SOFTWARE DESIGN DOCUMENT

for

QuizZone - An Online Quiz Application

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Contents

1 Introduction

1.1 Purpose

Developing a quiz application serves various purposes, including education and learning, engagement, assessment, competition, and data collection. It provides a fun and interactive way to educate users, keeps them entertained, tests their knowledge, fosters competition, and collects valuable data. Overall, a quiz application is an effective tool for entertainment, education, engagement, and data collection.

1.2 Scope

Quiz apps offer a variety of benefits. They can serve as educational tools for students, providing a fun way to test their knowledge and offering explanations for correct answers. Additionally, quiz apps provide entertainment value, allowing users to challenge themselves and others, leading to increased engagement. Quiz applications are a fantastic way to engage and entertain users on websites. Whether you want to test knowledge, provide educational content, or simply offer a fun activity.By this quiz application the user will come to know about his/her level and can learn addi- tional knowledge.Also by this application a user can expand his/her knowledge among the world.This application will be used in educational institutions as well as in corporate world. These apps also promote social interaction, as users can compete with friends, join mul- tiplayer games, and participate in community challenges and facilitating interactive chat in team battles alongside a single-player mode for solo users. It can be used anywhere any time as it is a web based application

1.3 Overview

- System Architecture Design
- Application Architecture Design
- GUI Design
- API Design
- Database Design
- Technology Stack

2 System Architecture Design

The design consists of user page through which the users and the admin can login.This is one of the main module of this Online web application.This also involves an admin module ,whether to allow the user to create the quiz based on checking the content of the questions and answers(sensitive contents).

Firebase authenticates the email and password and if true they are logged in else return back to the login page.

The authentication and the user management module is responsible for the registration ,login and the management of the user module.

The quiz management module is for creating ,editing and managing quizzes.It include features of selecting question types,setting timers and defining score rules.

Real time scoreboard management module is for displaying real time score board,updating is based on the users answers and the time taken.

Question generation module generates a diverse range of questions including text and image based queries.

User profile module is for viewing the users progress ,achievements and the performance in the quiz.

Single player module is the module for supporting quizzes foe individual players.

Team mode module to support quizzes foe teams including team creation ,management and scoring.

Chat system module is to enable interactive chat between the users especially in team battles.

```
                          ┌──────────────┐
                          │     user     │
                          └──────┬───────┘
                                 │
                                 ▼
                          ┌──────────────┐      False
                          │ Register/Login│◄────────────┐
                          └──────┬───────┘              │
                                 │                      │
                                 ▼                      │
              Checking       ◇──────────◇              │
         ┌◄──────────────  Authentication ────────────►┤
     ┌───┴───┐           ◇──────────◇                  │
     │Firebase│               │                 True   │
     └───────┘               │                         │
                             ▼                  ◇──────────◇
                    ┌──────────────┐   Admin   │ Sensitive │
                    │Quiz creation │──────────►│ contents  │
                    │    page      │           ◇──────────◇
                    └──────┬───────┘                 │
          ┌────────────────┼─────────────┐     False │
          ▼                ▼              ▼
   ┌────────────┐   ┌────────────┐            ┌────────────┐
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   │   mode     │   │   mode     │◄──────┐    └─────┬──────┘
   └─────┬──────┘   └─────┬──────┘       │          │
         │           ┌────┴─────┐        │    ┌────────────┐
         ▼           ▼          ▼        │    │  Adding    │
  ┌────────────┐ ┌────────┐ ┌────────┐   │    │ questions  │
  │Questions   │ │Single  │ │ Multi  │   │    └────────────┘
  │they selected│ │player  │ │player  │   │
  │and selected│ └───┬────┘ └───┬────┘   │    ┌────────────┐
  │answers     │     │          │        │    │ Selecting  │
  └─────┬──────┘     ▼          ▼        │    │   timer    │
        │      ┌─────────┐ ┌────────┐    │    └────────────┘
        ▼      │Questions │ │Chat    │    │
  ┌──────────┐ │they sel. │ │system  │    │    ┌────────────┐
  │  Local   │ │and sel.  │ └───┬────┘    │    │ Selecting  │
  │ storage  │ │answers   │     │         │    │  correct   │
  └──────────┘ └────┬─────┘     ▼         │    │  answer    │
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                    │      │Questions │   │
                    ▼      │they sel. │   │      ┌───────┐
                 ┌─────┐   │and sel.  │   │      │Firebase│
                 │Firebase│◄│answers  │   └──────┤       │
                 └──┬──┘   └──────────┘          └───────┘
                    │
                    ▼
              ┌───────────┐
              │Leaderboard│
              └─────┬─────┘
                    ▼
              ┌───────────┐
              │User profile│
              └───────────┘
```

user

Register/Login

False

Checking — Firebase

Authentication

True

Quiz creation page

Admin — Sensitive contents

False

Play offline mode

Play online mode

Create quiz

Questions they selected and selected answers

Single player

Multi player

Adding questions

Local storage

Questions they selected and selected answers

Chat system

Selecting timer

Questions they selected and selected answers

Selecting correct answer

Firebase

Firebase

Leaderboard

User profile

3 Application Architecture Design

User home include email,password of users for login and registration.
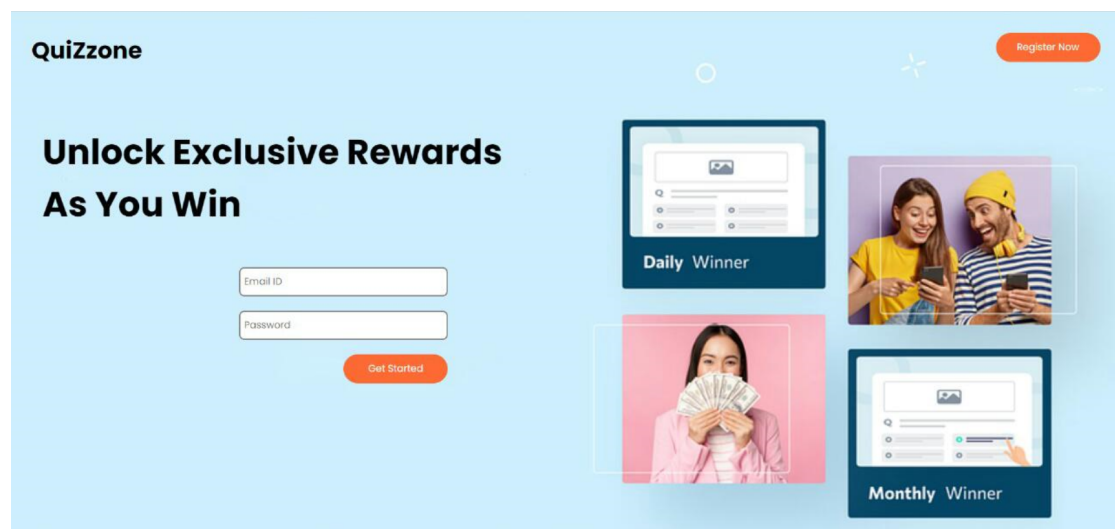
Admin home include email ,password of the admin.

```
                        ┌──────────────┐
                        │     User     │
                        └──────────────┘
                               │
                               ▼
                        ┌──────────────┐                          False
                        │ Register/Login │◄──────────────────────┐
                        └──────────────┘                          │
                               │                                  │
                               ▼                                  │
  ┌─────────┐  Checking   ◄───────────────────────────►          │
  │ Firebase│◄──────────      Authentication          ──────────┘
  └─────────┘                                          │
                               │ True            True  │
                               ▼                       ▼
                     ┌──────────────────┐  Admin   ◄──────────►
                     │ Quiz creation page │────────  Sensitive
                     └──────────────────┘            contents
                                                         │ False
```

Play offline mode   Play online mode   Create quiz

    Questions they   Single player   Multi player   Adding questions
  selected and selected
       answeres

    Local storage   Questions they selected   Chat system   Setting timer
                       and selected answers

                            Firebase   Questions they   Selecting correct
                                            selected and selected   answers
                                                  answers
                           Leaderboard   Firebase

                           User profile

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4 GUI Design

The user interface includes the Login and the Sign Up page.

Also include Online mode module, Offline mode module and Quiz creation module.

In Offline mode module the participants access quizzes through a dedicated interface where they can view quiz details such as title, description, and instructions, selecting and playing quizzes.After completing a quiz, participants are directed to a results page displaying their performance.The results page shows the total score

In Online mode module participants access quizzes through a dedicated interface where they can view quiz details such as question and option.Timer display indicating remaining time. Display of score at the end of the quiz. Leaderboard showing top scores.

In Create quiz module the quiz creation interface allows quiz creators to easily design and customize quizzes.It features intuitive form fields for adding questions and answer.Quiz creators can set time limits,no. Of questions
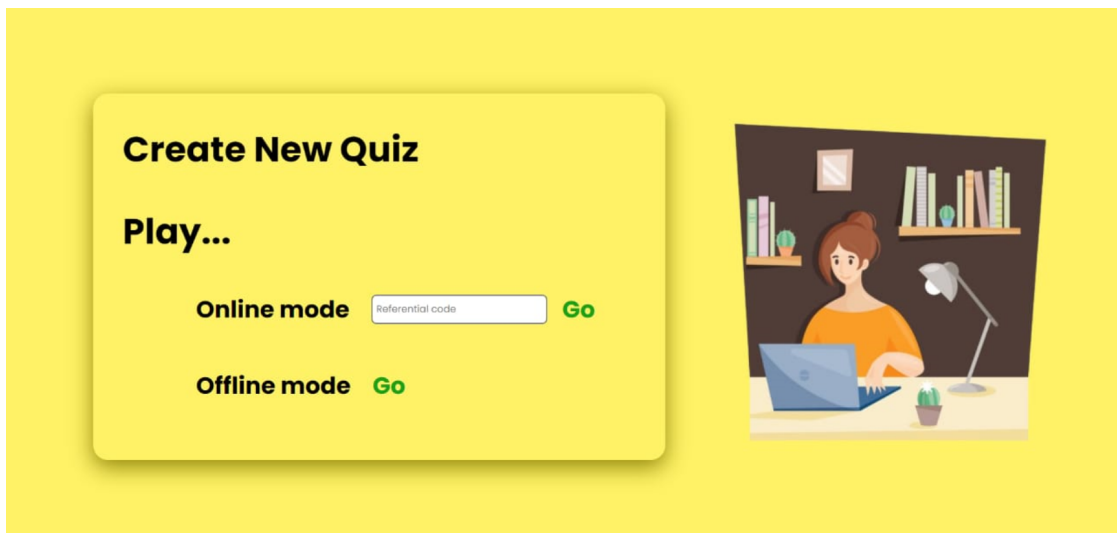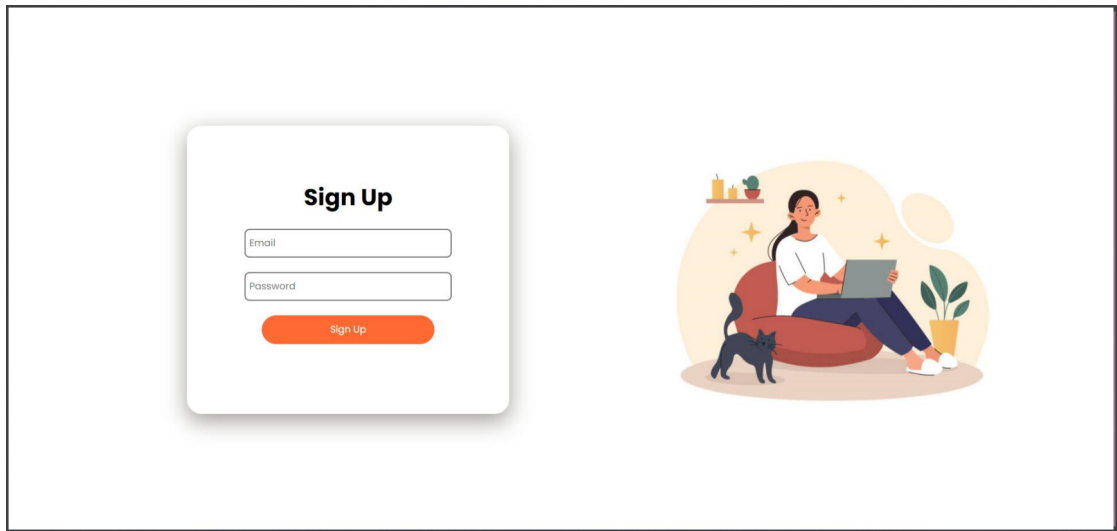
Sign Up

Email

Password

Sign Up

Create New Quiz

Play...

Online mode Referential code **Go**

Offline mode **Go**

Real-time Leaderboard

| Rank	Name	Score
1	Player 1	100
2	Player 2	50
3	Player 3	10

Refresh Leaderboard

5 API Design
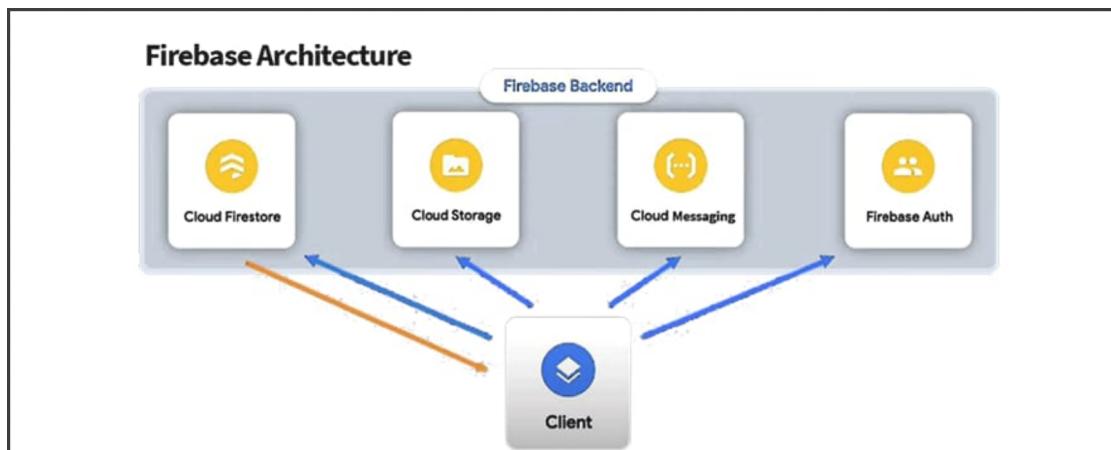
Firebase API is a backend-as-a-service platform by Google that helps developers build and scale mobile and web applications. It offers features like real-time data syncing, user authentication, cloud messaging, file storage, and analytics. Firebase simplifies backend tasks and allows developers to focus on creating great app experiences.

6 Database Design
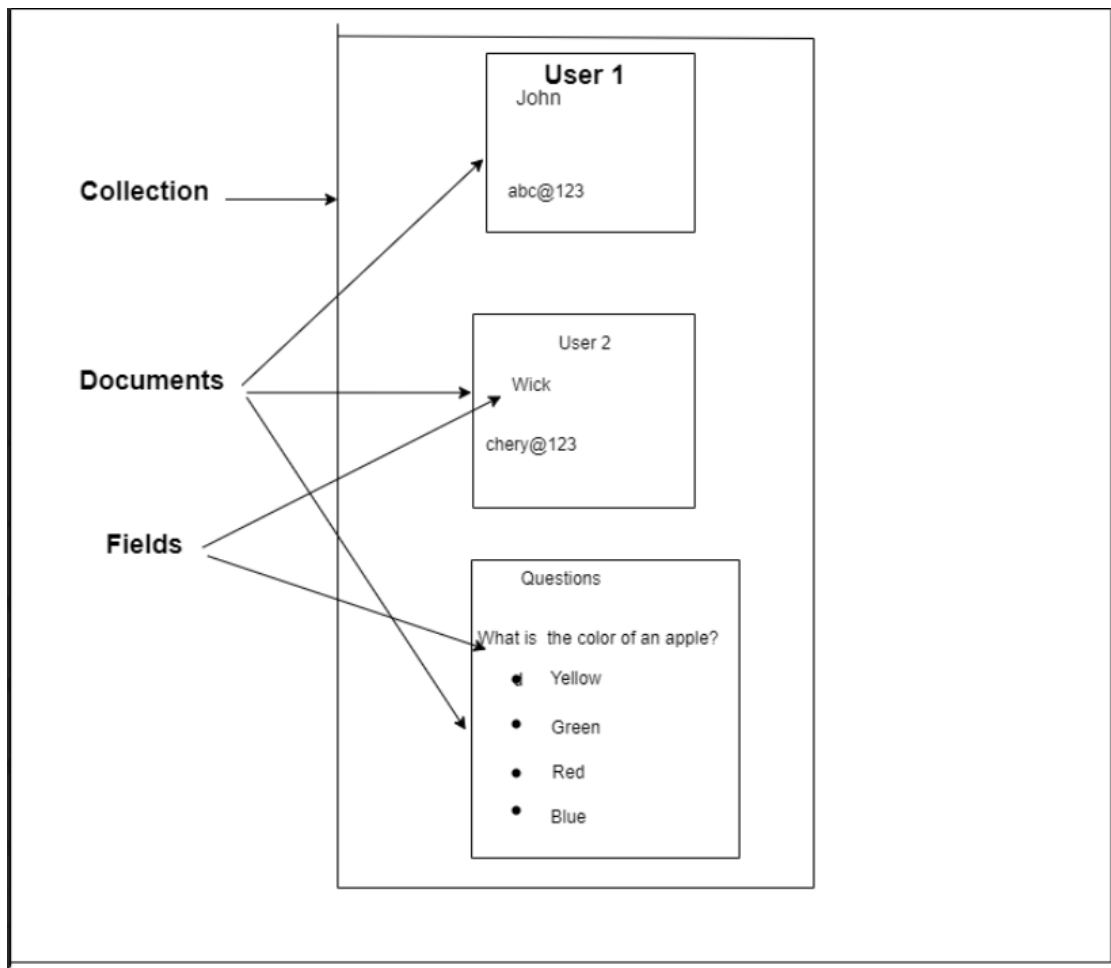
7 Technology Stack

- Back-End - Firebase

- Front-End - HTML, CSS, Java Script

- Database - Firebase