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Planning Document

1. System Description
    a. LynxUp is an application that will give prospective students a tour of Rhodes College. The application will use augmented reality (AR) to introduce students to the college's many facets. Students can scan items to get fun facts about the college. Additionally, LynxUp will provide various quests to give the students a guided tour of different parts of the campus. LynxUp will supply a collective space where new students can meet each other and collaborate on quests throughout the campus. Each student will have a personalized experience based on the items they have collected and the quests they have completed. Students who have completed quests will be listed on a leaderboard, fostering competition and engagement.
2. Architectural Overview
    a. Our architecture comprises four major parts: the frontend, backend, database, and maps API. The frontend is built via Unity's AR IOS kit, it will interact with the backend and the maps API using REST API. The backend consists of a Flask server programmed with Python; it will facilitate an interaction with the front end and the database. The database will hold the user's data, progress, and asset information. The database will also provide links to the virtual items in the storage. Finally, the maps API will provide the minimap functionality and coordinate your location to the quest.
    b.
        1. Firebase (Database)
        2. Firebase (Storage)
        3. Python/Flask (Server/Backend)
        4. Unity IOS AR frontend
        5. Maps API

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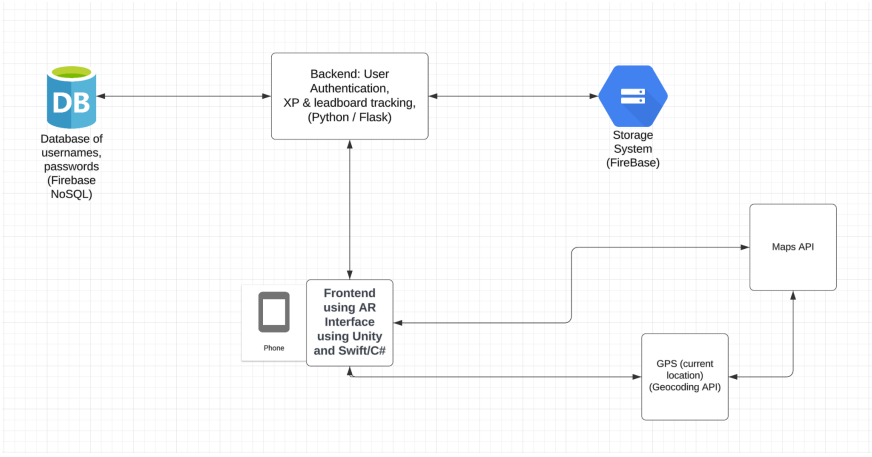
c. 

3. Functional Requirements
    a. Information related to specific facets of the college is displayed when those particular buildings are scanned.
        i. A pop-up is displayed describing the building's purpose
    b. Scanning a building will provide the user with experience points (XP)
    c. If a user chooses to log in, they will have access to leaderboards consisting of all who have used the app previously, allowing them to compare XP
    d. A quest system where users can move through the college on a linear path
        i. If they find items outside the desired linear path, users gain additional XP

EPIC 1 - Placing Items
As a LynxUp user **I want** to be able to place items around campus **So that** I can interact with the environment around me

EPIC 2 - Campus knowledge / understanding
As a LynxUp user **I want** to be able to locate buildings/items throughout campus with facts about the items **So that** I can learn my way around campus

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EPIC 3 - Quests
As a LynxUp user **I want** to have the option of a fun guided tour of the campus **So that** exploring the campus is enjoyable

EPIC 4 - Finding my way across campus
As a LynxUp user **I want** to have some guidance exploring the campus **So that** I can learn as much about the history and significance of the college

EPIC 5 - Incentives
As a LynxUp user **I want** some encouragement (ex. leaderboard) or incentives to continue playing the game **So that** the game continues to be fun over a longer period

4. Non-Functional Requirements
    a. The AR displays should load in no longer than 1 second on the app
    b. The app should function in an offline mode with pre-downloaded campus maps
    c. The app should require no more than 4 steps to set up the AR mode by identifying buildings.
5. Technologies and Frameworks
    a. Swift / Xcode for app making, Unity for AR, Firebase SQL for database
    b. GPS to determine relative positioning on campus
6. Minimum Viable Product
    a. The app should have two modes: an AR mode/quest mode, the user can move around the map or campus to discover AR facts about buildings that pop up when the user walks around campus with an added story. A second mode should be integrated with the first with an XP system that involves discovering buildings and geocaches with a leaderboard between peers.
7. Roadmap:
    a. Sprint 1 - app does not crash, AR display, login page with Google sign-in with a Firebase Database

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b. Sprint 2 - AR can identify buildings; tapping a building provides information about the building.
c. Sprint 3 - Minimal functional quest in AR between 2 buildings.
d. Sprint 4 - Continue adding quests dynamically and making an automated pipeline for quest creation. Add leadership board and personal catalog of discovered locations and items.
e. Sprint 5 - Add a mini-map for the quests within Rhodes College
f. Sprint 6 - Integrating mini-map with dynamic quest making.