ASSIGNMENT

Course Title: Software Engineering
Course Code: CSE333

Submitted by

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60_C

Department of Computer Science and Engineering

Daffodil International University

Submitted to

Sharmin Akter Rima

Assistant Professor

Faculty of Science and Information Technology

Department of Computer Science and Engineering

Daffodil International University

Dear Mam,

Re:**Enclosed Application Agreement for SkyScribe: Drone Technology Website**

As dedicated students passionate about innovation, we understand that creating a client-oriented web application requires a blend of technical excellence and clear communication. We strive to ensure you receive the very best service by combining these elements. Every client has unique needs, and we aim to deliver tailored, innovative, and cost-effective solutions that align with your business requirements. Our team is committed to ensuring timely delivery and adherence to budget constraints.

Based on your specific business requirements, we have designed SkyScribe: Drone Technology Website to meet and exceed your expectations. This system includes features for drone operation management, real-time analytics, and userfriendly authentication and database management through Firebase.

In the enclosed agreement, we have outlined every detail and feature of the application, ensuring clarity and transparency. We request you to review this document carefully. If it aligns with your expectations, kindly sign and confirm the agreement so we may proceed accordingly.

Thank you for this opportunity to collaborate. We look forward to working with you on this innovative project.

Sincerely,

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Md Ragib Shakil Hridoy
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Shah. Md Mafidur Hasan
ID: 213-15-4350

Alok Roy
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Section: 60_C
Daffodil International University

SKYSCRIBE WEBSITE

1. Project Overview

Purpose:
To develop a drone technology-focused website, **SkyScribe**, using raw HTML, CSS, and JavaScript, integrated with Firebase for user authentication and realtime data storage. The website aims to provide an intuitive platform for users to explore, learn about, and manage drone-related services and features.

Scope:
The application includes user management, drone specifications, operational guides, real-time drone status tracking, and service request modules.

Definitions, Acronyms, and Abbreviations:

- **UAV**: Unmanned Aerial Vehicle
- **UI**: User Interface
- **DBMS**: Database Management System
- **API**: Application Programming Interface

Overview:
The website focuses on offering a seamless experience for users to interact with drone-related functionalities. Firebase Authentication ensures secure access, and Firebase Realtime Database supports dynamic updates and storage of drone data and user interactions.

2. Overall Description

ProductPerspective:
The website leverages Firebase services to handle backend functionalities, including user authentication and data management. It is designed to provide realtime interaction with drone data, ensuring users can monitor and manage drones effectively.

Product Functions:

- Admin login and registration
- Access to drone specifications and operational details
- Submission and management of service requests
- Educational resources about drone technology

User Characteristics:

- **Users**: Browses drone-related content, tracks drone and submits service requests.
- **Admin**: Manages drone inventory, user queries, and service requests.
- **Technician**: Accesses service requests, updates repair or maintenance status in real-time.

Constraints:

- Reliance on Firebase for backend operations.
- Responsive design must ensure compatibility across various devices.
- Maintaining real-time performance for drone tracking updates.

Assumptions and Dependencies:

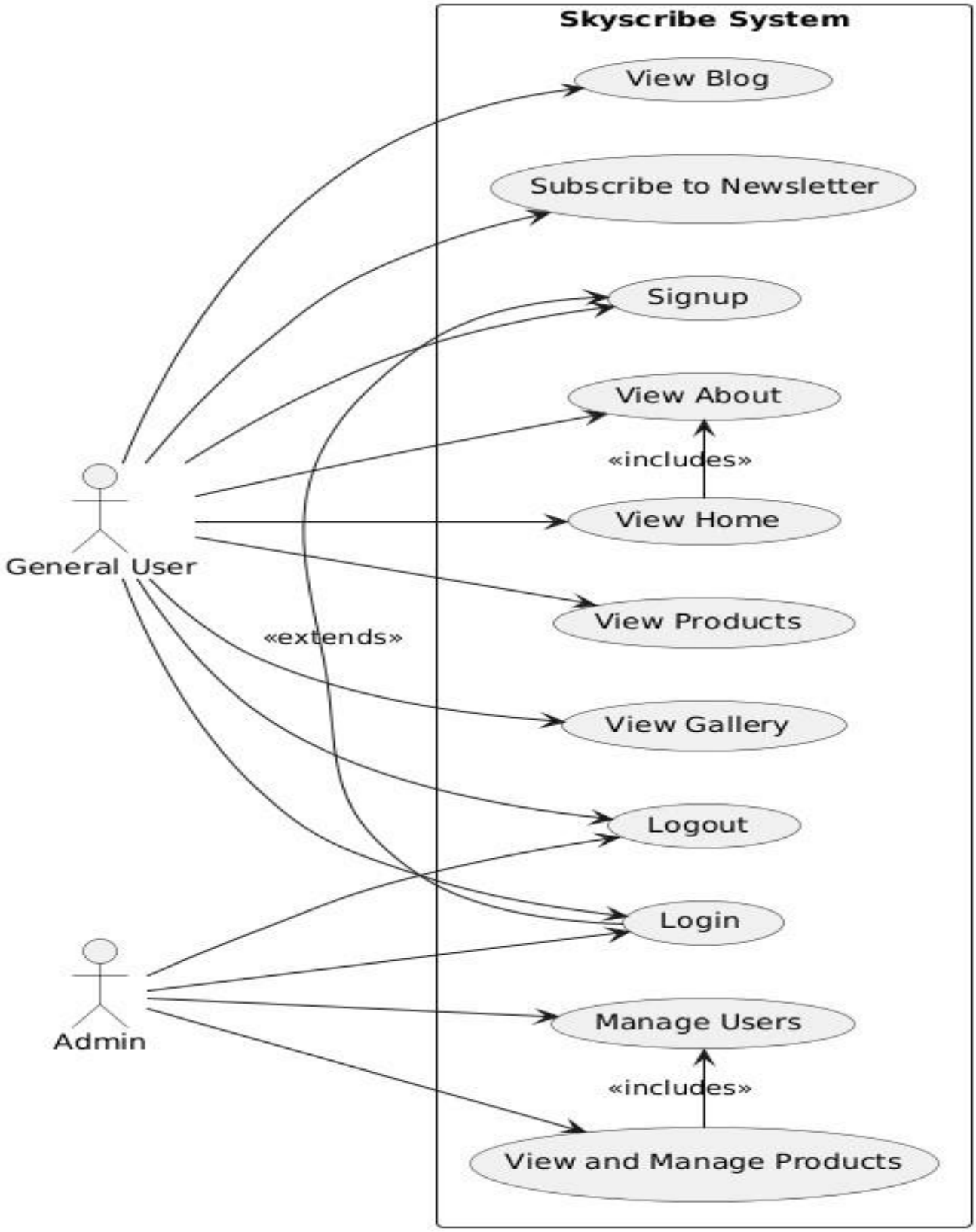
- Stable Firebase services for authentication and database operations.
- Dependable internet connectivity for real-time updates.
- Accurate and consistent drone data for user interactions.

2. System Features

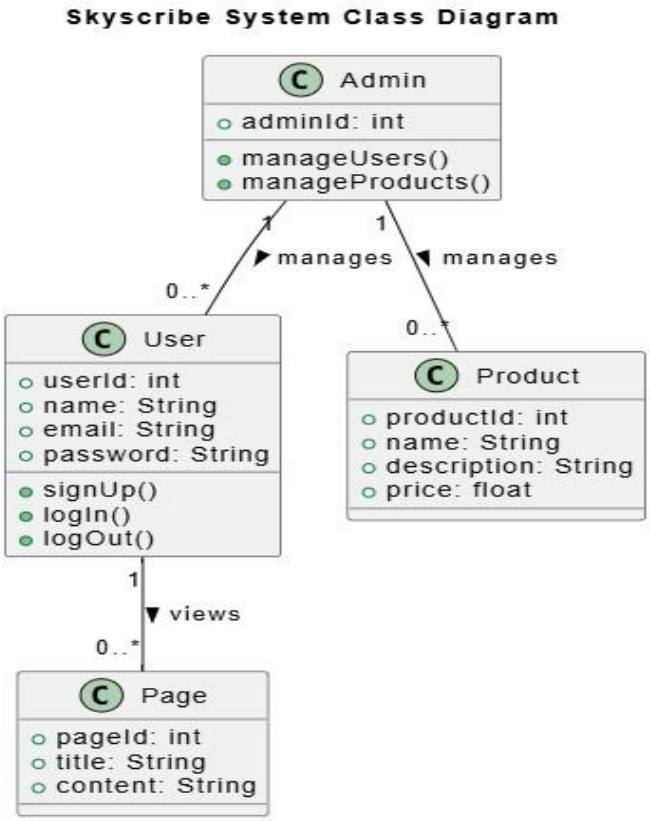
User Roles and Permissions:

- **Customer**: Views drone specifications, tracks drone statuses, and submits service requests.
- **Admin**: Manages drone inventory, reviews and assigns service requests, and handles user queries.
- **Technician**: Views and updates assigned service requests in real-time.

Use Case Diagram:



Class Diagram:



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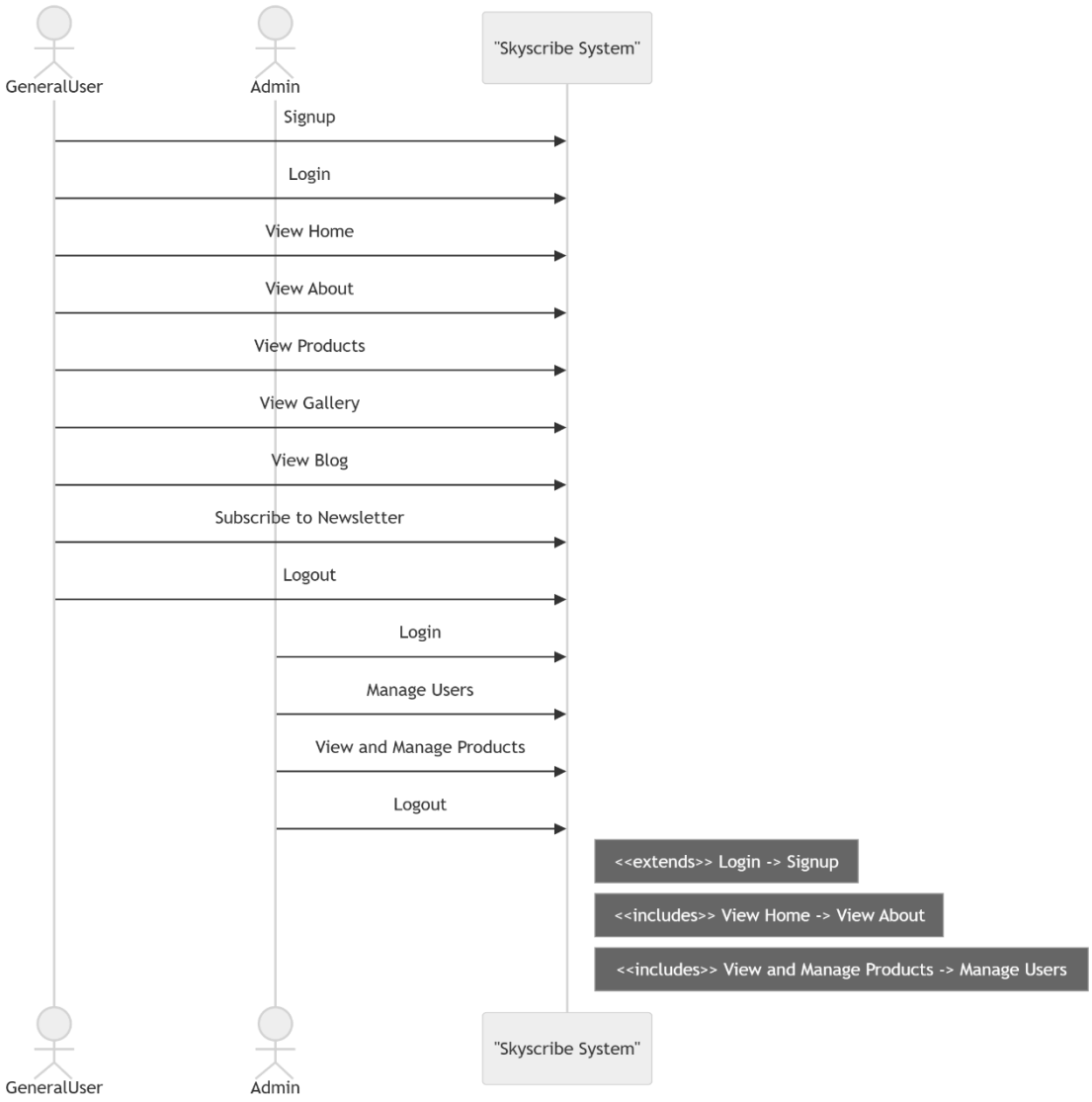
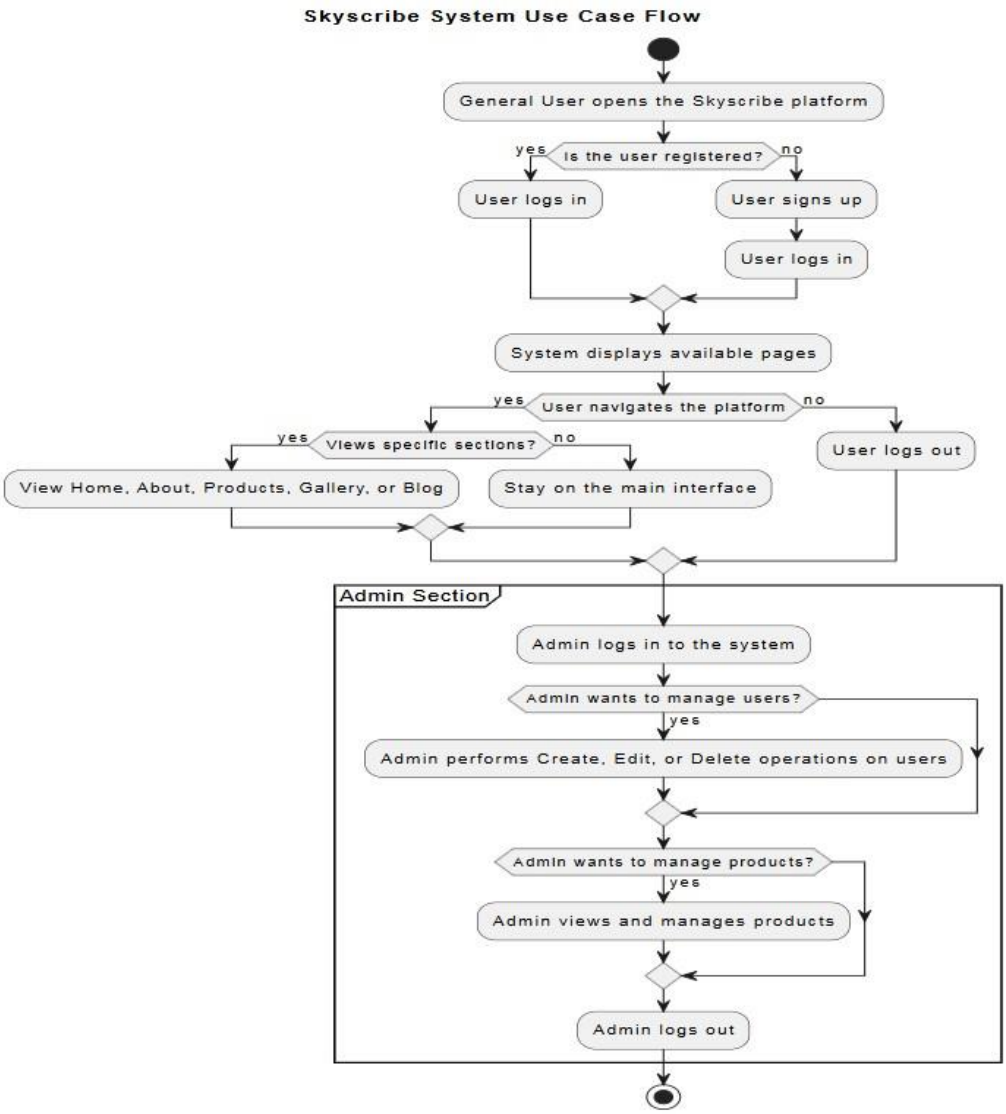


Activity Diagram:



Use Case Description

Use Case Name:

General User Access

Actors:

- **General User**: A visitor who uses the platform to explore and interact with its content.
- **Admin**: A system administrator responsible for managing users and products.

Use Case 1: User Registration and Login

Description:

Allows a general user to register for an account or log in to access personalized features.

Actors:

General User

Preconditions:

- The user must have access to the Skyscribe platform.

Basic Flow:

1. The user opens the Skyscribe platform.
2. If not registered, the user selects the "Sign Up" option and provides details.
3. The system stores the user’s credentials.
4. The user logs in using their credentials.
5. The system verifies the credentials and grants access.

Alternate Flow:

- **Invalid Credentials**: If login credentials are invalid, the system displays an error message and prompts the user to retry.

Postconditions:

- The user is logged into their account and redirected to the main interface.

Use Case 2: Explore Platform

Description:

Allows a general user to browse and interact with available pages.

Actors:

General User

Preconditions:

- The user must be logged in or accessing public pages as a guest.

Basic Flow:

1. The user navigates to the main interface.
2. The user selects a section to explore: Home, About, Products, Gallery, or Blog.
3. The system displays the content of the selected section.

Postconditions:

- The user successfully views content on the platform.

Use Case 3: Manage Users

Description:

Allows the admin to create, edit, or delete user accounts.

Actors:

Admin

Preconditions:

- The admin must be logged into the system.

Basic Flow:

1. The admin logs into the Skyscribe platform.
2. The admin selects the "Manage Users" option.
3. The admin creates a new user account or edits/deletes existing accounts.
4. The system validates and stores the changes.

Postconditions:

- The user database is updated successfully.

Use Case 4: Manage Products

Description:

Allows the admin to view and manage product listings on the platform.

Actors:

Admin

Preconditions:

- The admin must be logged into the system.

Basic Flow:

1. The admin selects the "View and Manage Products" option.
2. The admin views the list of products.
3. The admin creates, edits, or deletes product entries.
4. The system validates and stores the changes.

Postconditions:

- The product database is updated successfully.

General Alternate Flows:

1. **System Error**: If the system encounters an issue (e.g., connectivity or database error), it displays a message and logs the error.
2. **Access Denied**: If a user or admin tries to access unauthorized features, the system displays an access error message.

1. Detailed Workflows

User Workflow:

1. Registration & Login:

- User registers or logs in using Firebase Authentication.
- On successful login, Firebase issues a token for session management.

2. Dashboard Access:

- User accesses their personalized dashboard showing relevant data retrieved from Firebase Realtime Database.

3. Task Submission:

- Users can create, update, or delete tasks (or relevant content) in the app.

- Task data is stored in Firebase Realtime Database.

4. **Notifications:**
   - Real-time notifications are triggered using WebSockets or Firebase Realtime Database listeners.
5. **Account Management:**
   - Users can update their profile or account information stored in Firebase Authentication and Realtime Database.

Admin Workflow:

1. **Admin Login:**
   - Admin logs in via Firebase Authentication using a privileged role.
   - Admin privileges are verified through custom claims or a dedicated admin flag in the database.
2. **User Management:**
   - Admin views and manages registered users.
   - Admin can deactivate/reactivate users or modify their roles.
3. **Content Moderation:**
   - Admin reviews and moderates user-submitted content or tasks stored in the database.
4. **System Analytics:**
   - Admin accesses analytics dashboards displaying system performance, user activity, and other metrics pulled from Firebase Realtime Database.
5. **Real-Time Monitoring:**

- Admin monitors real-time system updates using Firebase's real-time capabilities.

2. **Module Description**

User Modules:

1. **Authentication Module:**
   - Handles user sign-up, login, logout, and password recovery using Firebase Authentication.
2. **Profile Module:**
   - Allows users to view and edit their profiles (name, email, etc.).
3. **Task Management Module:**
   - Enables users to create, edit, delete, and view their tasks or content.
4. **Notification Module:**
   - Provides real-time notifications using Firebase listeners.

Admin Management Modules:

1. **Admin Authentication Module:** - Ensures only privileged users can access the admin panel.
2. **User Management Module:**
   - Manages user profiles, permissions, and roles stored in the Firebase Realtime Database.
3. **Content Moderation Module:**
   - Admin reviews and takes action on user content (approves, deletes, or flags).
4. **Analytics Module:**

- Displays data visualization of system metrics (e.g., user activity, database statistics).

Admin Panel (Optional):

- A separate interface designed for admins with access to all admin modules and workflows.
- Features include data visualization, quick actions (e.g., ban user, moderate content), and detailed reports.

3. Technology Stack

Frontend:

- Frameworks: Pure HTML, CSS, and JavaScript for building the user interface.
- Design Principles: Modular, reusable components to ensure scalability and maintainability.

State Management:

- Firebase API: Handles authentication, database interactions, and real-time data updates**.**

Backend API:

- **Firebase Dependencies:**
  - firebase: Core library for authentication, database, and hosting.
  - firebase-tools: CLI for deployment and management.
  - @firebase/app: Initializes Firebase in your app.
  - @firebase/auth: Manages user authentication.
  - @firebase/database: Manages Realtime Database interactions.

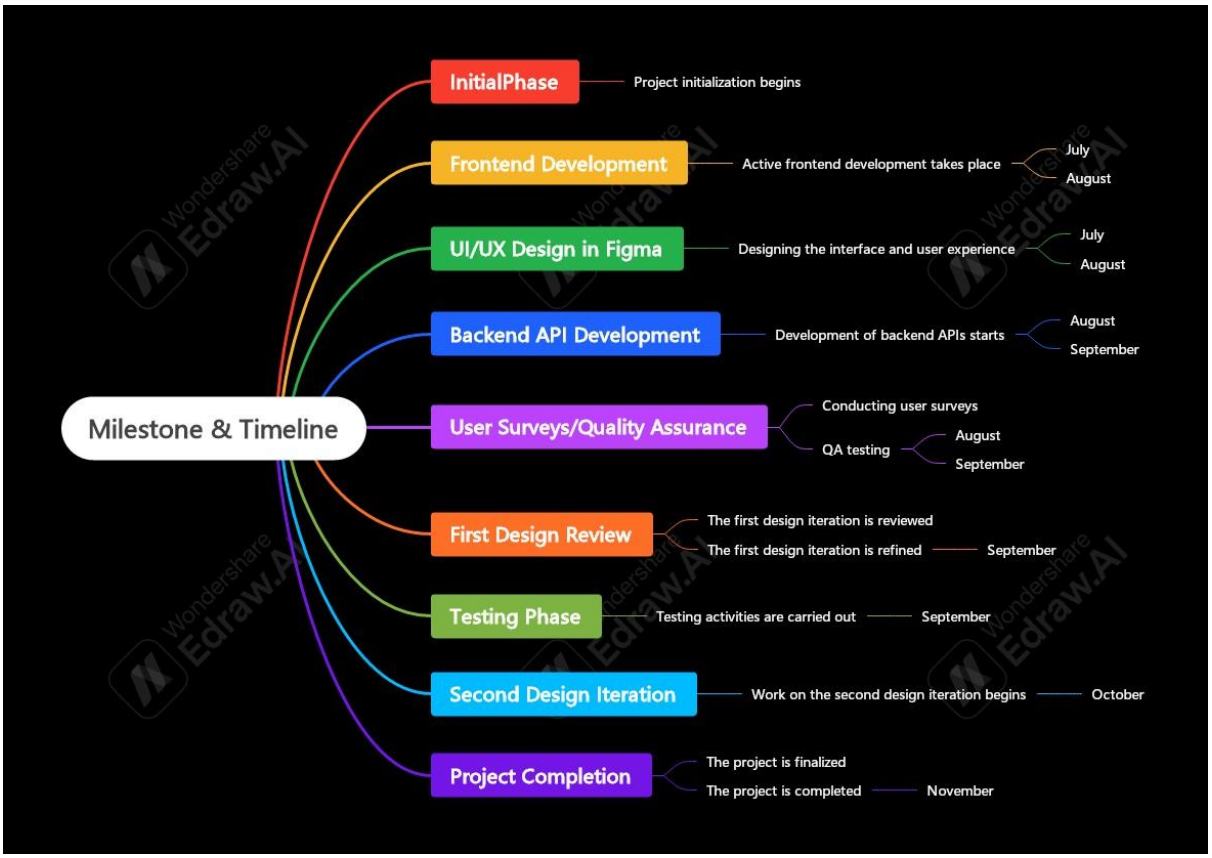
Database:

- **Firebase Realtime Database:** Stores user, admin, and application data, with real-time sync capabilities.

Real-Time Updates:

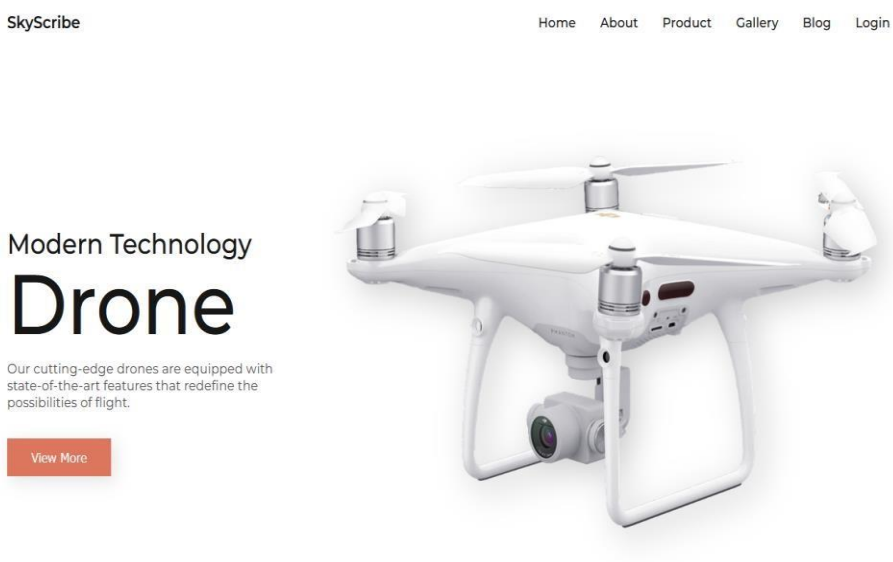
- Firebase Listeners: Utilize Firebase's built-in listeners for automatic updates.
- **WebSockets/Server-Sent Events (Optional):** For custom real-time functionality in delivery tracking.

6. Milestones and Timeline



GUI:

Home:



About

About Us

We are more than just a team; we are a community of drone enthusiasts dedicated to pushing the boundaries of aerial innovation.With a shared love for cutting-edge technology and the limitless possibilities it offers, we have come together to bring you the best in drone solutions.

Our journey is fueled by a commitment to excellence, from the sleek design of our drones to the advanced features that make them stand out in the sky. Join us on this exciting adventure, and discover the world from a new perspective. Elevate your experience; elevate with us.

View More

Where to Buy

Read More

Support

Read More

Fly Safe

Read More

Product Categories

- Consumer
- Professional
- Enterprise
- Components

Where to Buy

- Official Store
- Best Buy
- B&H Photo Video
- Hobby Shops

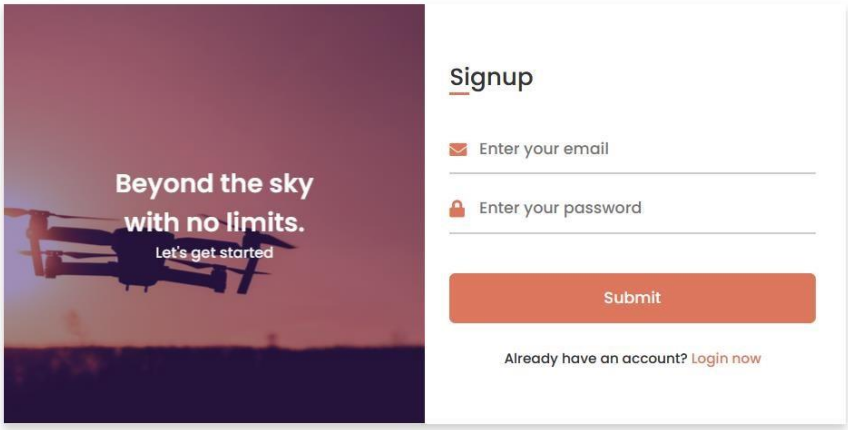
Quick Links

- Who we are
- Contact us
- Careers
- Dealer Portal

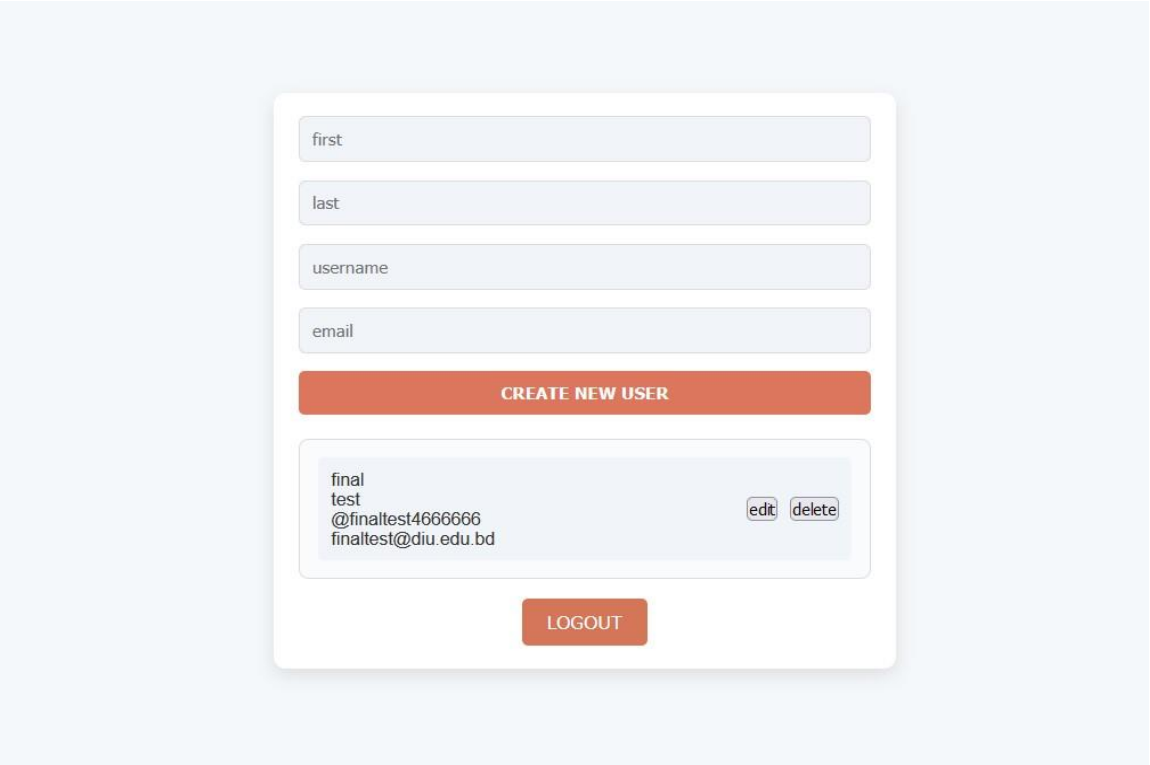
Service Plan

- Maintenance
- Workshops
- Insurance
- Upgrade

SignUp:


Beyond the sky
with no limits.
Let's get started
Signup
Enter your email
Enter your password
Submit
Already have an account? Login now

Dashboard:


first
last
username
email
CREATE NEW USER
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edit
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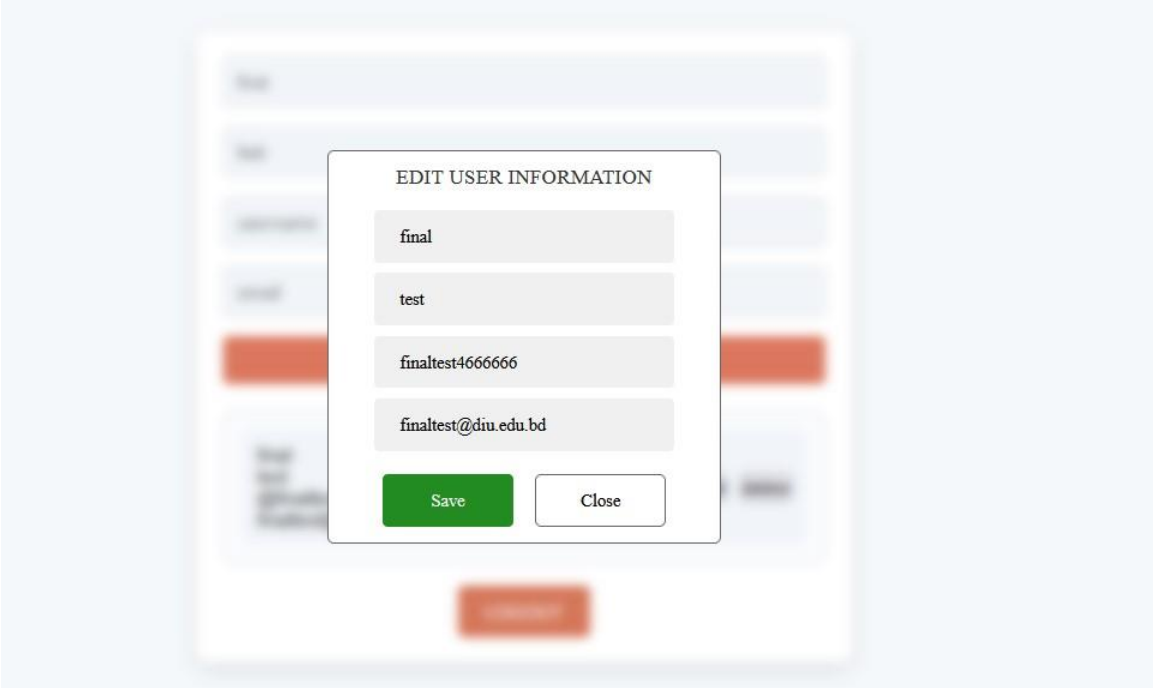
LOGOUT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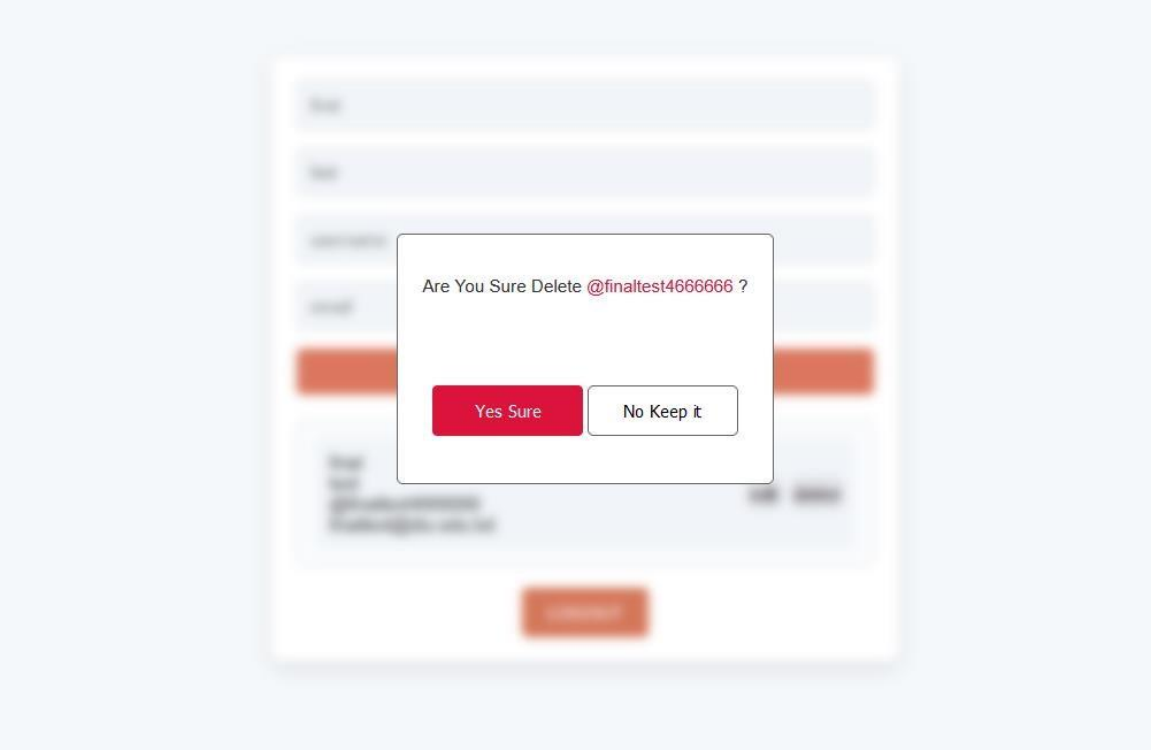
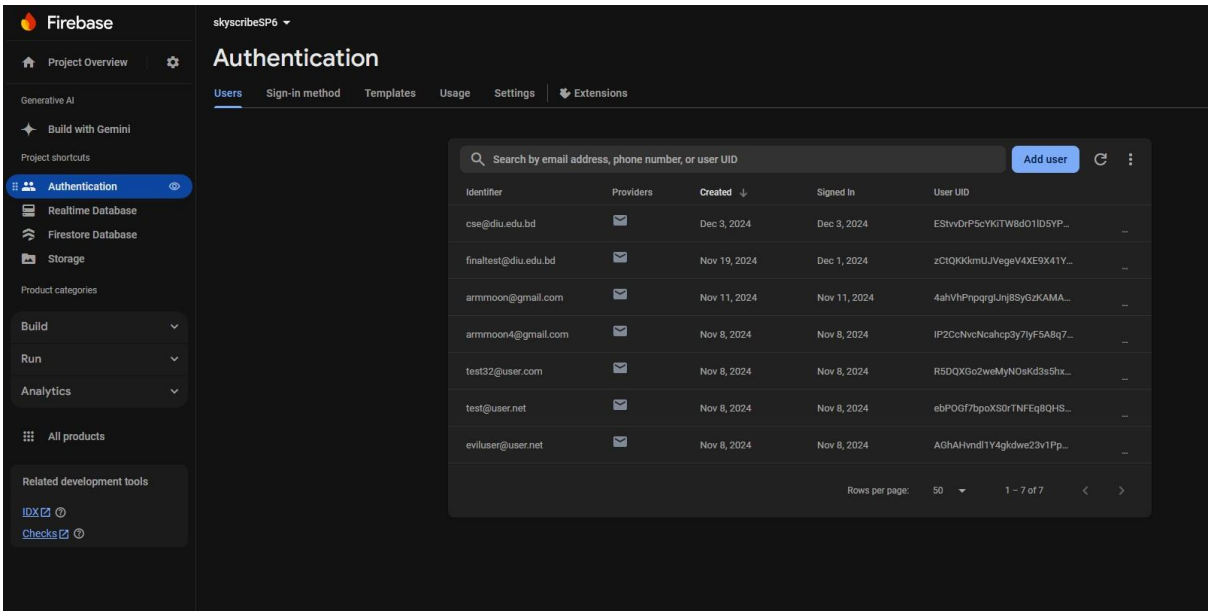

Are You Sure Delete @finaltest4666666 ?
Yes Sure
No Keep it

Database:


Firebase
skyscribeSP6
Project Overview
Generative AI
Build with Gemini
Project shortcuts
Authentication
Realtime Database
Firestore Database
Storage
Product categories
Build
Run
Analytics
All products
Related development tools
IDX
Checks
Authentication
Users
Sign-in method
Templates
Usage
Settings
Extensions
Search by email address, phone number, or user UID
Add user
Identifier
Providers
Created
Signed In
User UID
cse@diu.edu.bd
Dec 3, 2024
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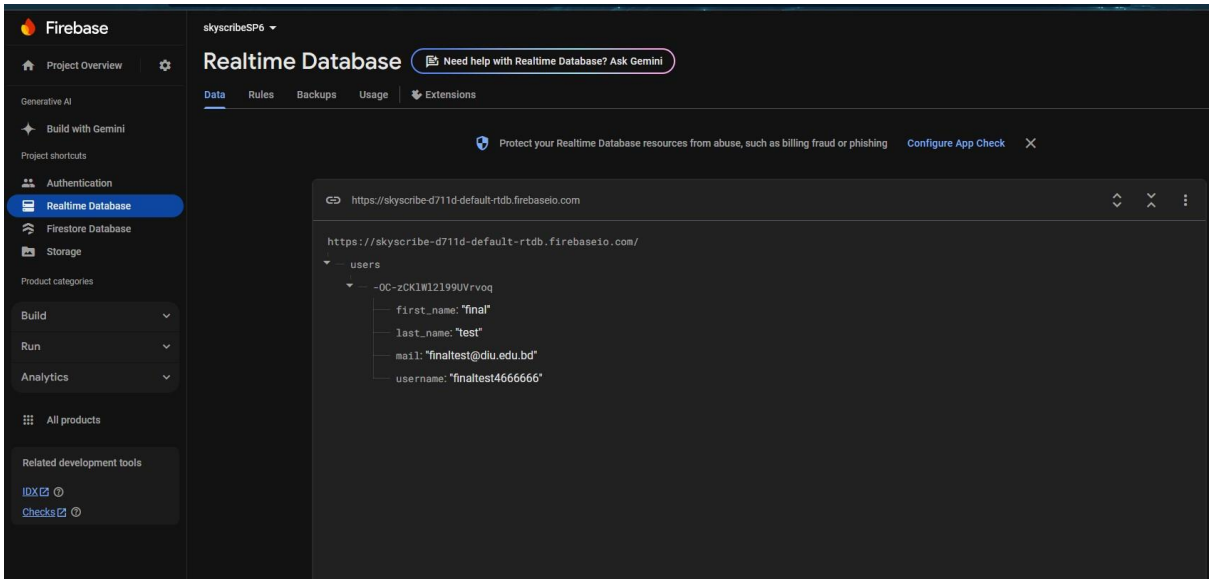

6. Testing Process

Unit Testing:

- **Scope:** Verifies individual modules such as authentication, profile management, and task handling.
- **Tools:** Utilize lightweight JavaScript libraries such as Mocha or Jasmine for pure JavaScript projects.
- **Examples:** ○ Test Firebase Authentication for login and signup flow.
    - ○ Test functions for task creation, editing, and deletion.

Integration Testing:

- **Scope:** Ensures seamless interaction between frontend modules and Firebase backend APIs.
- **Tools:** Combine Mocha with Sinon.js for mocking Firebase API responses during tests. • **Examples:**

- Validate synchronization between the Task Management Module and Firebase Realtime Database. ○ Ensure real-time notifications update correctly using Firebase listeners.

End-to-End Testing:

- **Scope:** Simulates full user workflows to validate the application's behavior.
- **Tools:** Cypress for automating scenarios like user login, task creation, and admin moderation.
- **Examples:**
  - Test a user signing up, adding tasks, and receiving real-time notifications.
  - Simulate an admin moderating user content via the Admin Panel.

User Acceptance Testing (UAT):

- **Scope:** Feedback from a test group to ensure features meet business and user requirements.
- **Execution:** Provide access to users for testing critical workflows and gather insights for improvement.

7. Support and Maintenance

Support Services:

- **Availability:** Provide dedicated support channels for both end-users and administrators.

- **SLA Guidelines:**
  - Critical Issues: Resolved within 1 hour.
  - Non-critical Issues: Resolved within 24 hours.

Maintenance Plan:

- **Regular Updates:** Weekly checks for Firebase library updates and security patches.
- **Feature Enhancements:** Rolling out new features like advanced analytics and user role management.
- **Bug Fixes:** Address reported issues promptly to ensure seamless operations.

8. Pricing and Payment Terms

Total Project Fee:

- $10,000 USD.

Payment Schedule:

1. **20%:** Completion of requirement analysis and design approval.
2. **40%:** Delivery of the fully functional frontend and backend integration.
3. **30%:** After successful testing and user acceptance.
4. **10%:** Post-deployment sign-off.

9. Roles and Responsibilities

User Modules Responsibilities:

- **Authentication Module:** Provide secure access through Firebase Authentication.
- **Profile Module:** Ensure user profiles are editable and up-to-date
- **Task Management Module:** Enable CRUD operations with real-time updates
- **Notification Module:** Deliver instant updates via Firebase listeners.

Admin Management Modules Responsibilities:

- **Admin Authentication Module:** Restrict admin access to authorized users only.
- **User Management Module:** Manage and update user roles and permissions securely.
- **Content Moderation Module:** Allow admins to review and act on usergenerated content.
- **Analytics Module:** Deliver accurate data insights for system and user activities.

Admin Panel (Optional):

- Design an admin-exclusive interface with full access to administrative modules.
- Features include real-time dashboards, quick-action controls, and analytics reporting. **Technical Team:**
- **Frontend Developer:**

- Build user interfaces with pure HTML, CSS, and JavaScript.
- Integrate Firebase for state management and real-time updates.

- **Backend Developer:**
  - Configure Firebase Authentication and Realtime Database. ○ Develop Firebase Cloud Functions for advanced backend logic.
  - Maintain secure data access policies.

10. Contact Us

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Phone:+8801872933718

Github: https://github.com/armmoon4