

Project Approach – QuizMaster



1. Understanding the Requirements

Before starting development, I carefully analyzed the problem statement to understand the key expectations:

1. Build an interactive quiz application
2. Ensure responsive design for mobile and desktop
3. Provide live feedback after each answer
4. Track progress and score
5. Maintain accessibility and usability
6. Keep Header and Footer consistent across pages
7. Use modern frontend practices

This helped me plan the application structure before writing code.

2. Technology Stack Selection

I chose the following tools based on scalability, performance, and industry relevance:

1. **React.js** – For component-based UI development
2. **React Router DOM** – For multi-page navigation without page reloads
3. **Tailwind CSS** – For rapid, responsive, and consistent styling
4. **Lucide React Icons** – For clean and modern UI icons
5. **Google Fonts** – For professional typography
6. **Public API (Advice Slip API)** – To demonstrate API integration

3. Application Architecture

To keep the project clean and maintainable, I followed a **modular structure**:

1. **Components** – Reusable UI elements (Header, Footer, QuizContainer, Buttons, etc.)
2. **Pages** – Route-level components (Home, Leaderboard, About)
3. **Hooks** – Custom hooks for logic separation (useQuiz, useQuoteFetcher)
4. **Data** – Centralized quiz data using a local JSON file

This separation ensures scalability and readability.

4. Routing Strategy

I implemented **client-side routing** using react-router-dom:

1. / → Home (Quiz)
2. /leaderboard → Leaderboard page
3. /about → About page.

5. Quiz Logic Implementation

The quiz functionality was handled using a **custom hook (useQuiz)**:

1. Tracks current question index
2. Stores selected answers
3. Calculates score and streak
4. Controls quiz completion state
5. Supports keyboard navigation for accessibility

This logic is completely decoupled from the UI, improving reusability and testability.

6. Live Feedback & Progress Tracking

After each answer submission:

1. Immediate visual feedback is shown (correct / incorrect)
2. Correct answer and explanation are displayed
3. Progress bar updates dynamically
4. Question count (X of Y) is shown at the top
5. For continuous Correct Answers, the Streaks are Counted and Displayed.

This improves user engagement and learning effectiveness.

7. Accessibility & Responsiveness

Accessibility was considered throughout the project:

1. Keyboard navigation support
2. Proper focus handling
3. Semantic HTML structure
4. ARIA-friendly components where required

Responsive design was achieved using Tailwind's utility classes, ensuring usability on both mobile and desktop devices.

8. API Integration

In the **About page**, I integrated an external API to demonstrate real-world usage:

1. Implemented loading and error states
2. Prevented duplicate API calls caused by React Strict Mode
3. Displayed dynamic content with user interaction

9. Styling & Brand Consistency

1. Followed the provided **brand color palette**
2. Maintained consistent spacing, typography, and UI patterns
3. Used custom utility classes for Google Fonts
4. Ensured a clean and modern UI aligned with frontend best practices

10. Testing & Refinement

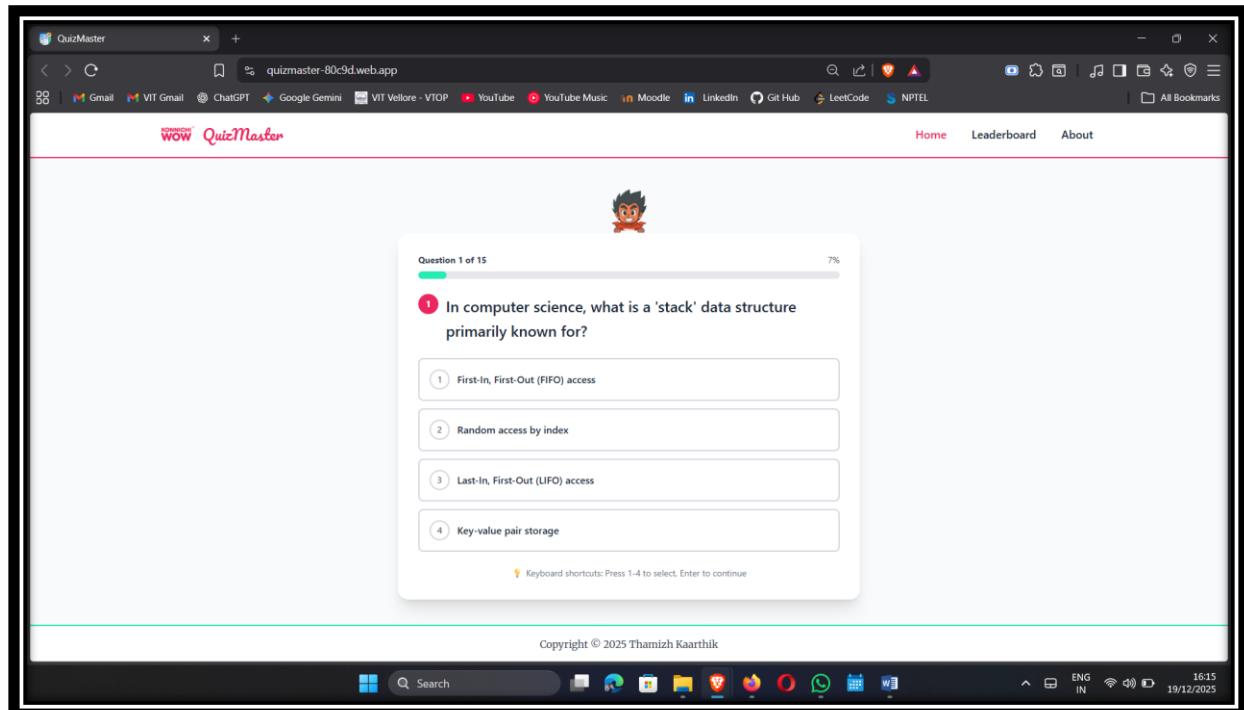
Before submission, I tested:

1. Navigation between pages
2. Quiz flow from start to summary
3. API behavior on refresh
4. Responsive layouts
5. Keyboard accessibility

Issues found during testing were iteratively fixed to improve stability and UX.

11. Screenshots

Home Page



Attempting the quiz!

Question 1 of 15

7%

1 In computer science, what is a 'stack' data structure primarily known for?

1 First-In, First-Out (FIFO) access

2 Random access by index

3 Last-In, First-Out (LIFO) access ✓

4 Key-value pair storage

✓ Correct! A stack is an abstract data type that serves as a collection of elements, with two principal operations: Push, which adds an element to the collection, and Pop, which removes the most recently added element that was not yet removed. This is known as Last-In, First-Out (LIFO).

Next Question →

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Streak Counted for Continuous Correct Answers!

Question 6 of 15

40%

3 Streak! ↗

1 Which of the following describes a compiler?

1 A program that executes code line by line

2 A program that translates source code written in a high-level language into machine code before the program is run ✓

3 A tool for debugging and testing code during runtime

4 A system for managing large datasets in a database

✓ Correct! A compiler is a program that reads code written in one language (source language) and translates it into an equivalent code in another language (target language, usually machine code), which can then be executed by the computer's processor.

Next Question →

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Summary Page!

WOW QuizMaster

Home Leaderboard About

Quiz Complete!

13/15 Correct Answers 87% Score 12 🔥 Best Streak

[Take Quiz Again](#)

Review Your Answers

1 In computer science, what is a 'stack' data structure primarily known for?

Your answer: LIFO, First-Out, FIFO correct

A stack is an abstract data type that serves as a collection of elements, with two principal operations: Push, which adds an element to the collection, and Pop, which removes the most recently added element that was not yet removed. This is known as Last-In, First-Out (LIFO).

2 Which of the following is the standard protocol for securely transferring hypertext documents over a network?

Your answer: FTP correct answer: HTTPS

HTTPS (HyperText Transfer Protocol Secure) is the standard protocol for secure data transfer over the web. It is HTTP with encryption using TLS/SSL.

3 What is the primary role of an API (Application Programming Interface)?

Your answer: To serve as a user-facing graphical interface correct

Correct answer: It defines the methods and data formats that software components can use to communicate with each other.

An API defines how different software systems or components can interact, specifying the requests and responses they can use to exchange information.

4 In object-oriented programming (OOP), what is polymorphism?

Your answer: The ability of a single interface to represent different underlying terms (data types) correct

Polymorphism (having many forms) allows a single interface (like a function name or operator) to be used for a general class of actions, or for objects to take on different forms depending on their class.

5 What does the acronym SQL stand for?

Your answer: Structured Query Language correct

SQL stands for Structured Query Language. It is a domain-specific language used in programming and designed for managing data held in a relational database management system (RDBMS).

6 Which of the following describes a compiler?

Your answer: A program that translates source code written in a high-level language into machine code before the program is run correct

A compiler is a program that reads code written in one language (source language) and translates it into an equivalent code in another language (target language, usually machine code), which can then be executed by the computer's processor.

7 What is the primary purpose of the Git version control system?

Your answer: To manage and track changes to source code over time correct

Git is a distributed version control system designed to handle everything from small to very large projects with speed and efficiency, primarily by tracking changes to files.

8 In the context of networking, what is an IP Address?

Your answer: A numerical label assigned to each device connected to a computer network that uses the Internet Protocol for communication correct

An IP address is a numerical identifier for a device or a network interface on a computer network. It serves two primary functions: host or network interface identification and location addressing.

9 What does JSON stand for?

Your answer: JavaScript Object Notation correct

JSON (JavaScript Object Notation) is a lightweight data interchange format. It is easy for humans to read and write and easy for machines to parse and generate.

10 In relational databases, what is a 'primary key'?

Your answer: A field or unique identifier we've created in a table correct

A primary key is a column or set of columns in a table whose values uniquely identify every row in that table. It must contain unique values and cannot contain NULL values.

11 Which term describes a vulnerability where an attacker can execute malicious script into a web page viewed by other users?

Your answer: Cross-Site Scripting (XSS) correct

Cross-Site Scripting (XSS) attacks are a type of injection in which malicious scripts are injected into otherwise trusted web sites. It occurs when a web application uses untrusted user input directly in the output without proper sanitization.

12 What is the fundamental difference between HTML and XML?

Your answer: HTML has predefined tags for displaying data, while XML uses custom, self-describing tags for hierarchical data correct

HTML is designed to display data and has predefined tags. XML is designed to transport and store data and uses custom tags defined by the user.

13 What is the concept of 'Big O Notation' used for in algorithm analysis?

Your answer: To measure the algorithm's complexity (time and space requirements) as the input size grows correct

Big O notation is used to classify algorithms according to how their running time or space requirements grow as the input size grows. It describes the worst-case scenario for an algorithm's performance.

14 Which term refers to running a complete operating system inside another operating system as an application?

Your answer: Virtualization correct

Virtualization is the technology that allows one computer (host) to run multiple operating system environments (guests) simultaneously. This is often achieved through a hypervisor.

15 What is the main role of DNS (Domain Name System)?

Your answer: It translates human readable domain names (like google.com) into IP addresses correct

The DNS is a distributed naming system for computers, services, or other resources located in the Internet or a private network. Its main job is to translate domain names (or IP addresses) for end-users to specific resources.

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Leadership Page!

The screenshot shows the QuizMaster application's leadership page. At the top left is the QuizMaster logo. At the top right are navigation links for "Home", "Leaderboard" (which is highlighted in red), and "About". The main content area has a header "Leaderboard" and a sub-header "Leaderboard feature coming soon" with a small star icon. At the bottom of the page is a copyright notice: "Copyright © 2025 Thamizh Kaarthik".

About Page!

The screenshot shows the QuizMaster application's about page. At the top left is the QuizMaster logo. At the top right are navigation links for "Home", "Leaderboard", and "About". The main content area features a large heading "Welcome to the QuizMaster Headquarters!" with a star icon. Below it is a sub-headline: "We're less of an app, more of a friendly knowledge-gobbling robot." A central box contains a quote: "A common regret in life is wishing one had the courage to be ones true self." with "Your Daily Wisdom" above it. A button labeled "Generate New Quote" is present. Below the quote box are three cards: "The Secret Recipe" (React and Tailwind CSS), "Our Grand Mission" (To make learning addictive), and "Accessibility Ninja" (Built with keyboard navigation and accessibility in mind). At the bottom of the page is a copyright notice: "Copyright © 2025 Thamizh Kaarthik".

Quotes API Integration!

The screenshot shows the QuizMaster application's home page. At the top, there is a navigation bar with the QuizMaster logo on the left and links for Home, Leaderboard, and About on the right. The main content area features a large, central quote card with a teal border. The card has a title "Your Daily Wisdom" and a quote: "Never regret. If it's good, it's wonderful. If it's bad, it's experience." Below the quote is a "Generate New Quote" button and a message indicating "You have generated 8 quotes!". To the left of the main card is a section titled "The Secret Recipe" with a React icon, which includes a brief description of the app's technology stack. To the right are two other sections: "Our Grand Mission" with a circular icon and "Accessibility Ninja" with a lightning bolt icon.

KWONCHI WOW QuizMaster

Home Leaderboard About

⭐ Welcome to the QuizMaster Headquarters!

We're less of an app, more of a friendly knowledge-gobbling robot.

Your Daily Wisdom

"Never regret. If it's good, it's wonderful. If it's bad, it's experience."

Generate New Quote

You have generated 8 quotes!

<> The Secret Recipe

We're powered by [React](#) and styled with [Tailwind CSS](#), delivering smooth, responsive, and delightful quote experiences.

Our Grand Mission

To make learning addictive—in a good way—through instant feedback, streaks, and interactive designs.

⚡ Accessibility Ninja

Built with keyboard navigation and accessibility in mind so everyone can enjoy quiz glory.

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13. Mobile Responsiveness

The image displays four screenshots of the QuizMaster mobile application, illustrating its responsive design across different screen sizes.

- Home Screen:** Shows the app's logo, navigation bar (Home, Leaderboard, About), and a large question card for "Question 1 of 15". The question asks: "In computer science, what is a 'stack' data structure primarily known for?". Four options are listed: 1. First-In, First-Out (FIFO) access, 2. Random access by index, 3. Last-In, First-Out (LIFO) access, and 4. Key-value pair storage. A note at the bottom says: "Keyboard shortcuts: Press 1-4 to select, Enter to continue".
- Question Screen:** Shows the same question and options. Below the options, a detailed explanation is provided: "A stack is an abstract data type that serves as a collection of elements, with two principal operations: Push, which adds an element to the collection, and Pop, which removes the most recently added element that was not yet removed. This is known as Last-In, First-Out (LIFO).". A "Next Question" button is at the bottom.
- Quiz Complete Screen:** Displays the results of a completed quiz. It shows "7/15 Correct Answers", "47% Score", and a "4 🔥" streak icon. A "Take (Gold) Again" button is present.
- Leaderboard Screen:** Shows a "Welcome to the QuizMaster Headquarters!" message. It features a "Your Daily Wisdom" section with a quote ("The best nights out are when people around you are simply having fun."), a "Generate New Quote" button, and a "The Secret Recipe" section with a note about being powered by React and Tailwind CSS.

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12. GitHub Repository

Link : <https://github.com/thamizhkarthik05/QuizMaster>