



Crafting Knowledge, One Question at a Time.

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Overview

QuaestioCraftor is an AI-powered quiz generation app built with React Native to run seamlessly on both iOS and Android devices. The app allows students and teachers to generate quizzes instantly from study materials such as text, web articles, or uploaded documents. Users can take quizzes directly in the app, receive instant feedback, bookmark quizzes for later revision, and track their performance. A built-in leaderboard adds a competitive element, motivating learners through gamification.

Problem and needs

- Teachers spend significant time manually creating quizzes and assessments, which reduces the time they can spend teaching or providing one-on-one support.
- Students often rely on generic study resources that do not align with their coursework, making self-study less effective.
- Traditional quiz tools lack personalization and gamification, which can reduce engagement and long-term retention of knowledge.



Target Audience

Primary Users: Students

- High school and university students preparing for tests and exams.
- Need personalized quizzes aligned to their own notes and study material.
- Care because it saves time, helps revision, and makes studying interactive.

Secondary Users: Anyone

- Anyone would want to quickly understand or get information about something
- It can easily allow people to search and learn anything



Scope

The scope of QuaestioCraftor is to build a mobile-first AI-powered quiz application that allows users to:

- Generate quizzes instantly from text, documents, or URLs.
- Attempt quizzes and receive immediate feedback.
- Track progress through results history.
- Bookmark quizzes for later.
- Compete via a leaderboard system.

Smart objectives

- Specific: Build A Cross-Platform React Native App With Supabase Backend That Lets Users Generate, Take, And Save Quizzes.
- Measurable: Users Can Generate At Least 3 Quizzes Per Day And See Results Within 10 Seconds Of Input.
- Achievable: By Using Supabase (Auth + Database) And QuizGecko API, Development Time Is Reduced.
- Relevant: Addresses Real Educational Challenges (Time-Saving For Teachers, Better Revision For Students).
- Time-Bound: Complete MVP Within 5 Weeks.



Features

MVP (Must-Have):

- User authentication (login/signup via Supabase).
- Quiz-taking interface (multiple choice, true/false, short answers).
- Results page (score, correct answers shown).
- Dashboard with history of past attempts.

Nice-to-Have:

- Bookmark quizzes for later revision.
- Leaderboard with ranking by score/attempts.
- Dark mode for accessibility.

Future Considerations:

- Adaptive quizzes that change difficulty based on performance.
- Flashcard learning mode.
- Multilingual support (English, Afrikaans, Zulu, etc.).
- Export quizzes as PDF for offline use.
- Teacher-specific mode for classroom sharing.
- AI quiz generation from text/document/URL.



Pages

Login/Signup Screen

User authentication via Supabase

Dashboard/Home Screen

Overview of past quizzes, entry point for new quiz generation.

Quiz Generation Screen

Input text/upload document/paste URL to create quiz.

Quiz Page

Interactive quiz-taking interface

Results Page

Display score, correct/incorrect answers, retry option.

Leaderboard Page

Rankings of users based on total score.

Profile/Settings Page

Edit profile, toggle dark mode, manage account, History



Roles

Standard User (Student/Teacher)

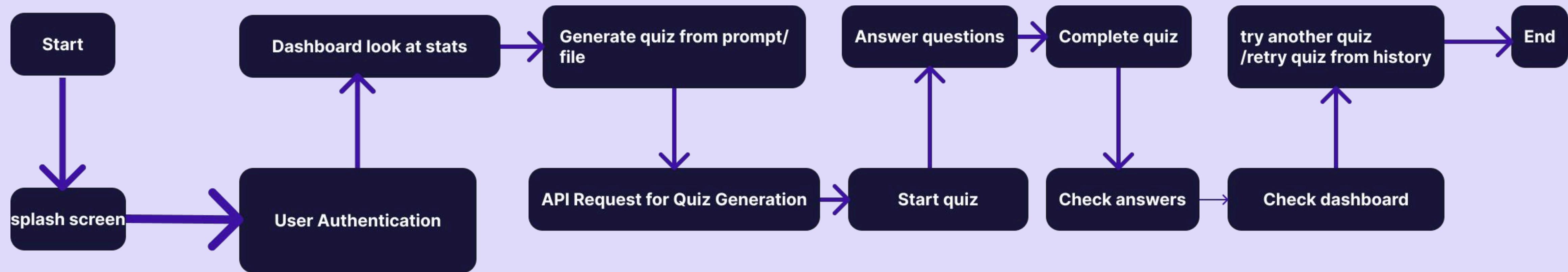
- Generate quizzes.
- Attempt quizzes and view results.
- Bookmark quizzes.
- View leaderboard.

Admin (optional for MVP)

- Manage user accounts.
- Monitor app usage and content quality.



Task flow



Type of AI Technology

The app requires Natural Language Processing (NLP) and Generative AI.

- I have to Parse and understand input text/documents.
- I need to Generate well-structured quiz questions (MCQ, True/False, Short Answer).
- I have to provide difficulty scaling and diversity of question types.

AI Service

Primary Service: QuizGecko API

- Handles quiz generation from raw text, uploaded documents, or URLs.
- Supports multiple question formats and difficulty levels.
- Provides API endpoints for both text input and file upload.
- Saves development time by outsourcing quiz-generation logic.

Fallback Service: OpenAI API

- Acts as a backup when more customization is required (e.g., prompts like “Generate 5 medium-difficulty multiple-choice questions from this text”).
- Ensures flexibility if QuizGecko has limitations or downtime.

Generative AI option: Runware.ai:

- Runware.ai is a generative media / image-and-video API platform. It supports a huge variety of models (Stable Diffusion, LoRA, ControlNet, etc.) all accessible via a single API.
- It has flexible pricing: very low per-image costs, pay-as-you-go, no need for you to run your own GPU infrastructure.
- Offers advanced generation options: text-to-image, image-to-image, inpainting, outpainting, background removal, upscaling, etc.
- Free trial / credit available: you can generate about 1000 images (depending on plan) to experiment before paying

Challenges

API Rate Limits / Costs

- Challenge: AI services have request limits and costs per call.
- Solution: Implement free-tier limitations (e.g., 3 quizzes/day per user). Offer caching of generated quizzes to reduce repeated API calls.

File Upload Handling (Mobile → QuizGecko)

- Challenge: Uploading PDFs/Word docs from mobile can be inconsistent.
- Solution: Store files in Supabase Storage first, then forward securely to QuizGecko via Edge Function.

Complex Data Relationships

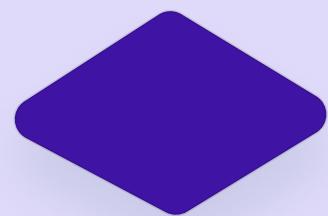
- Challenge: Linking users, quizzes, questions, and results can complicate schema.
- Solution: Clear ERD design, normalized schema, Supabase relational features.

Performance & Latency

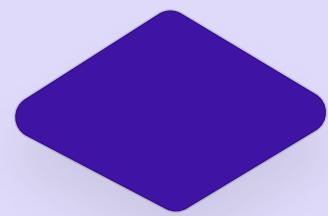
- Challenge: AI quiz generation may take several seconds.
- Solution: Show loading states + allow background processing. Notify users when quiz is ready.



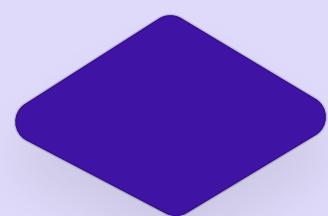
Technologies used



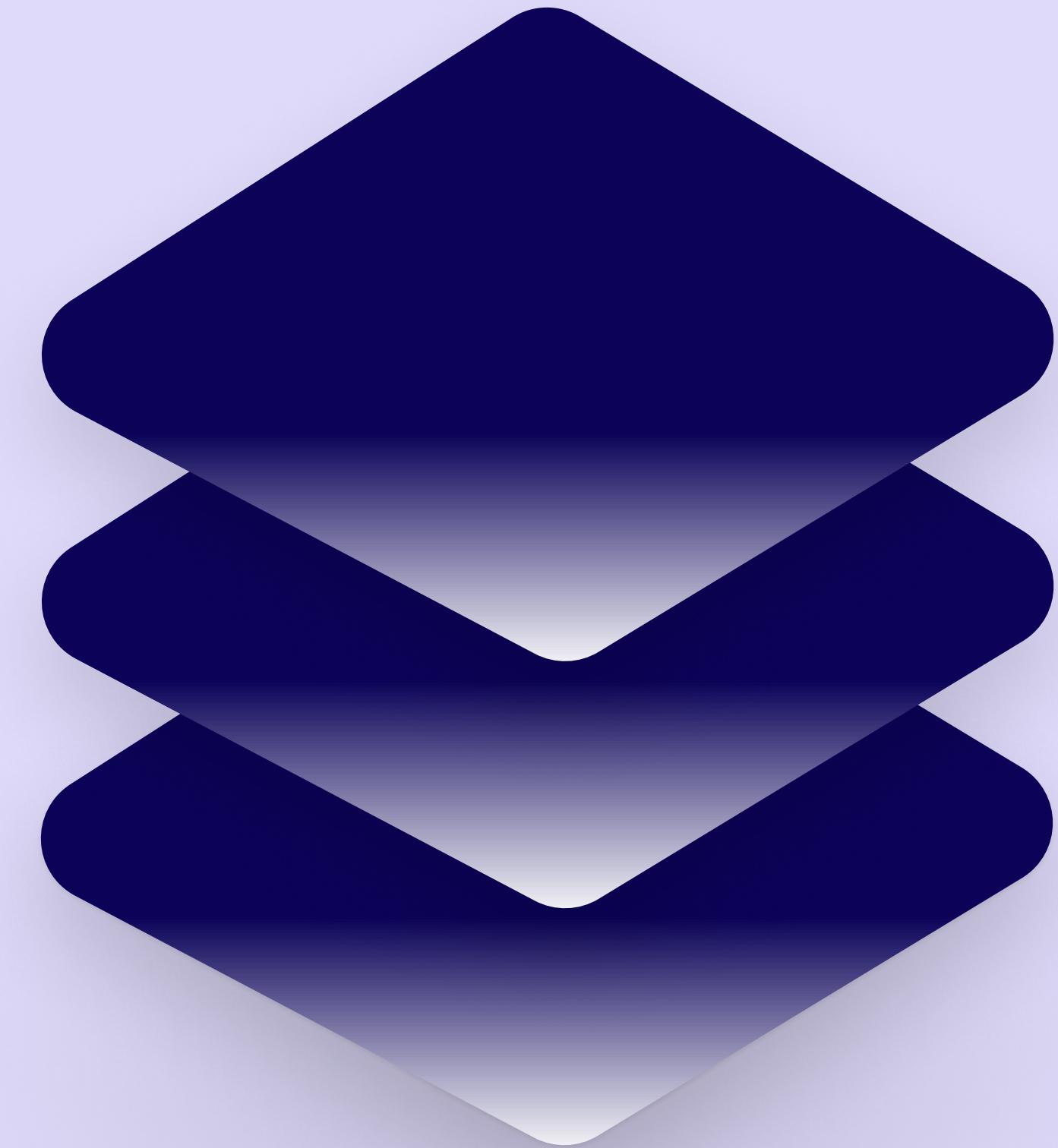
React Native: Interesting and robust ui as well and cross-platform



Supabase: Will help with the AI and quiz stability and is easy to integrate.

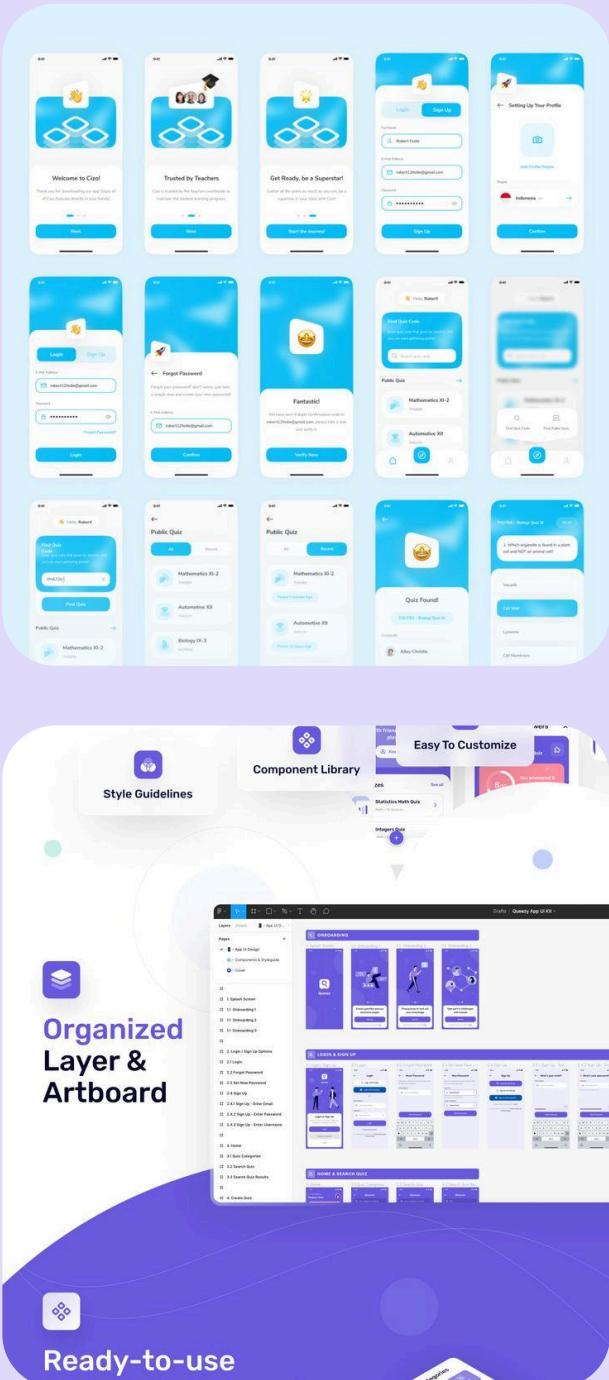
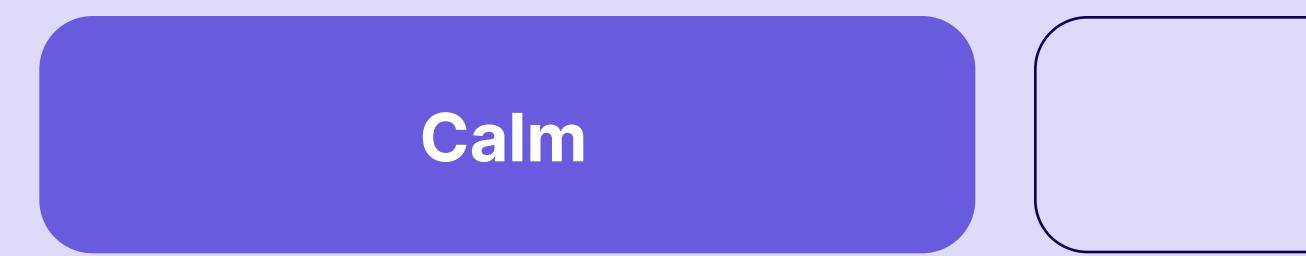
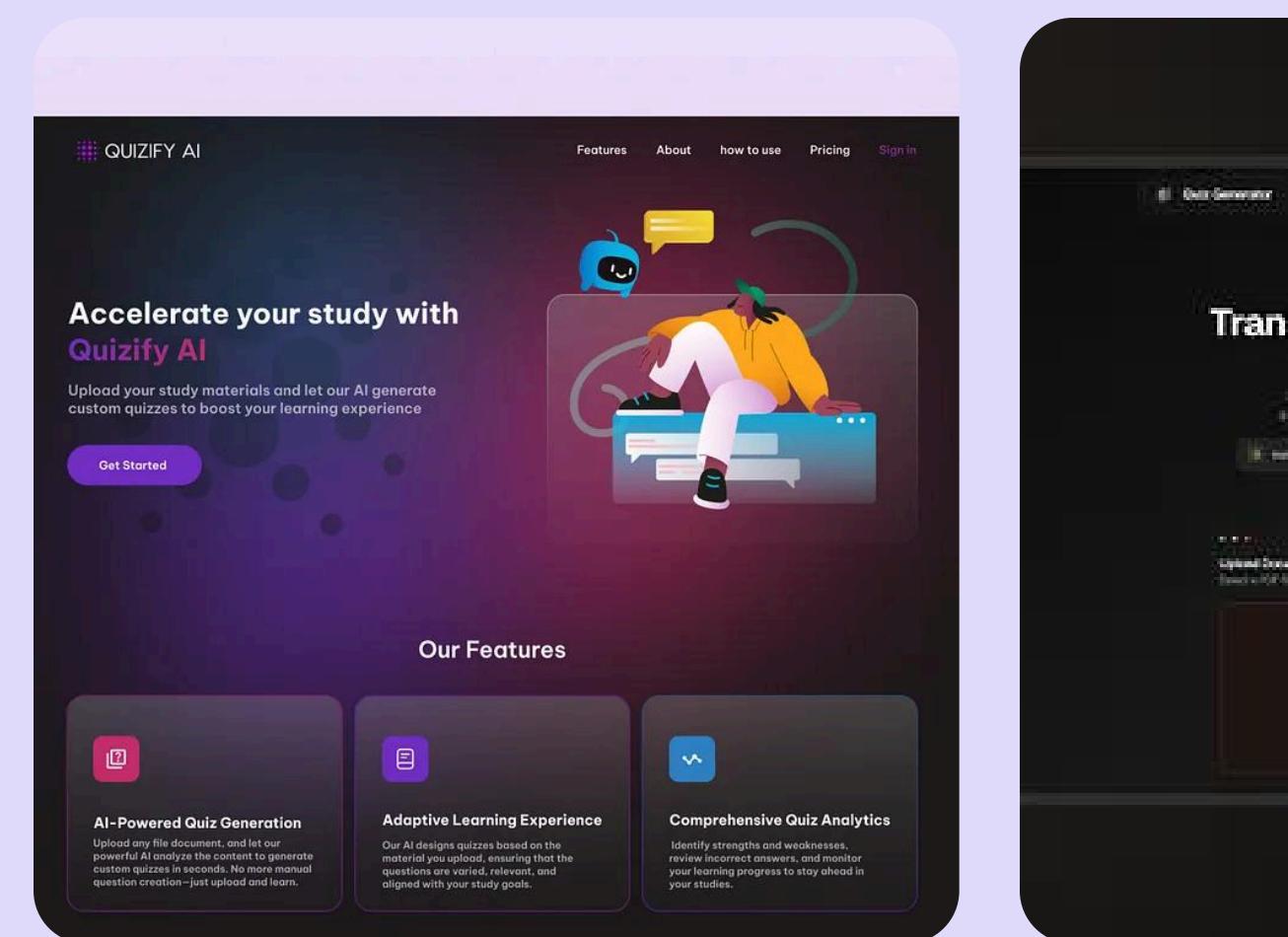
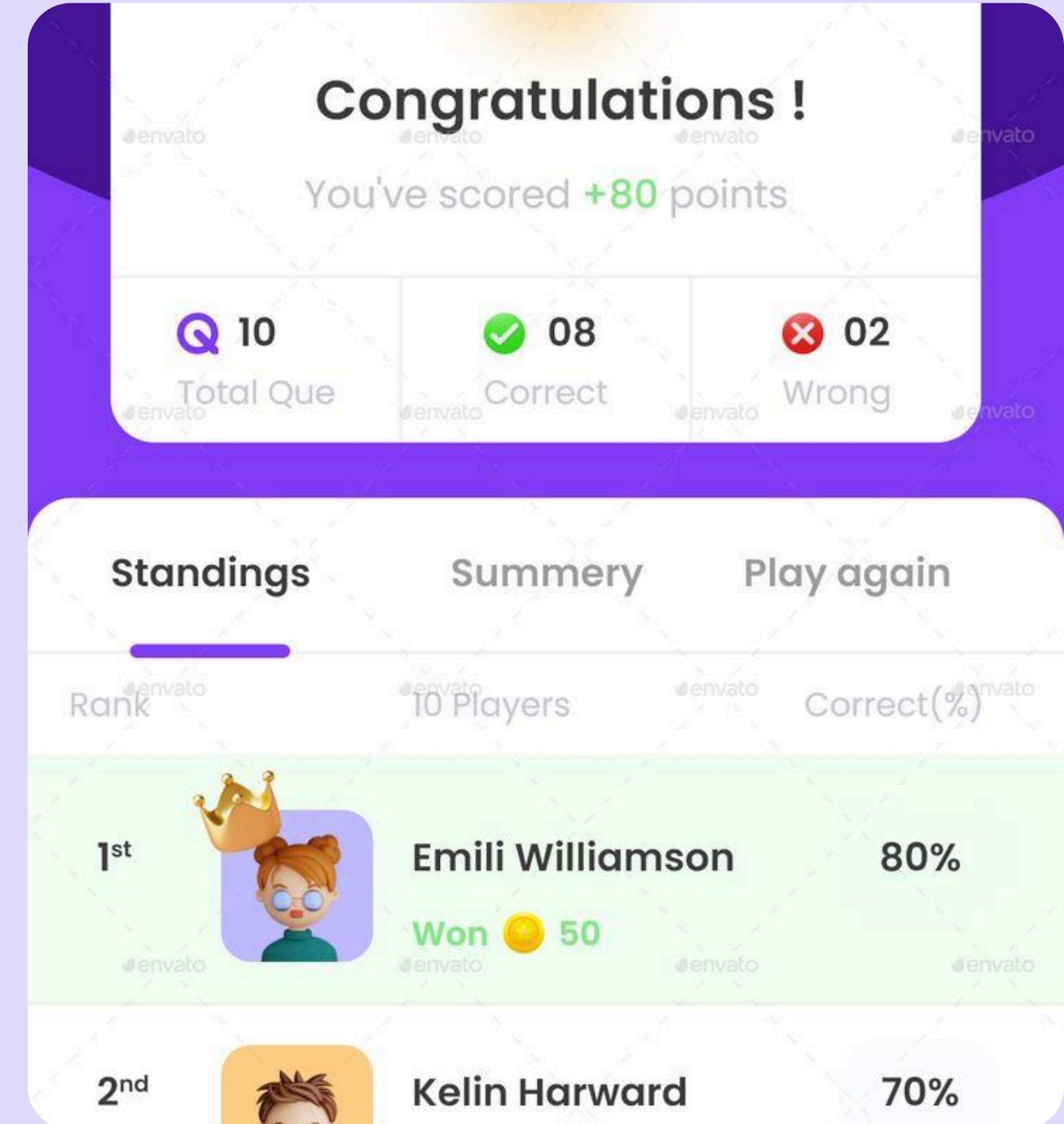
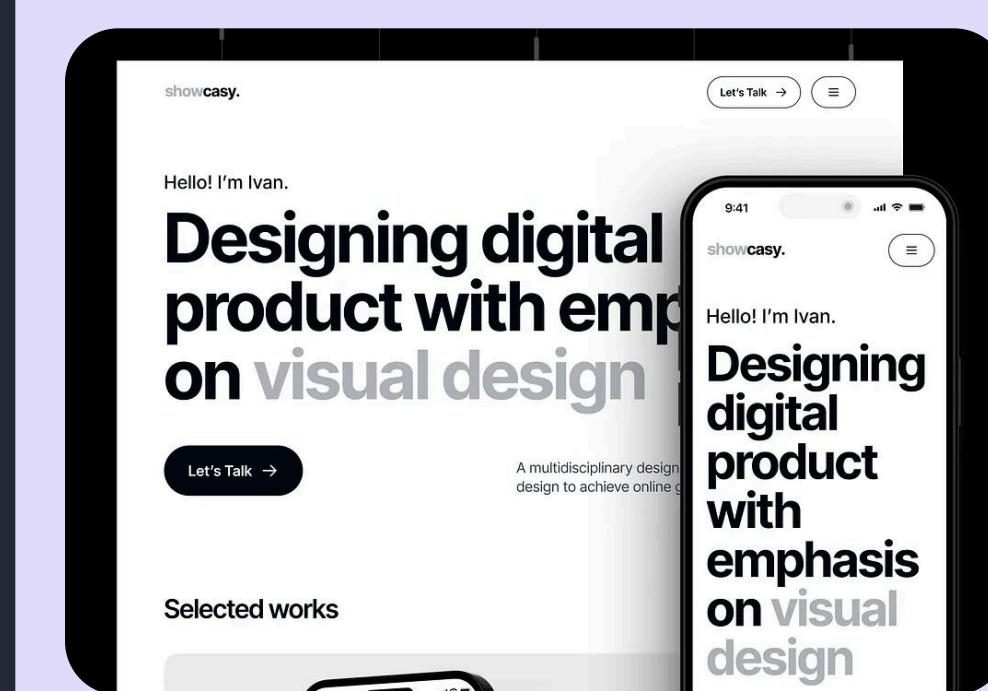
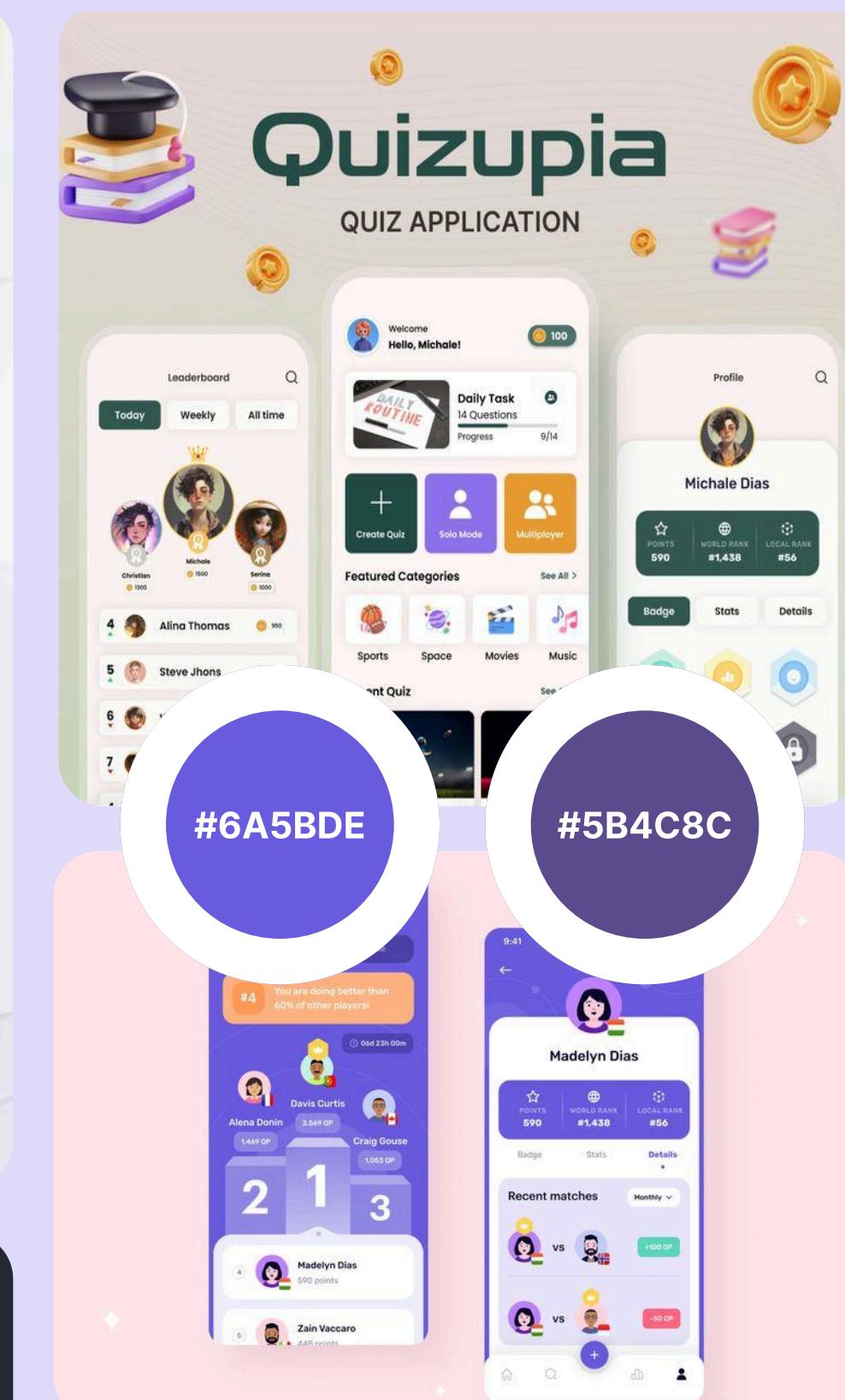
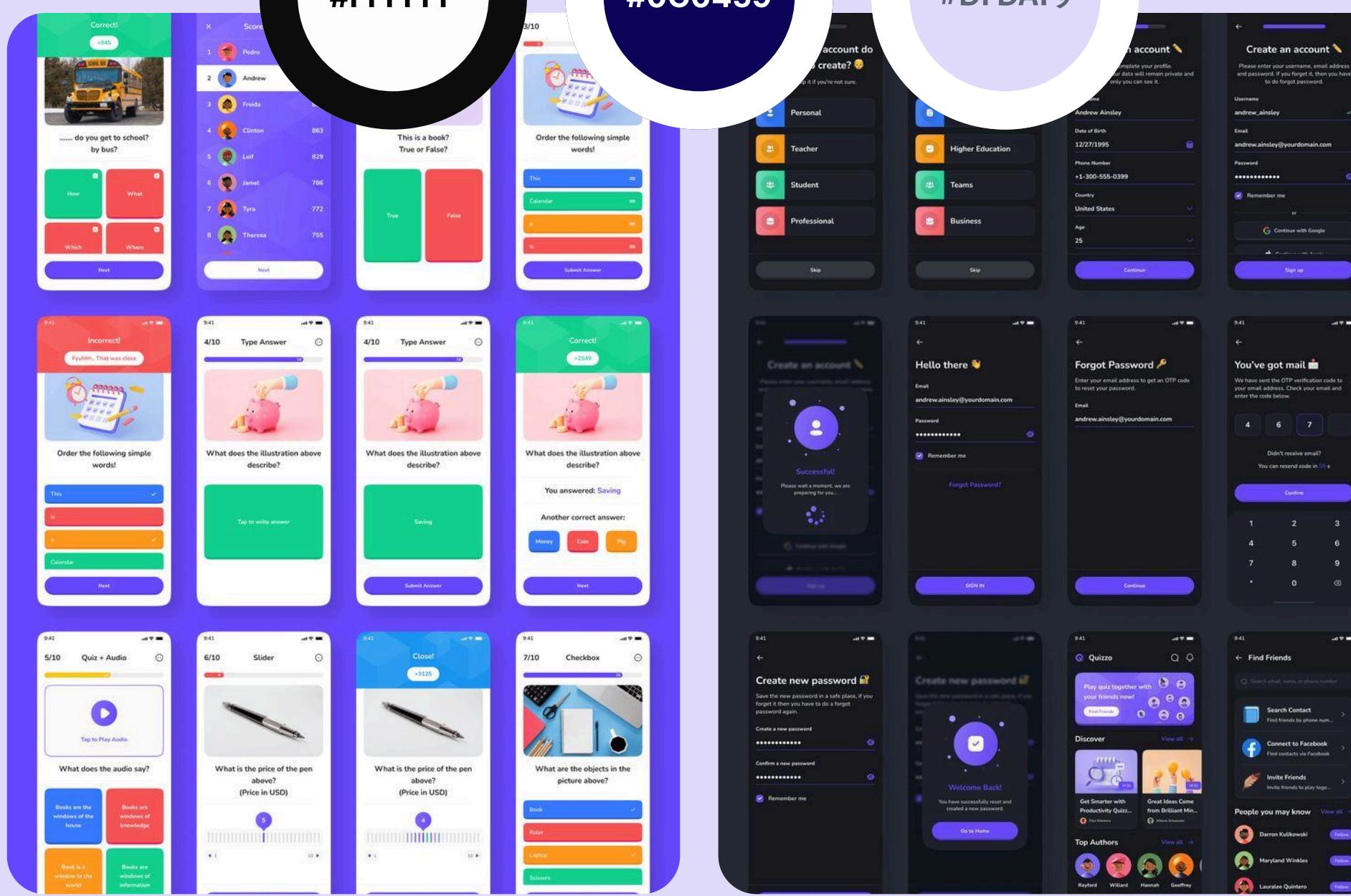
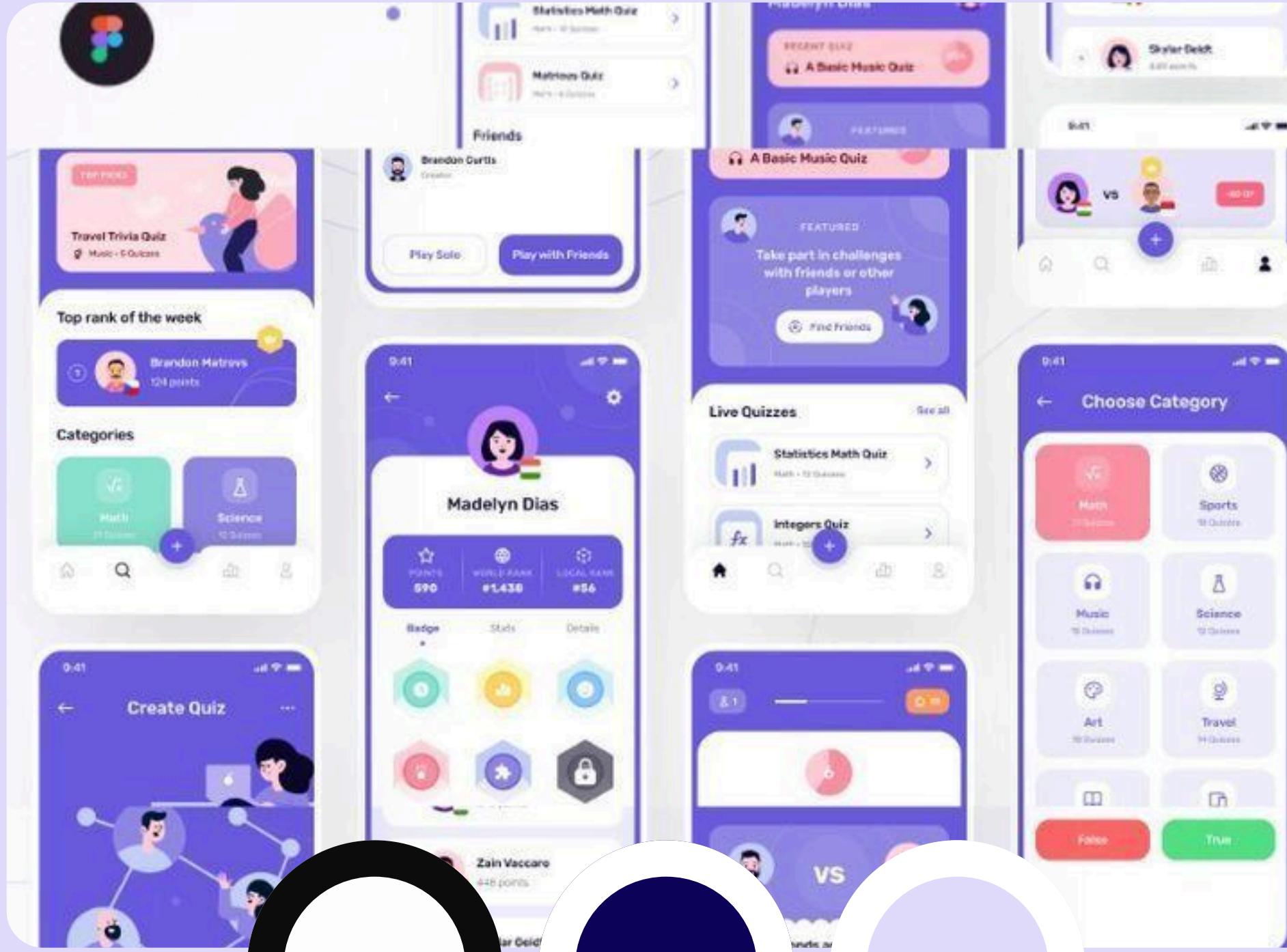


AI Service quizGecko/OpenAI api and there might be possible use of runware.ai api for image generation

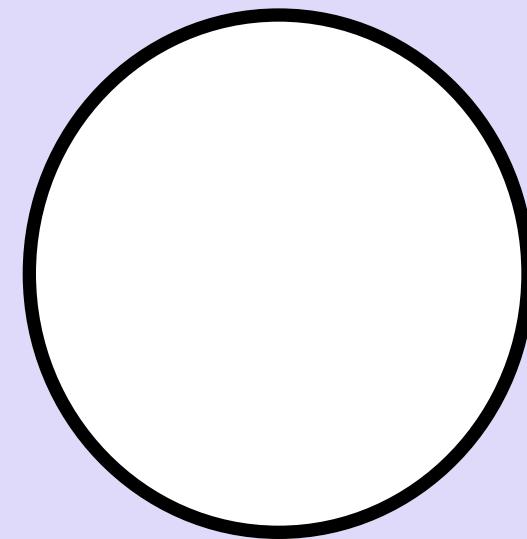


ER Diagram

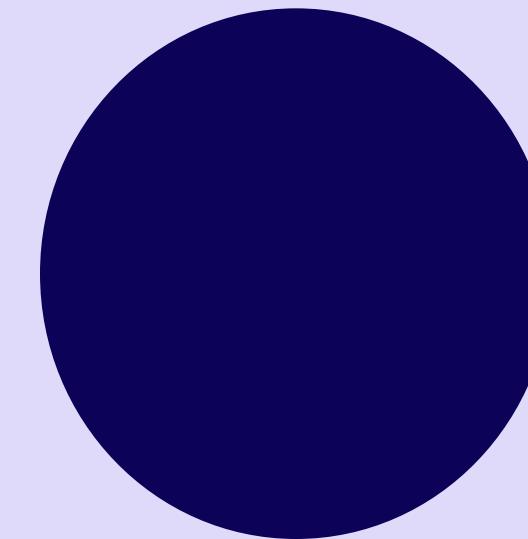




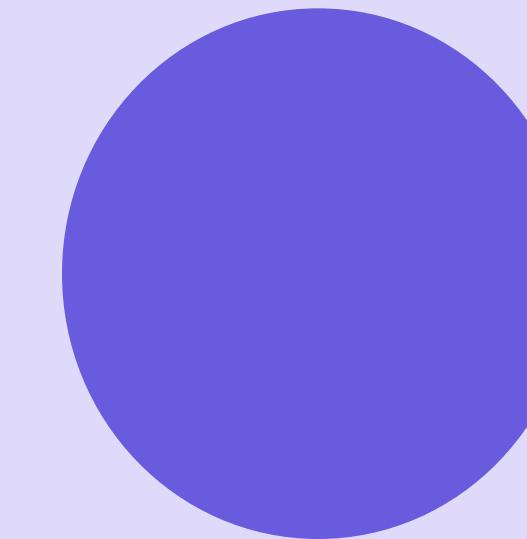
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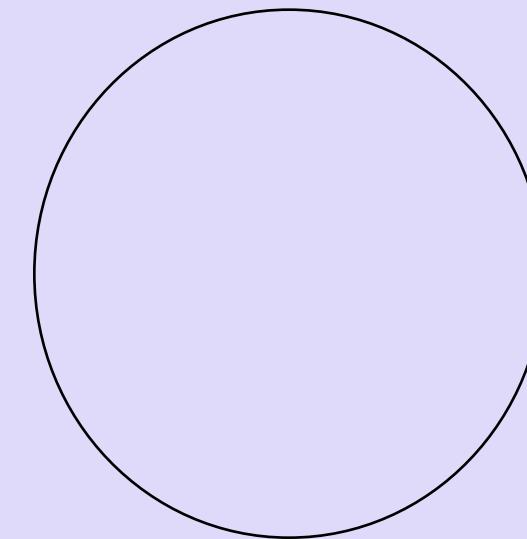
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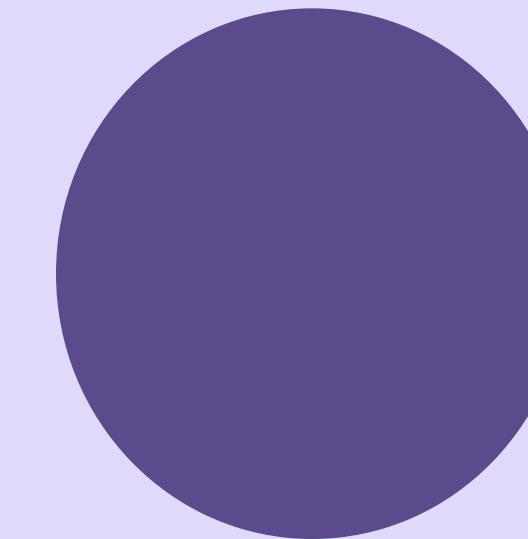
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Fonts

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Typescale

	Font size
Heading 1	32.44px
Heading 2	28.83px
Heading 3	25.63px
Heading 4	22.78px
Heading 5	18px
Heading 6	16px
Body	14.22px
Small	12.64px

UX designs

The image displays five screenshots of a mobile application interface, likely a quiz or study tool, with a purple and white color scheme.

- Screenshot 1 (Top Left): Sign-in Screen**

QuaestioCraftor logo (shield with question mark, lightning bolt, gear).
Sign-in fields for Email and Password.
Or, Continue with Google button.
Sign in button.
- Screenshot 2 (Top Middle): Quiz Creation Screen**

Welcome Hello Sean!
Quiz settings: MCQ, True/False, Short answer; Easy, Medium, Hard.
15 Questions.
Drag and drop file (.jpeg, .png, .pdf) input.
Text field: please enter what you want to test on.
Bottom navigation: Home, Create quiz, Leaderboard, Profile.
- Screenshot 3 (Top Right): Leaderboards Screen**

Leaderboards section with Today, Weekly, All time tabs.
Rankings:
 - 1 (highlighted)
2
3
 - 4 1500
 - 5 1400
 - 6 1300
 - 7 1200
 - 8 1100
 - 9 1000
Bottom navigation: Home, Create quiz, Leaderboard, Profile.
- Screenshot 4 (Bottom Right): Quiz Detail Screen**

Quiz Title: 1/15
Question: What is the primary function of mitochondria in a cell?
List of answers:
 - A To control the movement of substances in and out of the cell
 - B To produce energy through cellular respiration
 - C To control the movement of substances in and out of the cell
 - D To store genetic information!

Previous and Next buttons.
Bottom navigation: Home, Create quiz, Leaderboard, Profile.
- Screenshot 5 (Bottom Left): Quiz Detail Screen (Continued)**

Continuation of the quiz detail screen from Screenshot 4.

UX designs

Profile

Elly500

quizzes Completed	Points	Percentage
500	21500	80%

History **Personal info**

Understanding mitochondria test

Questions : 15 Score : 13/15

Results

Congratulations!

You have scored 90 points

10 Questions	9 Correct	1 Wrong

Question 5 :
What is the primary function of mitochondria in a cell?

A To control the movement of substances in and out of the cell

B To control the movement of substances in and out of the cell

Welcome
Hello Sean!

Generate quiz

Leaderboards

Discover

Understanding mitochondria test

Questions : 15 Score : 13/15

Recent quizzes

Understanding mitochondria test

Questions : 15 Score : 13/15

Roadmap

Week 2

- Set up React Native project (Expo or bare RN).
- Configure Supabase project (database, storage, authentication).
- Implement user login/signup screens (Supabase Auth).
- Set up CI/CD (GitHub Actions for builds).

Week 3

- Integrate QuizGecko API (text → quiz).
- Implement quiz generation screen (user enters text/URL or uploads doc).
- Display generated questions in JSON (raw output first).

Week 4

- Build Quiz Page (interactive multiple-choice/true-false/ short answer).
- Implement Results Page (show score, correct vs incorrect answers).
- Save results into Supabase (Results + UserAnswers tables).
- Add local loading states (quiz generation may take 5–10s).

Week 5

- Implement Bookmarks (save quiz for later).
- Implement Leaderboard (rank users by total score).
- Add Dashboard/Home Page (history of past attempts + quick actions).
- Add dark mode for accessibility.

Week 6

- Conduct usability testing with peers.
- Fix bugs, polish UI .
- Optimize API calls (limit API calls).

Conclusion

QuaestioCraftor I believe will really test my backend knowledge and relationships and I am excited to try and explore supabase. While I wanted to try flutter I do not have the time to fully explore it and integrate it. However, I believe that react native is better for this since I do not believe I will use a lot of UI and animations as much and it will run faster and better than using flutter through the development stage.

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