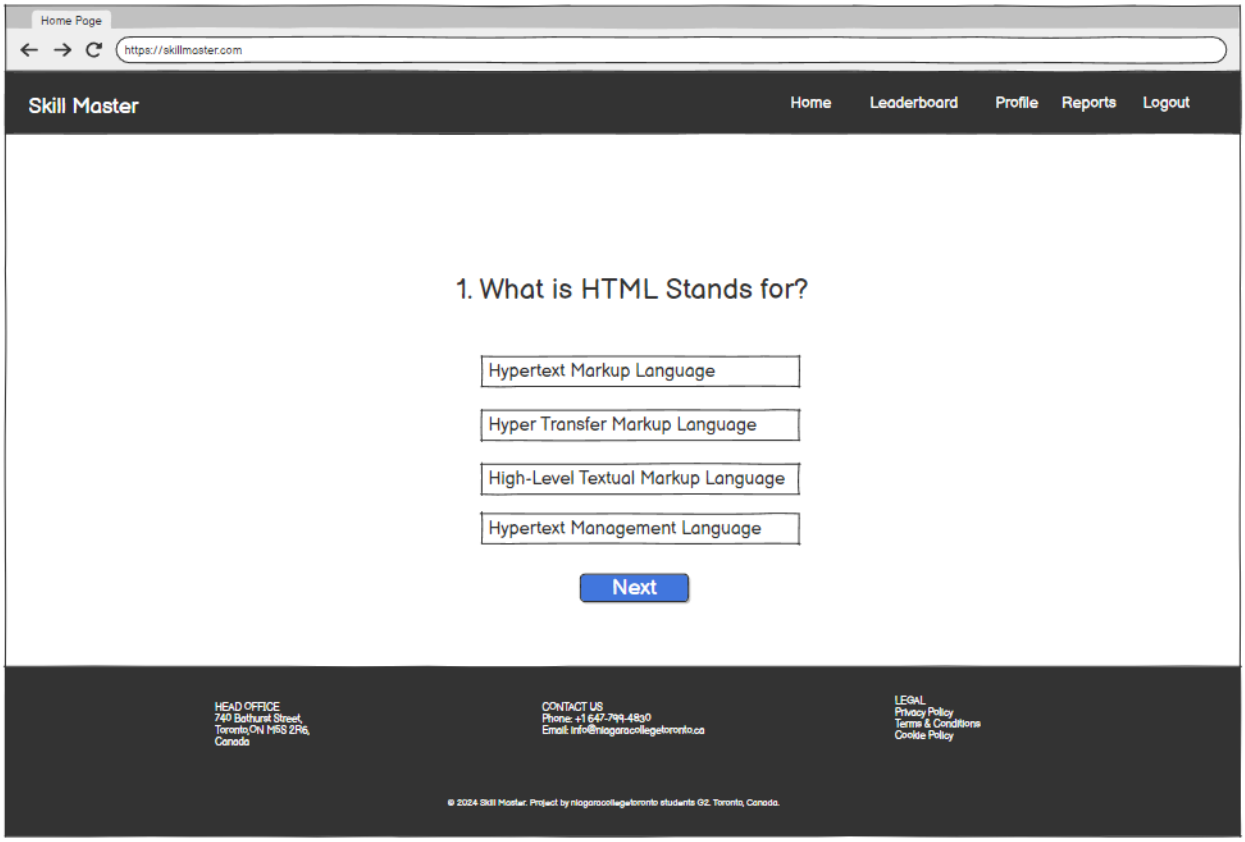
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1. What is HTML Stands for?
Hypertext Markup Language
Hyper Transfer Markup Language
High-Level Textual Markup Language
Hypertext Management Language
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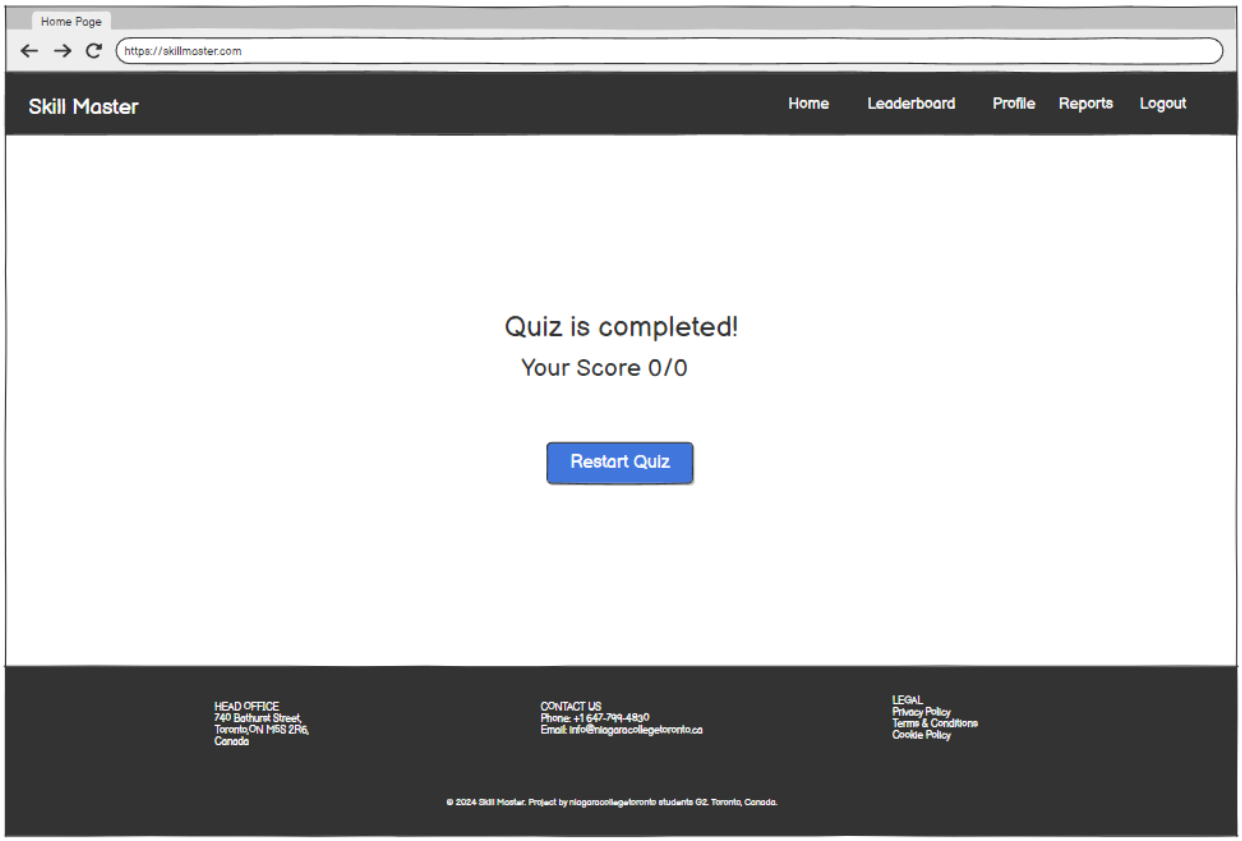
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Quiz is completed!
Your Score 0/0
Restart Quiz
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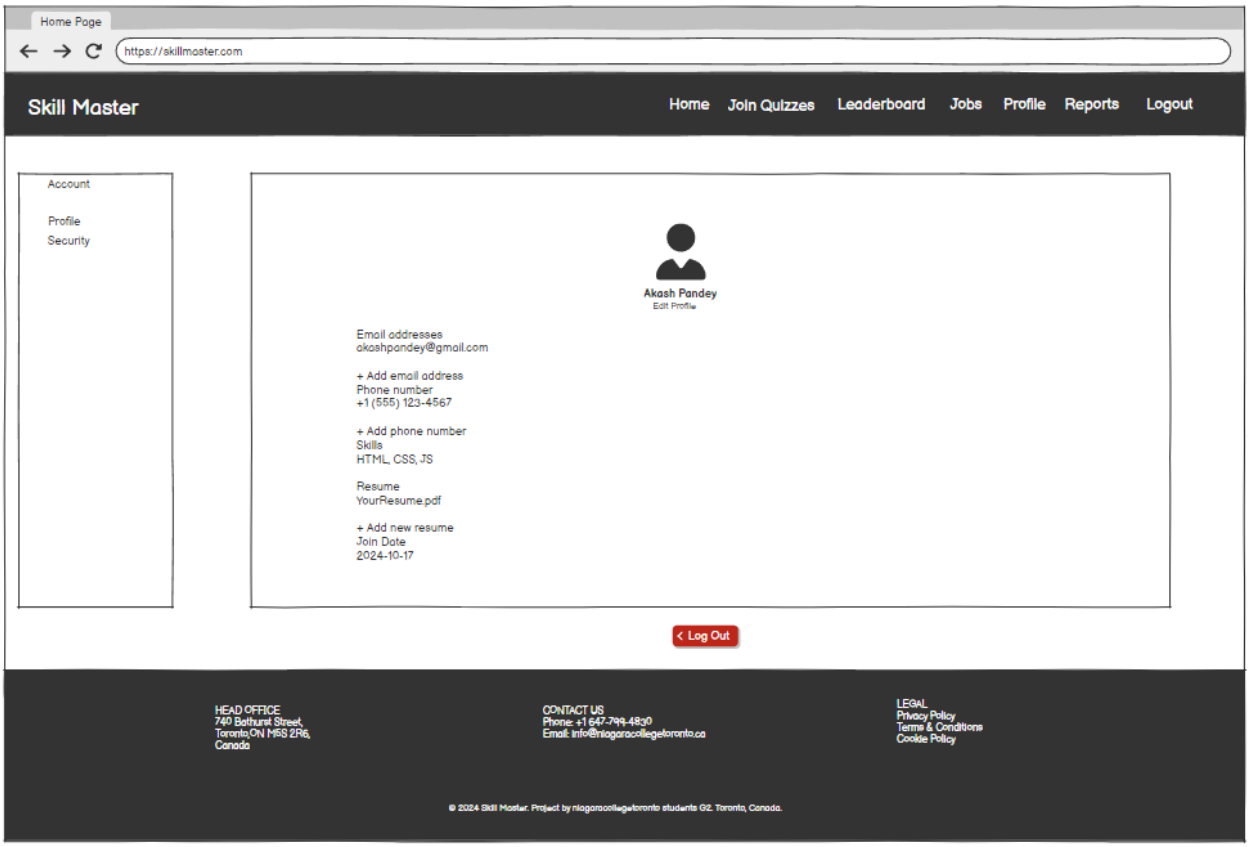
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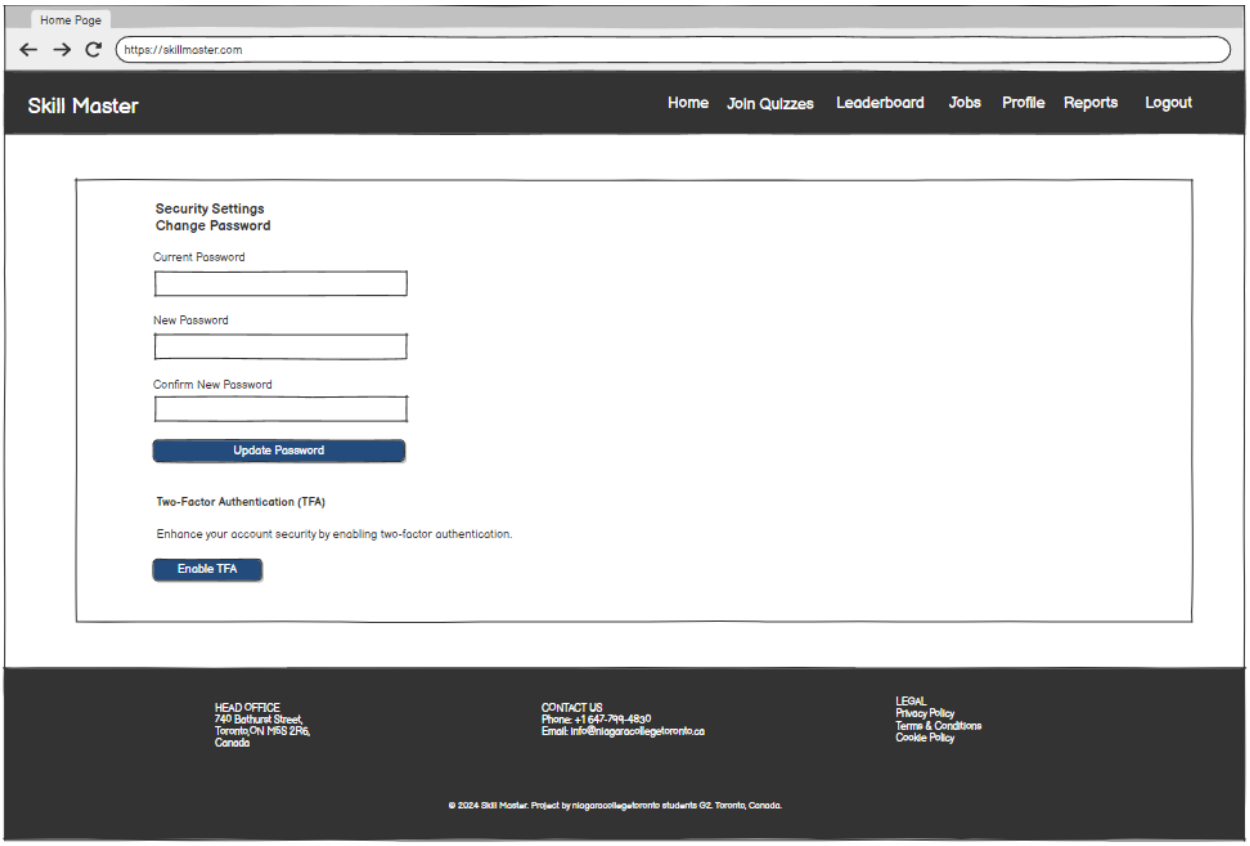
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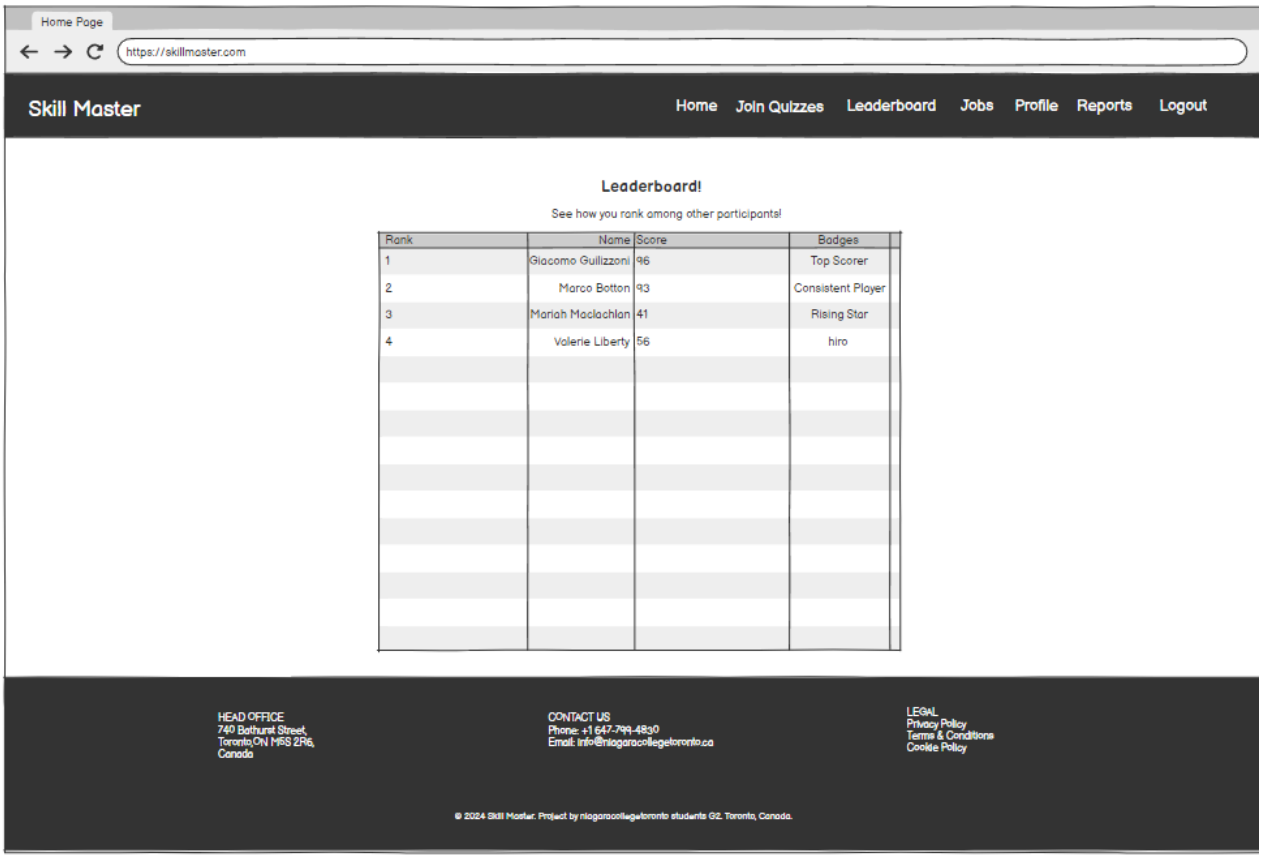
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Technical correctness

The feasibility of the proposed web-based industry-specific quiz for interview preparation is supported by a thorough study of both functional and non-functional requirements. The following sections present a breakdown:

Functional Requirements

Requirement	Description	Priority
User Registration & Login	Users can create accounts, log in, and save quiz progress.	High
Quiz Creation	Admins can create and edit quizzes with MCQ.	High
Quiz Taking	Users can select and take quizzes, with timers and review questions.	High
Scoring & Feedback	After quiz submission, users receive instant feedback and detailed results.	Medium
Progress Tracking	Users can track their quiz history, see their progress, and receive personalized recommendations.	Medium
Admin Dashboard	Admins can manage users, quizzes, and view performance analytics.	Low

Non-Functional Requirements

Requirement	Description	Priority
Security	The system must ensure user data (including quiz results) is protected with encryption and secure logins.	High
Performance	The system should load quiz questions and feedback within 2 seconds for a smooth user experience.	Medium

Usability	The interface must be easy to navigate for users of all levels of tech proficiency.	High
Availability	The system should have at least 99.5% uptime for availability across different devices and browsers.	Medium
Scalability	The system must be able to handle growth in user base and quiz data without significant performance loss.	Low

Analysis of Similar Projects in the Market

This document compares existing solutions in the market for gamified assessment, AI-driven interview platforms, and job matching platforms with interview preparation tools. Each platform is compared based on its key features, differentiators, and potential downsides or limitations.

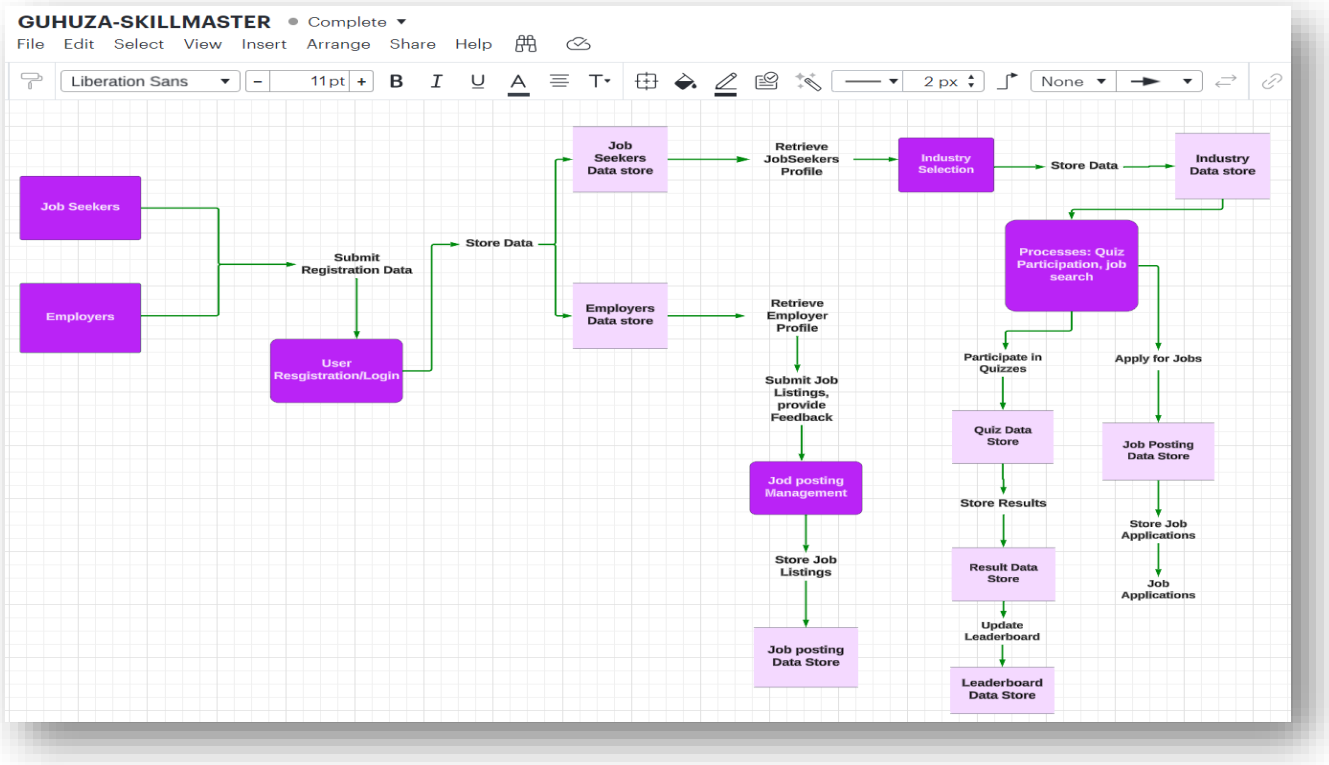
Platform	Type	Key Features	Differentiation	Downside/Limitations
Pymetrics	Gamified Assessment Platform	Uses neuroscience-based games to assess cognitive and emotional traits; aligns candidates with job opportunities.	Focuses on soft skills evaluation and predicting job compatibility for companies like Unilever and LinkedIn.	May not fully capture technical skills; focuses heavily on cognitive and emotional traits.
Arctic Shores	Gamified Assessment Platform	Offers psychometric assessments via immersive, game-based tasks to evaluate personality traits and cognitive abilities.	Provides deep, data-driven insights on candidates' personality for more informed hiring decisions.	Heavy reliance on psychometrics might not suit every industry or job type; costly for small businesses.

Harver	Gamified Assessment Platform	Pre-employment assessments focus on evaluating skills and cultural alignment, using data-driven insights to reduce bias in hiring.	Focuses on bias reduction and enhancing the quality of hires using gamified evaluations.	Could oversimplify complex traits like cultural fit; automated scoring may overlook nuance.
HireVue	AI-Driven Video Interview	Combines video interviews with AI assessments of verbal and non-verbal cues, including game-based technical and soft skill evaluations.	Integrates video interviewing with game-based assessments for streamlined candidate evaluation.	AI-driven evaluations raise concerns about bias and privacy; candidates may find the process impersonal.
LinkedIn	Job Matching & Interview Prep	Uses machine learning to provide tailored job recommendations and includes an interview prep platform with AI-generated feedback.	Offers AI-driven interview prep with commonly asked questions and expert insights alongside job recommendations.	Limited depth in industry-specific prep; interview feedback can feel generic.
Indeed	Job Matching & Interview Prep	Provides job alerts tailored to candidates' preferences; includes interview prep tools with guides, company reviews, and expert advice.	Supports job seekers with comprehensive interview prep tools and personalized job alerts.	Interview prep tools are more static and less interactive than AI-driven platforms; less personalized guidance.

ZipRecruiter	Job Matching Platform	AI-powered job matching connects employers and candidates; automatically notifies job seekers of relevant opportunities.	Uses AI technology to match candidates with opportunities efficiently, focusing on real-time job alerts.	Focuses on job matching, with limited interview preparation tools; less emphasis on skill or cultural fit.

Data Flow Diagram:

The Data Flow Diagram (DFD) represents the flow of information within the Guhuza-SkillMaster platform. The system allows two primary user groups—Job Seekers and Employers—to register and interact with the platform. Job seekers and employers complete the Registration/Login process, submitting their data, which is then stored in separate data stores (for Job Seekers and Employers). Job seekers can then engage with the platform by selecting an industry of interest and participating in industry-specific Quizzes. The smooth interaction between the data stores and processes ensures that the platform supports job preparation (through quizzes) in a cohesive system.



Process

Problem Analysis

1. Problem Statement

Job seekers currently lack access to practical, industry-focused interview preparation tools. Most existing platforms offer generalized questions that fail to address the specific needs of different industries, leaving candidates unprepared for the technical depth and problem-solving skills required in real-world interviews.

2. Cause and Effect Analysis

The absence of tailored preparation tools results in candidates lacking the confidence and specialized knowledge to perform well in interviews. They may struggle to answer industry-specific questions without proper guidance, reducing their chances of securing job offers. Users who rely on generic preparation tools may find themselves at a disadvantage in competitive job markets. The lack of field-specific practice limits their ability to sharpen relevant skills, making them less competitive during interviews.

5W Analysis (Who, What, Where, When, Why)

1. Who:

Job Seekers: Individuals looking for job opportunities and preparing for interviews.
Employers: Companies looking to assess candidates for job openings.

2. What:

A lack of interactive, real-time quiz-based tools for interview preparation and candidate assessment.

3. Where:

Online job-seeking platforms that traditionally focus on resume-based applications without interactive assessment features.

4. When:

During the job-seeking process, particularly during interview preparation and candidate shortlisting.

5. Why:

To improve job seekers' readiness for interviews and employers' ability to assess candidates' practical skills effectively.

Sources of ideas:

Platform	Type	Key Features	Inspiration for the app
Duolingo	Gamified Learning App	Uses gamification elements like badges, points, and progression through levels.	Add badges, progression through quiz difficulty levels, and instant feedback to engage users in a gamified learning process.
Kahoot!	Game-Based Learning Platform	Real-time quizzes with competition and interactive elements for group participation.	Implement real-time quizzes, leaderboards, and timed sessions to encourage user competition and engagement.
Quizlet	Custom Flashcard/Quiz App	Users can create custom quizzes and flashcards to study and practice.	Allow users or employers to create industry-specific quizzes, giving users more control over their learning.

Project Functionality Roadmap: Present vs. Later Stages

Stage	Description	Core Functionalities (Present)	Core Functionalities (Later Stages)
Proof-of-Concept	The initial phase where the basic concept is validated to prove feasibility.	- Basic user registration and login. - Industry-specific quiz selection. - Simple quiz participation.	N/A

Prototype Version	A refined version with core functionalities to test user interaction and basic workflows.	- User dashboard for quiz access. - Quiz scoring and feedback system. - Initial UI/UX design.	N/A
Production Version	The final, fully functional version ready for deployment with all advanced features and enhancements.	N/A	- Full security encryption. - Leaderboard with rankings. - Employer-created quizzes. - Job posting system. - Complete Guhuza platform integration.

Database Creation and Handling

Overview of the Database Structure

The Guhuza Skill Master platform requires a well-structured database to manage user registration, quiz data, job postings, quiz results, and leaderboard rankings. The database was designed using MySQL to ensure efficient data handling for job seekers and employers. The structure follows a relational model to maintain data integrity and streamline user interactions.

Entity-Relationship Diagram (ERD)

The database is structured as shown in the ER diagram, capturing relationships between critical entities like Job Seekers, Employers, Quizzes, Quiz Results, and Leaderboard. The main entities and relationships include:

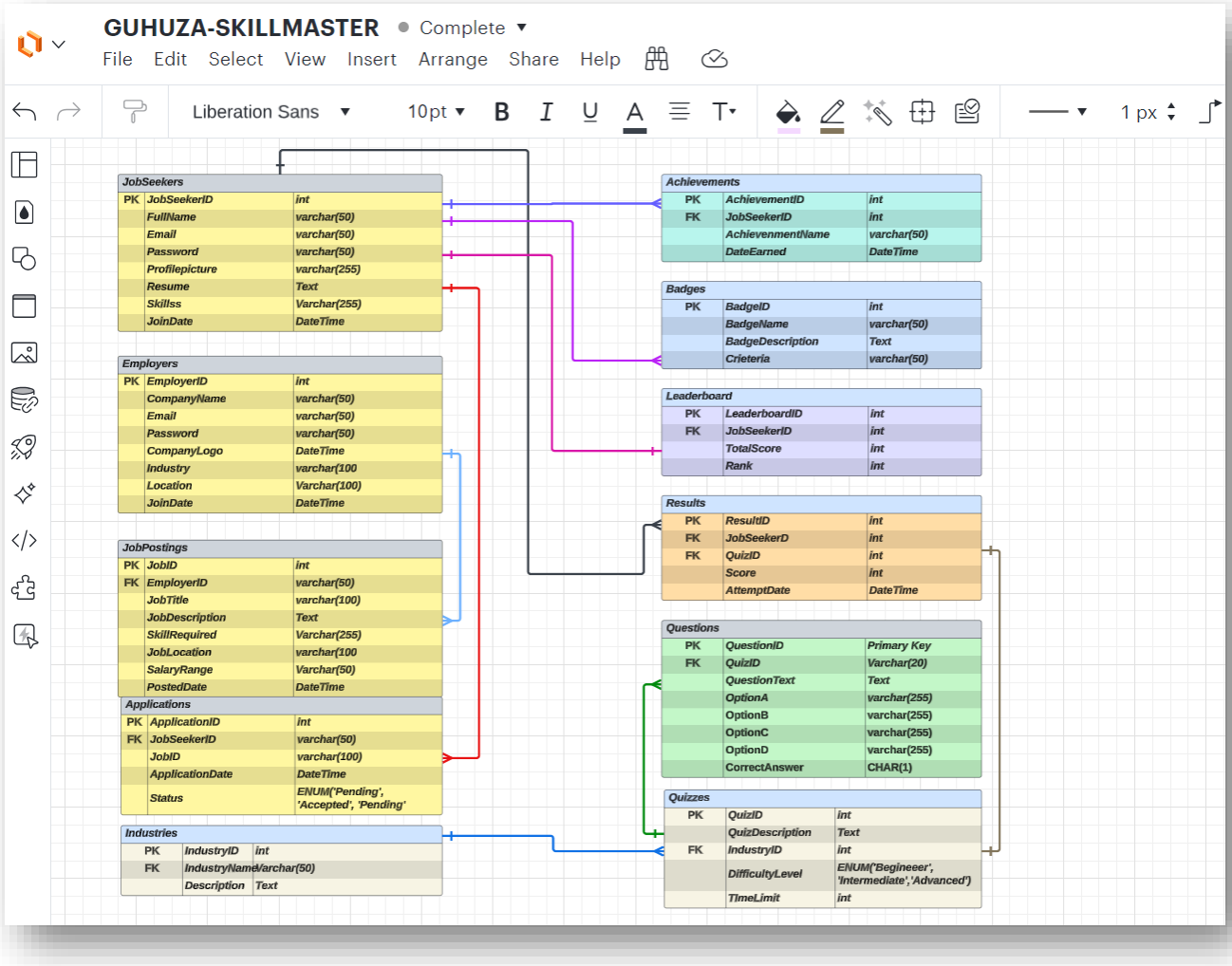
Job Seekers: Store user-specific information, including profile details and quiz results.

Employers: Store employer data, job postings, and application management.

Quizzes: Handle data related to the quizzes, including questions, answers, and difficulty levels.

Quiz Results: Stores the results of job seekers after completing quizzes.

Leaderboard: Tracks and ranks users based on their quiz performance.



Database Management and Maintenance

MySQL: The database is built on MySQL, a relational database management system known for scalability, speed, and robustness in handling large datasets.

Data Integrity: Primary and foreign key constraints are enforced across tables to maintain relationships and ensure data consistency between job seekers, quizzes, and results.

Security: Passwords are securely hashed/encrypted, and Role based access control mechanisms are applied to restrict access to sensitive data such as quiz results and employer job postings.

Handling User Data and Quiz Results

User Data: The JobSeekers Table and Employers Table are the central repository for user and employer data. Foreign keys link users to their quiz results and job applications.

Quiz Results and Leaderboard: The QuizResults Table stores individual quiz scores, which are then used to update the Leaderboard Table for ranking purposes, incentivizing users to improve their performance.

Future Enhancements

Leaderboard

Quiz results are stored in the Result Data Store, and their scores contribute to a Leaderboard, motivating competition and enabling employers to view top-performing candidates.

Progress Tracking

To improve user experience, progress tracking will be implemented for each quiz session. Users will be able to see their progress during quizzes, such as the number of questions answered, remaining time, and current score. Additionally, post-quiz reports will provide detailed feedback on performance, highlighting areas for improvement and keeping users engaged with their learning journey.

Progress Overview

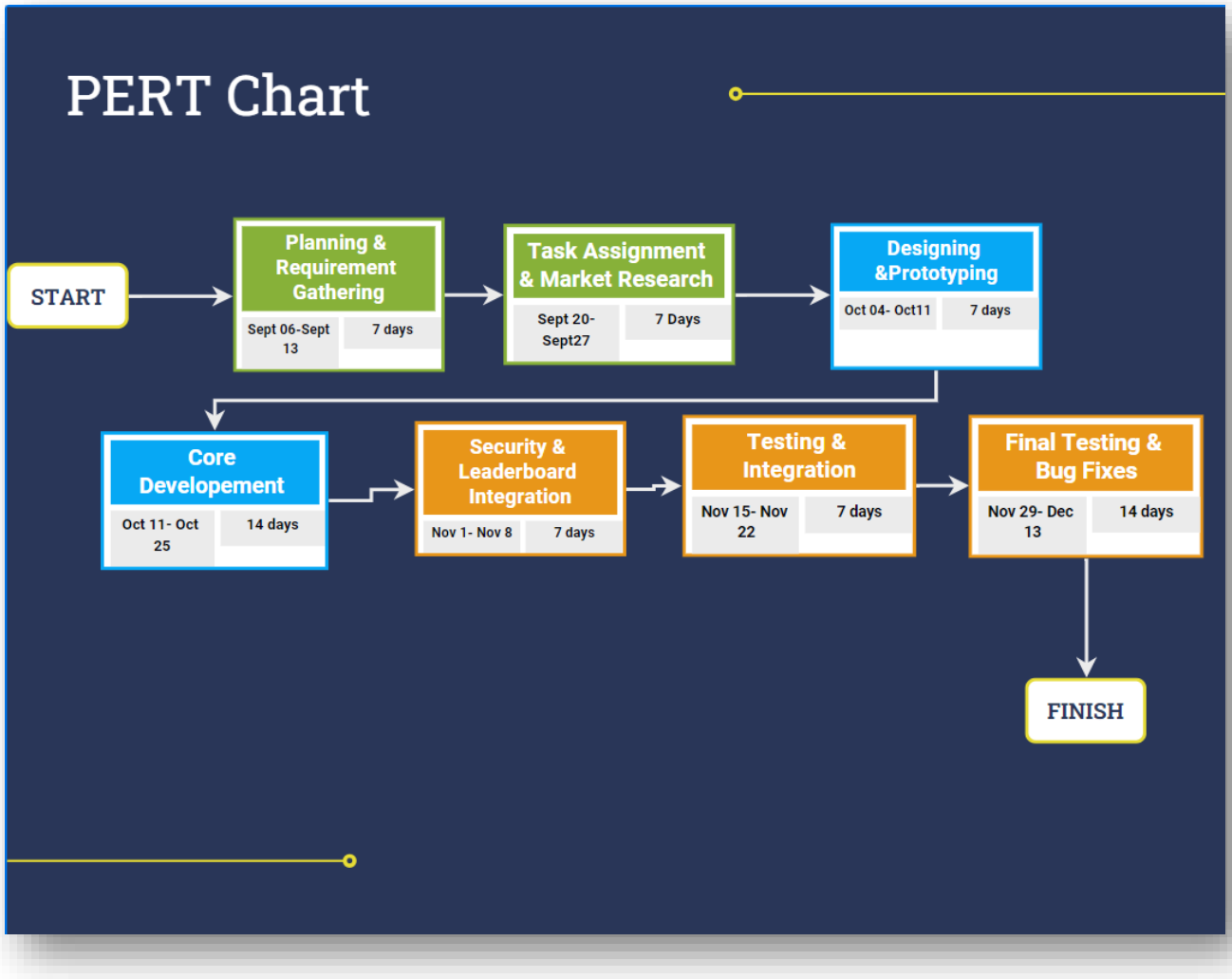
The Guhuza Skill Master project follows the Agile Software Development Life Cycle (SDLC), utilizing incremental and iterative development techniques. Using this, we can focus on rapid development, continuous testing, and feedback integration by breaking the project into smaller sprints. This approach allows us to remain flexible and adapt to changes in requirements as the project progresses. The goal is to create a quiz-based platform for job seekers and employers to have their interview prepared, including skill-specific quizzes and real-time scoring.

Phase	Weeks	Key Activities	Screenshots/Artifacts
Planning & Requirement Gathering	Weeks 1-2	- Finalize project scope - Define functional and non-functional requirements - Project team alignment	- Gantt Chart - PERT Chart
Task Assignment & Market Research	Weeks 3-4	- Assign tasks and allocate resources - Conduct market and competitor research - Design database structure (ERD)	- ERD Diagram - Market research summary
Design & Prototyping	Weeks 5-6	- Define skill-specific quizzes - Develop UI/UX wireframes - Complete system prototyping - Develop initial quiz prototypes	- Wireframe design - Quiz flow diagram
Core Development	Weeks 6-7	- Implement User Registration/Login System and MySQL database - Develop core quiz scoring logic and badge system	- User registration UI - Database screenshots

Phase Explanations

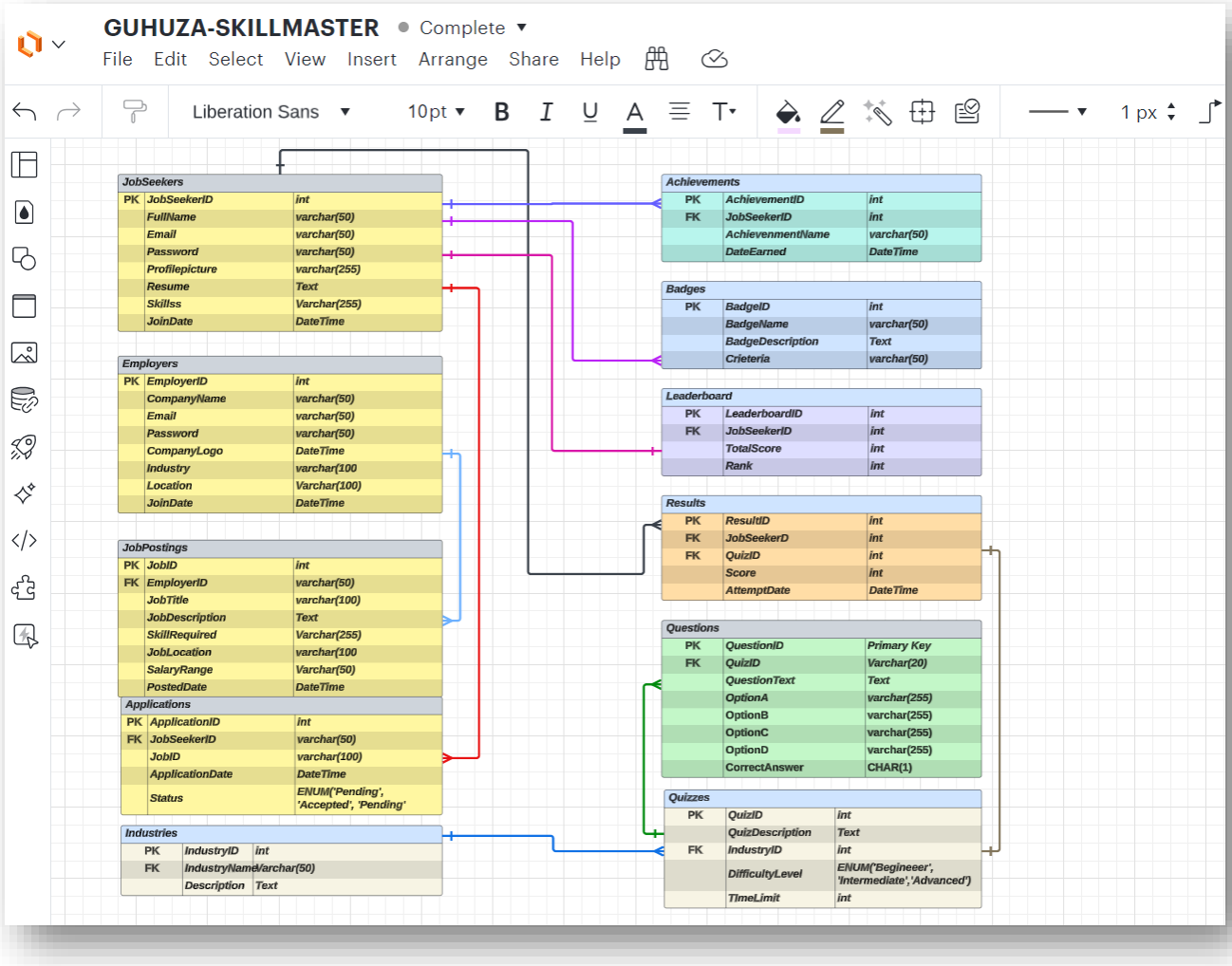
Planning & Requirement Gathering (Weeks 1-2)

The project started with finalizing the scope and defining the functional and non-functional requirements. The team used the Agile methodology, which emphasizes adaptability and iterative progress. Gantt and PERT charts were prepared to help visualize the timeline and manage the dependencies of various tasks.



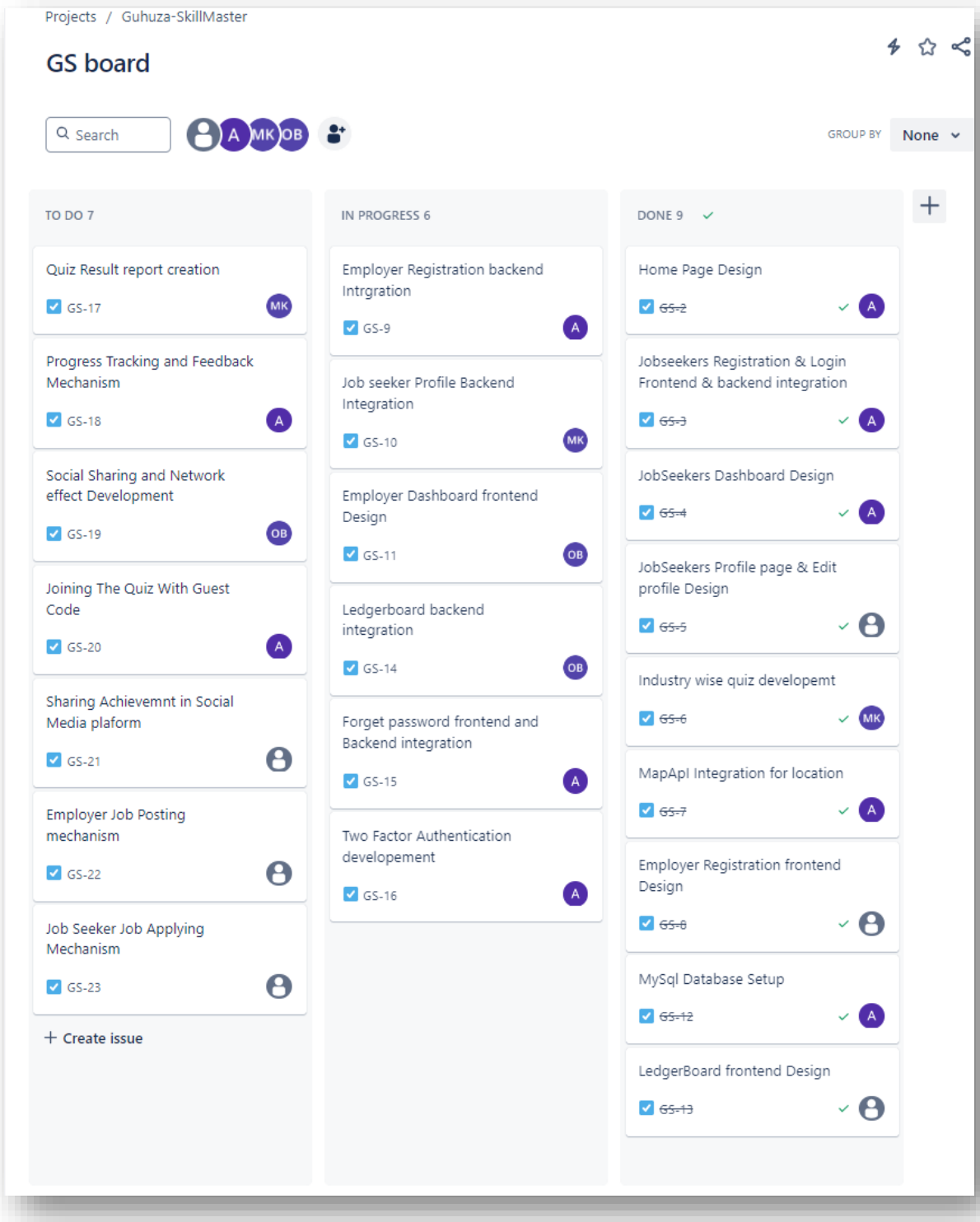
Task Assignment & Market Research (Weeks 3-4)

Using the Agile approach, tasks were assigned in short, manageable sprints. The team conducted market research on existing quiz-based platforms, such as Pymetrics and Harver, to understand industry trends. The Entity-Relationship Diagram (ERD) was created to structure the database, ensuring smooth data flow between users and quizzes.



Kanban Board

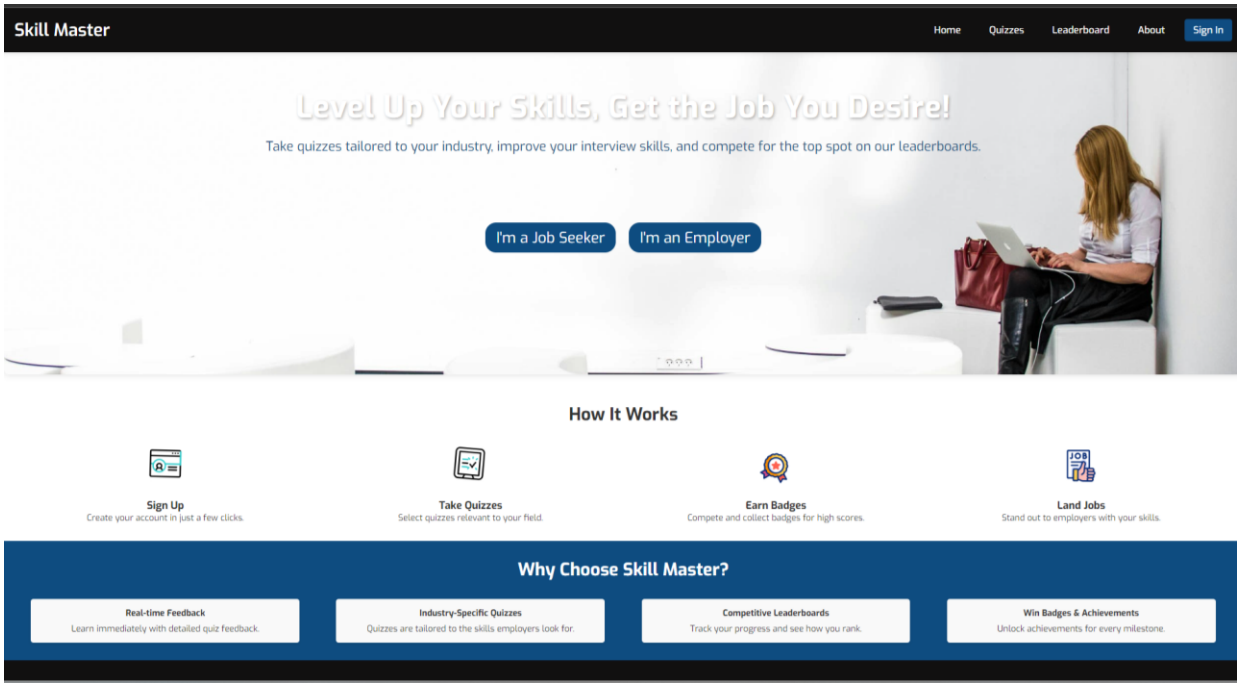
The kanban board for the Guhuza-SkillMaster project is organized into three sections: "To Do," "In Progress," and "Done." The "To Do" column lists seven tasks yet to be started, including key features like creating a quiz result report, implementing progress tracking, and developing job posting and application mechanisms. The "In Progress" column contains six tasks currently being worked on, such as backend integration for employer registration, backend integration for job seeker profiles, designing the employer dashboard frontend, and implementing two-factor authentication. The "Done" column displays nine completed tasks, which include designing the job seekers' registration and login frontend, integrating both frontend and backend, setting up MySQL databases, designing the leaderboard frontend, and integrating the map API for location-based features. Each task is assigned to specific team members, indicated by initials or avatars, providing a clear view of project progress and responsibilities.



Design & Prototyping (Weeks 5-6)

In this sprint, the focus was on designing the platform's user experience. UI/UX wireframes were developed to create intuitive interfaces for job seekers and employers. The first prototype of the quiz logic, allowing users to take industry-specific quizzes, was also completed.

UI Screens: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Home
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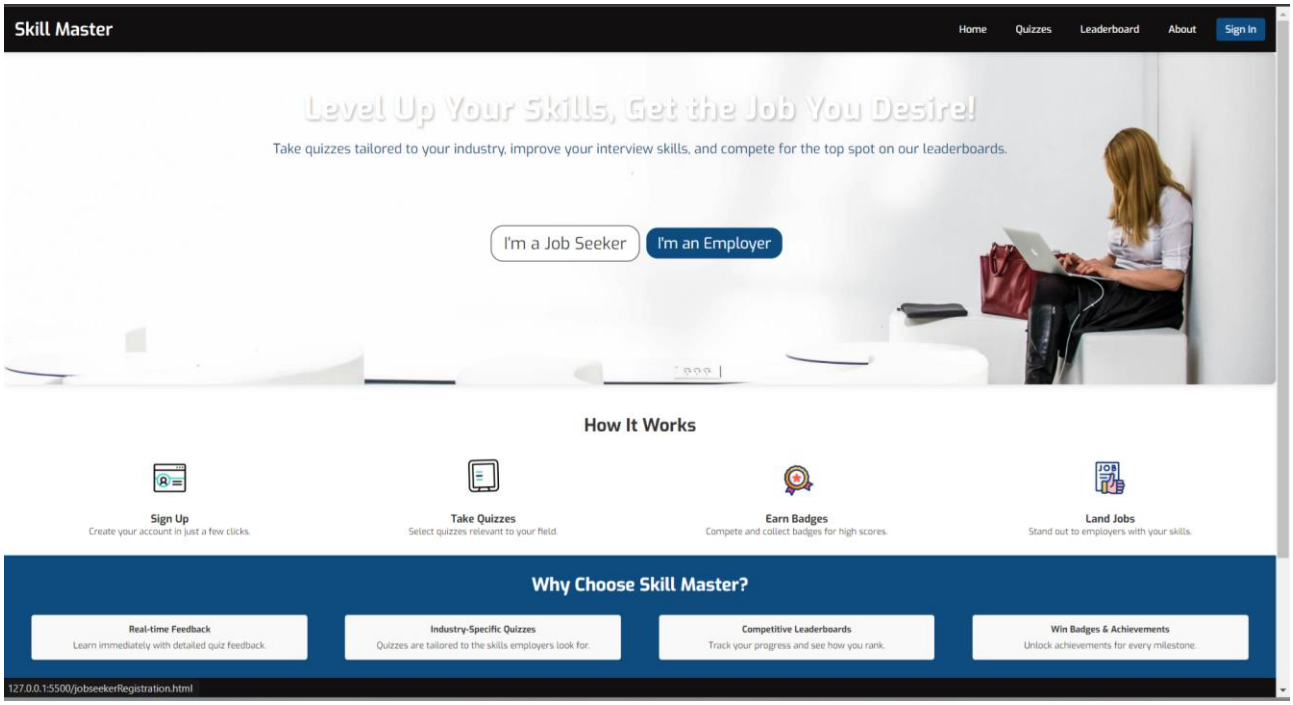
About
Sign In
Level Up Your Skills, Get the Job You Desire!
Take quizzes tailored to your industry, improve your interview skills, and compete for the top spot on our leaderboards.
I'm a Job Seeker
I'm an Employer
How It Works
Sign Up
Create your account in just a few clicks.
Take Quizzes
Select quizzes relevant to your field.
Earn Badges
Compete and collect badges for high scores.
Land Jobs
Stand out to employers with your skills.
Why Choose Skill Master?
Real-time Feedback
Learn immediately with detailed quiz feedback.
Industry-Specific Quizzes
Quizzes are tailored to the skills employers look for.
Competitive Leaderboards
Track your progress and see how you rank.
Win Badges & Achievements
Unlock achievements for every milestone.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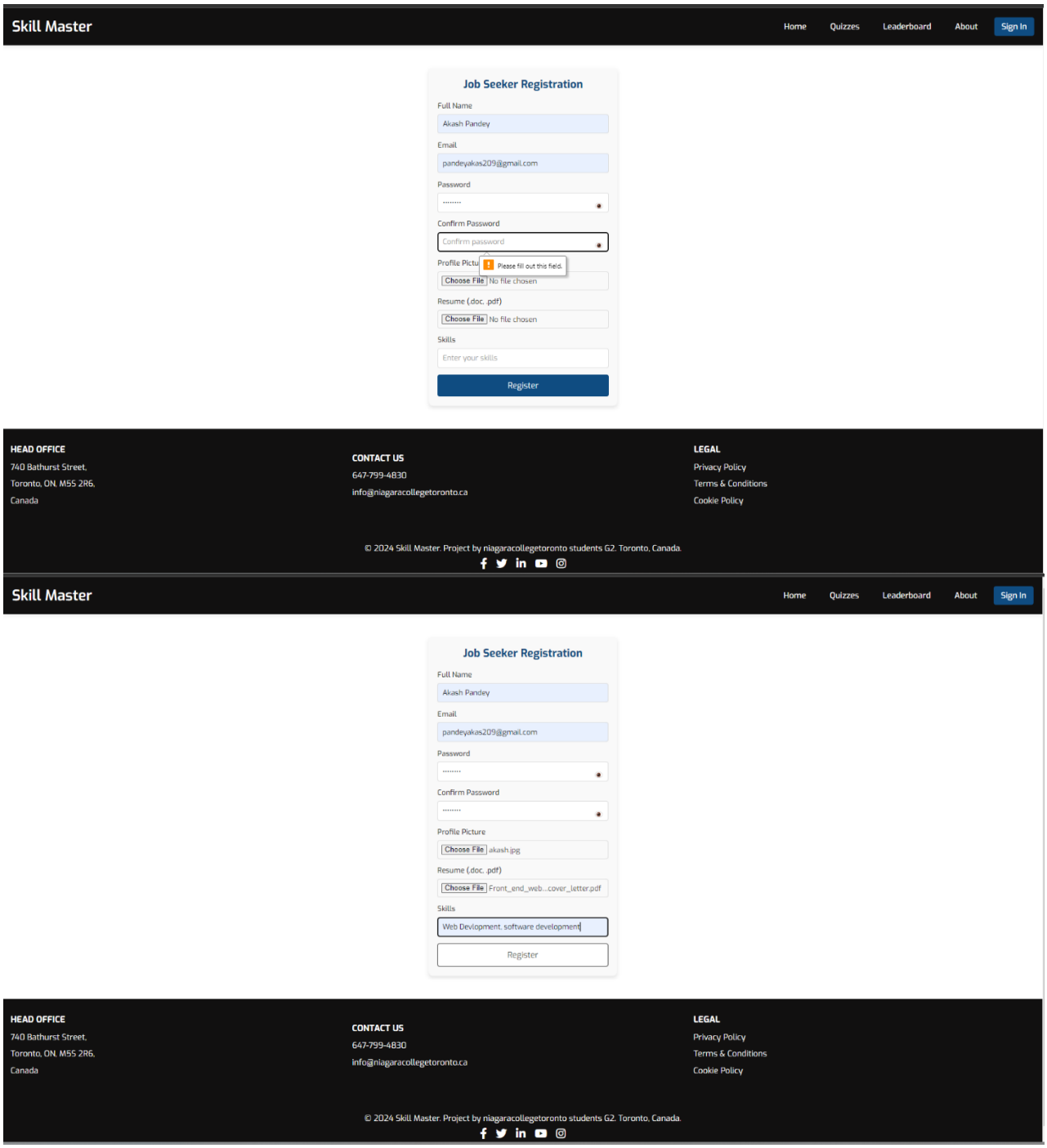
Sign In
Level Up Your Skills, Get the Job You Desire!
Take quizzes tailored to your industry, improve your interview skills, and compete for the top spot on our leaderboards.
I'm a Job Seeker
I'm an Employer
How It Works
Sign Up
Create your account in just a few clicks.
Take Quizzes
Select quizzes relevant to your field.
Earn Badges
Compete and collect badges for high scores.
Land Jobs
Stand out to employers with your skills.
Why Choose Skill Master?
Real-time Feedback
Learn immediately with detailed quiz feedback.
Industry-Specific Quizzes
Quizzes are tailored to the skills employers look for.
Competitive Leaderboards
Track your progress and see how you rank.
Win Badges & Achievements
Unlock achievements for every milestone.
127.0.0.1:5500/jobseekerRegistration.html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Home
Quizzes
Leaderboard
About
Sign In
Job Seeker Registration
Full Name
Akash Pandey
Email
pandeyakas209@gmail.com
Password
Confirm Password
Confirm password
Please fill out this field.
Choose File No file chosen
Resume (.doc, .pdf)
Choose File No file chosen
Skills
Enter your skills
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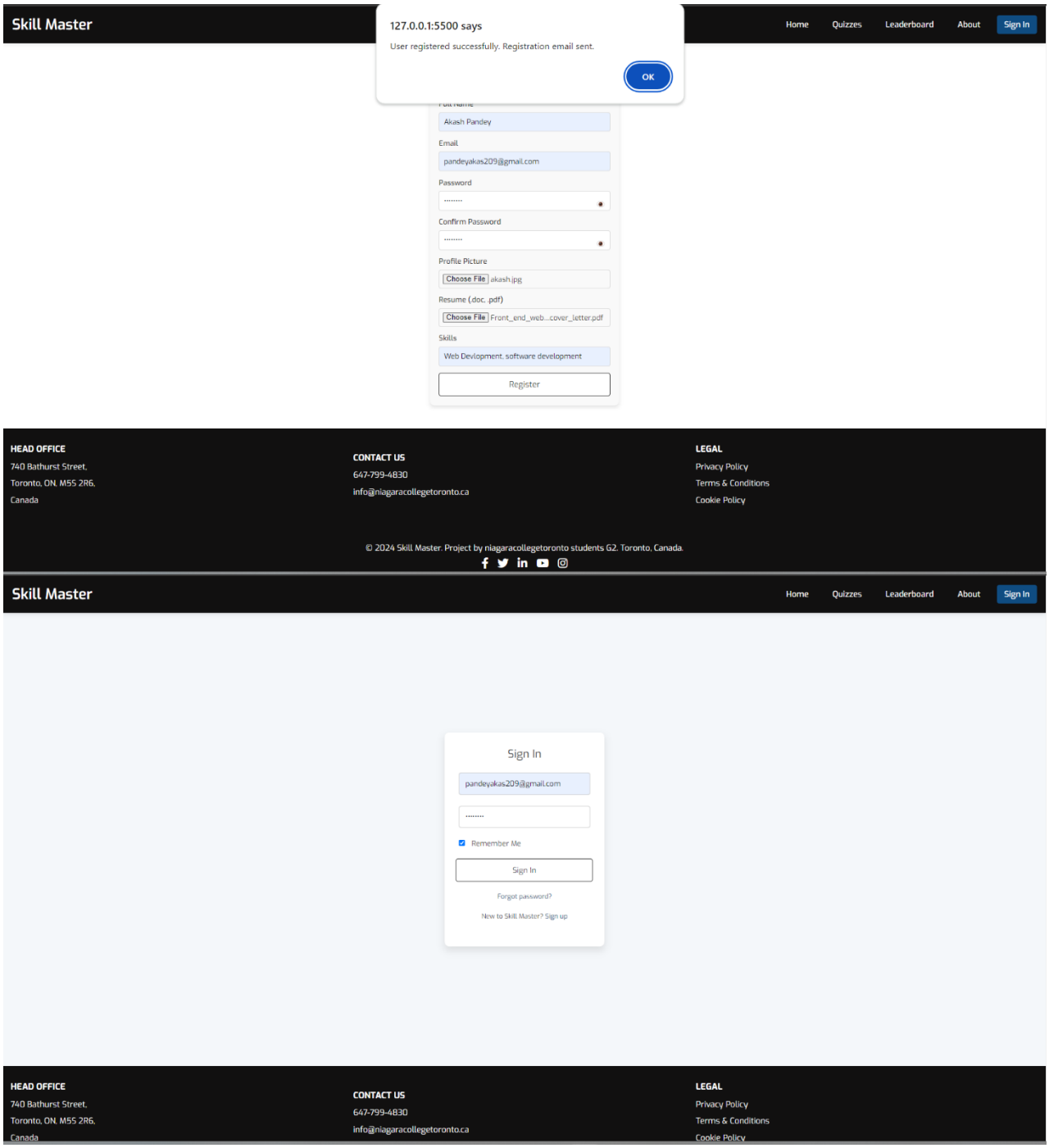
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127.0.0.1:5500 says
User registered successfully. Registration email sent.
OK
Akash Pandey
Email
pandeyakas209@gmail.com
Password
Confirm Password
Profile Picture
Choose File akash.jpg
Resume (.doc, .pdf)
Choose File Front_end_web...cover_letter.pdf
Skills
Web Devlopment, software development
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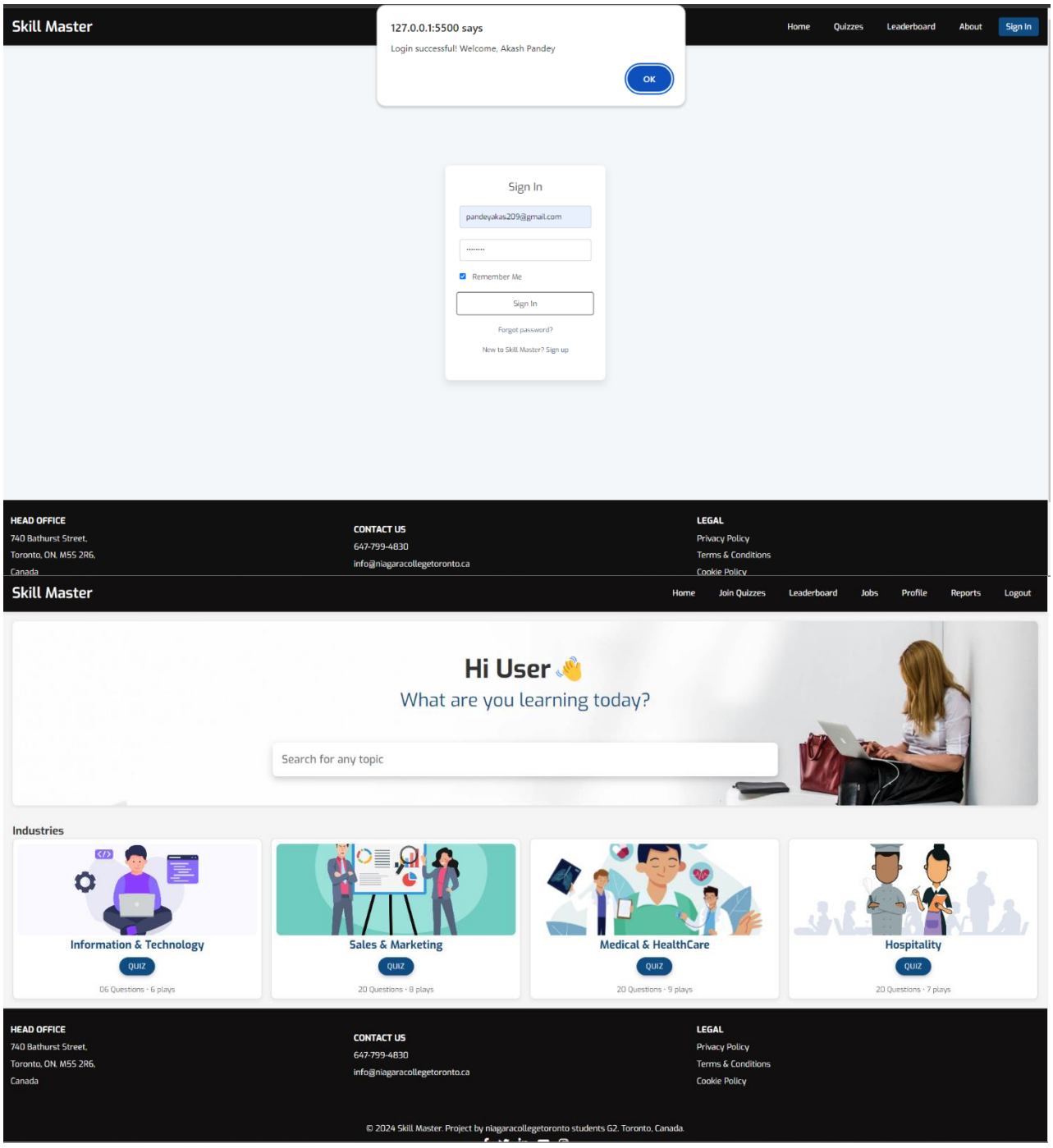
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06 Questions · 6 plays
Sales & Marketing
QUIZ
20 Questions · 8 plays
Medical & HealthCare
QUIZ
20 Questions · 9 plays
Hospitality
QUIZ
20 Questions · 7 plays
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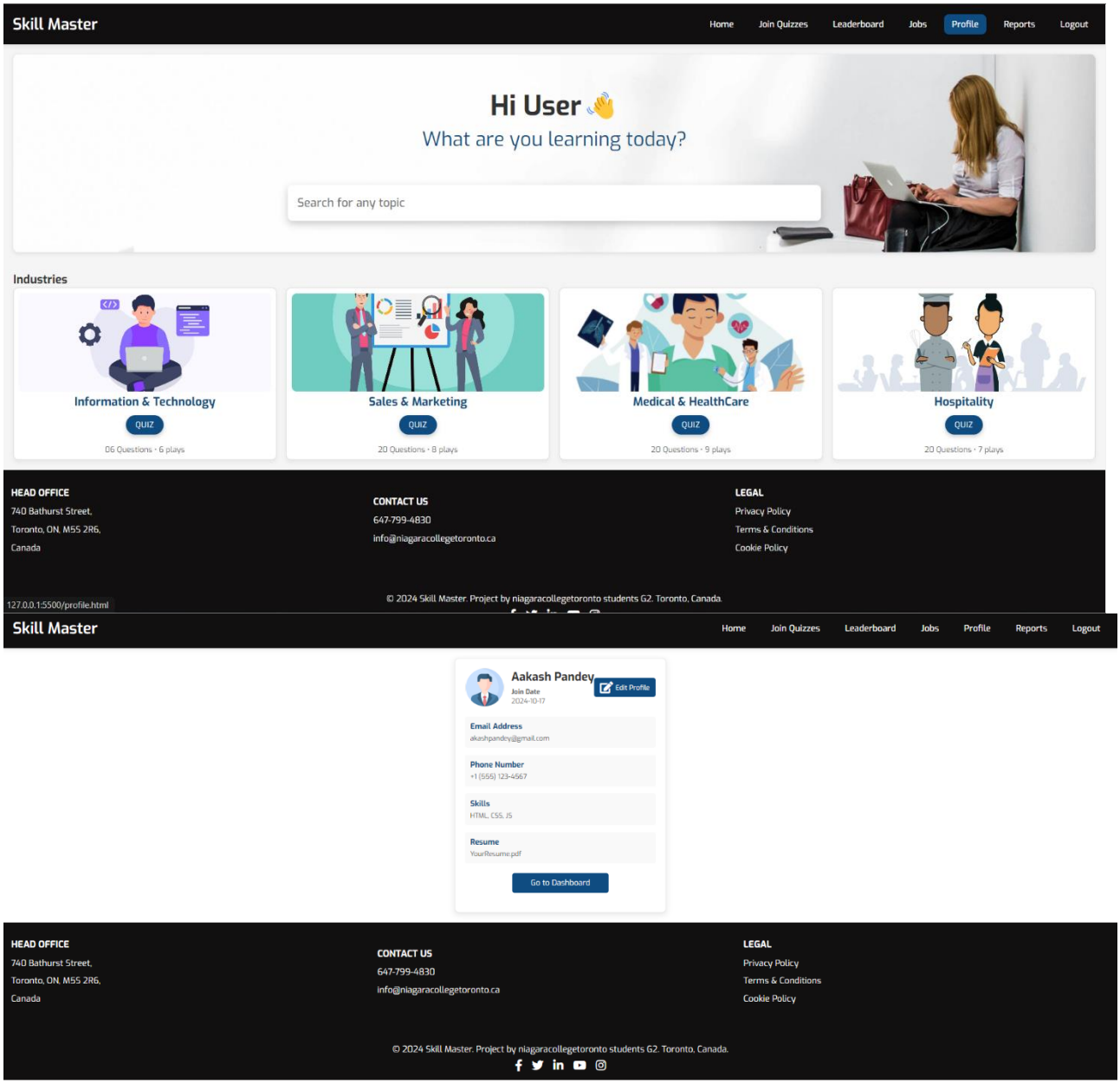
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QUIZ
06 Questions · 6 plays
Sales & Marketing
QUIZ
20 Questions · 8 plays
Medical & HealthCare
QUIZ
20 Questions · 9 plays
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QUIZ
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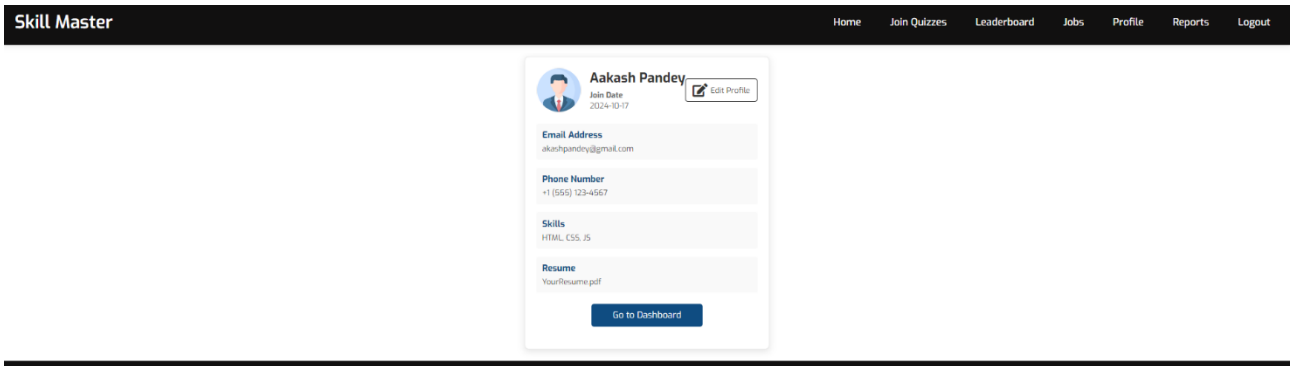
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Phone Number
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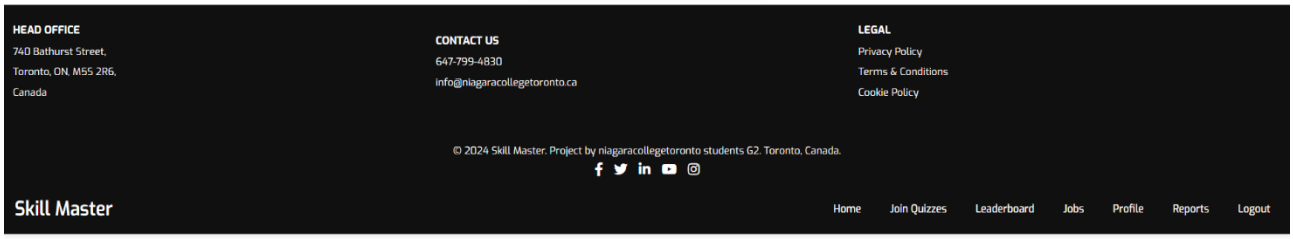
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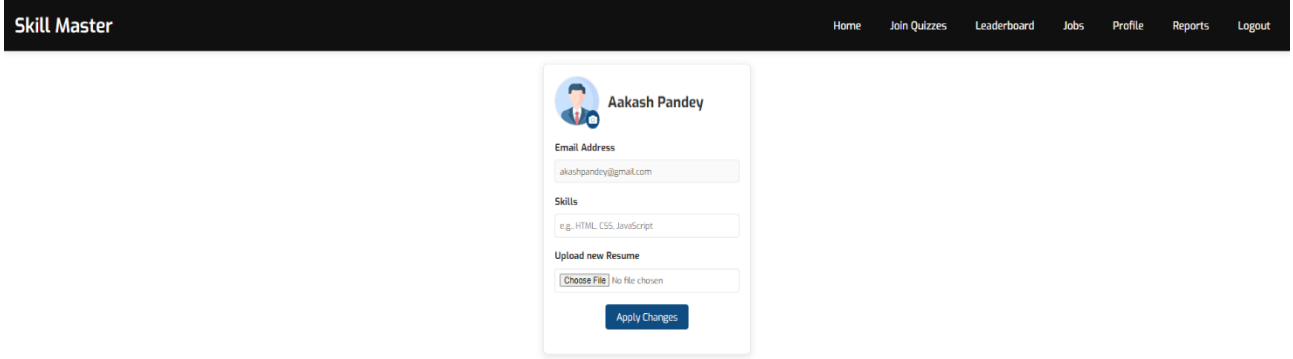
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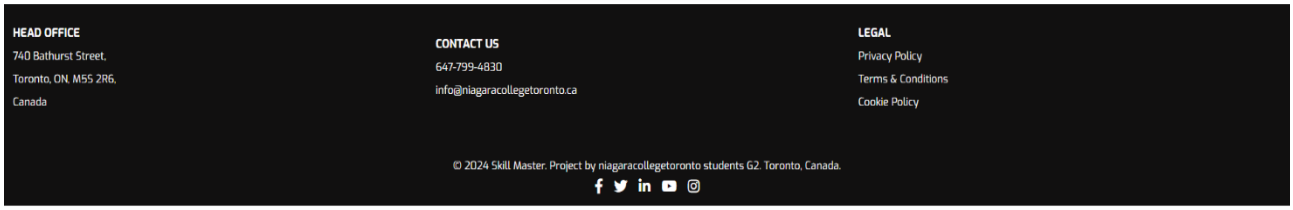
Apply Changes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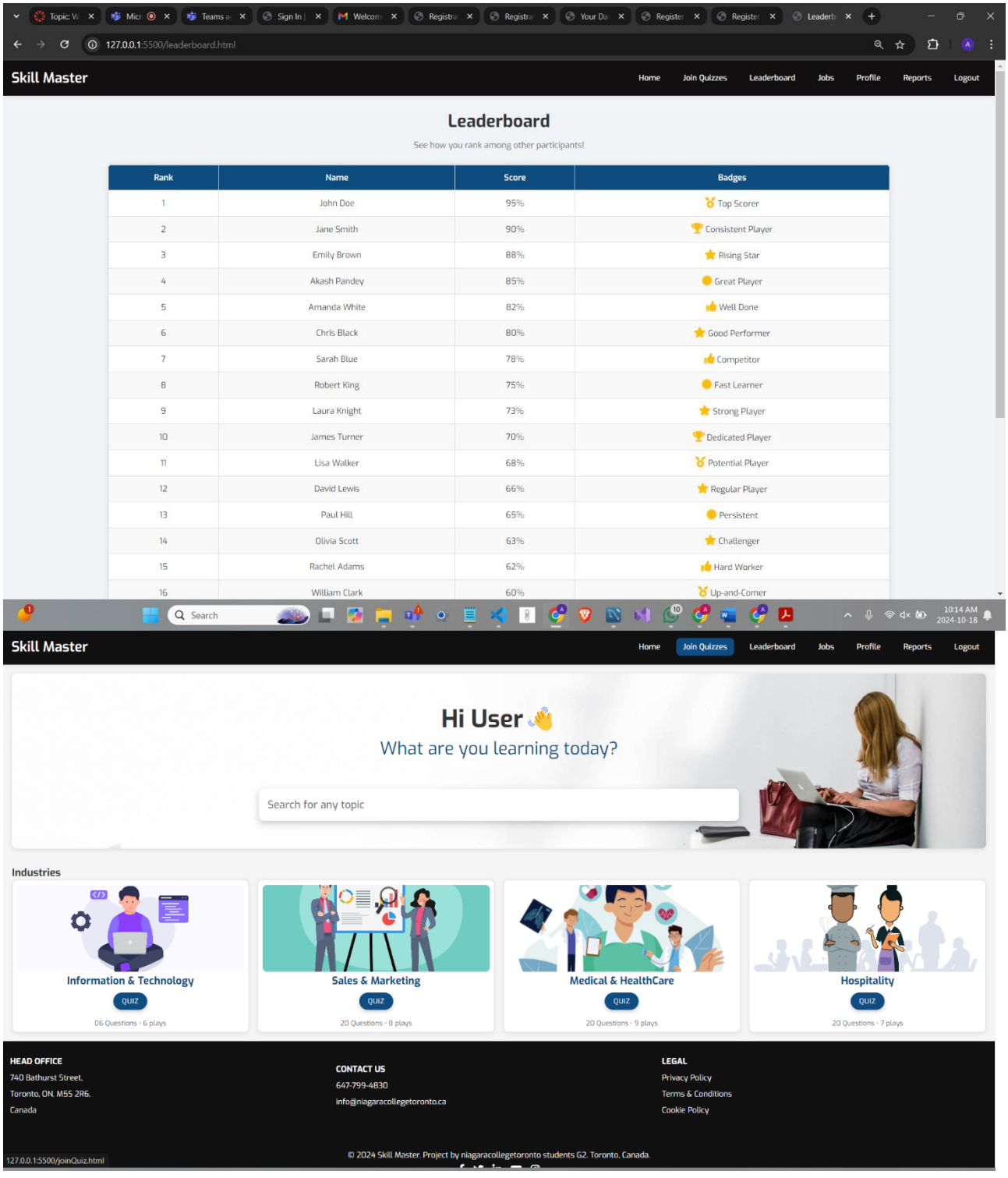
127.0.0.1:5500/leaderboard.html
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Home
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Leaderboard
See how you rank among other participants!
Rank
Name
Score
Badges
1 John Doe 95% Top Scorer
2 Jane Smith 90% Consistent Player
3 Emily Brown 88% Rising Star
4 Akash Pandey 85% Great Player
5 Amanda White 82% Well Done
6 Chris Black 80% Good Performer
7 Sarah Blue 78% Competitor
8 Robert King 75% Fast Learner
9 Laura Knight 73% Strong Player
10 James Turner 70% Dedicated Player
11 Lisa Walker 68% Potential Player
12 David Lewis 66% Regular Player
13 Paul Hill 65% Persistent
14 Olivia Scott 63% Challenger
15 Rachel Adams 62% Hard Worker
16 William Clark 60% Up-and-Comer
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2024-10-18
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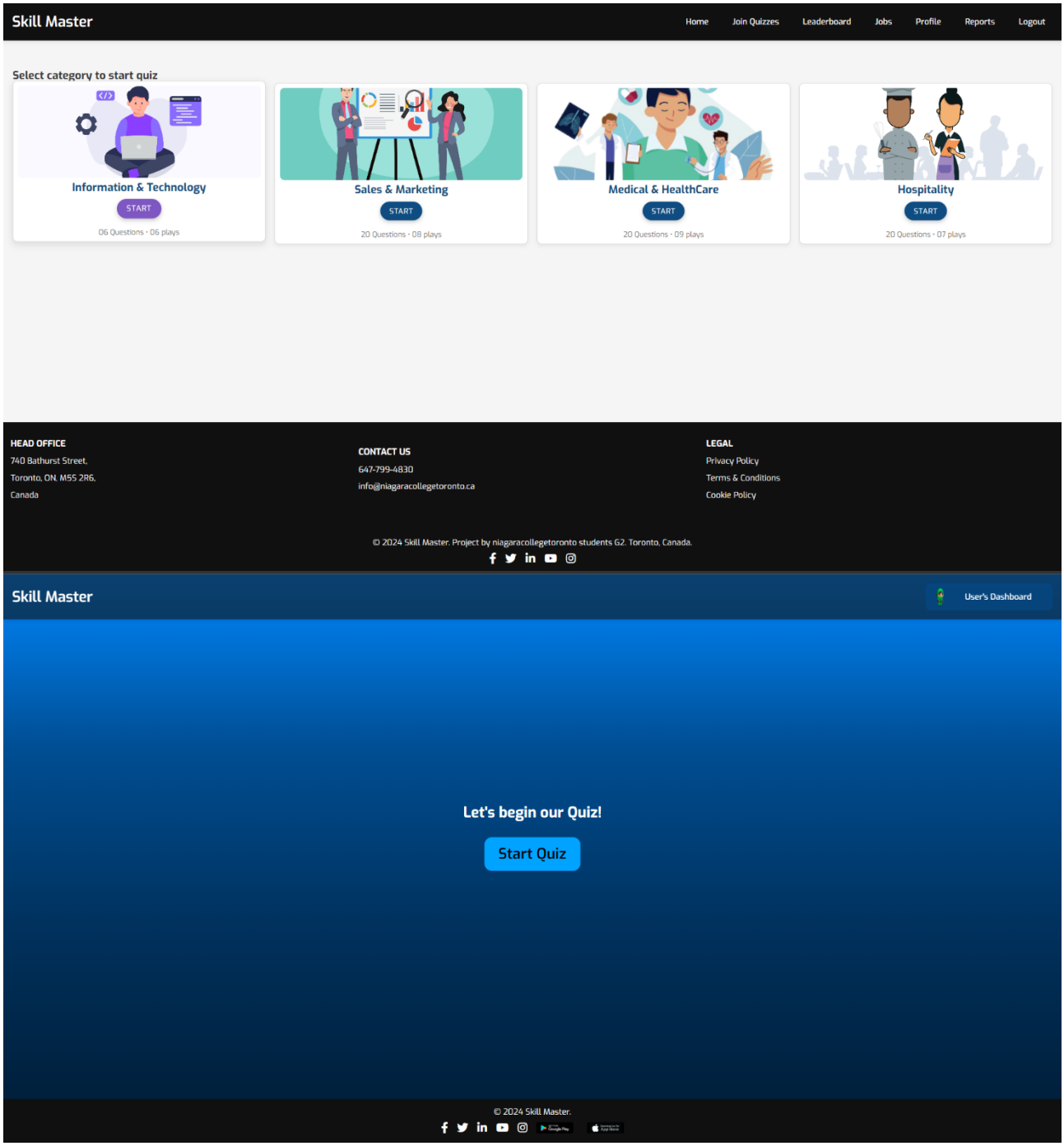
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Home
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Leaderboard
Jobs
Profile
Reports
Logout
Select category to start quiz
Information & Technology
START
06 Questions · 06 plays
Sales & Marketing
START
20 Questions · 08 plays
Medical & HealthCare
START
20 Questions · 09 plays
Hospitality
START
20 Questions · 07 plays
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User's Dashboard
Let's begin our Quiz!
Start Quiz
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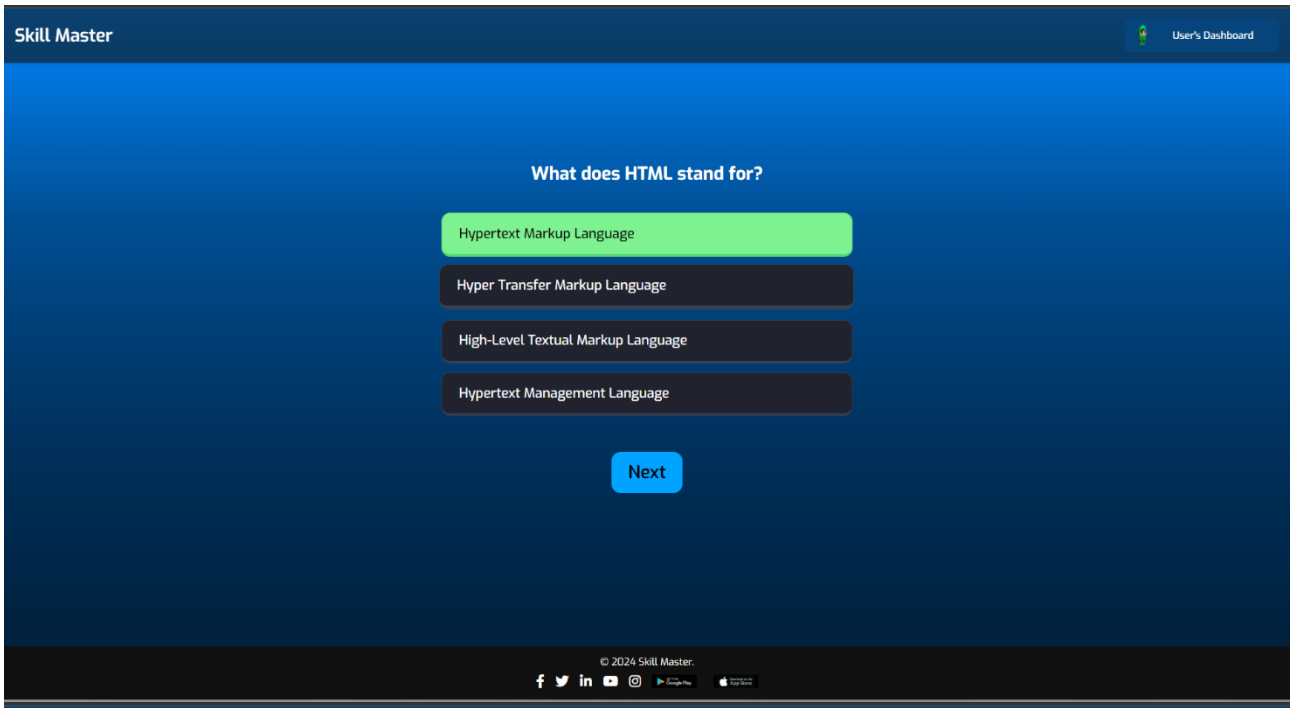
Skill Master
User's Dashboard
What does HTML stand for?
Hypertext Markup Language
Hyper Transfer Markup Language
High-Level Textual Markup Language
Hypertext Management Language
Next
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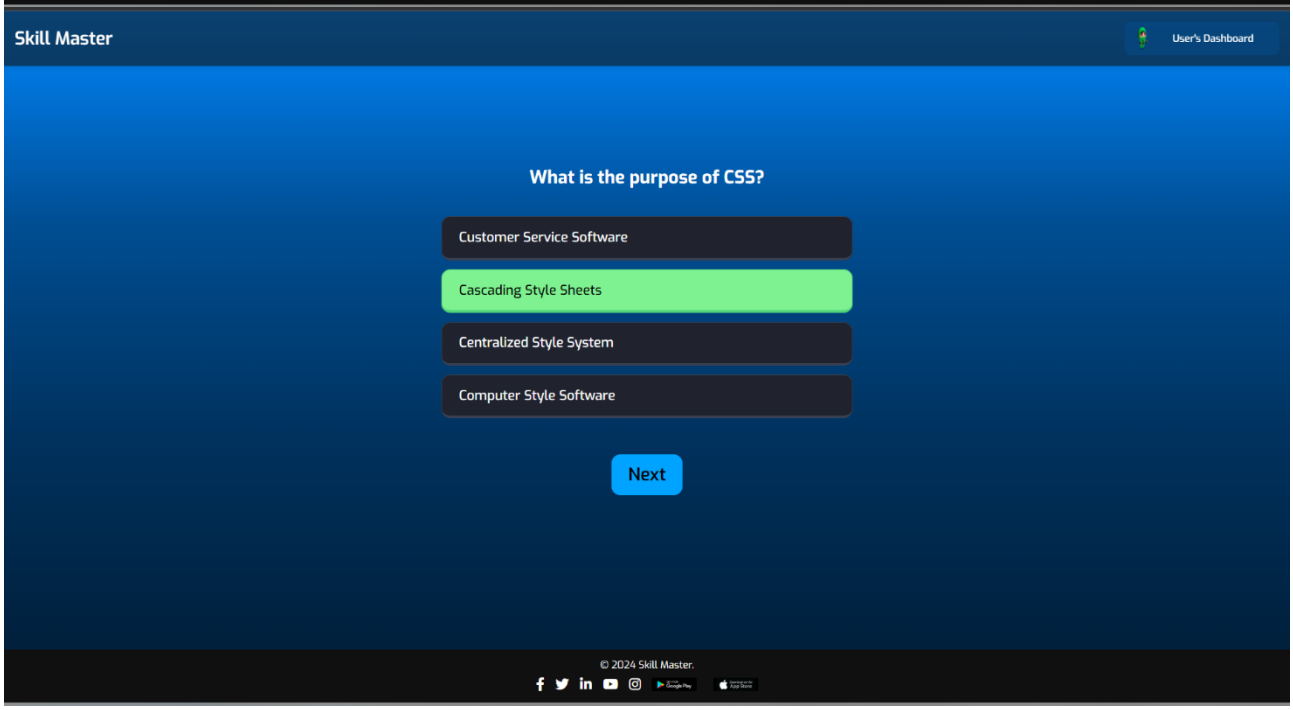
Skill Master
User's Dashboard
What is the purpose of CSS?
Customer Service Software
Cascading Style Sheets
Centralized Style System
Computer Style Software
Next
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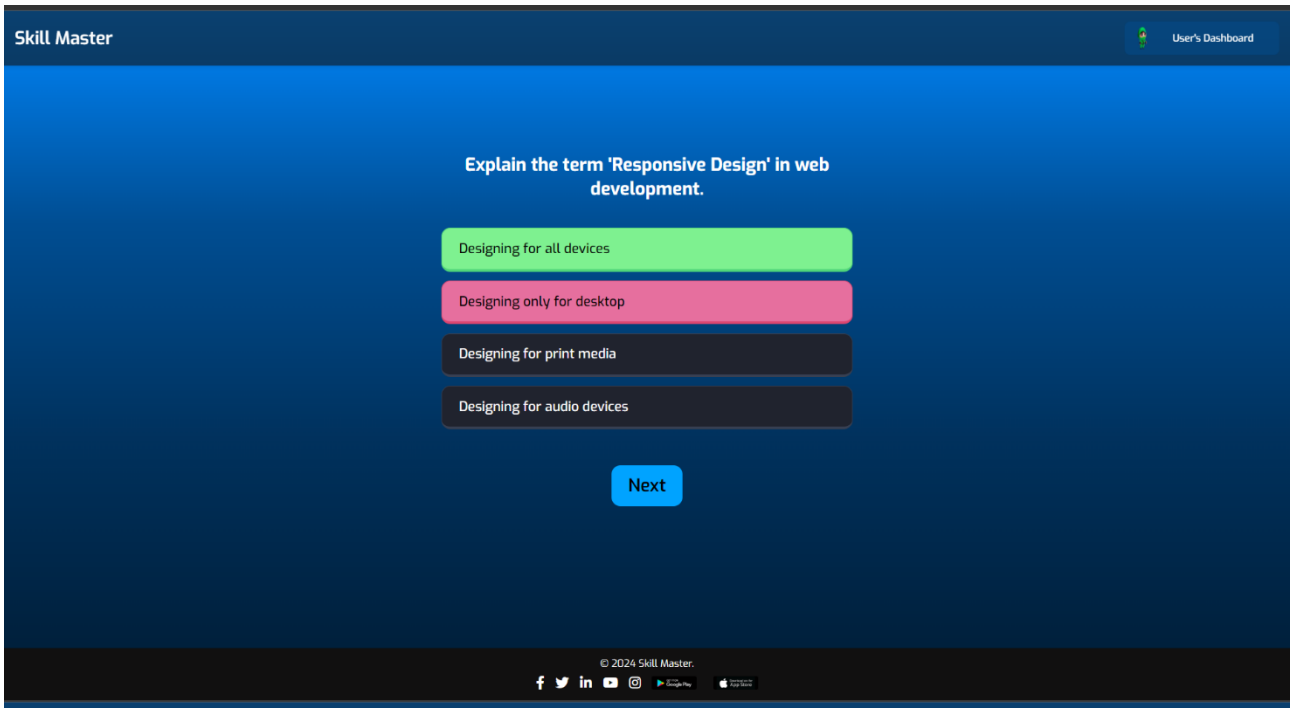
Skill Master
User's Dashboard
Explain the term 'Responsive Design' in web development.
Designing for all devices
Designing only for desktop
Designing for print media
Designing for audio devices
Next
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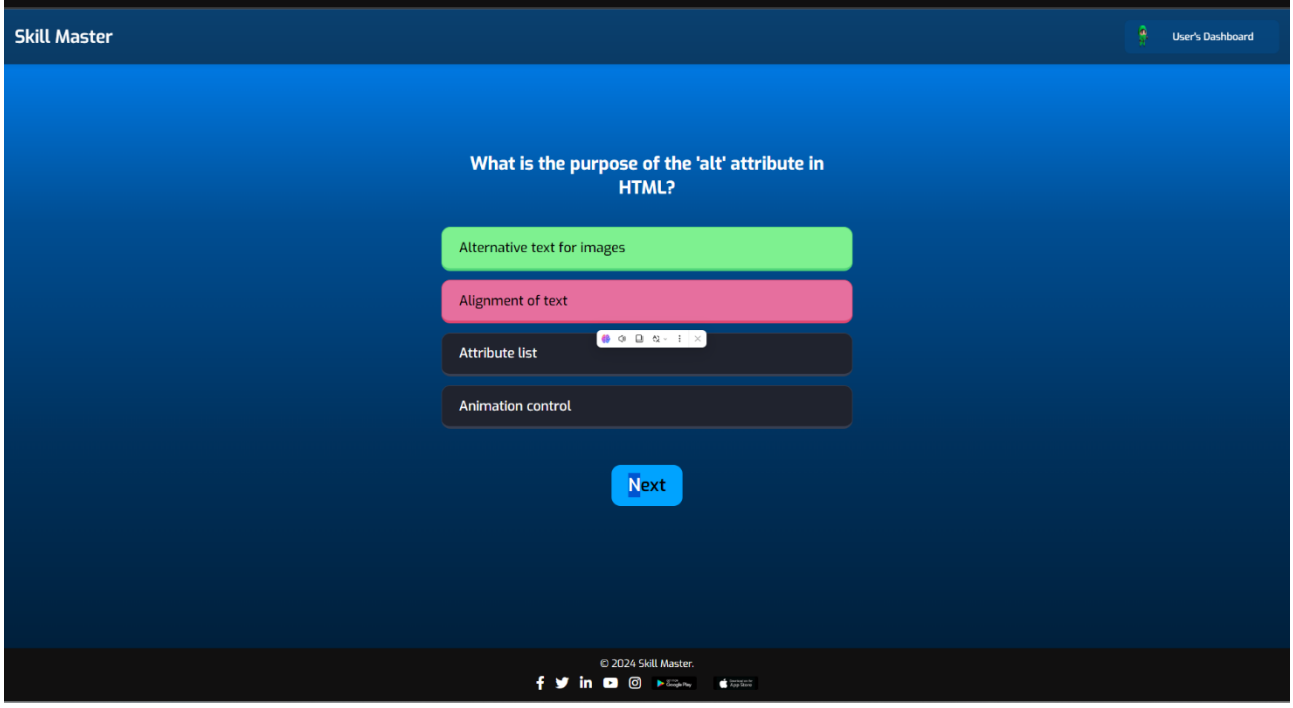
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User's Dashboard
What is the purpose of the 'alt' attribute in HTML?
Alternative text for images
Alignment of text
Attribute list
Animation control
Next
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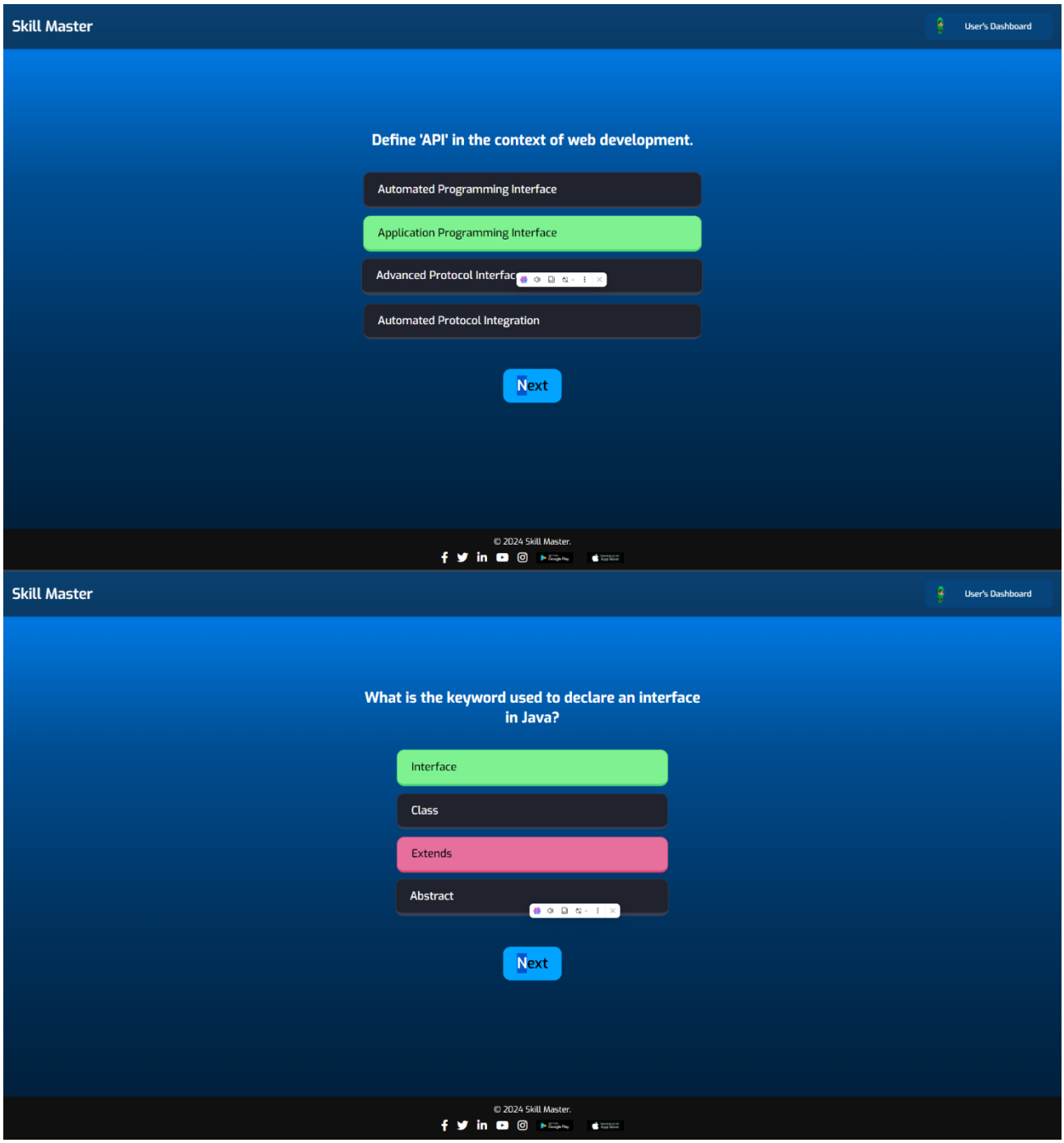
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User's Dashboard
Define 'API' in the context of web development.
Automated Programming Interface
Application Programming Interface
Advanced Protocol Interfac
Automated Protocol Integration
Next
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User's Dashboard
What is the keyword used to declare an interface in Java?
Interface
Class
Extends
Abstract
Next
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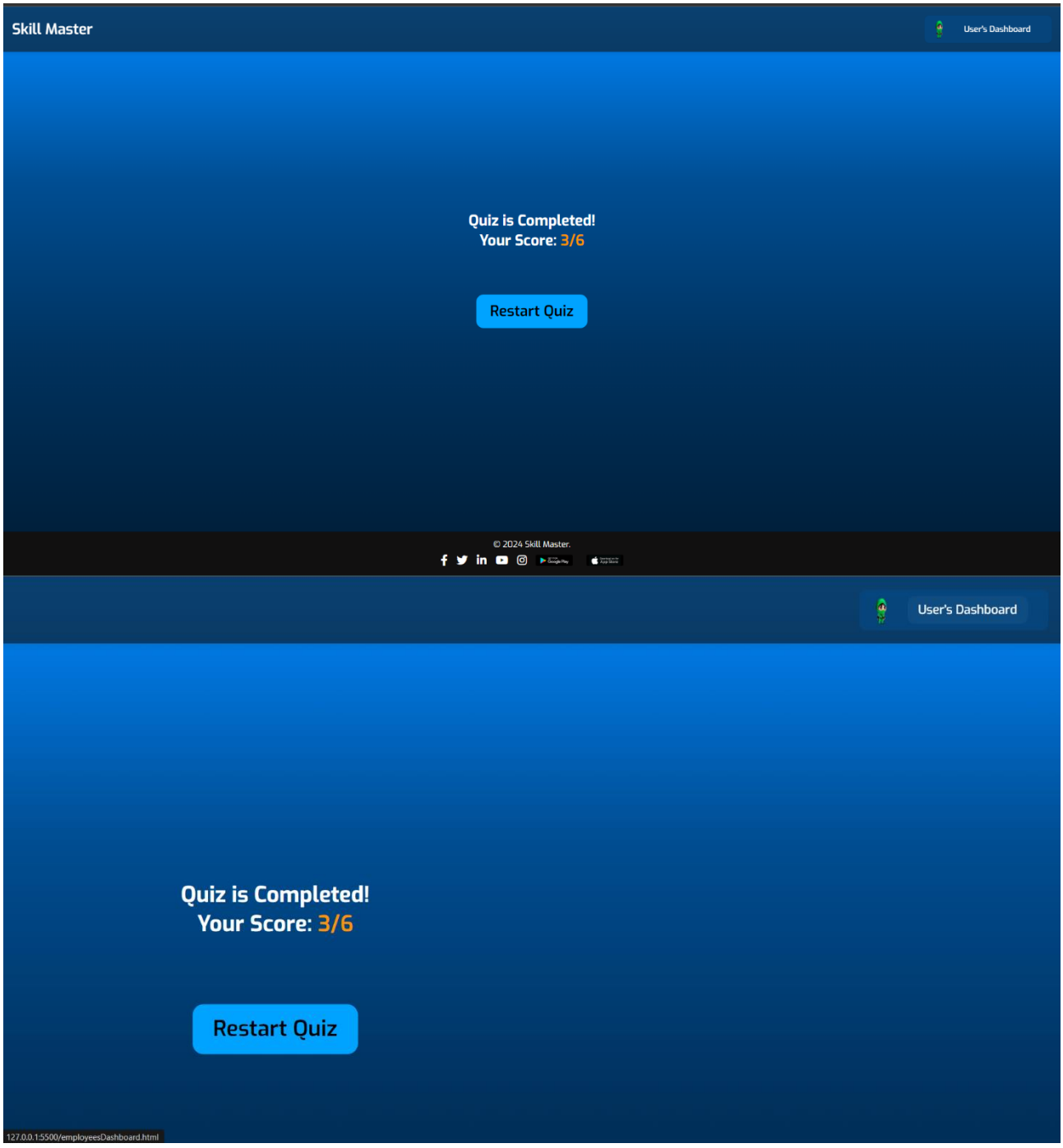
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User's Dashboard
Quiz is Completed!
Your Score: 3/6
Restart Quiz
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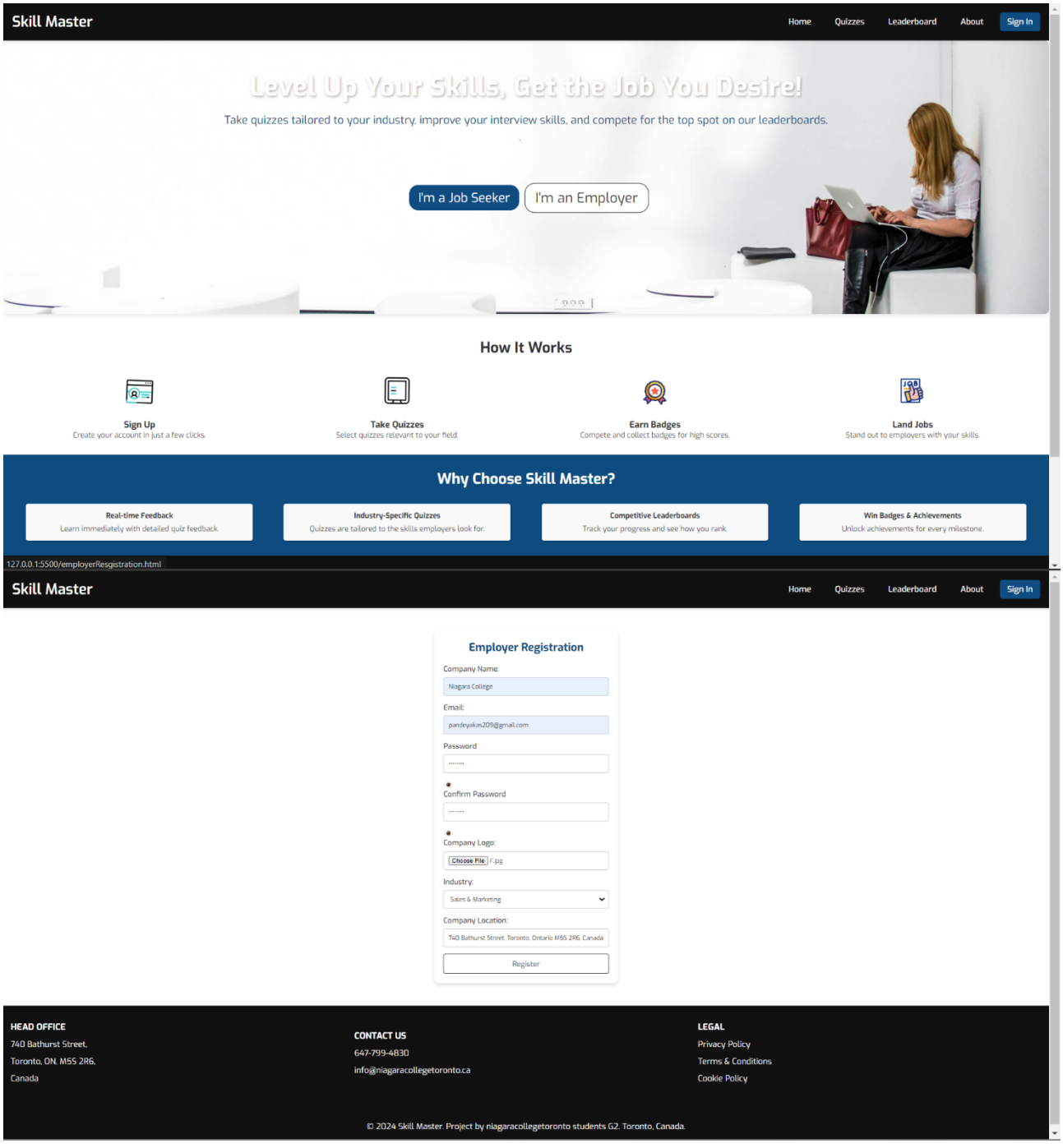
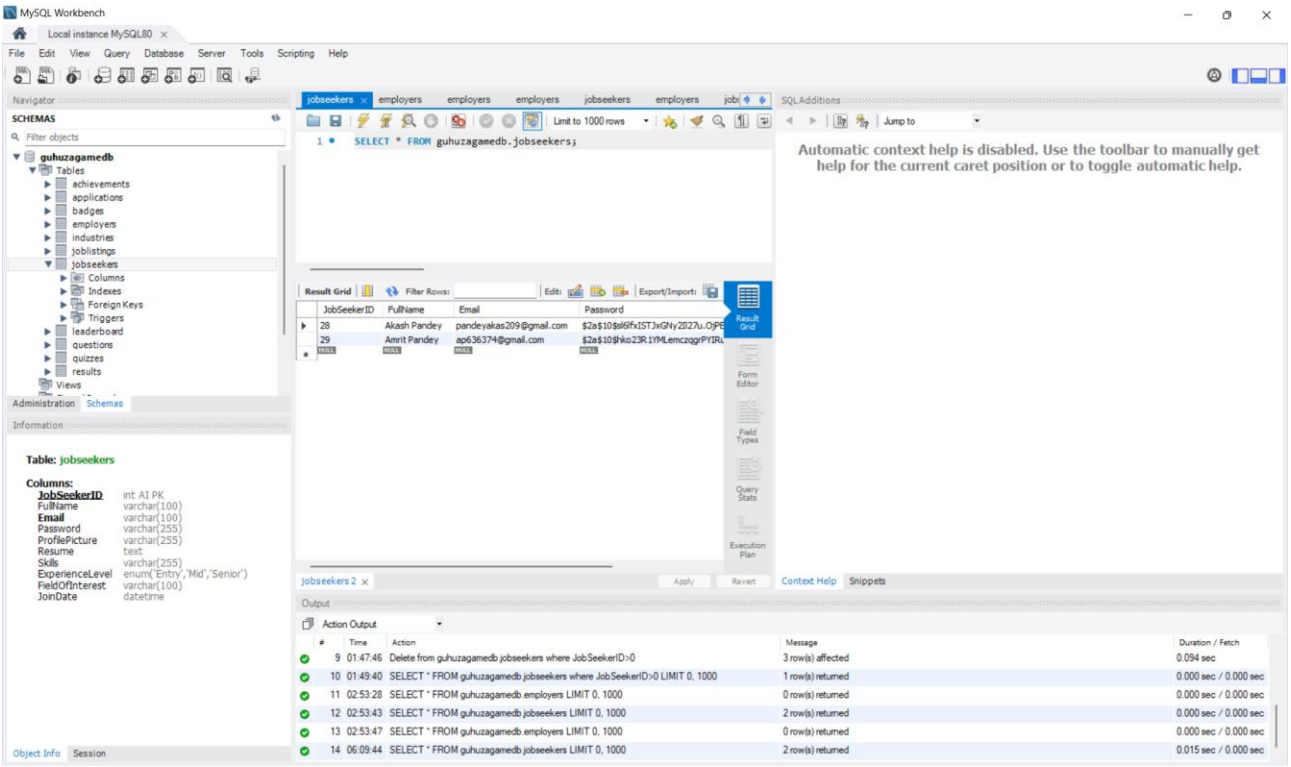
Quiz is Completed!
Your Score: 3/6
Restart Quiz
127.0.0.1:5500/employeesDashboard.html



Core Development (Weeks 6-8)

The development team implemented the user registration and login system. The MySQL database was also integrated to store quiz data, and the core quiz scoring logic was developed. This phase marks the foundation for the quiz functionality and user interaction.



Conclusion:

To conclude prototype 2, we developed the prototype version of the project as a team. The prototype version includes the project's basic concept and functionality. The fundamental idea remains to build a quiz for job seekers so they can prepare for their interviews without having to search the Internet for resources, ultimately leading to network effects for Guhuza. Wireframes and database components have been initiated in this part. Important functionalities like progress tracking and a leaderboard are planned for future work.

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