Verification Plan

The two design inputs that have been chosen for verification for this project are the following:

- Email Notification for Grocery List
    - The system should send an email to the user within 3 minutes of the set time with the most up-to-date grocery list.

- Recipe Adherence to Dietary Restrictions
    - The system must adhere 90% to the user's indicated allergies, religious guidelines, and disease-specific limitations.

Email Notifications for the Grocery List

Reason for the Test

A user should be able to set a scheduled time for their grocery list to be emailed to them. We need to verify that the user receives the email in their inbox within three minutes to ensure timely reminders.

Materials, Equipment, and Facilities Needed

- agenda.js scheduling and sending out an email for the grocery list. [26]
- **email.js** framework to send an email. [10] [11]
- Stopwatch to measure the time it takes for an email to be received. [17]

Experiment Protocol

1. User Input and Scheduling

- Take note of the user's current grocery list
- The user selects a scheduled time for receiving the grocery list email and it is stored in the database.
- Add more items to the grocery list and take note of the new grocery list

2. Retrieving and Sending the Email

- At the scheduled time:
    - The system retrieves the grocery list from the app's database. [6]
    - The email is generated with the latest grocery list content.
    - The system sends the email using email.js [10] [11]
    - Manually start the stopwatch [17]

3. Receiving and Verifying the Email:

- Once the email is in the user's inbox:
    - Compare the timestamp of the email in the user's inbox to the set scheduled send time and ensure it was within 3 minutes.
    - Manually stop the stopwatch and note the time it took for the email to send out for higher precision of the 3-minute time check.
    - Compare the list sent in the email to the user's grocery list in the app to ensure the most up-to-date list was sent, and not a previous version of the list.

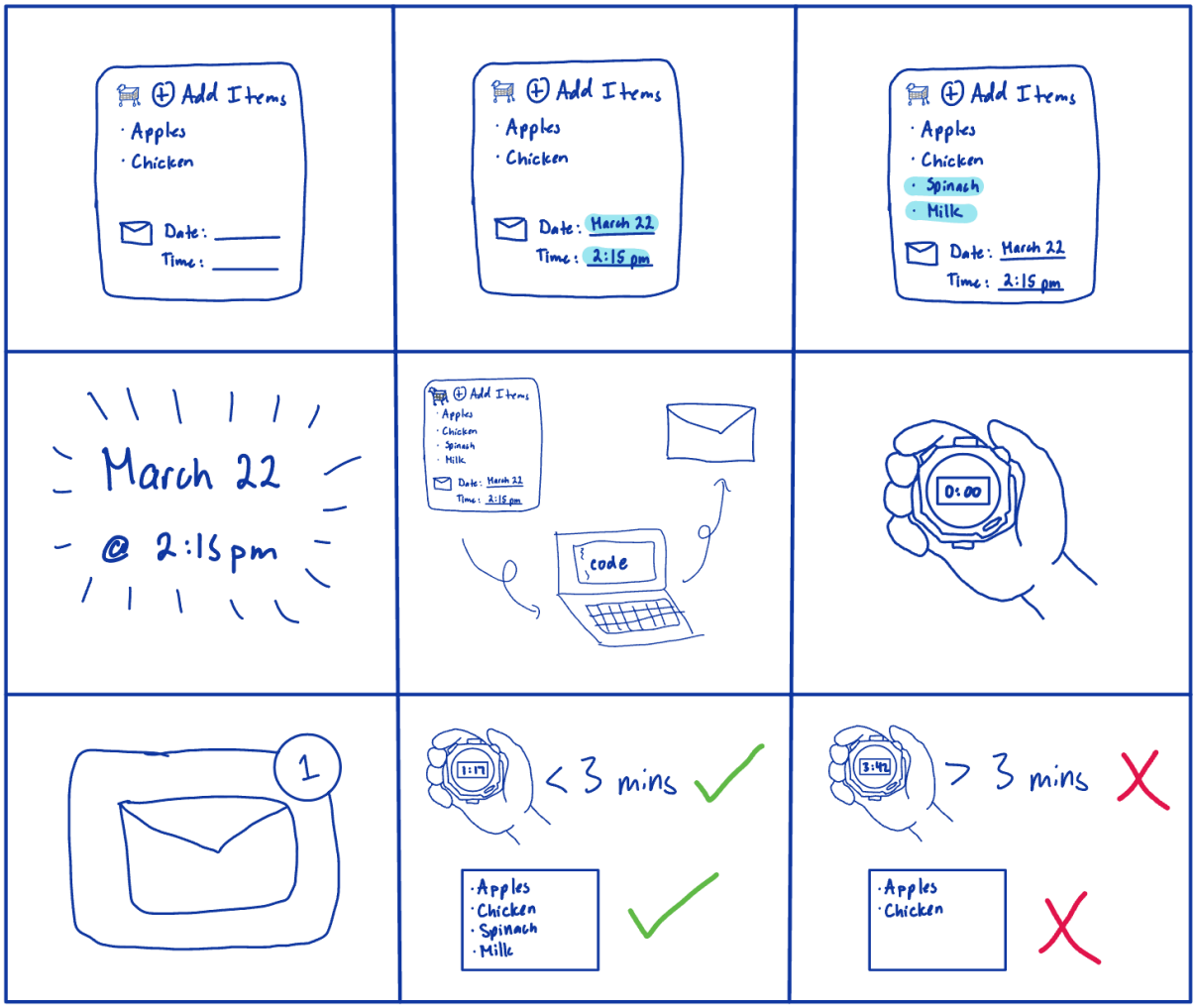

Figure 6: Storyboard Demonstrating the Protocol for Grocery Email Verification

Compliance to Dietary Restrictions for Recipe Recommendations

Reason for the Test

A user should only receive recipe recommendations that comply with their dietary restrictions with 90% accuracy. This test ensures that the system correctly filters recipes based on user-provided restrictions, preventing recommendations that could lead to allergic reactions or dietary non-compliance.

Materials, Equipment, and Facilities Needed

- A database to store the user's dietary restrictions. [6]
- A recipe API to provide a selection of recipes. [6] [13]
- A filtering and search algorithm to find recipes that fit the dietary restrictions. [3]
- Test user accounts with different dietary restrictions. [8]
- A database to record all suggested recipes. [6]
- Test script to verify dietary compliance.

Experiment Protocol

1. **User Input and Recipe Selection**
    - Create at least 10 test user accounts with specific dietary restrictions, including allergies, religious guidelines, and disease-specific limitations.
    - Each test profile is submitted to the app.
    - The system stores the restrictions and retrieves potential recipes from the recipe API.
2. **Recipe Filtering**
    - The system applies filtering algorithms to exclude recipes containing restricted ingredients.
    - The app displays the filtered recipes to the user for selection.
    - The system logs all recipes recommended for each test profile for later analysis.
3. **Verification of Dietary Compliance**
    - Review 1000 recommended recipes across all test user accounts.
    - A test script will be run to cross-reference all listed ingredients in a given recipe to the listed dietary restrictions on the profile for the 1000 recipes.
    - Any recipe that does not fully comply is recorded as a failure.
    - Randomly select 20% of the passing recipes to manually verify dietary compliance for additional verification.
4. **Analysis**
    - Calculate the percentage of recommended recipes that met all dietary restrictions.