AI Powered Quiz Application

A

MAJOR PROJECT - II REPORT

Submitted in partial fulfillment of the requirements.

for the degree of

BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE & ENGINEERING

By

GROUP NO. 01

Satyam Kumar	**0187CS211150**
Sintu Kumar	**0187CS211165**
Samrat Singh	**0187CS211145**
Shivankit Dubey	**0187CS211158**

Under the guidance of

Prof. Amit Swami

(Assistant Professor)

Department of Computer Science & Engineering
Sagar Institute of Science &Technology (SISTec), Bhopal (M.P)

Approved by AICTE, New Delhi & Govt. of M.P.
Affiliated to Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal (M.P)

June -2025

Sagar Institute of Science & Technology (SISTec), Bhopal (M.P)
Department of Computer Science & Engineering

CERTIFICATE

We hereby certify that the work which is being presented in the B.Tech. Major Project-II Report entitled **AI Powered Quiz Application,** in partial fulfillment of the requirements for the award of the degree of ***Bachelor of Technology***, submitted to the Department of **Computer Science & Engineering**, Sagar Institute of Science & Technology (SISTec), Bhopal (M.P.) is an authentic record of our own work carried out during the period from Jan-2025 to April-2025 under the supervision of **Prof. Amit Swami.**

The content presented in this project has not been submitted by us for the award of any other degree elsewhere.

Satyam Kumar	**Sintu Kumar**	**Samrat Singh**	**Shivankit Dubey**
0187CS211150	**0187CS211165**	**0187CS211145**	**0187CS211158**

This is to certify that the above statement made by the candidate is correct to the best of our knowledge.

Date:

Prof. Amit Swami	**Dr. Amit Kumar Mishra**	**Dr. D.K. Rajoriya**
Project Guide	**HOD, CSE**	**Principal**

ACKNOWLEDGEMENT

We would like to express our sincere thanks to **Dr. D. K. Rajoriya, Principal, SISTec and Dr. Swati Saxena, Vice Principal SISTec** Gandhi Nagar, Bhopal for giving us an opportunity to undertake this project.

We also take this opportunity to express a deep sense of gratitude to **Dr. Amit Kumar Mishra, HOD, Department of Computer Science & Engineering** for his kindhearted support

We extend our sincere and heartfelt thanks to our guide, **Prof. Amit Swami**, for providing us with the right guidance and advice at crucial junctures and for showing us the right way.

We are thankful to the **Project Coordinator, Prof. Deepti Jain**, who devoted her precious time in giving us the information about various aspects and gave support and guidance at every point of time.

We would like to thank all those people who helped us directly or indirectly to complete our project whenever we found ourself in any issue.

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ABSTRACT

With the growing demand for interactive learning solutions, our project introduces an AI-powered quiz application designed for an engaging and adaptive knowledge assessment experience. Unlike traditional quiz platforms, our system leverages artificial intelligence to generate dynamic questions, analyze user responses, and provide personalized feedback. The application integrates NLP and ML to curate questions based on user proficiency levels, ensuring a tailored learning experience. It features an intuitive interface where users can select topics, attempt quizzes, and receive real-time feedback on their performance. AI-driven analytics assess response patterns, helping users identify strengths and areas for improvement. The core architecture includes a backend powered by a recommendation engine that adapts quiz difficulty, Notifications and progress tracking ensure continuous engagement. Compared to static quiz systems, our solution enhances retention through personalized learning paths and interactive features. With applications in education, corporate training, and competitive exam preparation, our AI-powered quiz application serves as an intelligent, user-centric tool for knowledge acquisition and assessment

LIST OF ABBREVIATIONS

ACRONYM	FULL FORM
SDLC	Software Development Life Cycle
UCD	Use Case Diagram
Wi-Fi	Wireless Fidelity
DC	Direct Current
IDE	Integrated Development Environment
API	Application Programming Interface
UI	User Interface
UX	User Experience
HTTP	Hyper Text Transfer Protocol
SDK	Standard Development Kit
OS	Operating System
USB	Universal Serial Bus
AI	Artificial Intelligence
ML	Machine Learning
DL	Deep Learning
GPT	Generative Pre-trained Transformer
LLM	Large Language Model
NLP	Natural Language Processing
REST	Representational State Transfer

LIST OF FIGURES

Chapter 1
Introduction

CHAPTER-1 INTRODUCTION

1.1 ABOUT PROJECT

The AI-powered Quiz Application is an intelligent learning platform designed to provide interactive and adaptive quiz-based assessments. Utilizing Google's Gemini AI, the system generates dynamic quiz questions, evaluates responses, and offers personalized learning recommendations based on user performance.

This Android-based application leverages AI to create an engaging learning experience, making it suitable for students, professionals, and self-learners. The app supports multiple question formats, including multiple-choice, true/false, and fill-in-the-blank questions:

1.1.1 LOCAL AND REMOTE ALERTS: The application provides instant feedback on answers, allowing users to learn from their mistakes. It also offers AI-driven performance insights, tracking progress over time and suggesting areas for improvement.

1.1.2 VERSATILE APPLICATION: Designed for a wide range of users, including students, professionals, and corporate trainees. The system can be implemented in educational institutions, workplace training programs, and self-paced learning environments to enhance engagement and knowledge retention.

1.2 PROJECT OBJECTIVE

1.2.1 ENHANCE SECURITY: Develop an AI-powered quiz system that dynamically adapts to user proficiency levels, providing an engaging and interactive learning environment.

1.2.2 REAL-TIME NOTIFICATION: Deliver instant feedback and performance analysis using AI-driven insights, allowing learners to track progress and improve in real-time.

1.2.3 EFFICIENT POWER MANAGEMENT: Optimize question generation and assessment processes using machine learning algorithms to ensure adaptive and intelligent evaluations.

1.2.4 **SCALABILITY:** Create a flexible solution that can be expanded or adapted for various security applications, such as residential, commercial, or healthcare environments.

1.2.5 **COST-EFFECTIVE SECURITY:** This AI-powered quiz application aims to revolutionize digital assessments by making learning more interactive, personalized, and insightful.

1.3 FUNCTIONALITY

The following point covers the functionality of the project:

1.3.1 **ADAPTIVE QUESTION GENERATION**: The system uses AI and machine learning to generate quiz questions dynamically based on user proficiency levels and past performance.

1.3.2 **REAL-TIME FEEDBACK & SCORING:** Provides instant feedback, highlighting correct answers, explanations, and suggestions for improvement.

1.3.3 **PERSONALIZED LEARNING PATH:** AI-driven analytics track user progress and apt quiz difficulty, ensuring a customized learning experience.

1.3.4 **CHATBOT TUTOR:** AI-powered assistant helps explain answers.

1.3.5 **PERFORMANCE ANALYSIS**: Provides insights into strengths and areas of improvement.

1.4 INTERFACE

The interface of an AI-powered quiz application should be user-friendly, engaging, and responsive. Below is a breakdown of the key UI/UX components:

1.4.1 **HOME SCREEN:** Displays quiz categories, trending quizzes, and a start button with login options.

1.4.2 **QUIZ PLAY SCREEN:** Shows questions, answer options, progress bar, timer, and AI-powered hints.

1.4.3 **RESULTS & DASHBOARD:** Displays scores, performance insights, leaderboard, and personalized quiz recommendations.

1.5 DESIGN AND IMPLEMENTATION CONSTRAINTS

The design and implementation constraints of the projects are:

1.5.1 SCALABILITY: The system must efficiently handle multiple users simultaneously without performance degradation.

1.5.2 AI MODEL ACCURACY: The machine learning model should generate relevant and well-structured questions based on user knowledge levels.

1.5.3 REAL-TIME PROCESSING: The application should provide immediate feedback, ensuring seamless user experience.

1.5.4 DATA PRIVACY & SECURITY: User data, quiz history, and analytics must be securely stored and comply with data protection regulations.

1.5.5 CROSS-PLATFORM COMPATIBILITY: The system should function smoothly on the web and mobile platforms for accessibility.

1.5.6 MINIMAL LATENCY: AI-based recommendations and analytics should be optimized for fast response times.

1.5.7 USER-FRIENDLY INTERFACE: The design should be intuitive, making it easy for users to navigate quizzes, track progress, and receive insights.

1.6 ASSUMPTIONS AND DEPENDENCIES

1.6.1 ASSUMPTIONS

- **RELIABLE AI PROCESSING**: The system assumes the AI model will function accurately, dynamically generating questions with minimal errors or irrelevant content. This ensures a seamless learning experience.
- **STABLE POWER SUPPLY**: Continuous access to power is essential for the platform's availability. Any interruption could disrupt quiz sessions, requiring backup solutions like offline mode or cloud synchronization.
- **HIGH-QUALITY DATA INPUT**: The system assumes accurate and meaningful data input, ensuring effective question generation, adaptive learning, and personalized feedback. AI performance depends on reliable data sources and user interactions.

- **CONSISTENT INTERNET CONNECTIVITY**: The application relies on a stable internet connection for real-time quiz generation, AI-driven analytics, and user notifications via email or push alerts. Network stability is crucial for an uninterrupted experience.

1.6.2 DEPENDENCIES

- **MACHINE LEARNING MODELS**: The system depends on AI/ML models for generating adaptive quizzes, analyzing user performance, and providing personalized recommendations.
- **NATURAL LANGUAGE PROCESSING (NLP) FRAMEWORKS**: NLP tools are required to understand user queries, generate relevant questions, and provide meaningful feedback.
- **DATABASE MANAGEMENT SYSTEM**: A robust database (e.g., RealTime DB) is needed to store user progress, quiz data, and efficient feedback.
- **CLOUD SERVICES**: Cloud platforms (Firebase) are required for hosting, storage, and scalable AI processing.
- **INTERNET CONNECTIVITY**: A stable network is crucial for real-time quiz updates, AI-driven analytics, and push notifications.
- **THIRD-PARTY APIS**: Integration with authentication services (Google Sign-In), messaging platforms (email, push notifications), and external knowledge sources (Wikipedia, Gemini API) enhance functionality.

Chapter 2
Software & hardware requirements

CHAPTER-2 SOFTWARE & HARDWARE REQUIREMENTS

2.1 INTRODUCTION

The AI-Powered Quiz Application seamlessly integrates software and intelligent algorithms to deliver a dynamic and personalized learning experience. It utilizes machine learning models to generate adaptive quizzes based on user performance, ensuring a tailored assessment approach. The system processes user responses, analyzes patterns, and adjusts question difficulty in real-time to optimize knowledge retention and engagement.

2.1 SOFTWARE REQUIREMENTS

2.1.1 SOFTWARE REQUIREMENTS (DEVELOPER)

- **ANDROID STUDIO**: Android Studio is the official integrated development environment (IDE) for developing Android applications. It provides a robust and user-friendly interface for building, testing, and debugging the AI-powered quiz application. With features like an intelligent code editor, emulator, and Gradle-based build system, developers can efficiently create high-performance applications. Android Studio supports Kotlin and Java, allowing flexibility in development.
- **FIREBASE INTEGRATION:** Firebase is a cloud-based backend solution that enhances real-time data synchronization, authentication, and storage. It is used for managing user profiles, storing quiz questions, and tracking user progress. Firebase's Fire store database ensures seamless updates and scalability, making it ideal for an AI-powered quiz application.
- **RETROFIT & RESTFUL APIS:** Retrofit is a widely used networking library in Android development that enables seamless API communication. It allows the quiz application to interact with cloud servers, fetch dynamic quiz questions, and submit user responses. RESTful APIs ensure efficient data exchange between the app and backend services**.**
- **NATURAL LANGUAGE PROCESSING (NLP) LIBRARIES:** For AI-powered text processing, NLP libraries such as Spacey, NLTK, or Google's ML Kit enable intelligent question generation, sentiment analysis in responses, and chatbot-style quiz interactions. These tools enhance user engagement by providing interactive and personalized assessments.
- **WI-FI & CLOUD SYNCING:** The quiz application supports online and offline modes, utilizing Wi-Fi and mobile data connectivity for real-time syncing with cloud servers.

2.1.2 SOFTWARE REQUIREMENTS (CLIENT)

The AI-Powered Quiz Application is designed for Android users, ensuring a seamless and interactive learning experience. Below are the essential software requirements for clients using the

OPERATING SYSTEM:

- Android 8.0 (Oreo) and above for optimal performance and compatibility.
- Supports both smartphones and tablets running Android OS.

MOBILE APPLICATION:

- The AI-powered quiz app is available as an APK (Android Package Kit) for installation via the Google Play Store or direct download.
- User-friendly UI designed with Material Design principles for smooth navigation and accessibility.

INTERNET CONNECTIVITY:

- Requires Wi-Fi or mobile data for cloud synchronization, real-time quiz updates, and AI-driven analytics.
- Offline mode supported using local storage (Room Database) for quiz completion without an active internet connection.

STORAGE REQUIREMENTS:

- At least 100MB of free space required for app installation and temporary data storage.
- Additional storage needed for caching quiz data, user progress.

ACCOUNT AND AUTHENTICATION:

- Google Sign-In, Email, or Phone Authentication (powered by Firebase Authentication) to enable secure login and personalized experiences.

AI AND ADAPTIVE LEARNING FEATURES:

- Integrated AI-powered recommendation engine for personalized quiz suggestions based on user performance.
- Speech-to-text and text-to-speech support (via Google ML Kit) for accessibility and interactive learning.

NOTIFICATIONS AND REMINDERS:

- Push notifications for quiz reminders, performance updates, and learning suggestions using Firebase Cloud Messaging (FCM).

2.2 HARDWARE REQUIREMENTS

The AI-Powered Quiz Application for Android is designed to run smoothly on a variety of devices, ensuring accessibility and a seamless user experience. Below are the hardware requirements for optimal performance:

2.2.1 CLIENT-SIDE (USER'S DEVICE)

- **Operating System:** Android 8.0 (Oreo) and above
- **Processor:** Quad-core 1.8 GHz or higher (Snapdragon, MediaTek, or equivalent)
- **RAM:** Minimum 2GB RAM (4GB+ recommended for smooth AI processing)
- **Storage:** 100MB of free space for app installation (additional space for cache & offline quizzes)
- **Display:** 5-inch or larger screen (1080p resolution recommended for best UI experience)
- **Connectivity:** Wi-Fi or mobile data (3G, 4G, 5G) for online quizzes, cloud sync, and real-time analytics
- **Sensors & Audio:** Microphone support for speech-to-text quizzes, speakers for text-to-speech assistance

2.2.2 SERVER-SIDE (CLOUD & AI PROCESSING)

- Google Firebase (Fire store & Realtime Database) for storing quiz questions, user progress, and AI-driven analytics
- TensorFlow Lite Server for machine learning-based question recommendations
- Fast API/Django Backend to manage API requests and user data securely

2.2.3 ADDITIONAL PERIPHERALS (OPTIONAL FOR ADVANCED FEATURES)

- **Bluetooth Headset/Microphone:** For voice-based quiz interactions
- **Stylus or Smart Pen:** For handwritten answer recognition (if supported)
- **Chromecast or HDMI Support:** For quiz display on larger screens (smart TVs, projectors)

Chapter 3
Problem Description

CHAPTER-3
PROBLEM DESCRIPTION

In today's education-driven world, the demand for intelligent and adaptive learning solutions has grown significantly. Enhancing engagement and ensuring effective knowledge retention has become more crucial than ever. Traditional quiz applications, such as fixed-question assessments and static multiple-choice quizzes, have been widely used but face notable limitations in addressing the diverse learning needs of modern users. These systems often rely heavily on pre-defined question banks, making them less effective in providing personalized learning experiences.

A key drawback of traditional quiz systems is their inability to provide real-time adaptation. Standard quizzes present the same set of questions to every user, without considering individual strengths, weaknesses, or learning progress. This static approach can result in reduced engagement, ineffective assessments, and limited opportunities for improvement. Manual quiz creation, on the other hand, is time-consuming and requires constant updates, making it impractical for large-scale learning environments such as schools, universities, corporate training programs, and self-learning platforms.

The challenge lies in creating a quiz system that is not only dynamic and intelligent but also capable of delivering personalized experiences without the need for constant manual intervention. Many traditional quiz systems fail to analyze user performance in real time, limiting their ability to provide meaningful feedback and guidance. Without AI-driven adaptability, learners may struggle to progress at an optimal pace, leading to decreased motivation and learning inefficiencies.

To address these critical gaps, the AI-Powered Quiz Application proposes an innovative solution that integrates machine learning (ML) and natural language processing (NLP) for real-time question generation, difficulty adjustment, and performance-based feedback. Unlike traditional quiz platforms, this AI-driven system automates quiz creation and evaluation, ensuring an engaging and adaptive experience for users. Traditional quiz applications often lack adaptability, engagement, and personalized learning experiences. Most conventional quiz systems rely on static question banks that do not adjust based on individual learning patterns, limiting their effectiveness in catering to diverse learning needs. These systems fail to provide real-time feedback, track progress efficiently, or offer dynamic question difficulty based on user performance. As a result, learners may struggle with either too easy or too difficult questions, leading to disengagement and reduced motivation. Additionally, existing quiz applications do not leverage artificial intelligence to analyze user responses and optimize learning outcomes. They also lack interactive features such as Natural Language Processing (NLP)-based question generation, automated feedback, and personalized recommendations. Without AI-driven insights, users miss opportunities for targeted learning improvements.

To address these challenges, an AI-powered Quiz Application is proposed, which utilizes machine learning algorithms to dynamically generate and adjust quizzes. This system ensures adaptive difficulty, real-time performance tracking, and personalized feedback. AI-driven analytics will help users identify their strengths and weaknesses, enhancing overall learning efficiency. By integrating gamification elements such as leaderboards and rewards, the application will also increase engagement, making learning interactive, efficient, and tailored to individual needs. By leveraging cloud-based storage and cross-platform accessibility, our AI-powered solution ensures that users can learn anytime, anywhere. Automated notifications and intelligent recommendations further enhance the learning experience. This application is designed to benefit students, professionals, and lifelong learners by providing an intuitive, data-driven, and interactive approach to assessments. In today’s fast-paced digital era, traditional learning methods often fail to provide personalized and engaging experiences for users. Many learners struggle with standardized quiz applications that offer static question banks and lack adaptability to individual learning styles. Additionally, educators and learners require an intelligent system that can dynamically adjust question difficulty, track progress, and provide real-time insights to enhance learning outcomes.

The AI-powered quiz application for Android addresses these challenges by leveraging artificial intelligence and machine learning to create a smart, adaptive, and interactive learning platform. Unlike conventional quiz apps, this system analyses user performance, predicts learning gaps, and generates tailored questions to improve retention and engagement. With the increasing demand for personalized and interactive learning, traditional quiz applications often fail to engage users effectively. Many quiz apps rely on static question banks, lack adaptability to individual learning needs, and provide little to no intelligent feedback. As a result, learners struggle with repetitive content, lack motivation, and do not receive real-time insights to improve their knowledge.

The AI-powered quiz application for Android is designed to transform digital learning by integrating Artificial Intelligence (AI) and Machine Learning (ML) to create a smart, adaptive, and user-friendly quiz experience. Unlike traditional quiz apps, this application dynamically analyses user performance, generates personalized questions, and adjusts difficulty levels to enhance learning efficiency. In today's fast-paced digital world, traditional learning methods are gradually becoming less effective due to their static nature and lack of adaptability. Many learners struggle to stay engaged with conventional quiz applications, which often provide predefined question banks that do not adapt to the user's performance. Additionally, these apps fail to offer personalized learning experiences, real-time insights, or engaging features that motivate users to continue learning. To address these critical gaps, the AI-Powered Quiz Application proposes an innovative solution that integrates machine learning (ML) and natural language processing (NLP) for real-time question generation, difficulty adjustment, and performance-based feedback. Unlike traditional quiz platforms, this AI-driven system automates quiz creation and evaluation, ensuring an engaging and adaptive experience for users. Traditional quiz applications often lack adaptability, engagement, and personalized learning experiences. Most conventional quiz systems rely on static question banks that do not adjust based on individual learning patterns, limiting their effectiveness in catering to diverse learning needs. These systems fail to provide real-time feedback, track progress efficiently, or offer dynamic question difficulty based on user performance. As a result, learners may struggle with either too easy or too difficult questions, leading to disengagement and reduced motivation.

Key features of the AI-powered quiz application include:

- AI generates real-time questions based on user input, selected topics, and difficulty levels.
- AI analyzes responses and provides instant explanations and improvement recommendations.
- AI helps educators by generating customized quizzes based on learning objectives
- AI provides instant feedback by analyzing responses and offering explanations and improvement suggestions.

By leveraging AI technologies, this system minimizes the dependency on manual quiz preparation while enhancing the overall efficiency and effectiveness of assessments. The AI-powered quiz application ensures that learners receive a personalized, engaging, and continuously evolving learning experience.

Chapter 4
Literature Survey

CHAPTER-4
LITERATURE SURVEY

This literature survey explores various aspects of AI-powered quiz applications, focusing on industry trends, technological advancements, and user experience considerations. By synthesizing findings from academic research, industry reports, and professional articles, this survey provides insights into the evolving landscape of AI-driven learning solutions. Key topics include AI-based question generation, adaptive learning mechanisms, real-time feedback systems, gamification strategies, and the role of automation in education. The survey aims to inform educators, technology developers, and researchers about current best practices and emerging opportunities in AI-powered quiz applications.[1]

In 1664, René Descartes' *Treatise on Man* theorized cognitive processes in terms of mechanical responses, inspiring later studies on intelligence and learning. While speculative, such theories laid the foundation for AI-driven education. By the 20th century, researchers began developing systems capable of adapting to user inputs, leading to modern AI-powered quiz applications that generate dynamic questions, analyze responses, and personalize learning experiences.[2]

In the mid-20th century, advancements in AI and machine learning accelerated the development of intelligent quiz applications. Early systems relied on rule-based algorithms to generate static questions, but with the rise of neural networks and adaptive learning models, AI-powered quizzes became more dynamic. Just as vacuum tubes in the 1920s enhanced signal amplification for motion detection, AI now enhances learning experiences by generating personalized quizzes, analyzing responses, and adjusting difficulty levels in real time. [3]

The history of digital learning systems dates to the 1960s, with the development of computer-assisted instruction (CAI). Projects like PLATO (Programmed Logic for Automated Teaching Operations) at the University of Illinois introduced one of the first interactive learning platforms, incorporating multiple-choice and fill-in-the-blank assessments. These early quiz systems, however, were static and lacked adaptability to individual learners' needs.[4]

The integration of artificial intelligence into educational systems gained momentum in the 1980s and 1990s. AI-driven Intelligent Tutoring Systems (ITS), such as SCHOLAR and ANDES, provided adaptive learning experiences based on student performance. These systems laid the groundwork for AI-powered quiz applications by introducing personalized feedback, difficulty adjustments, and real-time assessment. With the rise of machine learning (ML) and natural language processing (NLP) in the 2000s, quiz applications began leveraging AI to generate automated, personalized questions Early AI driven assessment systems used rule-based models but recent advancements in deep learning have enabled more sophisticated adaptive learning platforms. Knew ton (2011): One of the first AI-powered adaptive learning platforms that personalized quizzes based on student progress. Coursera & EdX (2010s): Integrated AI-driven assessments into Massive Open Online Courses (MOOCs), providing instant feedback and analytics. [5]

Duolingo (2012): Used AI to adjust quiz difficulty based on language proficiency levels, pioneering gamified adaptive learning. The future of AI-powered quiz applications lies in integrating advanced technologies such as machine learning, natural language processing (NLP), and adaptive learning systems to enhance user experience, engagement, and educational effectiveness. By leveraging AI, quiz applications can dynamically tailor content to users' needs, providing personalized question generation, intelligent feedback, and automated difficulty adjustments. One of the most significant advancements in AI-powered quiz applications is adaptive learning. Traditional quiz applications follow a fixed structure, presenting the same set of questions to all users. However, AI-driven systems analyze users' responses in real time, adjusting the difficulty and type of questions accordingly. This ensures that each user receives a customized learning experience, helping them to strengthen weak areas while avoiding repetitive or redundant questions on topics they have already mastered. For instance, machine learning algorithms can evaluate a user's performance and identify patterns in their answers. If a student consistently struggles with mathematical equations but excels in history, the system will generate more math-based questions while limiting history-related content. This personalized approach improves knowledge retention and makes learning more effective and engaging.[6]

AI-powered quiz applications can move beyond static question banks by generating real-time, context-aware questions. With advancements in natural language processing (NLP), these applications can extract relevant information from textbooks, articles, or online resources and generate unique quiz questions based on the latest data. This ensures that the quizzes remain up-to-date and relevant rather than relying on pre-set questions that may become outdated over time. Future AI-powered quiz applications will incorporate gamification elements to boost engagement. AI can monitor user interactions and suggest interactive features such as rewards, leaderboards, and daily challenges to keep users motivated. Additionally, AI chatbots and virtual tutors can simulate real-time interactions, providing hints and encouragement during quizzes. Another exciting development is the integration of speech recognition and voice-based interactions. Instead of typing answers, users could verbally respond to questions, making quiz applications more accessible and interactive. This would be especially beneficial for younger learners, visually impaired users, and language learners practicing pronunciation.[7]

Looking ahead, AI-powered quiz applications will benefit from continuous advancements in AI models, cloud computing, and data analytics. These technologies will enable more sophisticated behavioral analytics, allowing educators and institutions to track student progress in real time. Automated performance reports and predictive analytics will help teachers identify struggling students and provide targeted interventions. Furthermore, AI will enable multimodal learning, where quizzes incorporate images, videos, and interactive simulations instead of text-only formats. This will make learning more immersive and appealing to a broader audience.[8]

The future of AI-powered quiz applications is promising, with machine learning, NLP, and adaptive algorithms transforming how quizzes are designed and experienced. These advancements will lead to personalized learning experiences, intelligent question generation, real-time feedback, and enhanced engagement. As AI technology continues to evolve, quiz applications will become smarter, more interactive, and better suited to individual learners' needs, revolutionizing education and knowledge assessment.[9]

Chapter 5
Software Requirement Specifications

CHAPTER-5
SOFTWARE REQUIREMENTS SPECIFICATION

5.1 FUNCTIONAL REQUIREMENTS

5.1.1 USER MANAGEMENT

- Users can sign up and log in using email, social media, or single sign-on (SSO). Role-based access (Admin, Teacher, Student). Notifications must
- Profile management (update details, preferences, and avatars).
- AI-assisted question generation based on difficulty level and topic.

5.1.2 QUIZ CREATION & MANAGEMENT

- Admins/Teachers can create, edit, and delete quizzes.
- AI-assisted question generation based on difficulty level and topic.

5.1.3 AI-POWERED QUESTION GENERATION

- AI suggests quiz questions based on learning materials or uploaded documents.
- Adaptive difficulty level: AI adjusts questions based on user performance.

5.1.4 QUIZ ATTEMPT & EVALUATION

- Real-time progress tracking during the quiz.
- AI-powered automated grading for objective questions.

5.1.5 AI- DRIVEN PERSONALIZATION & ADAPTIVE LEARNING

- AI recommends quizzes based on user performance.
- Adaptive difficulty adjustments for better learning outcomes.

5.2 NON-FUNCTIONAL REQUIREMENTS

5.2.1 PERFORMANCE REQUIREMENTS

- The application should load quiz questions within 2 seconds to ensure a seamless experience.
- Quiz load time should not exceed 2 seconds under normal conditions.
- AI-generated questions should be created within 5 seconds.

- AI-based question generation and difficulty adjustment should happen in real-time with minimal processing delays.
- The app should support at least 1,000 concurrent users without performance degradation.

5.2.2 SCALABILITY

- The system should support scaling to accommodate a growing number of users and quizzes.
- Cloud-based infrastructure for auto-scaling based on demand.
- User data, including scores and progress, must be encrypted using AES-256 for secure storage.

5.2.3 SCALABILITY REQUIREMENTS

- Cloud-based backend services (e.g., Firebase, AWS) should support auto-scaling to accommodate growing users.
- AI models should dynamically adapt based on the increasing number of users and data point.

5.2.4 AVAILABILITY REQUIREMENTS

- The system should maintain 99.9% uptime, ensuring the quiz services are always accessible.
- The app must support offline mode, allowing users to take quizzes even without an internet connection.

5.2.5 MAINTAINABILITY & UPGRADABILITY REQUIREMENTS

- The system should support modular updates without requiring a full app reinstall.
- The codebase should follow clean architecture principles, making it easy to debug and enhance.
- AI models should be updated periodically without disrupting the user experience.

5.2.6 USABILITY REQUIREMENTS

- The app should have a simple, intuitive UI/UX, making it easy for users of all age groups to navigate.
- Accessibility features such as voice-based interaction, text-to-speech, and dark mode should be supported.

5.2.7 RELIABILITY & FAULT TOLERANCE

- The app should recover automatically from crashes and errors without losing user progress.
- All user quiz history should be automatically backed up to the cloud.
- AI-driven question recommendations should work even if internet connectivity is unstable.

5.2.8 COMPLIANCE & LEGAL REQUIREMENTS

- The app must comply with GDPR, CCPA, and other data protection laws to ensure user privacy.
- AI-generated content should follow educational standards to avoid misinformation.

Chapter 6
Software & Hardware Design

CHAPTER-6
SOFTWARE AND HARDWARE DESIGN

6.1 SOFTWARE DESIGN

The AI-powered quiz application leverages Google's Gemini AI to provide an interactive and adaptive learning experience. This Android-based app utilizes machine learning to generate quizzes, evaluate user responses, and offer personalized recommendations:

6.1.1 ACTORS:

- User: interacts with the app, takes quizzes, and receives performance feedback.
- AI Model (Gemini AI): Generates quiz questions dynamically based on user responses.
- Notification System: Sends quiz reminders and progress reports.
- Speech-to-Text Engine**:** Converts spoken responses into text for evaluation.
- Admin: Manages content, monitors analytics, and updates quiz logic.

6.1.2 USE CASES:

- Generate Quiz Questions: The AI model dynamically generates quiz questions based on selected topics and difficulty levels.
- User Authentication: Users sign in using Google Authentication or other credentials.
- Attempt Quiz: Users answer quiz questions through text or voice input.
- Gamification & Rewards: Users earn badges, rankings, and achievements based on their quiz scores.

Evaluate Performance: AI evaluates responses, provides scores, and offers personalized recommendations.

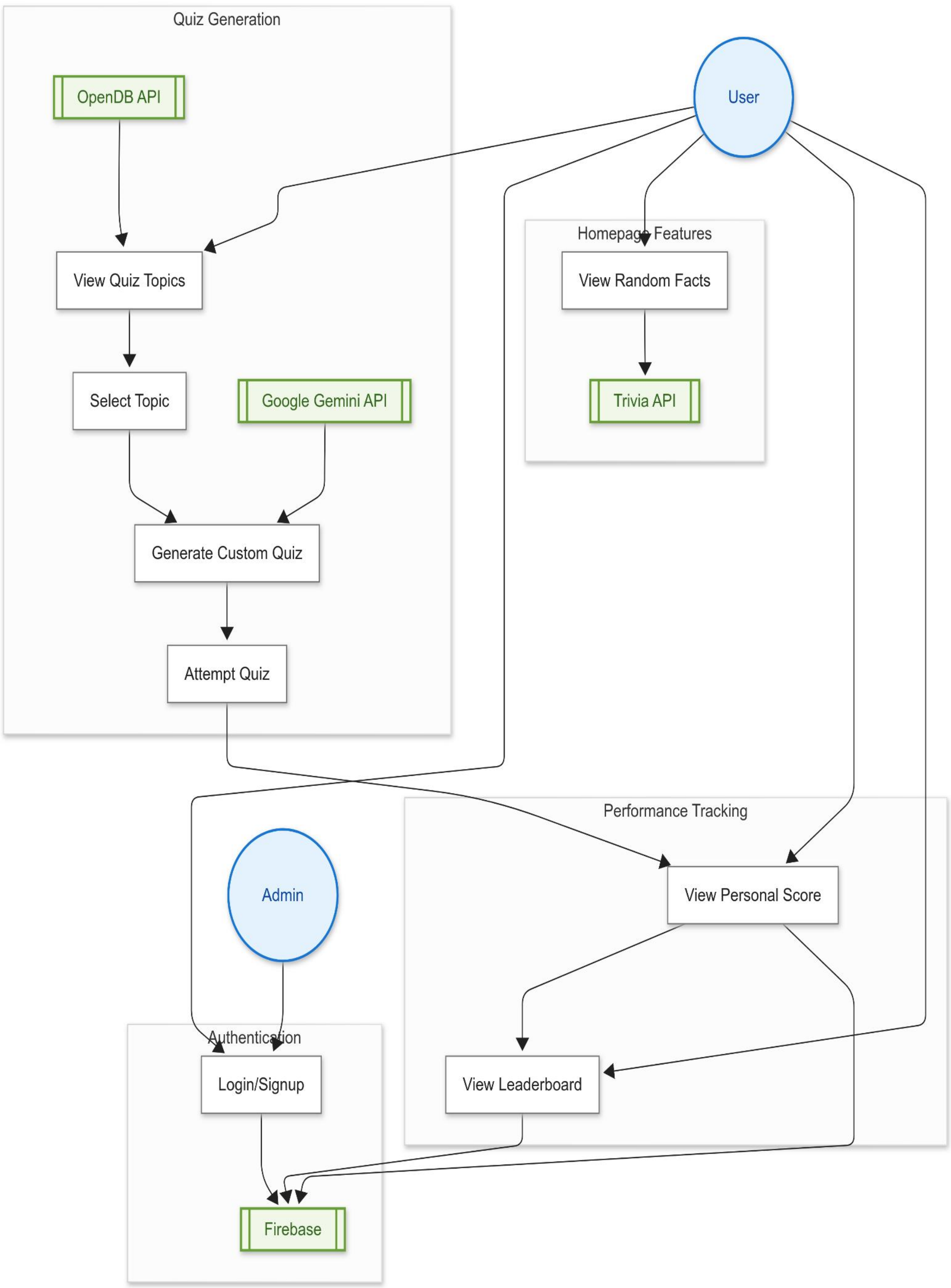


Figure 6.1: **Use case diagram of Ai powered quiz application**

6.1.3 SYSTEM FLOW:

- User logs in →
- Selects quiz topic and difficulty level →
- AI generates quiz questions →
- User answers (text) →
- AI evaluates response and updates score →

6.2 HARDWARE DESIGN

6.2.1 MOBILE DEVICE REQUIREMENTS

- Operating System: Android 8.0 (Oreo) or higher.
- Processor: Quard-core 2.0 GHz or higher.
- RAM: Minimum 3GB (Recommended 4GB for AI processing)
- Storage: At least 100MB free space for application and cache.
- Internet: Wi-Fi or mobile data required for AI-driven quiz generation.

Chapter 7
Coding

CHAPTER-7 CODING

The development of an AI-powered Quiz Application using the Gemini API marks a significant advancement in interactive learning and assessment technologies. This application leverages AI-driven question generation, real-time responses, and adaptive learning techniques to enhance user engagement and knowledge retention. The implementation involves integrating key components such as the Gemini API for intelligent question generation, Firebase for real-time data management, and an intuitive Android UI built with Jetpack Compose. The AI-driven system ensures personalized quizzes, instant feedback, and a dynamic question bank that evolves based on user performance. This scalable and user-friendly solution is designed for diverse educational environments, including schools, corporate training, and self-paced learning. The deployment is seamless, requiring minimal technical expertise while offering robust features like AI-curated quizzes, voice-enabled interactions, and performance analytics. With its intelligent question adaptation and real-time assessment capabilities, the application redefines digital learning, empowering users to enhance their knowledge efficiently.

STEP 1: SET UP A NEW ANDROID PROJECT

Open Android Studio and create a new project:

Select "Empty Activity" template
Name: "AIQuizApp"
Package name: com.example.aiquizapp
Language: Kotlin
Minimum SDK: API 13

STEP 2: GET GEMINI API KEY

Go to Google AI Studio
Sign in with your Google account
Create a new API key (under "Get API Key" section)
Copy the API key (keep this secure)

STEP 3: SET UP GEMINI API IN YOUR APP

Create a new Kotlin file GeminiRepository.kt:

STEP 4: CREATE VIEWMODEL

AUTHVIEWMODEL.KT

```
package com.venom.quizzapp.model
```

```
import androidx.lifecycle.LiveData
import androidx.lifecycle.MutableLiveData
import androidx.lifecycle.ViewModel
import androidx.lifecycle.viewModelScope
import com.google.firebase.auth.FirebaseAuth
import com.venom.quizzapp.Injection
import kotlinx.coroutines.launch

class AuthViewModel : ViewModel() {
    private val userRepository: UserRepository = UserRepository(
        FirebaseAuth.getInstance(),
        Injection.instance()
    )

    private val _authResult = MutableLiveData<Result<Boolean>>()
    val authResult: LiveData<Result<Boolean>> get() = _authResult

    fun signUp(email: String, password: String, userName: String) {
        viewModelScope.launch {
            _authResult.value = userRepository.signUp(email, password, userName)
        }
    }

    fun login(email: String, password: String) {
        viewModelScope.launch {
            _authResult.value = userRepository.login(email, password)
        }
    }

}
```

GEMINI API.KT

```
package com.venom.quizzapp.model

import android.os.Parcelable
import com.google.gson.annotations.SerializedName
import kotlinx.parcelize.Parcelize
import retrofit2.Retrofit
import retrofit2.converter.gson.GsonConverterFactory
import retrofit2.http.Body
import retrofit2.http.Headers
import retrofit2.http.POST
import retrofit2.http.Query

private val GeminiRetrofit = Retrofit.Builder()
    .baseUrl("https://generativelanguage.googleapis.com/")
    .addConverterFactory(GsonConverterFactory.create()).build()

val GeminiService: GeminiApi = GeminiRetrofit.create(GeminiApi::class.java)

interface GeminiApi {
    @Headers("Content-Type: application/json")
    @POST("v1beta/models/gemini-2.0-flash:generateContent")
    suspend fun generateTrivia(
        @Query("key") apiKey: String,
        @Body request: GeminiRequest
    ): GeminiResponse
}

data class GeminiRequest(
    @SerializedName("contents") val contents: List<Content>,
    @SerializedName("generationConfig") val generationConfig: GenerationConfig
)

@Parcelize
data class GeminiResponse(
    @SerializedName("candidates") val candidates: List<Candidate>
) : Parcelable

@Parcelize
data class Candidate(
    @SerializedName("content") val content: Content
) : Parcelable

@Parcelize
data class Content(
    @SerializedName("parts") val parts: List<Part>
) : Parcelable

@Parcelize
data class Part(
    @SerializedName("text") val text: String // This contains embedded JSON as a string
) : Parcelable

data class GenerationConfig(
    @SerializedName("responseMimeType") val responseMimeType: String
)
```

MAIN VIEW MODEL.KT

```
package com.venom.quizzapp.model

import androidx.compose.runtime.State
import androidx.compose.runtime.getValue
import androidx.compose.runtime.mutableFloatStateOf
import androidx.compose.runtime.mutableStateOf
import androidx.compose.runtime.remember
import androidx.compose.runtime.setValue
import androidx.lifecycle.ViewModel
import androidx.lifecycle.viewModelScope
import com.google.gson.Gson
import com.venom.quizzapp.BuildConfig
import kotlinx.coroutines.flow.MutableStateFlow
import kotlinx.coroutines.flow.asStateFlow
import kotlinx.coroutines.launch

class QuizViewModel : ViewModel() {
private val _isLoaded = MutableStateFlow(false)
val isLoaded = _isLoaded.asStateFlow()

var query = mutableStateOf("")
var subquery = mutableStateOf("")
var difficultylevel = mutableStateOf("Any")

fun resetGenerateValues() {
query.value = ""
subquery.value = ""
difficultylevel.value = "Any"
}

init {
fetchTrivia()
fetchCategories()
_isLoaded.value = true
}

//Question State Management.
private var _questionsState = mutableStateOf(QuestionState())
val questionsState: State<QuestionState> = _questionsState
val isAIGenerated = mutableStateOf(false)

fun fetchQuestions(category: Int) {
viewModelScope.launch {
try {
resetAllVariables()
val response = questionService.getQuestion(category = category)
_questionsState.value = _questionsState.value.copy(
list = response.results, loading = false, error = null
)
initializeQuestion()
} catch (e: Exception) {
_questionsState.value = _questionsState.value.copy(
loading = false, error = "Error Fetching Questions"
)
}
}
}

private val apiKey = BuildConfig.API_KEY
```

```
fun sendGeminiRequest() {
val request = GeminiRequest(
contents = listOf(
Content(
parts = listOf(
Part(
text = "Generate a valid JSON response containing 10 multiple-choice trivia questions about
${query.value} ${"- $subquery"} in the format:\n\n{\n \"response_code\": 0,\n \"results\": [\n {\n
\"type\": \"multiple\",\n \"difficulty\": \"${difficultylevel.value}\",\n \"category\": \"$query\",\n
\"question\": \"Example question here?\",\n \"correct_answer\": \"Correct Answer\",\n
\"explanation\": \"This is the explanation for why the correct answer is right.\",\n
\"incorrect_answers\": [\"Wrong 1\", \"Wrong 2\", \"Wrong 3\"]\n }\n ]\n}\n\nEnsure that the
response is directly JSON-formatted with no additional text."
)
)
)
), generationConfig = GenerationConfig(responseMimeType = "application/json")
)
// Send request
viewModelScope.launch {
try {
resetAllVariables()
val geminiresponse = GeminiService.generateTrivia(apiKey, request)
val jsonString = geminiresponse.candidates[0].content.parts[0].text
val response = Gson().fromJson(jsonString, QuestionResponse::class.java)
_questionsState.value = _questionsState.value.copy(
list = response.results, loading = false, error = null
)
isAIGenerated.value = true
initializeQuestion()
} catch (e: Exception) {
_questionsState.value = _questionsState.value.copy(
loading = false, error = "Error Fetching Questions"
)
}

}
}

fun sendGeminiRegenerateRequest() {
val request = GeminiRequest(
contents = listOf(
Content(
parts = listOf(
Part(
text = "Generate a valid JSON response containing 10 multiple-choice trivia questions similar to the
given question: \"$incorrectQuestions\" in the format:\n\n{\n \"response_code\": 0,\n \"results\": [\n
{\n \"type\": \"multiple\",\n \"difficulty\": \"${difficultylevel.value}\",\n \"category\":
\"${query.value}.\",\n \"question\": \"Example similar question here?\",\n \"correct_answer\":
\"Correct Answer\",\n \"explanation\": \"This is the explanation for why the correct answer is
right.\",\n \"incorrect_answers\": [\"Wrong 1\", \"Wrong 2\", \"Wrong 3\"]\n }\n ]\n}\n\nEnsure that
the response is directly JSON-formatted with no additional text."
)
)
)
), generationConfig = GenerationConfig(responseMimeType = "application/json")
)
// Send request
viewModelScope.launch {
try {
resetAllVariables()
val geminiresponse = GeminiService.generateTrivia(apiKey, request)
val jsonString = geminiresponse.candidates[0].content.parts[0].text
val response = Gson().fromJson(jsonString, QuestionResponse::class.java)
_questionsState.value = _questionsState.value.copy(
list = response.results, loading = false, error = null
)
isAIGenerated.value = true
initializeQuestion()
} catch (e: Exception) {
_questionsState.value = _questionsState.value.copy(
loading = false, error = "Error Fetching Questions"
)
}

}
}
//Question Data management.

private var score = 0
var currentPosition = 0

// var currentProgress = mutableFloatStateOf(.1f)
// var progress = mutableStateOf("1/10")
var question = mutableStateOf("")
var options = mutableStateOf(listOf<String>())
val navigateToScore = mutableStateOf(false)
val selectedOptions: MutableList<String?> = MutableList(10) { null }
private val incorrectQuestions = StringBuilder()

fun resetAllVariables() {
score = 0
currentPosition = 0
// currentProgress.floatValue = .1f
// progress.value = "1/10"
question.value = ""
options.value = listOf<String>()
_questionsState.value = _questionsState.value.copy(
loading = true,
)
selectedOptions.fill(null)
incorrectQuestions.clear()
isAIGenerated.value = false
totalScore = 0
}

fun updatePosition(index: Int) {
currentPosition = index
question.value = questionsState.value.list[currentPosition].question
```

```
// currentProgress.floatValue =
// (currentPosition + 1).toFloat() / questionsState.value.list.size
// progress.value = "${currentPosition + 1}/${questionsState.value.list.size}"
options.value = shuffleOptions()
}

private fun shuffleOptions(): List<String> {
val allOptions =
questionsState.value.list[currentPosition].incorrect_answers.toMutableList() // Start with incorrect
answers
allOptions.add(questionsState.value.list[currentPosition].correct_answer) // Add the correct answer to
the list
allOptions.shuffle() // Shuffle the list randomly
return allOptions
}

private fun initializeQuestion() {
if (questionsState.value.list.isNotEmpty()) {
question.value = questionsState.value.list[currentPosition].question
options.value = shuffleOptions() // Shuffle options after initializing
// currentProgress.floatValue =
// (currentPosition + 1).toFloat() / questionsState.value.list.size
// progress.value = "${currentPosition + 1}/${questionsState.value.list.size}"
}
}

fun updateQuestion(selectedOption: String?) {
if (selectedOptions[currentPosition] == null) {
selectedOptions[currentPosition] = selectedOption
}
currentPosition++
navigateToScore.value = (currentPosition == questionsState.value.list.size)
if (currentPosition < questionsState.value.list.size) {
question.value = questionsState.value.list[currentPosition].question
// currentProgress.floatValue =
// (currentPosition + 1).toFloat() / questionsState.value.list.size
// progress.value = "${currentPosition + 1}/${questionsState.value.list.size}"
options.value = shuffleOptions()
} else {
for (index in 0..9) {
if (selectedOptions[index] == questionsState.value.list[index].correct_answer) {
totalScore += 1
} else {
incorrectQuestions.append(questionsState.value.list[index].question)
if (index != 9) {
incorrectQuestions.append(", ")
}
}
}
}
}

//Category State Management.
private val _categoriesState = mutableStateOf(CategoryState())
val categoriesState: State<CategoryState> = _categoriesState
```

```
fun fetchCategories() {
viewModelScope.launch {
try {
val response = categoryService.getCategories()
_categoriesState.value = _categoriesState.value.copy(
list = response.trivia_categories, loading = false, error = null
)
} catch (e: Exception) {
_categoriesState.value = _categoriesState.value.copy(
loading = false, error = "Error Fetching Categories ${e.message}"
)
}
}
}

//Trivia State Management.
private val _triviaState = mutableStateOf(TriviaState())
val triviaState: State<TriviaState> = _triviaState

fun fetchTrivia() {
viewModelScope.launch {
try {
val response = TriviaService.getFact()
_triviaState.value = _triviaState.value.copy(
fact = response, loading = false, error = null
)
} catch (e: Exception) {
_triviaState.value = _triviaState.value.copy(
loading = false, error = "Error Fetching Trivia Fact ${e.message}"
)
}
}
}

//TODO LeaderBoard Data Management.
val leaderBoardItems = listOf(
LeaderBoardItem(1, "Satyam", 1000),
LeaderBoardItem(2, "Satya", 900),
LeaderBoardItem(3, "Venom", 800),
LeaderBoardItem(4, "Sanedeepak", 700),
LeaderBoardItem(5, "Satyam", 600),
LeaderBoardItem(6, "Satya", 500),
LeaderBoardItem(7, "Sally", 400),
LeaderBoardItem(8, "Demon", 300),
LeaderBoardItem(9, "Lucky", 200),
LeaderBoardItem(10, "Unnamed", 100),
)
var totalScore = 0
var logged = mutableStateOf(false)
var loginDialogue = mutableStateOf(false)
var registerDialogue = mutableStateOf(false)

}

data class LeaderBoardItem(val rank: Int, val name: String, val score: Int)
```

```
//FINAL DATA CLASSES. Do not Mess with these data Classes.
data class QuestionState(
val loading: Boolean = true, val list: List<Question> = emptyList(), val error: String? = null
)

data class CategoryState(
val loading: Boolean = true, val list: List<Category> = emptyList(), val error: String? = null
)

data class TriviaState(
val loading: Boolean = true, val fact: TriviaResponse? = null, val error: String? = null
)
```

QUIZAPI.KT

```
package com.venom.quizzapp.model

import android.os.Parcelable
import kotlinx.parcelize.Parcelize
import retrofit2.Retrofit
import retrofit2.converter.gson.GsonConverterFactory
import retrofit2.http.GET
import retrofit2.http.Query


private val retrofit = Retrofit.Builder().baseUrl("https://opentdb.com/")
.addConverterFactory(GsonConverterFactory.create()).build()

private val TriviaRetrofit = Retrofit.Builder().baseUrl("http://numbersapi.com/")
.addConverterFactory(GsonConverterFactory.create()).build()

val questionService: QuizApi = retrofit.create(QuizApi::class.java)

val categoryService: CategoryApi = retrofit.create(CategoryApi::class.java)

val TriviaService: FactApi = TriviaRetrofit.create(FactApi::class.java)

interface QuizApi {
@GET("api.php") // Endpoint path without query parameters
suspend fun getQuestion(
@Query("amount") amount: Int = 10, // Fixed query parameter
@Query("type") type: String = "multiple", // Fixed query parameter
@Query("category") category: Int // Dynamic query parameter
): QuestionResponse
}

interface CategoryApi {
@GET("api_category.php")
suspend fun getCategories(): CategoryResponse
}

interface FactApi {
@GET("random/trivia?json")
suspend fun getFact(): TriviaResponse
}
```

```
//Data Classes for Api.
@Parcelize
data class Question(
val type: String,
val difficulty: String,
val category: String,
val question: String,
val correct_answer: String,
val incorrect_answers: List<String>,
val explanation: String?,
) : Parcelable

@Parcelize
data class Category(
val id: Int,
val name: String
) : Parcelable

data class QuestionResponse(val response_code: Int, val results: List<Question>)

data class CategoryResponse(val trivia_categories: List<Category>)


@Parcelize
data class TriviaResponse(
val text: String,
val number: Int,
val found: Boolean,
val type: String
) : Parcelable


//JSON from https://opentdb.com/api.php.
//"type": "multiple",
//"difficulty": "easy",
//"category": "General Knowledge",
//"question": "What is the Spanish word for &quot;donkey&quot;?",
//"correct_answer": "Burro",
//"incorrect_answers": [
//"Caballo",
//"Toro",
//"Perro"
//]

// JSON from https://opentdb.com/api_category.php
//"trivia_categories": [
//{
// "id": 9,
// "name": "General Knowledge"
//},

// JSON from http://numbersapi.com/random/trivia?json
//{
// "text": "729 is the number of times a philosopher's pleasure is greater than a tyrant's pleasure
according to Plato in the Republic.",
// "number": 729,
// "found": true,
// "type": "trivia"
//}
```

RESULT.KT

```
package com.venom.quizzapp.model

sealed class Result<out T> {
data class Success<out T>(val data: T) : Result<T>()
data class Error(val exception: Exception) : Result<Nothing>()
}
```

USERREPOSITORY.KT

```
package com.venom.quizzapp.model

import android.util.Log
import com.google.firebase.auth.FirebaseAuth
import com.google.firebase.firestore.FirebaseFirestore
import kotlinx.coroutines.tasks.await

class UserRepository(
private val auth: FirebaseAuth,
private val firestore: FirebaseFirestore
) {
suspend fun signUp(
email: String,
password: String,
name: String
): Result<Boolean> =
try {
auth.createUserWithEmailAndPassword(email, password).await()
//add user to firestore
val user = User(name, email)
saveUserToFirestore(user)
Result.Success(true)
} catch (e: Exception) {
Result.Error(e)
}

private suspend fun saveUserToFirestore(user: User) {
firestore.collection("users").document(user.email).set(user).await()
}

suspend fun login(email: String, password: String): Result<Boolean> =
try {
auth.signInWithEmailAndPassword(email, password).await()
Result.Success(true)
} catch (e: Exception) {
Result.Error(e)
}

suspend fun getCurrentUser(): Result<User> = try {
val uid = auth.currentUser?.email
if (uid != null) {
val userDocument = firestore.collection("users").document(uid).get().await()
val user = userDocument.toObject(User::class.java)
if (user != null) {
Log.d("user2", "$uid")
Result.Success(user)
} else {
Result.Error(Exception("User data not found"))
}
} else {
Result.Error(Exception("User not authenticated"))
}
} catch (e: Exception) {
Result.Error(e)
}
}

data class User(
val name: String = "",
val email: String = ""
)
```

STEP 5: CREATE COMPOSABLE SCREENS

ANIMATEDLOGO.KT

```
package com.venom.quizzapp.screens

import android.graphics.drawable.AnimatedVectorDrawable
import android.widget.ImageView
import androidx.compose.runtime.Composable
import androidx.compose.ui.Modifier
import androidx.compose.ui.viewinterop.AndroidView
import androidx.vectordrawable.graphics.drawable.AnimatedVectorDrawableCompat
import com.venom.quizzapp.R

@Composable
fun AnimatedLogo() {
AndroidView(
factory = { ctx ->
ImageView(ctx).apply {
setImageResource(R.drawable.loading_logo) // Load AVD

fun startAnimationLoop() {
post {
val drawable = drawable
if (drawable is AnimatedVectorDrawable) {
drawable.start()
postDelayed(
{ startAnimationLoop() },
500
) // Adjust delay to match animation duration
} else if (drawable is AnimatedVectorDrawableCompat) {
drawable.start()
postDelayed({ startAnimationLoop() }, 500)
}
}
}

startAnimationLoop() // Start the looping animation
}
},
modifier = Modifier
)
}
```

ANSWERSSCREEN.KT

```
package com.venom.quizzapp.screens

import android.text.Html
import androidx.compose.foundation.BorderStroke
import androidx.compose.foundation.background
import androidx.compose.foundation.layout.Arrangement
import androidx.compose.foundation.layout.*
import androidx.compose.foundation.lazy.LazyColumn
import androidx.compose.foundation.lazy.itemsIndexed
import androidx.compose.foundation.shape.RoundedCornerShape
import androidx.compose.material3.Card
import androidx.compose.material3.CardDefaults
import androidx.compose.material3.MaterialTheme
import androidx.compose.material3.Scaffold
import androidx.compose.material3.Text
import androidx.compose.runtime.Composable
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.platform.LocalContext
import androidx.compose.ui.text.font.FontWeight
import androidx.compose.ui.tooling.preview.Preview
import androidx.compose.ui.unit.dp
import androidx.navigation.NavHostController
import com.venom.quizzapp.Screen
import com.venom.quizzapp.model.Question
import com.venom.quizzapp.model.QuizViewModel
import com.venom.quizzapp.ui.theme.QuizzappTheme

@Composable
fun AnswerScreen(viewModel: QuizViewModel, navController: NavHostController) {
QuizzappTheme {
Scaffold(
topBar = {
TopBar(name = "Answers")
}
) { innerPadding ->
Column(
modifier = Modifier
.padding(innerPadding)
.background(MaterialTheme.colorScheme.background)
.fillMaxSize(),
verticalArrangement = Arrangement.Center,
horizontalAlignment = Alignment.CenterHorizontally
) {
Box(modifier = Modifier.fillMaxHeight(.9f)) {
LazyColumn(
contentPadding = PaddingValues(horizontal = 20.dp, vertical = 15.dp),
verticalArrangement = Arrangement.spacedBy(20.dp)
) {
itemsIndexed(viewModel.questionsState.value.list) { index, question ->
QuestionItem(index, question, viewModel)
}
}
}
if (viewModel.isAIGenerated.value) {
Row(
modifier = Modifier.fillMaxWidth(),
horizontalArrangement = Arrangement.SpaceAround
) {
SubmitButton(text = "Retry", 0.4f) {
viewModel.sendGeminiRegenerateRequest()
navController.navigate(Screen.QuizScreen.route)
}
SubmitButton(text = "Score", 0.6f) {
navController.navigate(Screen.Score.route)
}
}
} else {
SubmitButton(text = "Score ") {
navController.navigate(Screen.Score.route)
}
}
}
}
}
}

fun decodeHtml(encodedString: String): String {
return Html.fromHtml(encodedString, Html.FROM_HTML_MODE_LEGACY).toString()
}

@Composable
fun QuestionItem(index: Int, question: Question, viewModel: QuizViewModel) {
val selectedOption: String? = viewModel.selectedOptions[index]
Card(
modifier = Modifier.fillMaxWidth(),
elevation = CardDefaults.cardElevation(defaultElevation = 4.dp),
shape = RoundedCornerShape(12.dp),
colors = CardDefaults.cardColors(containerColor = MaterialTheme.colorScheme.background),
border = BorderStroke(3.dp, MaterialTheme.colorScheme.primary.copy(alpha = 0.3f))
) {
Column(modifier = Modifier.padding(16.dp)) {
Text(
text = decodeHtml(question.question),
style = MaterialTheme.typography.bodyLarge,
fontWeight = FontWeight.Bold
)
Spacer(modifier = Modifier.height(8.dp))
```

```
if (question.correct_answer != selectedOption) {
Text(
text = "Your Answer: ${if (selectedOption != null) decodeHtml(selectedOption) else "Not
Selected"}",
style = MaterialTheme.typography.bodyMedium,
fontWeight = FontWeight.Medium,
color = Color.Red
)
Text(
text = "Correct Answer: ${decodeHtml(question.correct_answer)}",
style = MaterialTheme.typography.bodyMedium,
fontWeight = FontWeight.Medium,
color = Color.Green
)
if (question.explanation != null) {
Text(
text = "Explanation: ${decodeHtml(question.explanation)}",
style = MaterialTheme.typography.bodyMedium,
fontWeight = FontWeight.Medium,
)
}
} else {
Text(
text = "Correct Answer: ${decodeHtml(question.correct_answer)}",
style = MaterialTheme.typography.bodyMedium,
fontWeight = FontWeight.Medium,
color = Color.Green
)
}

}
}
}

@Preview(showBackground = true)
@Composable
fun AnswerScreenPreview() {
AnswerScreen(QuizViewModel(), NavHostController(LocalContext.current))
}
```

CATEGORIESSCREEN.KT

```
package com.venom.quizzapp.screens

import androidx.compose.foundation.BorderStroke
import androidx.compose.foundation.background
import androidx.compose.foundation.layout.Arrangement
import androidx.compose.foundation.layout.Column
import androidx.compose.foundation.layout.PaddingValues
import androidx.compose.foundation.layout.fillMaxSize
import androidx.compose.foundation.layout.fillMaxWidth
import androidx.compose.foundation.layout.padding
import androidx.compose.foundation.lazy.LazyColumn
import androidx.compose.foundation.lazy.items
import androidx.compose.foundation.shape.RoundedCornerShape
import androidx.compose.material3.Button
import androidx.compose.material3.ButtonDefaults
import androidx.compose.material3.MaterialTheme
import androidx.compose.material3.Scaffold
import androidx.compose.material3.Text
import androidx.compose.runtime.Composable
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.platform.LocalContext
import androidx.compose.ui.text.style.TextAlign
import androidx.compose.ui.tooling.preview.Preview
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import androidx.navigation.NavHostController
import com.venom.quizzapp.Screen
import com.venom.quizzapp.model.QuizViewModel
import com.venom.quizzapp.ui.theme.QuizzappTheme

//TODO -Load data From Viewmodel
@Composable
fun CategoryScreen(viewModel: QuizViewModel, navController: NavHostController) {
QuizzappTheme {
Scaffold(
topBar = {
TopBar("Category")
},
bottomBar = {
BottomBar(viewModel, "Category", navController)
}
) { innerPadding ->
Column(
modifier = Modifier
.padding(innerPadding)
.background(MaterialTheme.colorScheme.background)
.fillMaxSize(),
verticalArrangement = Arrangement.Center,
horizontalAlignment = Alignment.CenterHorizontally
) {
Text(
text = "Click on a category to start quiz.",
color = MaterialTheme.colorScheme.secondary,
fontSize = 15.sp,
modifier = Modifier.padding(10.dp),
textAlign = TextAlign.Center
)
when {
viewModel.categoriesState.value.loading -> {
AnimatedLogo()
}

viewModel.categoriesState.value.error != null -> {
Text(text = "ERROR OCCURRED", fontSize = 25.sp, color = Color.Red)
SubmitButton(text = "Reload") { viewModel.fetchCategories() }
}
else -> {
CategoryList(viewModel, navController)
}
}
}
}
}
}

@Composable
fun CategoryList(viewModel: QuizViewModel, navController: NavHostController) {
QuizzappTheme {
LazyColumn(
contentPadding = PaddingValues(horizontal = 20.dp, vertical = 15.dp),
verticalArrangement = Arrangement.spacedBy(20.dp)
) {
items(viewModel.categoriesState.value.list) { category ->
CategoryButton(category.name) {
viewModel.fetchQuestions(category.id)
navController.navigate(Screen.QuizScreen.route)
}
}
}
}
}

@Composable
fun CategoryButton(category: String, onClick: () -> Unit) {
QuizzappTheme {
Button(
onClick = onClick,
modifier = Modifier
.fillMaxWidth(.95f),
shape = RoundedCornerShape(12.dp),
colors = ButtonDefaults.buttonColors(
MaterialTheme.colorScheme.background,
MaterialTheme.colorScheme.primary
),
border = BorderStroke(3.dp, MaterialTheme.colorScheme.primary.copy(alpha = 0.3f))
) {
Text(
text = category,
fontSize = 20.sp,
lineHeight = 30.sp,
textAlign = TextAlign.Center,
)
}
}
}

@Preview
@Composable
fun CategoryPreview() {
CategoryScreen(
viewModel = QuizViewModel(),
navController = NavHostController(LocalContext.current)
)
}


@Preview(showBackground = true)
@Composable
fun CategoryButtonPrev() {
CategoryButton("Animal") {}
}
```

GENERATEQUIZSCREEN.KT

```
package com.venom.quizzapp.screens

import androidx.compose.foundation.BorderStroke
import androidx.compose.foundation.background
import androidx.compose.foundation.border
import androidx.compose.foundation.layout.Arrangement
import androidx.compose.foundation.layout.Column
import androidx.compose.foundation.layout.fillMaxHeight
import androidx.compose.foundation.layout.fillMaxSize
import androidx.compose.foundation.layout.fillMaxWidth
import androidx.compose.foundation.layout.padding
import androidx.compose.foundation.shape.RoundedCornerShape
import androidx.compose.material3.Button
import androidx.compose.material3.ButtonDefaults
import androidx.compose.material3.DropdownMenuItem
import androidx.compose.material3.ExperimentalMaterial3Api
import androidx.compose.material3.ExposedDropdownMenuBox
import androidx.compose.material3.ExposedDropdownMenuDefaults
import androidx.compose.material3.MaterialTheme
import androidx.compose.material3.Scaffold
import androidx.compose.material3.Text
import androidx.compose.material3.TextField
import androidx.compose.material3.TextFieldDefaults
import androidx.compose.runtime.Composable
import androidx.compose.runtime.getValue
import androidx.compose.runtime.mutableStateOf
import androidx.compose.runtime.remember
import androidx.compose.runtime.setValue
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.platform.LocalContext
import androidx.compose.ui.text.style.TextAlign
import androidx.compose.ui.tooling.preview.Preview
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import androidx.navigation.NavHostController
import com.venom.quizzapp.Screen
import com.venom.quizzapp.model.QuizViewModel
import com.venom.quizzapp.ui.theme.QuizzappTheme

@OptIn(ExperimentalMaterial3Api::class)
@Composable
```

```
fun GenerateQuizScreen(viewModel: QuizViewModel, navController: NavHostController) {
val options = listOf("Easy", "Medium", "Hard", "Any")
var expanded by remember { mutableStateOf(false) }

QuizzappTheme {
Scaffold(
topBar = {
TopBar("Generate")
},
bottomBar = {
BottomBar(viewModel, "Generator", navController)
}
) { innerPadding ->
Column(
modifier = Modifier
.padding(innerPadding)
.background(MaterialTheme.colorScheme.background)
.fillMaxSize(),
Arrangement.Center,
Alignment.CenterHorizontally
) {
Column(
modifier = Modifier
.fillMaxWidth()
.fillMaxHeight(.8f)
.padding(20.dp),
verticalArrangement = Arrangement.SpaceBetween
) {
Column(
modifier = Modifier
.fillMaxHeight(.7f)
.fillMaxWidth(),
verticalArrangement = Arrangement.SpaceBetween,
horizontalAlignment = Alignment.CenterHorizontally
) {
Column {
Text(
text = "Enter a query to generate quiz. *",
color = MaterialTheme.colorScheme.secondary,
fontSize = 15.sp,
modifier = Modifier
.padding(10.dp)
.fillMaxWidth(),
textAlign = TextAlign.Center
)
TextField(
value = viewModel.query.value,
onValueChange = { viewModel.query.value = it },
label = { Text("Enter Subject") },
modifier = Modifier
.fillMaxWidth()
.border(
3.dp, MaterialTheme.colorScheme.primary.copy(alpha = 0.3f),
RoundedCornerShape(10.dp)
),
colors = TextFieldDefaults.colors(
focusedLabelColor = MaterialTheme.colorScheme.primary,
focusedIndicatorColor = Color.Transparent,
unfocusedLabelColor = Color.Gray,
unfocusedIndicatorColor = Color.Transparent,
cursorColor = MaterialTheme.colorScheme.primary,
unfocusedContainerColor = MaterialTheme.colorScheme.background,
focusedContainerColor = MaterialTheme.colorScheme.background,
),
shape = RoundedCornerShape(10.dp)
)
}
Column {
Text(
text = "Enter a Sub-query to generate quiz.",
color = MaterialTheme.colorScheme.secondary,
fontSize = 15.sp,
modifier = Modifier
.padding(10.dp)
.fillMaxWidth(),
textAlign = TextAlign.Center
)
TextField(
value = viewModel.subquery.value,
onValueChange = { viewModel.subquery.value = it },
label = { Text("Enter Topic") },
modifier = Modifier
.fillMaxWidth()
.border(
3.dp, MaterialTheme.colorScheme.primary.copy(alpha = 0.3f),
RoundedCornerShape(10.dp)
),
colors = TextFieldDefaults.colors(
focusedLabelColor = MaterialTheme.colorScheme.primary,
focusedIndicatorColor = Color.Transparent,
unfocusedLabelColor = Color.Gray,
unfocusedIndicatorColor = Color.Transparent,
cursorColor = MaterialTheme.colorScheme.primary,
unfocusedContainerColor = MaterialTheme.colorScheme.background,
focusedContainerColor = MaterialTheme.colorScheme.background,
),
shape = RoundedCornerShape(10.dp)
)
}
Column {
Text(
text = "Select difficulty level of the quiz.",
color = MaterialTheme.colorScheme.secondary,
fontSize = 15.sp,
modifier = Modifier
.padding(10.dp)
.fillMaxWidth(),
textAlign = TextAlign.Center
)
ExposedDropdownMenuBox(
expanded = expanded,
onExpandedChange = { expanded = !expanded }
) {
TextField(
value = viewModel.difficultylevel.value,
onValueChange = {},
readOnly = true,
trailingIcon = {
ExposedDropdownMenuDefaults.TrailingIcon(expanded = expanded)
},
modifier = Modifier
.menuAnchor()
.fillMaxWidth()
.border(
3.dp,
MaterialTheme.colorScheme.primary.copy(alpha = 0.3f),
RoundedCornerShape(10.dp)
),
colors = TextFieldDefaults.colors(
focusedLabelColor = MaterialTheme.colorScheme.primary,
focusedIndicatorColor = Color.Transparent,
unfocusedLabelColor = Color.Gray,
unfocusedIndicatorColor = Color.Transparent,
cursorColor = MaterialTheme.colorScheme.primary,
unfocusedContainerColor = MaterialTheme.colorScheme.background,
focusedContainerColor = MaterialTheme.colorScheme.background,
),
shape = RoundedCornerShape(topStart = 10.dp, topEnd = 10.dp)
)
ExposedDropdownMenu(
expanded = expanded,
onDismissRequest = { expanded = false },
modifier = Modifier
.background(MaterialTheme.colorScheme.background)
.border(
border = BorderStroke(
width = 2.dp,
color = MaterialTheme.colorScheme.primary.copy(alpha = 0.3f)
),
shape = RoundedCornerShape(
bottomEnd = 10.dp,
bottomStart = 10.dp
)
),
) {
options.forEach { option ->
DropdownMenuItem(
text = { Text(text = option) },
onClick = {
viewModel.difficultylevel.value = option
expanded = false
},
)
}
}
```

```
}
}
}
Button(
modifier = Modifier
.fillMaxWidth()
.border(
3.dp,
MaterialTheme.colorScheme.secondary,
RoundedCornerShape(10.dp)
),
onClick = {
viewModel.sendGeminiRequest()
navController.navigate(Screen.QuizScreen.route)
},
colors = ButtonDefaults.buttonColors(
containerColor = MaterialTheme.colorScheme.background,
contentColor = MaterialTheme.colorScheme.secondary
),
shape = RoundedCornerShape(10.dp),
enabled = viewModel.query.value.isNotEmpty()
) {
Text(text = "Generate", fontSize = 15.sp)
}
}
}
}
}
}

@Preview
@Composable
fun GenerateQuizPreview() {
GenerateQuizScreen(
viewModel = QuizViewModel(),
navController = NavHostController(LocalContext.current)
)
}
```

HOMESCREEN.KT

```
package com.venom.quizzapp.screens

import androidx.compose.foundation.background
import androidx.compose.foundation.layout.Arrangement
import androidx.compose.foundation.layout.Column
import androidx.compose.foundation.layout.fillMaxSize
import androidx.compose.foundation.layout.fillMaxWidth
import androidx.compose.foundation.layout.padding
import androidx.compose.material3.MaterialTheme
import androidx.compose.material3.Scaffold
import androidx.compose.material3.Text
import androidx.compose.runtime.Composable
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.platform.LocalContext
import androidx.compose.ui.text.font.FontWeight
import androidx.compose.ui.text.style.TextAlign
import androidx.compose.ui.tooling.preview.Preview
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import androidx.navigation.NavHostController
import com.venom.quizzapp.model.AuthViewModel
import com.venom.quizzapp.model.QuizViewModel
import com.venom.quizzapp.ui.theme.QuizzappTheme

@Composable
fun HomeScreen(
viewModel: QuizViewModel,
navHostController: NavHostController,
authViewModel: AuthViewModel
) {
if (!viewModel.logged.value) {
RegisterScreen(viewModel, authViewModel)
LoginScreen(viewModel, authViewModel)
}
QuizzappTheme {
Scaffold(
topBar = {
TopBar("Home")
},
bottomBar = {
BottomBar(viewModel, "Home", navHostController)
},
) { innerPadding ->
Column(
modifier = Modifier
.padding(innerPadding)
.background(MaterialTheme.colorScheme.background)
.fillMaxSize(),
horizontalAlignment = Alignment.CenterHorizontally,
verticalArrangement = Arrangement.Center
) {
when {
viewModel.triviaState.value.loading -> {
AnimatedLogo()
}

viewModel.triviaState.value.error != null -> {
Text(
text = "ERROR OCCURRED",
fontSize = 25.sp,
color = MaterialTheme.colorScheme.error
)
SubmitButton(text = "Reload") { viewModel.fetchTrivia() }
}

else -> {
//Display trivia fact
Column(
modifier = Modifier
.padding(20.dp)
.fillMaxWidth(),
verticalArrangement = Arrangement.Center,
horizontalAlignment = Alignment.CenterHorizontally
) {
Text(
text = "Trivia",
fontSize = 30.sp,
textAlign = TextAlign.Center,
color = MaterialTheme.colorScheme.secondary,
fontWeight = FontWeight.ExtraBold,
modifier = Modifier.padding(bottom = 20.dp)
)
Text(
text = viewModel.triviaState.value.fact!!.text,
fontSize = 25.sp,
textAlign = TextAlign.Center,
color = MaterialTheme.colorScheme.primary,
fontWeight = FontWeight.ExtraBold,
lineHeight = 50.sp
)
}
}
}
}
}
}
}

@Preview
@Composable
fun HomePreview() {
HomeScreen(
viewModel = QuizViewModel(),
navHostController = NavHostController(LocalContext.current),
authViewModel = AuthViewModel()
)
}
```

LEADERBOARDSCREEN.KT

```
package com.venom.quizzapp.screens

import androidx.compose.foundation.background
import androidx.compose.foundation.border
import androidx.compose.foundation.layout.Arrangement
import androidx.compose.foundation.layout.Column
import androidx.compose.foundation.layout.Row
import androidx.compose.foundation.layout.fillMaxSize
import androidx.compose.foundation.layout.fillMaxWidth
import androidx.compose.foundation.layout.height
import androidx.compose.foundation.layout.padding
import androidx.compose.foundation.lazy.LazyColumn
import androidx.compose.foundation.lazy.items
import androidx.compose.foundation.shape.RoundedCornerShape
import androidx.compose.material3.MaterialTheme
import androidx.compose.material3.Scaffold
import androidx.compose.material3.Text
import androidx.compose.runtime.Composable
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.platform.LocalContext
import androidx.compose.ui.text.font.FontWeight
import androidx.compose.ui.tooling.preview.Preview
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import androidx.navigation.NavHostController
import com.venom.quizzapp.model.LeaderBoardItem
import com.venom.quizzapp.model.QuizViewModel
import com.venom.quizzapp.ui.theme.QuizzappTheme

@Composable
fun LeaderBoardScreen(viewModel: QuizViewModel, navController: NavHostController) {
Scaffold(
topBar = { TopBar("Leaderboard") },
bottomBar = {
BottomBar(viewModel, "Leaderboard", navController)
}
) { innerPadding ->
Column(
modifier = Modifier
.padding(innerPadding)
.background(MaterialTheme.colorScheme.background)
.fillMaxSize()
.padding(top = 20.dp, bottom = 20.dp),
horizontalAlignment = Alignment.CenterHorizontally
) {
//TODO Change the value inside the function.
Row(
modifier = Modifier
.fillMaxWidth(.9F)
.height(50.dp)
.border(
2.dp,
MaterialTheme.colorScheme.primary.copy(alpha = 0.6f),
RoundedCornerShape(10.dp)
)
.padding(start = 15.dp, end = 15.dp),
verticalAlignment = Alignment.CenterVertically,
horizontalArrangement = Arrangement.SpaceBetween
) {
Text(
text = "RANK",
fontSize = 20.sp,
fontWeight = FontWeight.ExtraBold,
color = MaterialTheme.colorScheme.secondary,
maxLines = 1
)
Text(
text = "NAME",
fontSize = 20.sp,
fontWeight = FontWeight.ExtraBold,
color = MaterialTheme.colorScheme.secondary,
maxLines = 1
)
Text(
text = "SCORE",
fontSize = 20.sp,
fontWeight = FontWeight.ExtraBold,
color = MaterialTheme.colorScheme.secondary,
maxLines = 1
)
}
LeaderboardList(viewModel.leaderBoardItems)
}
}
}

@Composable
fun LeaderboardList(leaderboard: List<LeaderBoardItem>) {
LazyColumn(
modifier = Modifier
.fillMaxWidth()
.padding(top = 10.dp),
verticalArrangement = Arrangement.spacedBy(20.dp),
horizontalAlignment = Alignment.CenterHorizontally
) {
items(leaderboard) { item ->
LeaderboardColumn(
rank = item.rank.toString(),
name = item.name,
score = item.score.toString()
)
}
}
}

@Composable
fun LeaderboardColumn(rank: String, name: String, score: String) {
Row(
modifier = Modifier
.fillMaxWidth(.9f)
.border(
2.dp,
MaterialTheme.colorScheme.primary.copy(alpha = 0.3f),
RoundedCornerShape(20.dp)
)
.height(50.dp)
.padding(start = 30.dp, end = 20.dp),
verticalAlignment = Alignment.CenterVertically,
horizontalArrangement = Arrangement.SpaceBetween
) {
Text(
text = rank,
fontSize = 20.sp,
fontWeight = FontWeight.Normal,
color = MaterialTheme.colorScheme.primary,
maxLines = 1
)
Text(
text = name,
fontSize = 20.sp,
fontWeight = FontWeight.Normal,
color = MaterialTheme.colorScheme.primary,
maxLines = 1
)
Text(
text = score,
fontSize = 20.sp,
fontWeight = FontWeight.Normal,
color = MaterialTheme.colorScheme.primary,
maxLines = 1
)
}
}

@Preview
@Composable
fun LeaderboardPreview() {
QuizzappTheme {
LeaderBoardScreen(QuizViewModel(), NavHostController(LocalContext.current))
}
}
```

LOGINSCREEN.KT

```
package com.venom.quizzapp.screens

import androidx.compose.foundation.background
import androidx.compose.foundation.border
import androidx.compose.foundation.layout.Arrangement
import androidx.compose.foundation.layout.Column
import androidx.compose.foundation.layout.IntrinsicSize
import androidx.compose.foundation.layout.Row
import androidx.compose.foundation.layout.fillMaxWidth
import androidx.compose.foundation.layout.height
import androidx.compose.foundation.layout.padding
import androidx.compose.foundation.shape.RoundedCornerShape
import androidx.compose.foundation.text.KeyboardOptions
import androidx.compose.material3.BasicAlertDialog
import androidx.compose.material3.Button
import androidx.compose.material3.ButtonDefaults
import androidx.compose.material3.ExperimentalMaterial3Api
import androidx.compose.material3.MaterialTheme
import androidx.compose.material3.Text
import androidx.compose.material3.TextButton
import androidx.compose.material3.TextField
import androidx.compose.material3.TextFieldDefaults
import androidx.compose.runtime.Composable
import androidx.compose.runtime.LaunchedEffect
import androidx.compose.runtime.getValue
import androidx.compose.runtime.livedata.observeAsState
import androidx.compose.runtime.mutableStateOf
import androidx.compose.runtime.remember
import androidx.compose.runtime.setValue
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.text.font.FontWeight
import androidx.compose.ui.text.input.KeyboardType
import androidx.compose.ui.text.input.PasswordVisualTransformation
import androidx.compose.ui.text.style.TextAlign
import androidx.compose.ui.tooling.preview.Preview
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import com.venom.quizzapp.model.AuthViewModel
import com.venom.quizzapp.model.QuizViewModel
import com.venom.quizzapp.model.Result
import com.venom.quizzapp.ui.theme.QuizzappTheme
import kotlinx.coroutines.delay

@OptIn(ExperimentalMaterial3Api::class)
@Composable
fun LoginScreen(viewModel: QuizViewModel, authViewModel: AuthViewModel) {
var email by remember { mutableStateOf("") }
var password by remember { mutableStateOf("") }
val result by authViewModel.authResult.observeAsState()
var message by remember { mutableStateOf("") }
var textColor by remember { mutableStateOf(Color.Green) }


if (viewModel.loginDialogue.value) {
BasicAlertDialog(
modifier = Modifier
.background(
MaterialTheme.colorScheme.background,
shape = RoundedCornerShape(20.dp)
)
.border(
3.dp,
MaterialTheme.colorScheme.primary.copy(alpha = 0.6f),
RoundedCornerShape(20.dp)
),
onDismissRequest = {
viewModel.loginDialogue.value = false // Handle dismissing the dialog
}, content = {
Column(
modifier = Modifier.padding(20.dp),
horizontalAlignment = Alignment.End
) {
Text(
text = "Login",
fontSize = 30.sp,
modifier = Modifier.fillMaxWidth(),
textAlign = TextAlign.Center,
fontWeight = FontWeight.ExtraBold,
color = MaterialTheme.colorScheme.primary
```

```
)
TextField(
value = email,
onValueChange = { email = it },
label = { Text("Email") },
modifier = Modifier
.fillMaxWidth()
.padding(vertical = 8.dp)
.border(
1.dp, MaterialTheme.colorScheme.primary.copy(alpha = 0.3f),
RoundedCornerShape(10.dp, 10.dp)
),
colors = TextFieldDefaults.colors(
focusedLabelColor = MaterialTheme.colorScheme.primary,
focusedIndicatorColor = MaterialTheme.colorScheme.secondary,
unfocusedLabelColor = Color.Gray,
unfocusedIndicatorColor = Color.Gray,
cursorColor = MaterialTheme.colorScheme.primary,
unfocusedContainerColor = MaterialTheme.colorScheme.background,
focusedContainerColor = MaterialTheme.colorScheme.background
),
shape = RoundedCornerShape(10.dp, 10.dp)
)
TextField(
value = password,
onValueChange = { password = it },
label = { Text("Password") },
visualTransformation = PasswordVisualTransformation(),
keyboardOptions = KeyboardOptions(keyboardType = KeyboardType.Password),
modifier = Modifier
.fillMaxWidth()
.padding(vertical = 8.dp)
.border(
1.dp, MaterialTheme.colorScheme.primary.copy(alpha = 0.3f),
),
colors = TextFieldDefaults.colors(
focusedLabelColor = MaterialTheme.colorScheme.primary,
focusedIndicatorColor = MaterialTheme.colorScheme.secondary,
unfocusedLabelColor = Color.Gray,
unfocusedIndicatorColor = Color.Gray,
cursorColor = MaterialTheme.colorScheme.primary,
unfocusedContainerColor = MaterialTheme.colorScheme.background,
focusedContainerColor = MaterialTheme.colorScheme.background
),

)
Row(
modifier = Modifier.fillMaxWidth(),
horizontalArrangement = Arrangement.SpaceBetween
) {
TextButton(
onClick = {
//TODO Add Forgot password page.
},
colors = ButtonDefaults.buttonColors(
containerColor = Color.Transparent,
contentColor = MaterialTheme.colorScheme.secondary
)
) {
Text(
text = "Forgot Password?",
textAlign = TextAlign.Center,
)
}
if (message.isNotEmpty()) {
Text(
text = message,
textAlign = TextAlign.Center,
color = textColor
)
LaunchedEffect(Unit) {
delay(3000) // 3 seconds
message = ""
}
}
Button(
modifier = Modifier
.border(
2.dp,
MaterialTheme.colorScheme.secondary,
RoundedCornerShape(20.dp)
)
.height(40.dp),
onClick = { // Handle the login action
if (email.isNotEmpty() && password.isNotEmpty()) {
authViewModel.login(email, password)
when (result) {
is Result.Success -> {
textColor = Color.Green
message = "Success"
viewModel.logged.value = true
viewModel.loginDialogue.value = false
}

is Result.Error -> {
textColor = Color.Red
message = "Error"
}

else -> {

}
}
}
},
colors = ButtonDefaults.buttonColors(
containerColor = Color.Black,
contentColor = MaterialTheme.colorScheme.secondary
)
) {
```

```
Text(text = "Login", fontSize = 20.sp)
}
}
Row(
modifier = Modifier
.fillMaxWidth()
.padding(top = 20.dp)
.height(IntrinsicSize.Min),
horizontalArrangement = Arrangement.Center,
verticalAlignment = Alignment.CenterVertically
) {
Text(
text = "Don't have an account?",
textAlign = TextAlign.Center,
color = MaterialTheme.colorScheme.primary,
fontSize = 14.sp
)
TextButton(
onClick = {
viewModel.loginDialogue.value = false
viewModel.registerDialogue.value = true
},
colors = ButtonDefaults.buttonColors(
containerColor = Color.Transparent,
contentColor = MaterialTheme.colorScheme.secondary
)
) {
Text(
text = "Register",
textAlign = TextAlign.Center,
)
}
}

}
}
)
}
}

@Preview(showBackground = true)
@Composable
fun LoginScreenPreview() {
QuizzappTheme {
LoginScreen(QuizViewModel(), AuthViewModel())
}
}
```

PROFILESCREEN.KT

```
package com.venom.quizzapp.screens

import androidx.compose.foundation.background
import androidx.compose.foundation.layout.Arrangement
import androidx.compose.foundation.layout.Column
import androidx.compose.foundation.layout.Row
import androidx.compose.foundation.layout.fillMaxSize
import androidx.compose.foundation.layout.padding
import androidx.compose.material3.MaterialTheme
import androidx.compose.material3.Scaffold
import androidx.compose.material3.Text
import androidx.compose.runtime.Composable
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.platform.LocalContext
import androidx.compose.ui.text.font.FontWeight
import androidx.compose.ui.text.style.TextAlign
import androidx.compose.ui.tooling.preview.Preview
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import androidx.navigation.NavHostController
import com.venom.quizzapp.model.AuthViewModel
import com.venom.quizzapp.model.QuizViewModel
import com.venom.quizzapp.ui.theme.QuizzappTheme

@Composable
fun ProfileScreen(
viewModel: QuizViewModel,
navController: NavHostController,
authViewModel: AuthViewModel
) {
QuizzappTheme {
Scaffold(
topBar = {
TopBar("Profile")
},
bottomBar = {
BottomBar(viewModel, "Profile", navController)
},
) { innerPadding ->
Column(
modifier = Modifier
.padding(innerPadding)
.background(MaterialTheme.colorScheme.background)
.fillMaxSize(),
verticalArrangement = Arrangement.Center,
horizontalAlignment = Alignment.CenterHorizontally
) {
LoginScreen(viewModel = viewModel, authViewModel = authViewModel)
RegisterScreen(viewModel = viewModel, authViewModel = authViewModel)
if (viewModel.logged.value) {
Row {
//TODO Write profile page.
Text(
text = "Already logged in",
fontSize = 50.sp,
textAlign = TextAlign.Center,
color = MaterialTheme.colorScheme.primary,
fontWeight = FontWeight.ExtraBold,
modifier = Modifier.padding(bottom = 50.dp),
lineHeight = 50.sp
)
}
} else {
Text(
text = "Please Login First",
fontSize = 50.sp,
textAlign = TextAlign.Center,
color = MaterialTheme.colorScheme.primary,
fontWeight = FontWeight.ExtraBold,
modifier = Modifier.padding(bottom = 50.dp),
lineHeight = 50.sp
)
SubmitButton(text = "Login") {
viewModel.loginDialogue.value = true
}
}
}
}
}
}

@Preview
@Composable
fun ProfilePreview() {
ProfileScreen(
viewModel = QuizViewModel(),
navController = NavHostController(LocalContext.current),
authViewModel = AuthViewModel()
)
}
```

QUIZSCREEN.KT

```
package com.venom.quizzapp.screens

import android.text.Html
import androidx.compose.foundation.BorderStroke
import androidx.compose.foundation.background
import androidx.compose.foundation.layout.Arrangement
import androidx.compose.foundation.layout.Column
import androidx.compose.foundation.layout.PaddingValues
import androidx.compose.foundation.layout.Row
import androidx.compose.foundation.layout.fillMaxHeight
import androidx.compose.foundation.layout.fillMaxSize
import androidx.compose.foundation.layout.fillMaxWidth
import androidx.compose.foundation.layout.padding
import androidx.compose.foundation.layout.size
import androidx.compose.foundation.lazy.LazyColumn
import androidx.compose.foundation.lazy.itemsIndexed
import androidx.compose.foundation.shape.CircleShape
import androidx.compose.foundation.shape.RoundedCornerShape
import androidx.compose.material3.Button
import androidx.compose.material3.ButtonColors
import androidx.compose.material3.ButtonDefaults
import androidx.compose.material3.MaterialTheme
import androidx.compose.material3.Scaffold
import androidx.compose.material3.Text
import androidx.compose.runtime.Composable
import androidx.compose.runtime.mutableStateListOf
import androidx.compose.runtime.remember
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.platform.LocalContext
import androidx.compose.ui.text.font.FontWeight
import androidx.compose.ui.text.style.TextAlign
import androidx.compose.ui.tooling.preview.Preview
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import androidx.navigation.NavHostController
import com.venom.quizzapp.Screen
import com.venom.quizzapp.model.QuizViewModel
import com.venom.quizzapp.ui.theme.QuizzappTheme

@Composable
fun QuizScreen(viewModel: QuizViewModel, navController: NavHostController) {
val optionColor = MaterialTheme.colorScheme.background
val selectedOpt = MaterialTheme.colorScheme.secondary
val buttonColors =
remember { mutableStateListOf(optionColor, optionColor, optionColor, optionColor) }


fun updateButtonColors(selectedIndex: Int) {
buttonColors.fill(optionColor)
buttonColors[selectedIndex] = selectedOpt
}

fun decodeHtml(encodedString: String): String {
return Html.fromHtml(encodedString, Html.FROM_HTML_MODE_LEGACY).toString()
}

var selectedOption: String? = null

Scaffold(
topBar = { TopBar("Quiz-Time") }
) { innerPadding ->
Column(
modifier = Modifier
.padding(innerPadding)
.background(MaterialTheme.colorScheme.background)
.fillMaxSize(),
horizontalAlignment = Alignment.CenterHorizontally,
verticalArrangement = Arrangement.Center
) {
when {
viewModel.questionsState.value.loading -> {
AnimatedLogo()
}

viewModel.questionsState.value.error != null -> {
Text(
text = "ERROR OCCURRED",
color = MaterialTheme.colorScheme.error,
fontSize = 25.sp
)
}

else -> {
Text(
modifier = Modifier.padding(30.dp, 20.dp, 30.dp, 10.dp),
text = "Q${viewModel.currentPosition + 1}. " + decodeHtml(viewModel.question.value),
fontSize = 20.sp,
fontWeight = FontWeight.Bold,
color = MaterialTheme.colorScheme.primary,
lineHeight = 25.sp
)
TenButtonsInTwoRows(viewModel, viewModel.selectedOptions)
LazyColumn(
modifier = Modifier
.padding(horizontal = 30.dp)
.fillMaxHeight(.8f)
.fillMaxWidth(),
verticalArrangement = Arrangement.SpaceEvenly,
horizontalAlignment = Alignment.CenterHorizontally
) {
itemsIndexed(viewModel.options.value) { index, item ->
Button(
onClick = {
updateButtonColors(index)
selectedOption = item
},
modifier = Modifier
.fillMaxWidth(),
shape = RoundedCornerShape(12.dp),
colors = ButtonDefaults.outlinedButtonColors(
containerColor = buttonColors[index],
contentColor = MaterialTheme.colorScheme.primary
),
border = BorderStroke(
2.dp,
MaterialTheme.colorScheme.primary.copy(alpha = 0.6f)
)
) {
Text(
text = decodeHtml(item),
fontSize = 18.sp,
lineHeight = 25.sp,
color = MaterialTheme.colorScheme.primary,
textAlign = TextAlign.Center
)
}
}
}
SubmitButton(text = if (viewModel.currentPosition == 9) "Finish" else "Next") {
buttonColors.fill(optionColor)
viewModel.updateQuestion(selectedOption)
```

```
if (viewModel.navigateToScore.value) {
navController.navigate(Screen.Answer.route)
}
selectedOption = null
}
}
}
}
}
}

@Composable
fun TenButtonsInTwoRows(
viewModel: QuizViewModel,
items: List<String?>
) { // Replace String with your data type
Column(
modifier = Modifier.fillMaxWidth()
) {
// First row with 5 buttons
Row(
modifier = Modifier.fillMaxWidth(),
horizontalArrangement = Arrangement.SpaceEvenly
) {
for (i in 0 until 5) {
Button(
onClick = { viewModel.updatePosition(i) },
modifier = Modifier
.size(40.dp) // Same size for consistency
.padding(5.dp),
shape = CircleShape,
contentPadding = PaddingValues(0.dp),
colors = ButtonColors(
containerColor = if (viewModel.selectedOptions[i] != null) Color.Green else if (i ==
viewModel.currentPosition) Color.Cyan else Color.Red,
contentColor = MaterialTheme.colorScheme.primary,
disabledContainerColor = Color.Black,
disabledContentColor = Color.Black
)
) {
Text(text = (i + 1).toString(), fontSize = 24.sp)
}
}
}
// Second row with 5 buttons
Row(
modifier = Modifier.fillMaxWidth(),
horizontalArrangement = Arrangement.SpaceEvenly
) {
for (i in 5 until 10) {
Button(
onClick = { viewModel.updatePosition(i) },
modifier = Modifier
.size(40.dp) // Same size for consistency
.padding(5.dp),
shape = CircleShape,
contentPadding = PaddingValues(0.dp),
colors = ButtonColors(
containerColor = if (viewModel.selectedOptions[i] != null) Color.Green else if (i ==
viewModel.currentPosition) Color.Cyan else Color.Red,
contentColor = MaterialTheme.colorScheme.primary,
disabledContainerColor = Color.Black,
disabledContentColor = Color.Black
)
) {
Text(text = (i + 1).toString(), fontSize = 24.sp)
}
}
}
}
}


@Preview(showBackground = true)
@Composable
fun QuizScreenPreview() {
QuizzappTheme {
val viewModel = QuizViewModel()
val context = LocalContext.current
QuizScreen(viewModel, NavHostController(context))
}
}
```

REGISTERSCREEN.KT

```
package com.venom.quizzapp.screens

import androidx.compose.foundation.background
import androidx.compose.foundation.border
import androidx.compose.foundation.layout.Arrangement
import androidx.compose.foundation.layout.Column
import androidx.compose.foundation.layout.IntrinsicSize
import androidx.compose.foundation.layout.Row
import androidx.compose.foundation.layout.fillMaxWidth
import androidx.compose.foundation.layout.height
import androidx.compose.foundation.layout.padding
import androidx.compose.foundation.shape.RoundedCornerShape
import androidx.compose.foundation.text.KeyboardOptions
import androidx.compose.material3.BasicAlertDialog
import androidx.compose.material3.Button
import androidx.compose.material3.ButtonDefaults
import androidx.compose.material3.ExperimentalMaterial3Api
import androidx.compose.material3.MaterialTheme
import androidx.compose.material3.Text
import androidx.compose.material3.TextButton
import androidx.compose.material3.TextField
import androidx.compose.material3.TextFieldDefaults
import androidx.compose.runtime.Composable
import androidx.compose.runtime.LaunchedEffect
import androidx.compose.runtime.getValue
import androidx.compose.runtime.livedata.observeAsState
import androidx.compose.runtime.mutableStateOf
import androidx.compose.runtime.remember
import androidx.compose.runtime.setValue
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.text.font.FontWeight
import androidx.compose.ui.text.input.KeyboardType
import androidx.compose.ui.text.input.PasswordVisualTransformation
import androidx.compose.ui.text.style.TextAlign
import androidx.compose.ui.tooling.preview.Preview
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import com.venom.quizzapp.model.AuthViewModel
import com.venom.quizzapp.model.QuizViewModel
import com.venom.quizzapp.model.Result
import com.venom.quizzapp.ui.theme.QuizzappTheme
import kotlinx.coroutines.delay

@OptIn(ExperimentalMaterial3Api::class)
@Composable
fun RegisterScreen(viewModel: QuizViewModel, authViewModel: AuthViewModel) {
var username by remember { mutableStateOf("") }
var email by remember { mutableStateOf("") }
var password by remember { mutableStateOf("") }
val result by authViewModel.authResult.observeAsState()
var message by remember { mutableStateOf("") }
var textColor by remember { mutableStateOf(Color.Green) }

val textFieldColor = TextFieldDefaults.colors(
focusedLabelColor = MaterialTheme.colorScheme.primary,
focusedIndicatorColor = MaterialTheme.colorScheme.secondary,
unfocusedLabelColor = Color.Gray,
unfocusedIndicatorColor = Color.Gray,
cursorColor = MaterialTheme.colorScheme.primary,
unfocusedContainerColor = MaterialTheme.colorScheme.background,
focusedContainerColor = MaterialTheme.colorScheme.background
)

if (viewModel.registerDialogue.value) {
BasicAlertDialog(
modifier = Modifier
.background(
MaterialTheme.colorScheme.background,
shape = RoundedCornerShape(20.dp)
)
.border(
3.dp,
MaterialTheme.colorScheme.primary.copy(alpha = 0.6f),
RoundedCornerShape(20.dp)
),
onDismissRequest = {
viewModel.registerDialogue.value = false // Handle dismissing the dialog
}, content = {
Column(
modifier = Modifier.padding(20.dp),
horizontalAlignment = Alignment.End
) {
Text(
text = "Register",
fontSize = 30.sp,
modifier = Modifier.fillMaxWidth(),
textAlign = TextAlign.Center,
fontWeight = FontWeight.ExtraBold,
color = MaterialTheme.colorScheme.primary
)
TextField(
value = username,
onValueChange = { username = it },
label = { Text("Username") },
modifier = Modifier
.fillMaxWidth()
.padding(vertical = 8.dp)
.border(
1.dp, MaterialTheme.colorScheme.primary.copy(alpha = 0.3f),
RoundedCornerShape(10.dp, 10.dp)
),
colors = textFieldColor
)
TextField(
value = email,
onValueChange = { email = it },
label = { Text("Email") },
keyboardOptions = KeyboardOptions(keyboardType = KeyboardType.Email),
modifier = Modifier
.fillMaxWidth()
.padding(vertical = 8.dp)
.border(
1.dp, MaterialTheme.colorScheme.primary.copy(alpha = 0.3f),
),
colors = textFieldColor
)
TextField(
value = password,
onValueChange = { password = it },
label = { Text("Password") },
visualTransformation = PasswordVisualTransformation(),
keyboardOptions = KeyboardOptions(keyboardType = KeyboardType.Password),
modifier = Modifier
.fillMaxWidth()
.padding(vertical = 8.dp)
.border(
1.dp, MaterialTheme.colorScheme.primary.copy(alpha = 0.3f),
),
colors = textFieldColor
)
if (message.isNotEmpty()) {
Text(
text = message,
textAlign = TextAlign.Center,
color = textColor
)
LaunchedEffect(Unit) {
delay(3000) // 3 seconds
message = ""
}
}
Button(
modifier = Modifier
.border(
2.dp,
MaterialTheme.colorScheme.secondary,
RoundedCornerShape(20.dp)
)
.height(40.dp),
onClick = { //TODO Handle the Register action
if (email.isNotEmpty() && password.isNotEmpty() && username.isNotEmpty()) {
authViewModel.signUp(email, password, username)
when (result) {
is Result.Success -> {
textColor = Color.Green
message = "Success"
viewModel.registerDialogue.value = false
viewModel.loginDialogue.value = true
}

is Result.Error -> {
textColor = Color.Red
message = "Error"
}

else -> {

}
}

}
},
colors = ButtonDefaults.buttonColors(
containerColor = Color.Black,
contentColor = MaterialTheme.colorScheme.secondary
)
) {
Text(text = "Register", fontSize = 14.sp)
}

Row(
modifier = Modifier
.fillMaxWidth()
.padding(top = 20.dp)
.height(IntrinsicSize.Min),
horizontalArrangement = Arrangement.Center,
verticalAlignment = Alignment.CenterVertically
) {
Text(
text = "Already have account?",
textAlign = TextAlign.Center,
color = MaterialTheme.colorScheme.primary,
)
TextButton(
onClick = {
viewModel.registerDialogue.value = false
viewModel.loginDialogue.value = true
},
colors = ButtonDefaults.buttonColors(
containerColor = Color.Transparent,
contentColor = MaterialTheme.colorScheme.secondary
)
) {
Text(
text = "Login",
textAlign = TextAlign.Center,
)
}
}

}
})
}
}

@Preview(showBackground = true)
@Composable
fun RegisterScreenPreview() {
QuizzappTheme {
RegisterScreen(QuizViewModel(), AuthViewModel())
}
}
```

SCORESCREEN.KT

```
package com.venom.quizzapp.screens

import androidx.compose.foundation.Image
import androidx.compose.foundation.background
import androidx.compose.foundation.layout.Arrangement
import androidx.compose.foundation.layout.Column
import androidx.compose.foundation.layout.IntrinsicSize
import androidx.compose.foundation.layout.fillMaxSize
import androidx.compose.foundation.layout.padding
import androidx.compose.foundation.layout.width
import androidx.compose.material3.MaterialTheme
import androidx.compose.material3.Scaffold
import androidx.compose.material3.Text
import androidx.compose.runtime.Composable
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.platform.LocalContext
import androidx.compose.ui.res.painterResource
import androidx.compose.ui.text.font.FontWeight
import androidx.compose.ui.text.style.TextAlign
import androidx.compose.ui.tooling.preview.Preview
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import androidx.navigation.NavHostController
import com.venom.quizzapp.R
import com.venom.quizzapp.Screen
import com.venom.quizzapp.model.QuizViewModel
import com.venom.quizzapp.ui.theme.QuizzappTheme

@Composable
fun ScoreScreen(viewModel: QuizViewModel, navController: NavHostController) {
QuizzappTheme {
Scaffold(
topBar = {
TopBar(name = "Score")
}
) { innerPadding ->
Column(
modifier = Modifier
.padding(innerPadding)
.background(MaterialTheme.colorScheme.background)
.fillMaxSize(),
verticalArrangement = Arrangement.Center,
horizontalAlignment = Alignment.CenterHorizontally
) {
Column(
modifier = Modifier.padding(30.dp),
verticalArrangement = Arrangement.Center,
horizontalAlignment = Alignment.CenterHorizontally
) {
Text(
text = if (viewModel.totalScore > 5) "Congratulations" else "Better luck next time",
fontSize = 35.sp,
color = MaterialTheme.colorScheme.primary,
fontWeight = FontWeight.Bold,
textAlign = TextAlign.Center,
lineHeight = 40.sp
)
Image(
modifier = Modifier.padding(20.dp),
painter = painterResource(id = R.drawable.trophy_logo),
contentDescription = "Trophy Image"
)
Text(
text = "Your score is ${viewModel.totalScore}",
fontSize = 35.sp,
color = MaterialTheme.colorScheme.primary,
modifier = Modifier
.width(IntrinsicSize.Max)
.padding(bottom = 30.dp),
lineHeight = 50.sp,
fontWeight = FontWeight.Bold,
textAlign = TextAlign.Center
)
SubmitButton(text = "Finish") {
```

```
navController.navigate(Screen.Home.route)
viewModel.resetAllVariables()
}
}
}
}
}
}

@Preview(showBackground = true)
@Composable
fun ScoreScreenPreview() {
ScoreScreen(QuizViewModel(), NavHostController(LocalContext.current))
}
```

COMPONENTS.KT

```
package com.venom.quizzapp.screens

import androidx.compose.foundation.border
import androidx.compose.foundation.layout.*
import androidx.compose.foundation.shape.RoundedCornerShape
import androidx.compose.material3.*
import androidx.compose.runtime.Composable
import androidx.compose.runtime.mutableStateListOf
import androidx.compose.runtime.remember
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.platform.LocalContext
import androidx.compose.ui.res.painterResource
import androidx.compose.ui.text.font.FontWeight
import androidx.compose.ui.text.style.TextAlign
import androidx.compose.ui.tooling.preview.Preview
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import androidx.navigation.NavHostController
import com.venom.quizzapp.R
import com.venom.quizzapp.Screen
import com.venom.quizzapp.model.QuizViewModel
import com.venom.quizzapp.ui.theme.QuizzappTheme


@Composable
fun TopBar(name: String) {
QuizzappTheme {
Column(
modifier = Modifier.padding(top = 40.dp),
verticalArrangement = Arrangement.Center,
) {
HorizontalDivider(
color = MaterialTheme.colorScheme.primary.copy(alpha = 0.3f),
modifier = Modifier
.fillMaxWidth(),
thickness = 2.dp
)
Text(
textAlign = TextAlign.Center,
text = name.uppercase(),
fontSize = 40.sp,
modifier = Modifier
.fillMaxWidth()
.height(60.dp),
fontWeight = FontWeight.ExtraBold,
lineHeight = 60.sp
)
HorizontalDivider(
color = MaterialTheme.colorScheme.primary.copy(alpha = 0.3f),
modifier = Modifier
.fillMaxWidth(),
thickness = 2.dp
)
}
}
}

data class NavItem(val label: String, val route: String, val icon: Int, val index: Int)

@Composable
fun BottomBar(viewModel: QuizViewModel, name: String, navController: NavHostController) {
QuizzappTheme {
val iconSize = 40.dp
val iconColor = MaterialTheme.colorScheme.primary.copy(alpha = 0.6f)
val selectedIconColor = MaterialTheme.colorScheme.secondary
val buttonColors =
remember { mutableStateListOf(iconColor, iconColor, iconColor, iconColor, iconColor) }

val navItems = listOf(
NavItem("Home", Screen.Home.route, R.drawable.round_home_24, 0),
NavItem("Category", Screen.Categories.route, R.drawable.round_category_24, 1),
NavItem("Generator", Screen.Generator.route, R.drawable.ai_ml_icon, 2),
NavItem("Leaderboard", Screen.Leaderboard.route, R.drawable.round_leaderboard_24, 3),
NavItem("Profile", Screen.Profile.route, R.drawable.round_person_24, 4)
)

val enabled = remember { mutableStateListOf(true, true, true, true, true) }

fun updateButtonColors(selectedIndex: Int) {
buttonColors.fill(iconColor) // Reset all to white
buttonColors[selectedIndex] = selectedIconColor// Highlight the selected button
enabled[selectedIndex] = false
}

navItems.firstOrNull { it.label == name }?.let { updateButtonColors(it.index) }

Column(
modifier = Modifier
.fillMaxWidth()
.height(60.dp)
) {
HorizontalDivider(
color = MaterialTheme.colorScheme.primary.copy(alpha = 0.3f),
modifier = Modifier
.fillMaxWidth(),
thickness = 2.dp
)
Row(
modifier = Modifier
.fillMaxWidth(),
horizontalArrangement = Arrangement.SpaceAround
) {
navItems.forEach { item ->
IconButton(
onClick = {
navController.navigate(item.route)
updateButtonColors(item.index)
if (item.label == "Home") {
viewModel.fetchTrivia()
} else if (item.label == "Generator") {
viewModel.resetGenerateValues()
}
},
enabled = enabled[item.index]
) {
Icon(
painter = painterResource(id = item.icon),
contentDescription = "${item.label} Button",
modifier = Modifier.size(iconSize),
tint = buttonColors[item.index]
)
}
}
}
}
}
}

@Composable
fun SubmitButton(text: String, width: Float = 0.8f, onClick: () -> Unit) {
QuizzappTheme {
Button(
modifier = Modifier
.fillMaxWidth(width)
.border(3.dp, MaterialTheme.colorScheme.secondary, RoundedCornerShape(25.dp))
.height(50.dp),
onClick = onClick,
colors = ButtonDefaults.buttonColors(
containerColor = Color.Black,
contentColor = MaterialTheme.colorScheme.secondary
)
) {
Text(text = text.uppercase(), fontSize = 25.sp, textAlign = TextAlign.Center)
}
}
}

@Preview(showBackground = true)
```

```
@Composable
fun TopPreview() {
TopBar("Trivia")
}

@Preview(showBackground = true)
@Composable
fun BottomPreview() {
QuizzappTheme {
val context = LocalContext.current
BottomBar(QuizViewModel(), name = "Home", navController = NavHostController(context))
}
}

@Preview(showBackground = true)
@Composable
fun SubmitPreview() {
SubmitButton("Submit") {

}
}
```

STEP 6: SET UP NAVIGATION

NAVIGATION.KT

```
package com.venom.quizzapp


import androidx.compose.runtime.Composable
import androidx.navigation.compose.NavHost
import androidx.navigation.NavHostController
import androidx.navigation.compose.composable
import com.venom.quizzapp.model.AuthViewModel
import com.venom.quizzapp.screens.HomeScreen
import com.venom.quizzapp.screens.LeaderBoardScreen
import com.venom.quizzapp.screens.ProfileScreen
import com.venom.quizzapp.screens.QuizScreen
import com.venom.quizzapp.model.QuizViewModel
import com.venom.quizzapp.screens.AnswerScreen
import com.venom.quizzapp.screens.CategoryScreen
import com.venom.quizzapp.screens.GenerateQuizScreen
import com.venom.quizzapp.screens.ScoreScreen


sealed class Screen(val route: String) {
   data object Home : Screen("Home")
   data object Profile : Screen("Profile")
   data object Leaderboard : Screen("Leaderboard")
   data object QuizScreen : Screen("QuizScreen")
   data object Categories : Screen("Categories")
```

```
    data object Score : Screen("Score")
    data object Answer : Screen("Answer")
    data object Generator : Screen("Generator")
}

@Composable
fun MainScreen(
    viewModel: QuizViewModel,
    navController: NavHostController,
    authViewModel: AuthViewModel
) {

    NavHost(navController = navController, startDestination = Screen.Home.route) {
        //Bottom Navigation Options
        composable(Screen.Home.route) {
            HomeScreen(viewModel, navController, authViewModel)
        }
        composable(Screen.Categories.route) {
            CategoryScreen(viewModel, navController)
        }
        composable(Screen.Generator.route) {
            GenerateQuizScreen(viewModel, navController)
        }
        composable(Screen.Leaderboard.route) {
            LeaderBoardScreen(viewModel, navController)
        }
        composable(Screen.Profile.route) {
            ProfileScreen(viewModel, navController, authViewModel)
        }

        //Hidden Navigation Options
        composable(Screen.QuizScreen.route) {
            QuizScreen(viewModel, navController)
        }
        composable(Screen.Score.route) {
            ScoreScreen(viewModel, navController)
        }
        composable(Screen.Answer.route) {
            AnswerScreen(viewModel, navController)
        }
    }
}
```

STEP 7: UPDATE MAINACTIVITY

MAINACTIVITY.KT

```
package com.venom.quizzapp

import android.animation.ObjectAnimator
import android.os.Bundle
import android.view.View
import android.view.animation.OvershootInterpolator
import androidx.activity.ComponentActivity
import androidx.activity.compose.setContent
import androidx.activity.enableEdgeToEdge
import androidx.activity.viewModels
import androidx.core.animation.doOnEnd
import androidx.core.splashscreen.SplashScreen.Companion.installSplashScreen
import androidx.navigation.compose.rememberNavController
import com.venom.quizzapp.model.QuizViewModel
import com.venom.quizzapp.model.AuthViewModel
import com.venom.quizzapp.ui.theme.QuizzappTheme

class MainActivity : ComponentActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        enableEdgeToEdge()
        val viewModel by viewModels<QuizViewModel>()
        val authViewModel by viewModels<AuthViewModel>()
        installSplashScreen().apply {
            setKeepOnScreenCondition {
                !viewModel.isLoaded.value
            }
            setOnExitAnimationListener { screen ->
                val zoomX = ObjectAnimator.ofFloat(
                    screen.iconView, View.SCALE_X, 0.4f, 0.0f
                )
                zoomX.interpolator = OvershootInterpolator()
                zoomX.duration = 500L
                zoomX.doOnEnd { screen.remove() }
                val zoomY = ObjectAnimator.ofFloat(
                    screen.iconView, View.SCALE_Y, 0.4f, 0.0f
                )
                zoomY.interpolator = OvershootInterpolator()
                zoomY.duration = 500L
                zoomY.doOnEnd { screen.remove() }

                zoomX.start()
                zoomY.start()
            }
        }
        setContent {
            QuizzappTheme {
                val navController = rememberNavController()
                MainScreen(viewModel, navController, authViewModel)
            }
        }
    }
}
```

STEP 8: ADD INTERNET PERMISSION

Add to AndroidManifest.xml:

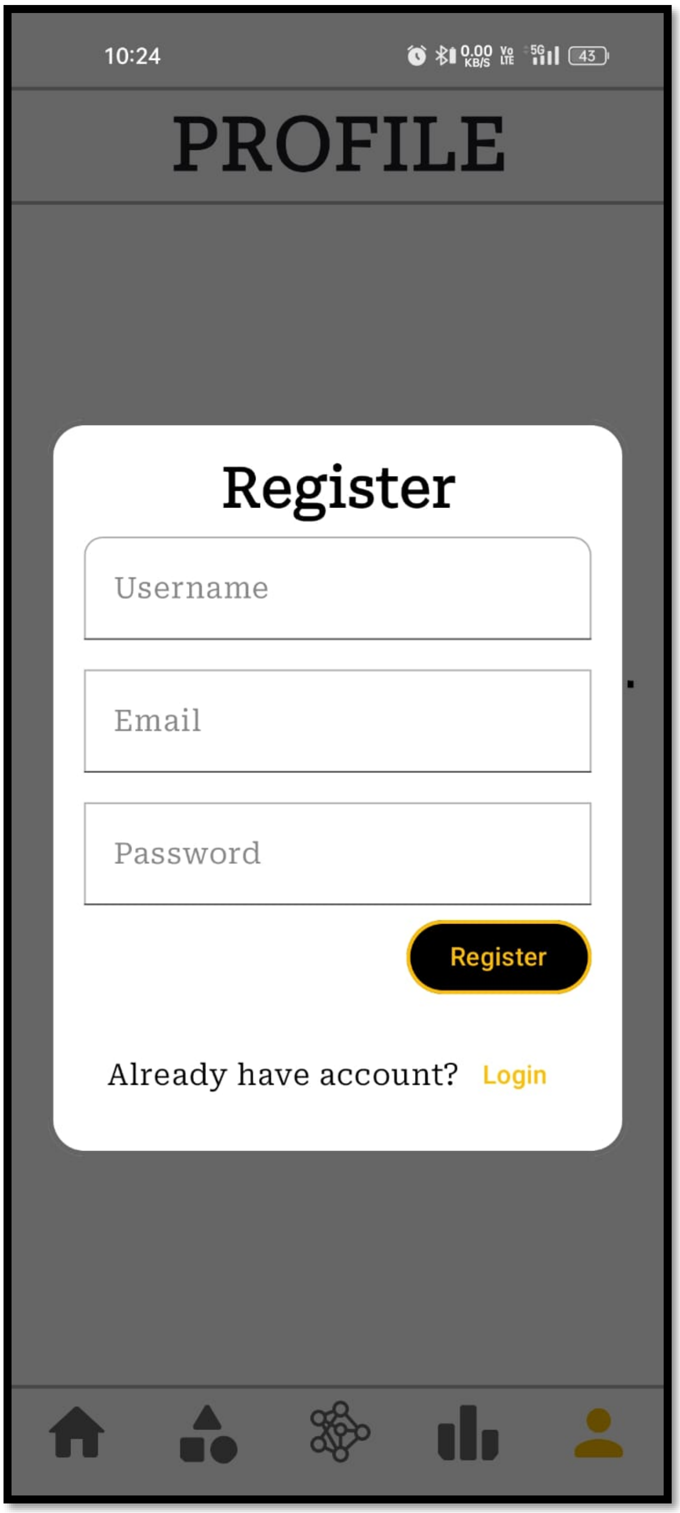
STEP 8: RUN THE APP

Build and run the app on an emulator or physical device
Enter a quiz topic and select difficulty
Click "Generate Quiz"
Answer the questions and see your score at the end

Chapter 8
Result & Output Screens

CHAPTER-8
RESULT AND OUTPUT SCREEN

8.1 SCREENSHOT OF AI POWERED QUIZ APPLICATION



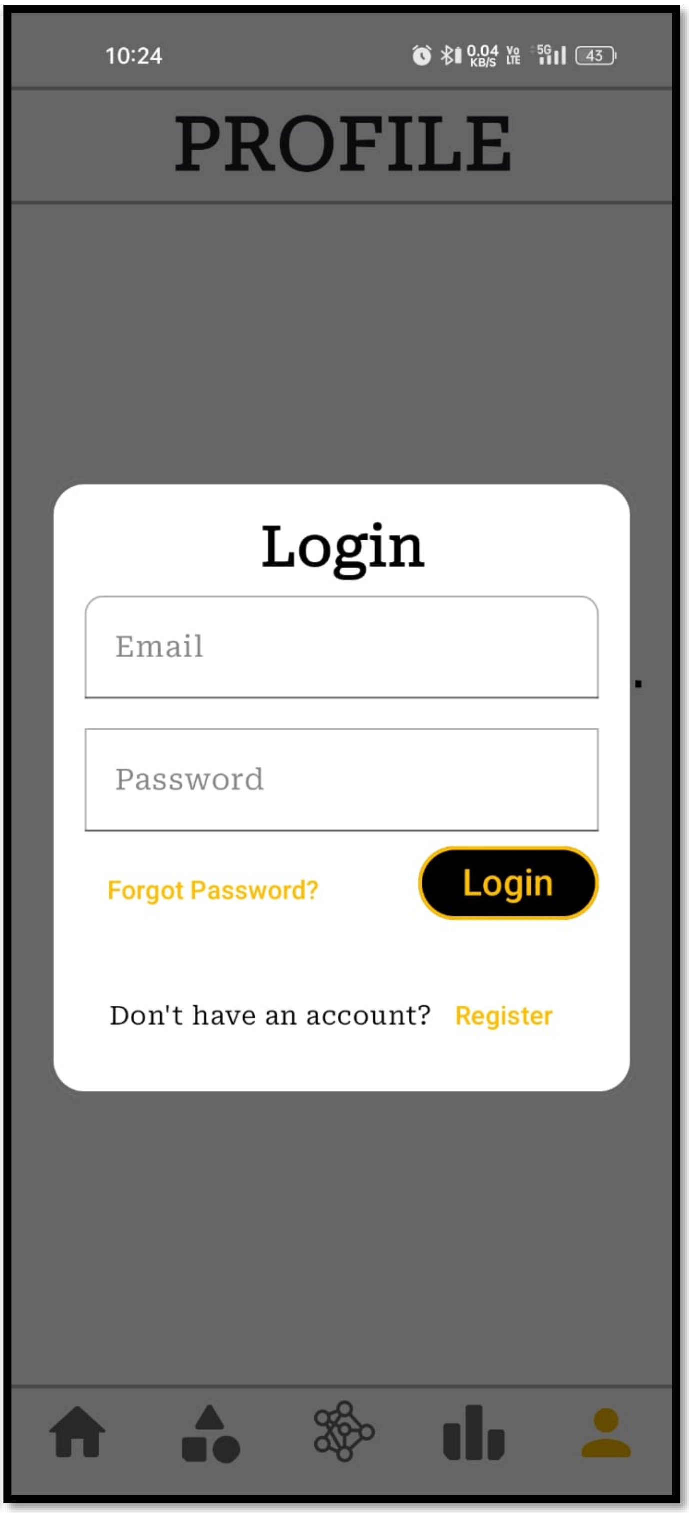
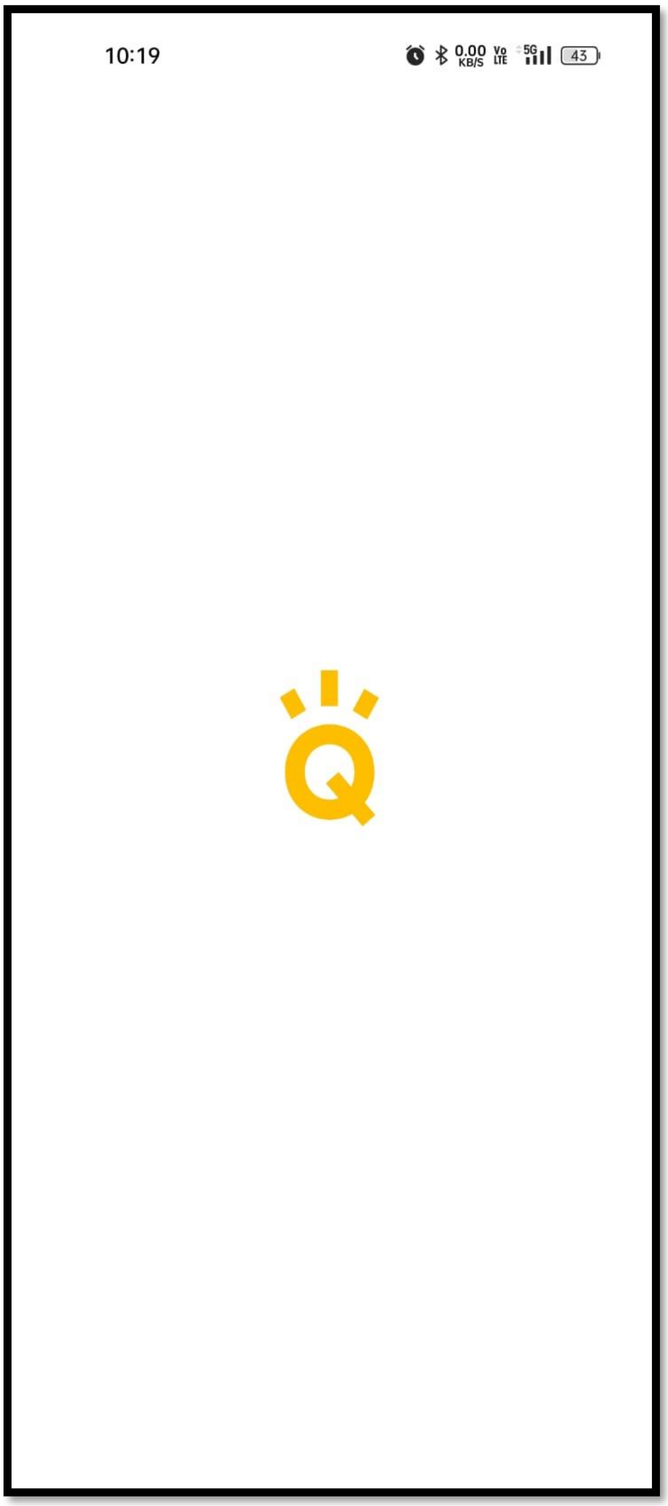
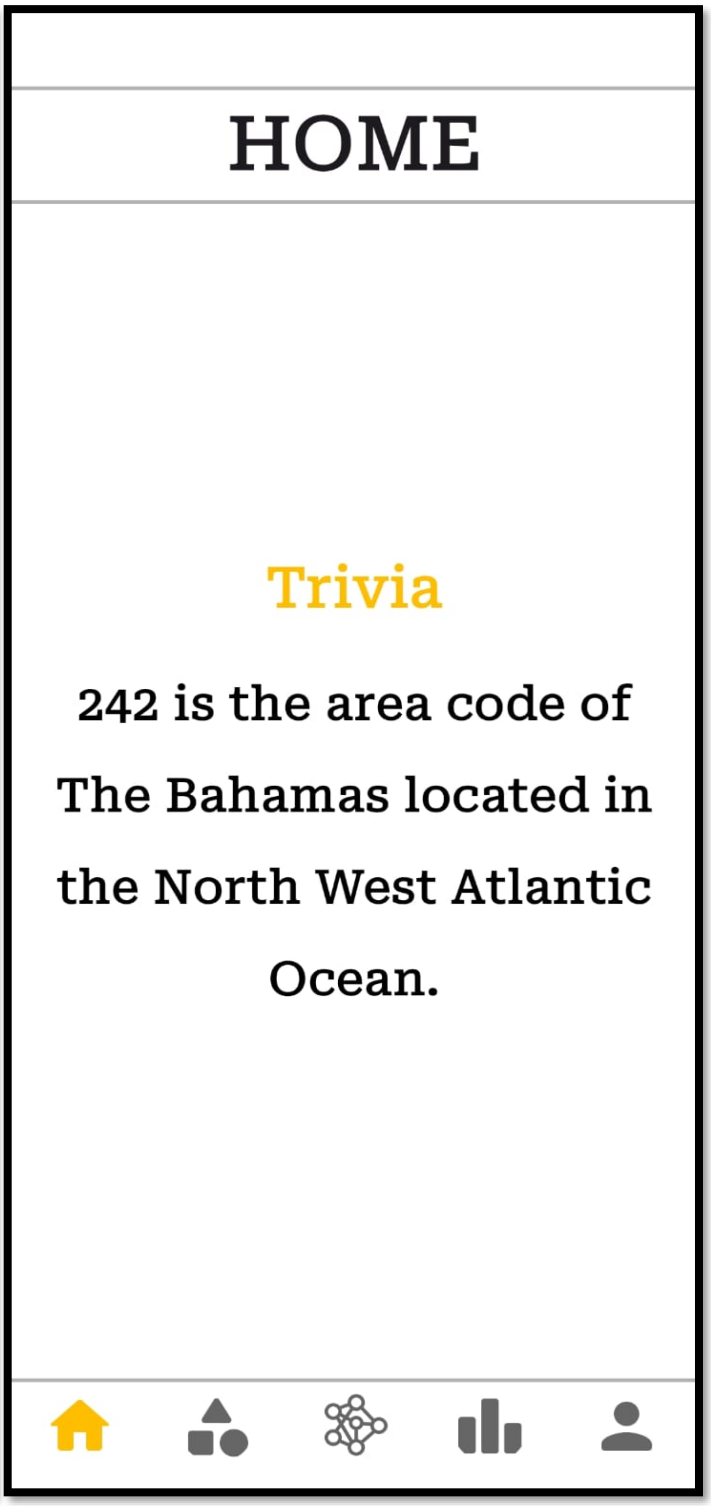


Figure 8.1: Register page **Figure 8.2: Login page**

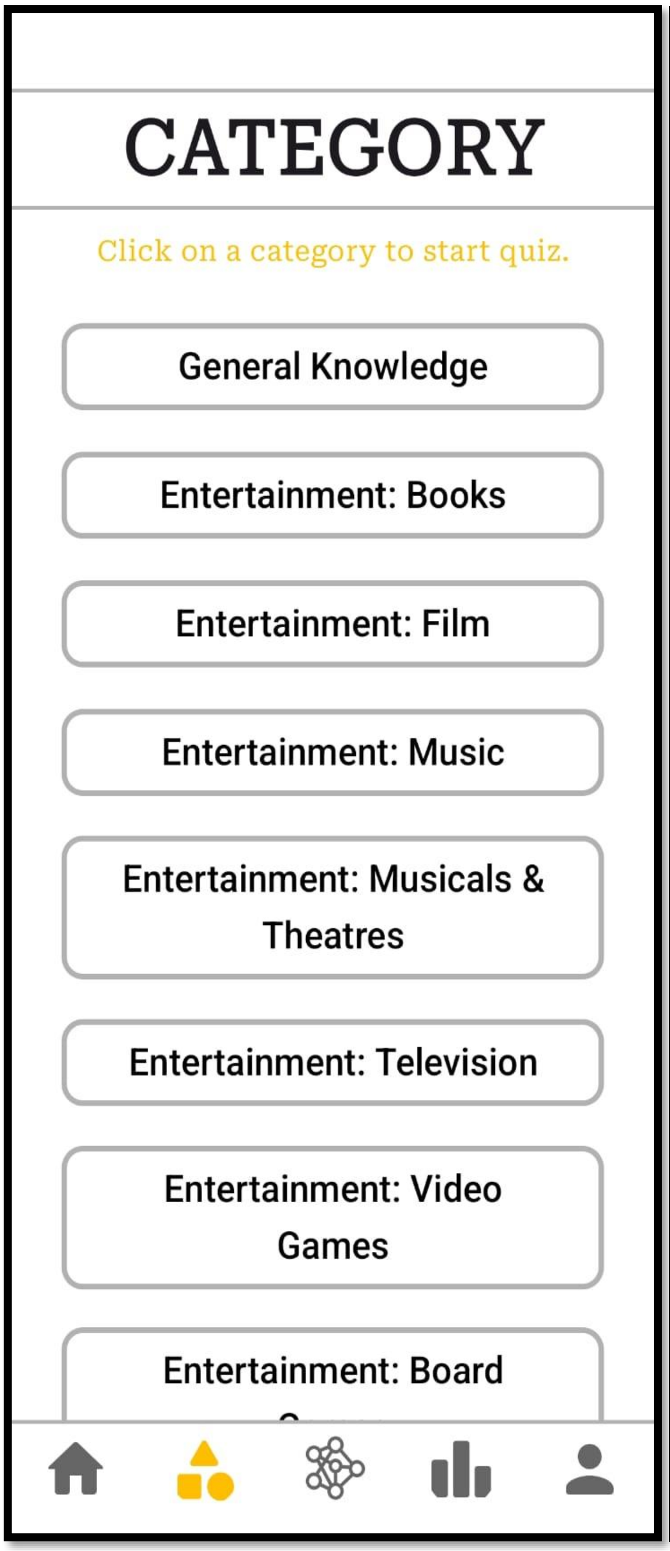




242 is the area code of The Bahamas located in the North West Atlantic Ocean.

Figure 8.3: Loading Screen

Figure 8.4: Home page



CATEGORY

Click on a category to start quiz.

General Knowledge

Entertainment: Books

Entertainment: Film

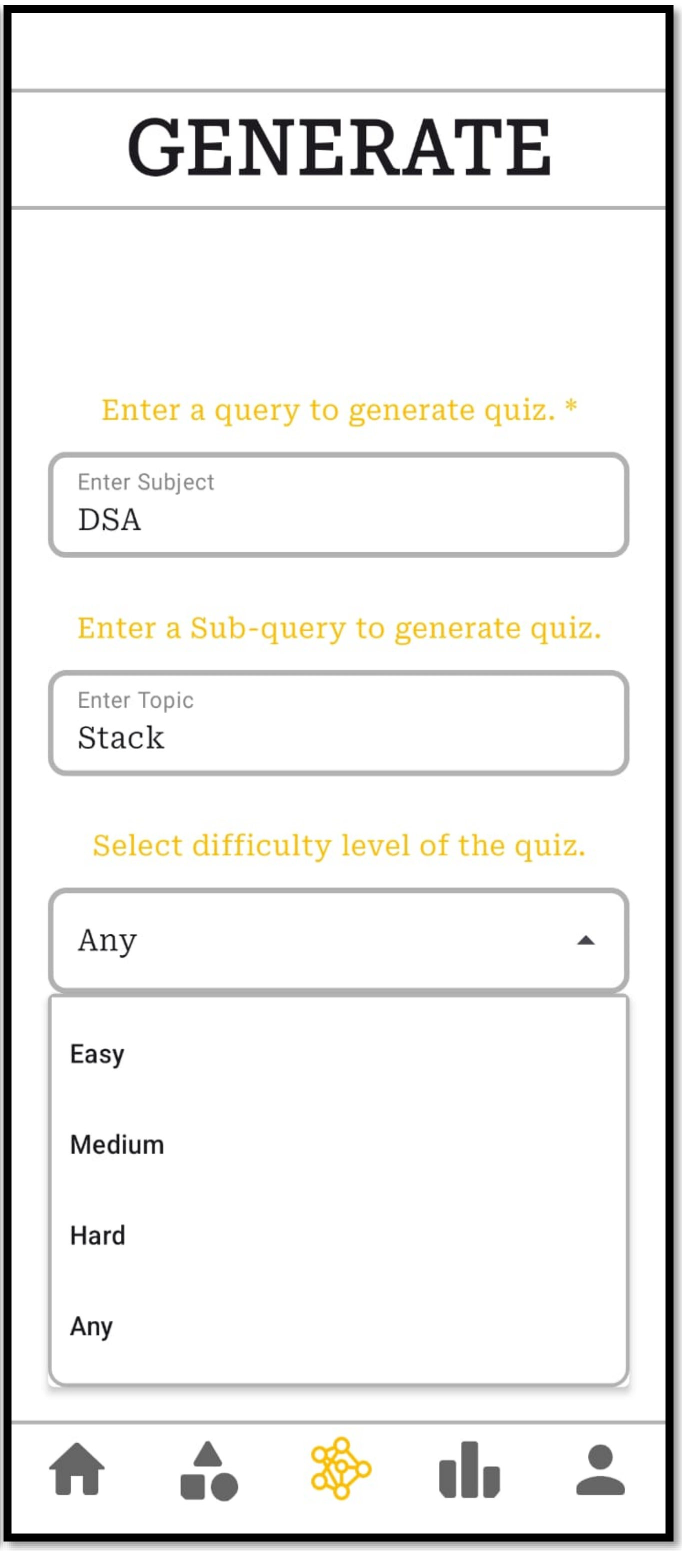
Entertainment: Music

Entertainment: Musicals & Theatres

Entertainment: Television

Entertainment: Video Games

Entertainment: Board



GENERATE

Enter a query to generate quiz. *

Enter Subject: DSA

Enter a Sub-query to generate quiz.

Enter Topic: Stack

Select difficulty level of the quiz.

Any

Easy

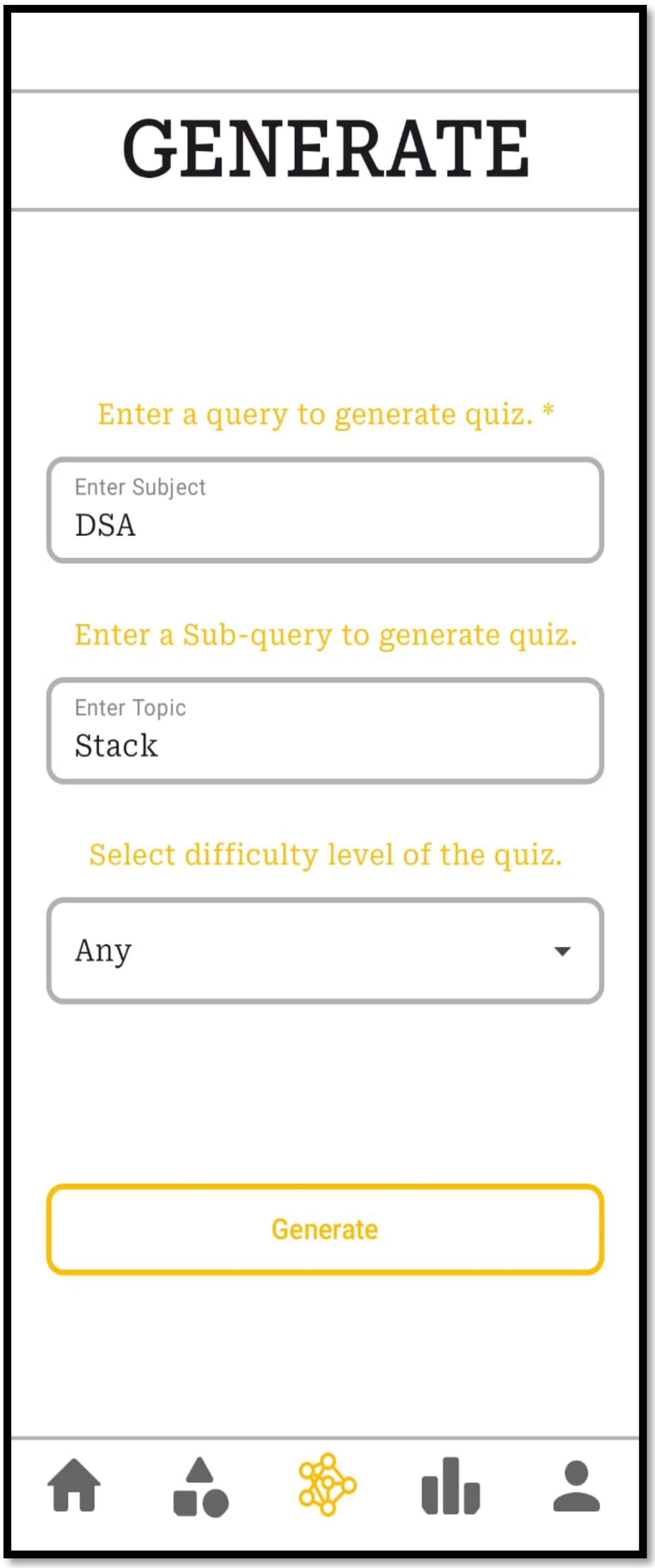
Medium

Hard

Any

Figure 8.5: Static Category Page

Figure 8.6: Difficulty levels



GENERATE

Enter a query to generate quiz. *

Enter Subject
DSA

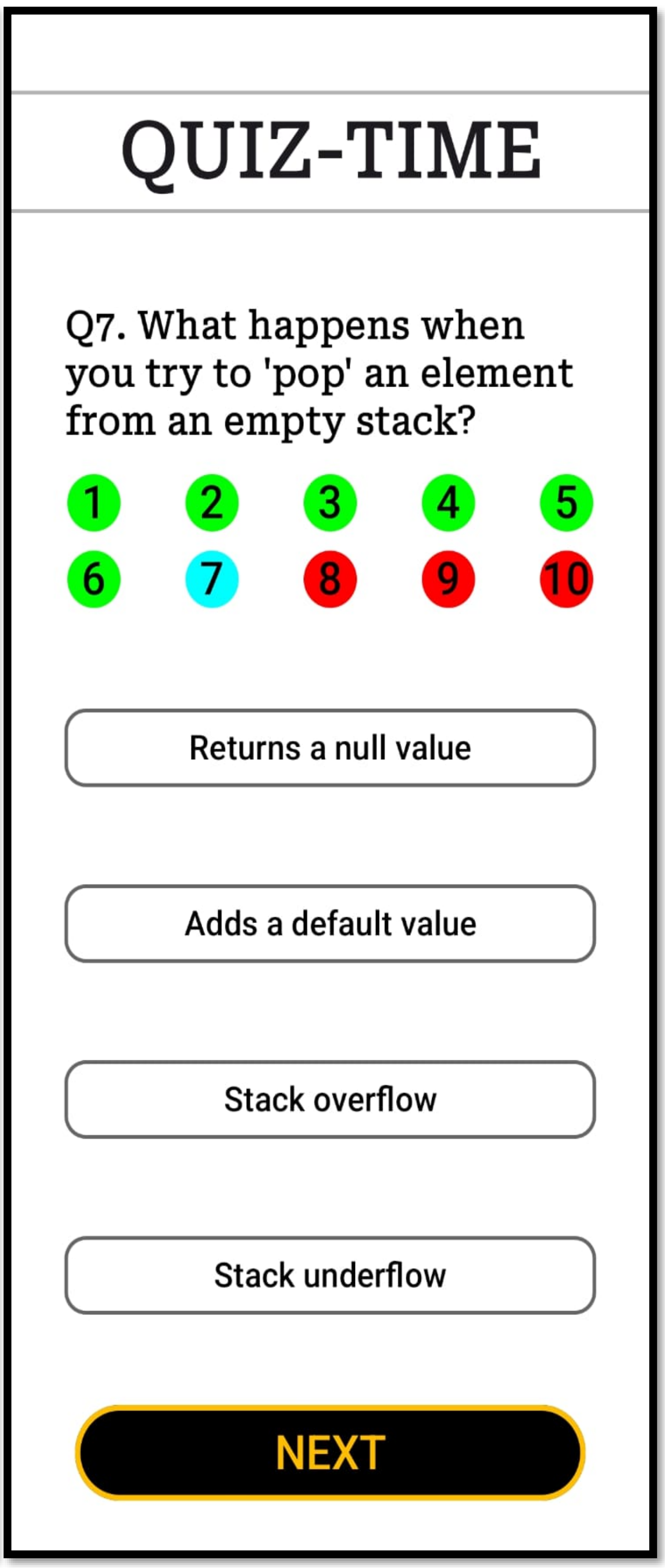
Enter a Sub-query to generate quiz.

Enter Topic
Stack

Select difficulty level of the quiz.

Any

Generate



QUIZ-TIME

Q7. What happens when you try to 'pop' an element from an empty stack?

1 2 3 4 5
6 7 8 9 10

Returns a null value

Adds a default value

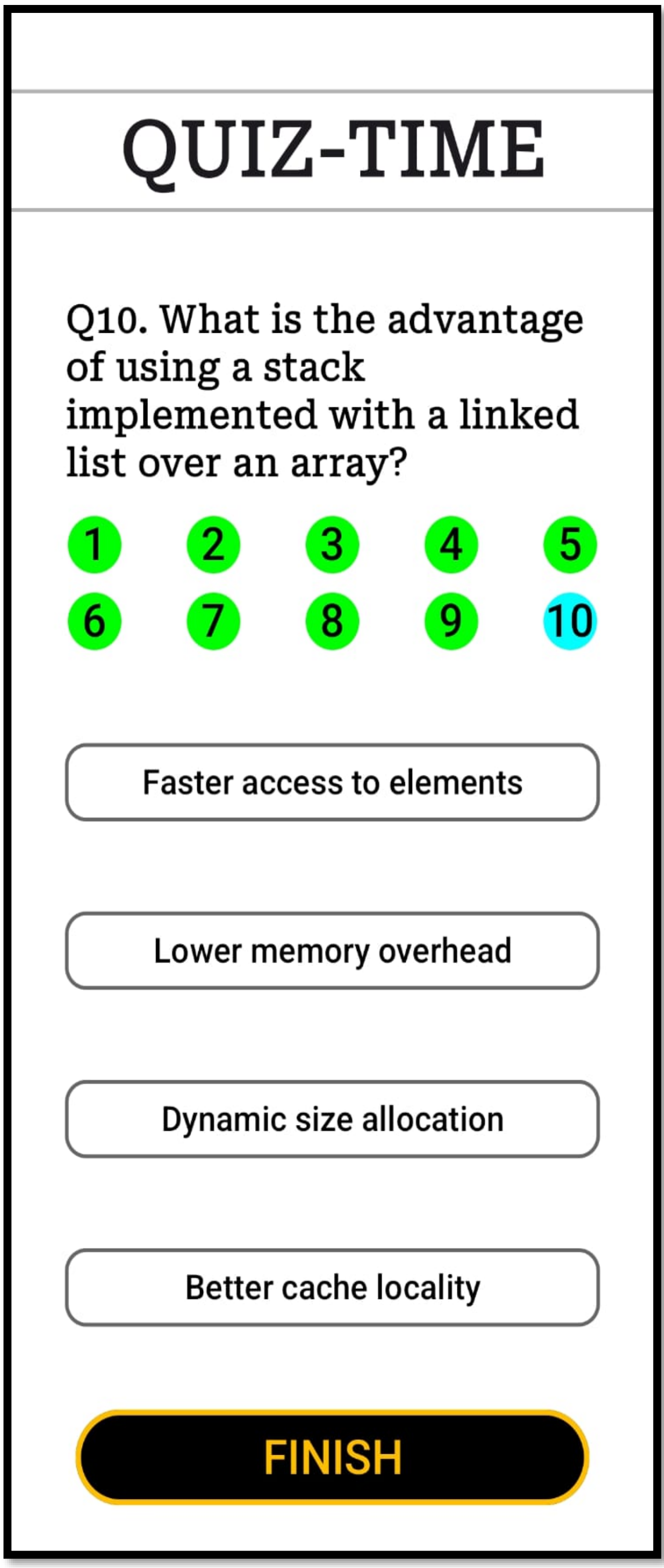
Stack overflow

Stack underflow

NEXT

Figure 8.7: Generate Quiz

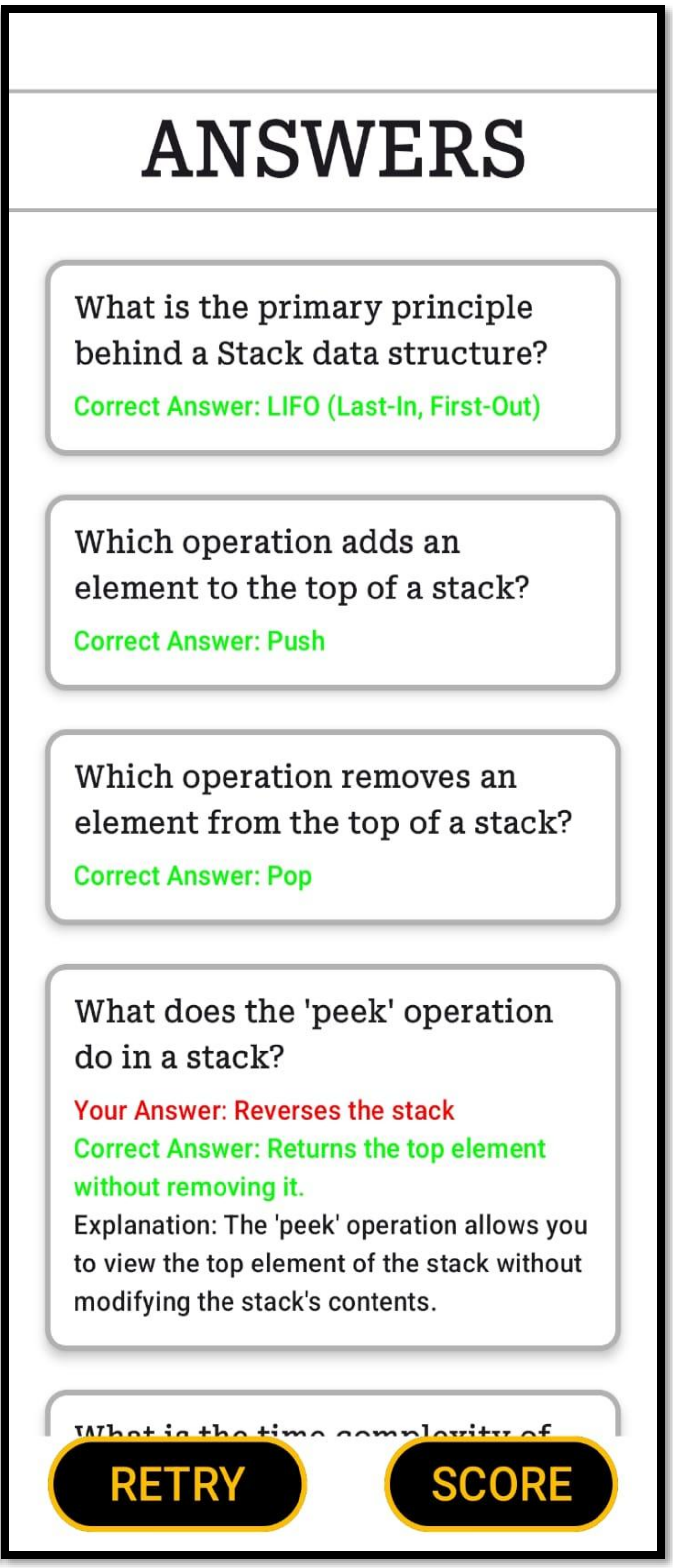
Figure 8.8: Quiz Page



QUIZ-TIME

Q10. What is the advantage of using a stack implemented with a linked list over an array?

- Faster access to elements
- Lower memory overhead
- Dynamic size allocation
- Better cache locality



ANSWERS

What is the primary principle behind a Stack data structure?
Correct Answer: LIFO (Last-In, First-Out)

Which operation adds an element to the top of a stack?
Correct Answer: Push

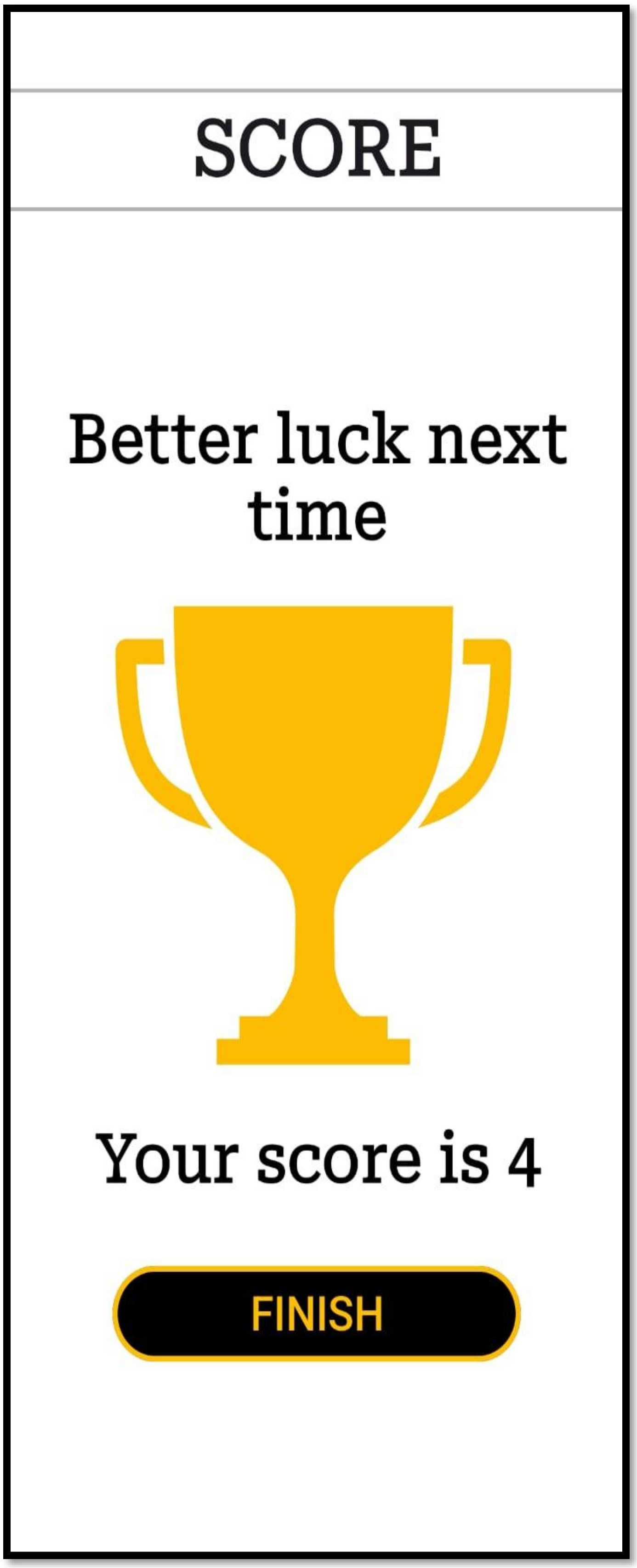
Which operation removes an element from the top of a stack?
Correct Answer: Pop

What does the 'peek' operation do in a stack?
Your Answer: Reverses the stack
Correct Answer: Returns the top element without removing it.
Explanation: The 'peek' operation allows you to view the top element of the stack without modifying the stack's contents.

What is the time complexity of

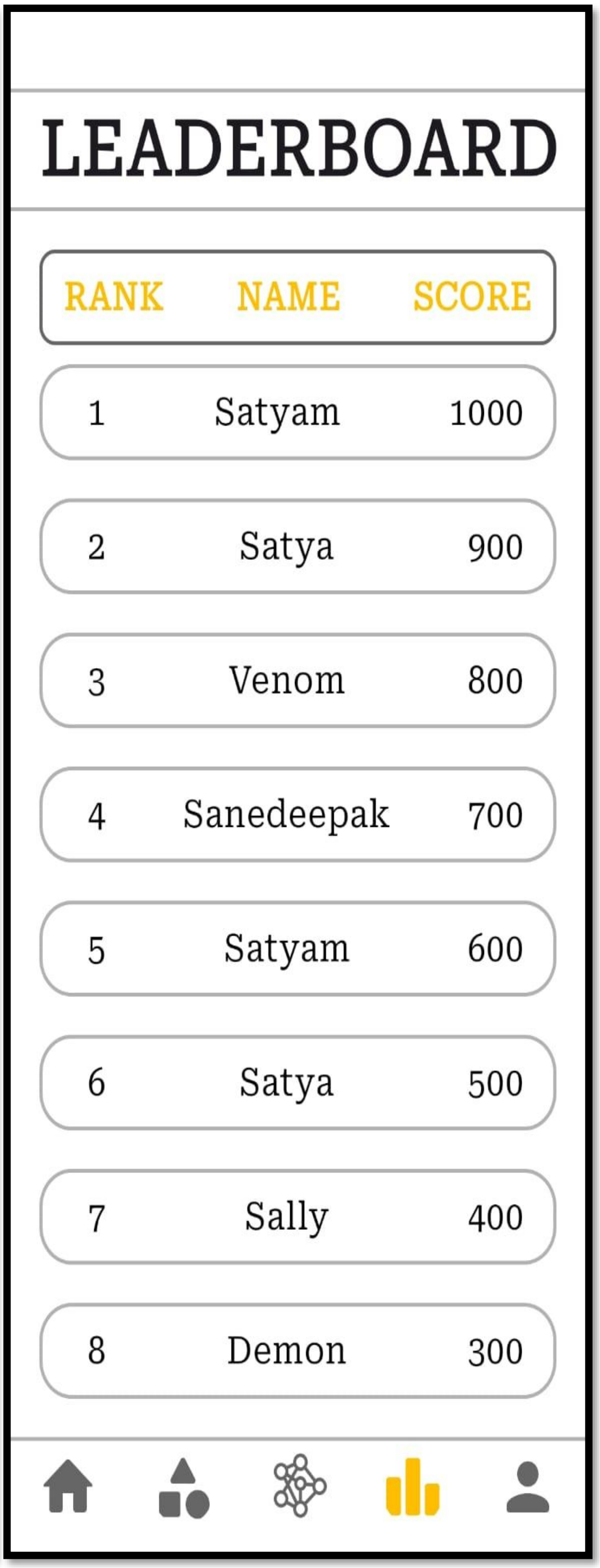
Figure 8.9: Final Question Page

Figure 8.10: Answer Page


SCORE

Better luck next time

Your score is 4


LEADERBOARD

RANK	NAME	SCORE
1	Satyam	1000
2	Satya	900
3	Venom	800
4	Sanedeepak	700
5	Satyam	600
6	Satya	500
7	Sally	400
8	Demon	300

Figure 8.11: Final Score Page

Figure 8.12: Leaderboard Page

Chapter 9
Conclusion & Future Work

CHAPTER-9 CONCLUSION AND FUTURE WORK

9.1 CONCLUSION

The AI-powered Quiz Application using Gemini in an Android app successfully demonstrates an intelligent and interactive platform for quiz-based learning and assessment. By leveraging Gemini's AI capabilities, the system provides personalized quizzes, adaptive difficulty levels, and real-time feedback, enhancing the user's learning experience. The integration with an Android app ensures accessibility and ease of use, making the application suitable for educational and training purposes.

The system is user-friendly, scalable, and versatile, offering applications in academic institutions, corporate training, and self-learning environments. By utilizing AI-driven analytics, the application can assess user performance and provide tailored recommendations for improvement, making learning more efficient and engaging.

9.2 FUTURE WORK

This project can be expanded and enhanced in the following ways:

9.2.1 INTEGRATION WITH CLOUD PLATFORMS

- Connect the application to cloud-based platforms like Firebase, AWS, or Google Cloud for real-time data storage and analytics.
- Implement cloud synchronization for seamless multi-device accessibility.

9.2.2 VOICE-ASSISTED QUIZZING

- Integrate voice recognition for a hands-free quiz experience, allowing users to answer questions verbally.

9.2.3 ADAPTIVE LEARNING

- Develop AI-driven algorithms that adjust quiz difficulty based on user performance.
- Implement personalized learning paths based on user strengths and weaknesses.

9.2.4 OFFLINE MODE

- Introduce an offline mode where users can attempt quizzes without an internet connection, syncing data once online.

9.2.5 MULTIMEDIA QUESTION SUPPORT

- Enable support for images, videos, and audio-based questions to enhance engagement and comprehension.

9.2.6 MULTI-LANGUAGE SUPPORT

- Expand language support using AI-driven translation and localization features.
- Provide text-to-speech and speech-to-text functionalities in multiple languages.

9.2.7 MACHINE LEARNING FOR USER ANALYTICS

- Integrate machine learning models to analyse user responses and provide personalized feedback.
- Develop AI-driven recommendations for additional learning materials based on quiz performance.

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11. https://www.tensorflow.org/tutorials/

PROJECT SUMMARY

About Project

Title of the project	AI Powered Quiz Application
Semester	8th
Members	4
Team Leader	Satyam Kumar
Describe role of every member in the project	Satyam Kumar: Team Lead, design, development and documentation. Sintu Kumar: Development, design, Requirement gathering and documentation. Samrat Singh: Documentation, Requirement Gathering and design. Shivankit Dubey: Documentation, Requirement Gathering and design.
What is the motivation for selecting this project?	This project combines cutting-edge technologies to Create an intelligent learning tool. Using jetpack Compose and Kotlin demonstrates modern Android development skills, while Gemini API integration showcases AI implementation. The app offers dynamic quiz generation on any topic, eliminating static content limitations. Developers gain hands-on experience with MVVM architecture, coroutines, and API parsing – crucial real-world skills. For users, it provides personalized, engaging knowledge testing. It's dynamic nature also makes it one-of-a-kind Quiz application.
Project Type **(Desktop Application, Web Application, Mobile App, Web)**	Mobile App

Tools & Technologies

Programming language used	Kotlin
Compiler used **(with version)**	2.0.1
IDE used **(with version)**	Android Studio Meerkat | 2024.3.1
Front End Technologies **(With version, wherever Applicable)**	Jetpack-Compose
Back End Technologies **(With version, wherever applicable)**	Firebase
Database used **(with version)**	Realtime-DB

Software Design & Coding

Is the prototype of the software developed?	Yes
SDLC model followed **(Waterfall, Agile, Spiral etc.)**	Agile
Why is the above SDLC model followed?	Agile is a SDLC model that defines how software development needs to be done. It’s not a single or specific method, and it is the collection of various methodologies and best practices that follow the value statement signed with the customer
Justify that the SDLC model mentioned above is followed in the project.	Since we didn’t exactly know all the functionalities or the functionalities were frequently changing, we used the Agile model, so that we could make desired changes whenever needed.
Software Design approach followed **(Functional or Object-oriented)**	Functional
Name the diagrams developed	Use Case Diagram

(According to the Design approach followed)	
In case Object Oriented approach is followed, which of the OOPS principles are covered in design?	Dependency Injection
No. of Tiers **(example 3-tier)**	3-tier
Total no. of front-end pages	15
Total no. of tables in database	N/A
Database in which Normal Form?	N/A
Are the entries in the database encrypted?	N/A
Front end validations applied (Yes / No)	No
Session management done **(in case of web applications)**	N/A
Is application browser compatible **(in case of web applications)**	N/A
Exception handling done **(Yes / No)**	Yes
Commenting done in code **(Yes / No)**	Yes
Naming convention followed **(Yes / No)**	Yes
What difficulties faced during deployment of the project?	Secure communication with Firebase and Realtime-DB
Total no. Of Use-cases	1
Given titles of Use-cases	AI powered quiz application

Project Requirements

MVC architecture followed **(Yes / No)**	No
If yes, write the name of	N/A

MVC architecture followed **(MVC-1, MVC-2)**	N/A
Design Pattern used **(Yes / No)**	YES
If yes, write the name of Design Pattern used	MVVM
Interface type **(CLI / GUI)**	GUI
No. of Actors	5
Name of Actors	User, Firebase, Gemini API, Numbers API, Open dB API
Total no. of Functional Requirements	5
List few important non-Functional Requirements	Reliability, Usability, Minimal response time

Testing

Which testing is performed? **(Manual or Automation)**	Manual
Is Beta testing done for this project?	yes

Write project narrative covering above mentioned points

At the heart of the AI-powered quiz application lies a vision to redefine learning and assessment through intelligent, interactive, and personalized experiences. Our mission is straightforward yet impactful: to develop an advanced system that integrates artificial intelligence, automation, and real-time feedback, empowering users to engage with educational content effortlessly and enhance their knowledge retention. The AI-powered quiz application leverages cutting-edge technologies, including machine learning algorithms and natural language processing, to dynamically generate and evaluate quiz questions tailored to individual user needs. With features such as real-time analytics, performance tracking, and AI-driven recommendations, the application ensures that users remain motivated and continuously challenged at their optimal level of difficulty. This AI-powered quiz application is designed to transform education by providing a smart, automated, and personalized learning experience.

Satyam Kumar	0187CS211150	**Guide Signature**
Sintu Kumar	0187CS211165	(Prof. Amit Swami)
Samrat Singh	0187CS211145	
Shivankit Dubey	0187CS211158	

APPENDIX 1 GLOSSARY OF TERM

A

Android	Android is a mobile operating system based on a modified version of the Linux kernel and other open-source software, designed primarily for touchscreen mobile devices such as smartphones and tablets.
Android Studio	Android Studio is the official Integrated Development Environment (IDE) for android application development.

G

Gemini	Gemini, formerly known as Bard, is a generative artificial intelligence chatbot developed by Google. Based on the large language model of the same name

J

Jetpack Compose	Jetpack Compose is a modern toolkit for building native Android UI. Jetpack Compose simplifies and accelerates UI development on Android with less code, powerful tools, and intuitive Kotlin APIs.

K

Kotlin	Kotlin is a general-purpose, statically typed, and open-source programming language. It runs on JVM and can be used anywhere Java is used today. It can be used to develop Android apps, server-side apps and much more.

L

LLM	LLM stands for Large Language Model, a type of artificial intelligence model that excels at natural language processing tasks by understanding and generating human language.

S

SDK	An SDK, or Software Development Kit, is a collection of tools, libraries, and documentation that developers use to build applications for a specific platform or operating system, making the development process easier and more efficient.

U

USB	Universal Serial Bus is an industry standard, developed by USB Implementers Forum, for digital data transmission and power delivery between many types of electronics.