

# RoomEase

## Spring 1 Planning

02.15.2025

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Team 16:

- Krish Patel
- William Parodi
- Nathan Huang
- John Raub
- Ishan Muhkerjee
- Carter Ellis

## **Sprint Overview:**

In this sprint, we will focus on setting up the foundational features of RoomEase. Our goal is to implement initial user setup, group creation, and task management functionalities, which will serve as the base for more advanced features in later sprints. This includes user registration/log in, group creation, chore management, and expense tracking.

**Scrum Master:** John Raub

**Meeting Plan:** Mondays @ 5:00pm / Saturdays @ 3:00pm

### **Risks and Challenges:**

As we are just starting our project this spring, the main challenge will be to establish proper programming styles/mechanisms throughout the project. Since, in the beginning, much of the work will be completed on a few files which can cause many collisions if we do not coordinate properly. Another challenge will be setting up many of the modules that will be used throughout the rest of the project. Since we are just starting the project, there will be little underlying infrastructure to work with, so much of our initial work will be setting up the classes and modules that'll make the development process smoother down the road. This means that we must extensively test our implementation for these early steps because everything we build later on will be based on it. If we don't do our best work now and organize everything, we risk further complications later.

# Functional Requirements for Sprint 1:

## User Authentication & Profile Setup (Assigned to Krish Patel):

1. As a user, I would like to Register/Login using Google (10 Hours)
2. As a user, I would like to Logout and Save My Data (10 Hours)
3. As a user, I would like to Create and Edit User Profile (10 Hours)

#	Description	Est. Time (Hrs)	Owner
1a	Create UI for initial user registration and login	1.875	Krish
1b	Implement Google OAuth authentication	2.875	Krish
1c	Secure API endpoints for user authentication	1.875	Krish
1d	Store user login information securely in MongoDB	2.875	Krish
1e	Testing	0.5	Krish
2a	Ensure user sessions are managed correctly	4.75	Krish
2b	Ensure user sessions are reloaded properly	4.75	Krish
2c	Testing	0.5	Krish
3a	Create UI for user profile setup	4.75	Krish

3b	Allow users to edit their name, profile picture, and contact details	4.75	Krish
3c	Testing	0.5	Krish

### Acceptance Criteria:

- As a user, I would like to Register/Login using Google
  1. Given that the UI for login and registration is implemented correctly, when a user attempts to register or log in using Google OAuth, then they should be authenticated successfully and assigned a unique JWT token for user management.
  2. Given that the authentication system is secured, when a user attempts to access protected API endpoints, then only authenticated users should be granted access, and login data should be securely stored in MongoDB.
  3. Given that error handling is implemented correctly, when a user encounters authentication failures, then they should receive clear and descriptive error messages, and be prompted to re-authenticate as needed
- As a user, I would like to Logout and Save My Data
  1. Given that session management is properly implemented, when a user logs out, then their session should be cleared, and upon reloading the application, authenticated users should remain logged in.
  2. Given that session persistence and data validation are correctly implemented, when a user updates their profile, then the changes should be securely stored, retrieved correctly, and validated to prevent invalid or malicious data entries.

3. Given that user feedback is essential for a smooth experience, when a user logs in, logs out, or updates their profile, then they should receive a confirmation message indicating the action was successful.
- As a user, I would like to Create and Edit User Profile
    1. Given that the user profile UI is fully functional, when a user sets up or edits their profile, then they should be able to update their name, profile picture, and contact details seamlessly.
    2. Given that form validation is implemented, when a user attempts to submit their profile information, then the system should prevent empty or incorrectly formatted inputs and display appropriate error messages.
    3. Given that user experience is a priority, when a user updates their profile information, then the changes should be reflected instantly in the UI without requiring a manual page refresh.

### **Group Creation & Management (Assigned to William Parodi):**

1. As a user, I would like to launch a main page displaying all roommate groups (10 Hours)
2. As a user, I would like to Create and Join a Roommate Group (10 Hours)
3. As a user, I would like to Invite Others to a Roommate Group (10 Hours)

#	Description	Est. Time (Hrs)	Owner
1a	Create UI for the user's homepage	3.25	William

1b	Display all the user's groups as doors	6.25	William
1c	Testing	0.5	William
2a	Implement functionality to create a new group	4	William
2b	Implement functionality to setup group specific settings	3	William
2c	Implement widgets to view incoming invites and functionality to accept/decline these invites.	2.5	William
2d	Testing	0.5	William
3a	Develop UI to invite other users to group	1.5	William
3b	Implement invite system via Notifications sent to the relevant User(s)	3.5	William
3c	Develop UI to manage group invites	1.5	William
3d	Ensure proper user validation when joining groups	3	William
3e	Testing	0.5	William

### Acceptance Criteria:

- As a user, I would like to launch a main page displaying all roommate groups

1. Given that the UI for the user's homepage has been set up correctly, the user, after logging in, should be brought to a page with options to view notifications, create rooms, join rooms they were invited to, and view rooms that they are currently in.
  2. Given that the UI for the user's homepage has been set up correctly, the user, upon viewing the homepage, should be able to view the roommate groups they are currently in displayed as doors with the roommate group's photo and the name under it as indicators of which roommate group's page the door will lead the user upon clicking.
  3. Given that the functionality for populating the homepage with the user's data has been implemented properly, the user, upon entering the homepage, should see all the rooms, notifications, etc. that are relevant to their specific user data.
- As a user, I would like to Create and Join a Roommate Group
    1. Given that the UI and functionality for group creation has been set up correctly, the user, once navigated to the homepage, should be able to select a door decorated with a plus in order to create a new roommate group. Upon creation, the room will be assigned its own JWT token for group management.
    2. Given that the UI and functionality for group settings management has been implemented properly, the user, upon creation of the roommate group or selection of a settings widget, should be able to modify which features (chores, grocery splitting, disputes, etc.) are made available to the roommate group.
    3. Given that the UI and functionality for receiving invites have been implemented properly, the user, upon entering the homepage, should be able to view incoming invites as doors with a red question mark

next to them. Upon clicking these doors, the user should see a pop up that allows them to accept or reject the invitation. If the user accepts, the invitation door will be replaced with a door that, when clicked, leads the user to the homepage of the roommate group that invited them. If the user rejects, the invitation door will be removed from the homepage.

- As a user, I would like to Invite Others to a Roommate Group
  1. Given that the UI and functionality for managing and sending group invites has been implemented properly, the user, upon navigating to the roommate group's page, should be able to select a widget that brings them to a page that allows them to add, view, and delete all outgoing invites to the roommate group.
  2. Given that the functionality for user validation has been properly implemented, the user, upon sending an invite to their roommate group, should receive a pop-up indicating whether the invitation has been sent to a valid user or if the specified username/user ID does not exist. If the user validation fails, there should be no data added to the database.
  3. Given that the Notification system for incoming invites has been properly implemented, the user, upon receiving an incoming invite or upon receiving an update on a recently accepted/declined invitation, should be able to view a Notification sent to them through the app's notification system.

## **Chore Management System (Assigned to John Raub):**



As a user, I would like to Assign, Track, and Set Deadlines for Chores (10 Hours)

As a user, I would like to Receive Notifications When a Chore is Due or Completed (10 Hours)

As a user, I would like to Mark Chores as Complete (10 Hours)

#	Description	Est. Time (Hrs)	Owner
1a	Develop UI for chore management	3.5	John
1b	Allow users to assign chores/tasks to themselves and/or others	6	John
1c	Testing	0.5	John
2a	Implement notifications	3	John
2b	Notify group members w/ assigned tasks about upcoming deadlines	3.5	John
2c	Notify group members about their overdue tasks	3	John
2e	Testing	0.5	John
3a	Implement functionality to mark tasks as done	5	John
3b	Sync changes across all group members	4.5	John

3c	Testing	0.5	John
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### Acceptance Criteria:

- As a user, I would like to Assign, Track, and Set Deadlines for Chores
  1. Given that the UI and functionality for the chore management page have been implemented correctly, the user should be able to select a widget on the roommate group page that navigates the user to the chore management page that displays all chores, who needs to complete each chore and the deadline for completing the chore.
  2. Given that the widgets and functionality for executing different chore management commands have been implemented properly, the user should, after navigating to the chore page, be able to add chores (along with adding who's participating in the chore, the name, and the deadlines).
  3. Given that the chores functionality has been implemented properly when a user views the chores page, they should be able to edit chores to adjust the order, description, and other important content.
  4. Given that the UI has been implemented correctly for the chores when a user tries to view the chores and there are too many to fit on the screen, a scroll bar functionality should appear allowing the user to scroll down and view all of the chores.
- As a user, I would like to Receive Notifications When a Chore is Due or Completed
  1. Given that the UI and functionality for Notifications have been implemented properly, the user should be able to select a widget from all pages besides the login page that brings them to a page to view all

of their incoming notifications. This widget should also light up and show a summary of a recent notification if the user has just received one.

2. Given that the Notification system for alerting members about upcoming or overdue chores has been implemented properly, the user should receive notifications whenever they have an upcoming chore to complete, when they have been assigned a chore, and when they have an overdue chore.
  3. Given that the Notification system has been properly implemented and the chores functionality has been properly implemented, when a user creates a new chore, the entire room should receive a notification informing them of the new chore, its description, when it is due, and who it is assigned to first.
- As a user, I would like to Mark Chores as Complete
    1. Given that the UI and functionality for chores have been implemented correctly, when a user completes a chore they should be able to interact with a widget to mark that chore as having been completed.
    2. Given that the UI and functionality for chores have been implemented correctly, when a user marks a recurring chore as having been completed, it should switch to the next person assigned to that chore, and update the due date. Additionally, it should notify the person to whom the chore is now assigned.
    3. Given that the Mark Chores functionality is correctly implemented. Non-recurring chores that are marked as complete should remain visible at the bottom of the UI. When a user wants to reactivate that chore, they should be able to interact with it and assign a new due date

which will mark it as active and return it to the ordering for the rest of the chores.

## **Grocery Requesting & Payment Tracking (Assigned to Carter Ellis):**

1. As a user, I would like to Add Items to a Shared Grocery List (10 Hours)
2. As a user, I would like to Mark Items as Purchased & Request Payment (10 Hours)
3. As a user, I would like to Mark When a Payment Has Been Completed (10 Hours)

#	Description	Est. Time (Hrs)	Owner
1a	Develop UI for grocery list tracking	2	Carter
1b	Allow users to add and remove requested items	4	Carter
1c	Allow users to edit their requests	3.5	Carter
1d	Testing	0.5	Carter
2a	Allow users to mark an item as purchased	3	Carter
2b	Allow users to upload their item prices	3.5	Carter
2c	Notify roommates for cost reimbursement	3	Carter
2d	Testing	0.5	Carter

3a	Allow users to mark a payment as completed	4	Carter
3b	Update user balances accordingly	5.5	Carter
3c	Testing	0.5	Carter

### Acceptance Criteria:

- As a user, I would like to Add Items to a Shared Grocery List
  1. Given that the grocery list UI is correctly implemented, when a user accesses it, the list should display all grocery items and allow smooth interaction with it.
  2. Given that the item management functionality is correctly implemented, when a user adds or removes an item in the grocery list, the list updates dynamically and displays changes in real-time.
  3. Given that the item management functionality is correctly implemented, when a user edits an item in the grocery list, it should update dynamically to reflect those changes in real-time
- As a user, I would like to Mark Items as Purchased & Request Payment
  1. Given that item fulfillment is implemented correctly, when a user marks an item as purchased, the system will update the item to indicate it has been bought and assign the purchaser.
  2. Given that price input is implemented correctly, when a user enters the total cost of a purchased item, the system will calculate and display the amount owed by each requester.

3. Given that the notifications are implemented correctly, when an item is marked as fulfilled, then all requesters will receive a notification requesting reimbursement.
- As a user, I would like to Mark When a Payment Has Been Completed
    1. Given that payment tracking is implemented correctly, when a user marks their payment as completed, their owed amount will be set to 0 in the system.
    2. Given that payment tracking is implemented correctly, when a user marks their payment as completed, the system will record the payment as complete and update the status of the related grocery item accordingly.
    3. Given that balance updates are implemented correctly, when payments are completed, the system will update all relevant balances accordingly.

### **Recurring Bills and Expenses (Assigned to Ishan Muhkerjee):**

1. As a user, I would like to Add Bills/Recurring Expenses (10 Hours)
2. As a user, I would like to Edit and Remove Bills/Recurring Expenses (10 Hours)
3. As a user, I would like to Indicate a “Pay Master” for Each Expenses (10 Hours)

#	Description	Est. Time (Hrs)	Owner
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1a	Develop a UI to display all bills/recurring expenses	3	Ishan
1b	Allow users to add bills/recurring expenses	6.5	Ishan
1c	Testing	0.5	Ishan
2a	Implement functionality to modify and remove bills and recurring expenses	5	Ishan
2b	Allow users to assign who is responsible for each bill	4.5	Ishan
2c	Testing	0.5	Ishan
3a	Assign a specific person responsible for paying each bill (the “Paymaster”)	4	Ishan
3b	Implement a tracking system for payments	5.5	Ishan
3c	Testing	0.5	Ishan

### Acceptance Criteria:

- As a user, I would like to Add Bills/Recurring Expenses
  - Given that the UIs and functionalities for the billing/expenses feature have been implemented properly, the user, upon selecting a widget in the roommate group homepage, should be brought to a billing UI displaying all ongoing expenses.

2. Given that the UIs and functionalities for the billing/expenses feature have been implemented properly, the billing UI should display the due dates for all ongoing expenses.
  3. Given that the UIs and functionalities for the billing/expenses feature have been implemented properly, the billing UI should show which users are assigned to each expense along with their designated Paymasters.
- As a user, I would like to Edit and Remove Bills/Recurring Expenses
    1. Given that the functionality for managing recurring bills/expenses has been properly implemented, the user, upon entering the billing page, should be able to select widgets that allow them to add, remove, and modify recurring bills/expenses.
    2. Given that the functionality for managing recurring bills/expenses has been properly implemented, any changes made to recurring bills/expenses should be reflected across all devices.
    3. Given that the functionality for managing recurring bills/expenses has been properly implemented, all relevant users should receive notifications upon the creation, removal, or modification of a recurring bill/expense.
  - As a user, I would like to Indicate a “Pay Master” for Each Expenses
    1. Given that the functionality for assigning a Paymaster has been properly implemented, the user, upon creating a recurring bill/expense, should be able to assign a Paymaster.
    2. Given that the functionality for assigning a Paymaster has been properly implemented, the user should also be able to update the Paymaster by selecting a widget on an existing recurring bill/expense.



3. Given that the functionality for assigning a Paymaster has been properly implemented, all relevant users should be notified when a Paymaster is assigned or updated.

### **Quiet Hours & Notifications (Assigned to Nathan Huang):**

1. As a user, I would like to Set Quiet Hours for the Group (10 Hours)
2. As a user, I would like to Receive Notifications for Scheduled Quiet Hours (10 Hours)
3. As a user, I would like to View the Room's Current State (10 Hours)

#	Description	Est. Time (Hrs)	Owner
1a	Develop a UI to allow the user to set Quiet Hours for the group	2	Nathan
1b	Allow users to set and modify quiet hour periods	4	Nathan
1c	Allow users to set levels of quiet hours	3.5	Nathan
1d	Testing	0.5	Nathan
2a	Implement notification system when quiet hours begin/are about to begin	5	Nathan
2b	Ensure that timely alerts are sent to all members in a group	4.5	Nathan

2c	Testing	0.5	Nathan
3a	Develop UI to show real-time updates about household activities and “quiet status”	4	Nathan
3b	Update status for all roommates affected by status update	5.5	Nathan
3c	Testing	0.5	Nathan

### Acceptance Criteria:

- As a user, I would like to Set Quiet Hours for the Group
  1. Given a user is in the main page of their room, they should be able to hit their respective UI in order to open the quiet hours page.
  2. Given that the user has entered the quiet hours page, they should be able to set quiet hours during times following their schedule, and set levels for these hours, (e.g. 4 - Absolute silence, 2 - talking allowed, etc.).
  3. For the quiet hour levels, these will be determined by the room settings, and will be modifiable by each of the users in the group.
- As a user, I would like to Receive Notifications for Scheduled Quiet Hours:
  1. After quiet hours are enacted, there should be a real time notification system that will prompt all necessary roommates when the quiet hours are to begin.
  2. If respective room-based quiet hours are changed or enacted, there should be a notification showing the change a customizable amount of time after.
  3. Before quiet hours are in effect, all roommates affected by the quiet

hours should get a notification ahead of time by some amount of minutes, set by the room settings.

- As a user, I would like to View the Room's Current State:
  1. Given the user has successfully made their last login, the notification will pop up on the main room page, where all the other notifications for the room(s) are centralized.
  2. Inside the main room, there should be a personalized, interactable UI to actively show the state of the room, as well as when any quiet hours or household activities are active.
  3. When the user clicks on the personalized UI, there will be a pop-up that shows a queue which will allow the user to put in a request to change the current state of the room. Requests will work in a FIFO manner, with priority assigned to requests.
  4. The first item on the queue will be the current status, which will display as a customizable setting on the main room page (e.g. if a roommate has an interview, the color will be red—or another metric to determine the status). When updates are made to the queue, the state should immediately change, followed by notifications to the relevant roommates.

# Non-Functional Requirements for Sprint 1:

- Must be able to access this app through the web
- Must have a database that is well organized and is able to expand as more different types of information is added
- Must have an interface that is intuitive and easy to navigate

## Remaining Backlog:

### Functional Requirements:

#### 1. User account registration:

As a user,

- a. I would like to register and login using my Google account.
- b. I would like to log out of my account and save my data.
- c. I would like to be able to create a profile with my name, birthday, profile picture, and contact information.
- d. I would like to be able to edit my profile at any time.

#### 2. Profile management and user settings:

As a user,

- a. I want to be able to customize the appliances within each individual bedroom.
- b. I want to be able to set chore difficulty levels and allocate points based on difficulty.
- c. I want to add notes/comments/expectations on chores (when completed / how to complete).
- d. I want to be able to customize the “master bedroom” so that each different group has their own customizable aesthetic.

#### 3. Recurring expenses:

As a user,

- a. I want a UI to display all bills/ recurring expenses in the group.
  - b. I want to add bills/recurring expenses onto the bills UI and be able to indicate which group members are a part of the expense.
  - c. I want to edit any of my bills/recurring expenses from the group and be able to edit which group members are a part of the expense.
  - d. I want to indicate a “Pay Master” (the person that actually pays the bill) for each bill/recurring expense that everyone must send what they owe to.
  - e. There will be a “Pay Master”, I want to indicate when members of my specific bill/recurring expense have paid me or not.
  - f. I would like to see a history of how much recurring expenses have cost in the past (track changes in electricity/water usage).
  - g. I want to receive web notifications when a new bill or recurring expense has been created with me as a contributor.
  - h. I want a UI to display my total balance owed/am owed by each group member.
  - i. I want to mark as settled all of what I owe/am owed by each group member at once (this would mark all payments requested as “paid”).
4. Quiet Hours and Room State:

As a user,

- a. I want a UI that displays all room states requested (present and future).
  - b. I want to view the room’s current state.
  - c. I want to set quiet hours for the household.
  - d. I want to receive web notifications when a roommate’s requested quiet hours has begun or been scheduled.
  - e. I would like to be able to see a clock which dictates the current state of the room
5. Creation and selection of groups or rooms:

As a user,

- a. I want to launch a main page that displays all my roommate groups.

- b. I want to create and join a roommate group.
- c. I want to be able to invite others to my roommate group.
- d. I want each roommate group to have a UI that displays all the features that RoomEase provides for each group in the form of common appliances.
- e. I want a room called the “master room” which will compile all the tasks, quiet hours, expenses from all groups that I am a part of into one room UI.
- f. I want a settings page for each roommate group where I can enable or disable certain RoomEase features such as grocery splitting, chore list, etc.
- g. I want to be able to leave my group and notify other members in the group.

6. Handing of chores and tasks:

As a user,

- a. I want to assign, track, and set deadlines for household chores.
- b. I want to receive web notifications when a chore is due or completed.
- c. I want to mark my chores as complete.
- d. I want a feature that allows me to request to swap chores with one of my other roommates

7. Maintaining group grocery lists:

As a user,

- a. I want to add items to a shared grocery list.
- b. I want to add comments to the items I put on the list.
- c. I want to mark an item on the list as purchased and request payment for the amount that I spent on it.
- d. I want to be able to mark when a payment has been completed.
- e. I want to receive web notifications when I have unpaid grocery balances.

8. Creating a communication network:

As a user,

- a. I would like to have a group chat for each roommate group.
- b. I would like to enable a chat filter (blur profanities) for my roommate group chat.

- c. I want to upload a group photo that will display on the door that leads to the group page.
  - d. I want to enable a bulletin board in my room where I post and remove notes to be publicly displayed.
  - e. I would prefer to create and see clauses in my roommate agreement with my roommate(s).
  - f. I want to be able to see and add house rules to a section of the bulletin board.
  - g. I would like to add pictures to a section of the bulletin board to save memories that I share with my roommate.
  - h. I would like to be able to interact with the different sections of the room that show me the different features.
9. Settling disputes among group members:

As a user,

- a. I want to be able to click a gavel on the desk that allows roommates to vote on disputes within the apartment
- b. I want to be able to bring up a page to vote on disputes
- c. I want to be able to issue a dispute through the UI the gavel brings up when clicked.

10. Implementation of points system:

As a user,

- a. I want to be able to earn points based on completing my tasks/getting groceries for my roommates.
- b. I want to use points to purchase cosmetics to decorate my rooms.
- c. I want to be able to enable a monthly review of my roommates in certain categories (cleanliness, noise, expenses paid, etc.) for groups larger than 2 people.

11. Leaderboard management:

As a user,

- a. I want to see “RoomEase Wrapped”, which is a monthly leaderboard of who did the most of what chores / bought groceries the most, etc.
- b. I want to view an all time, dynamically updated leaderboard of who did the most of what chores / bought groceries the most, etc. throughout the entire existence of the roommate group.