

# Milestone 3: Design

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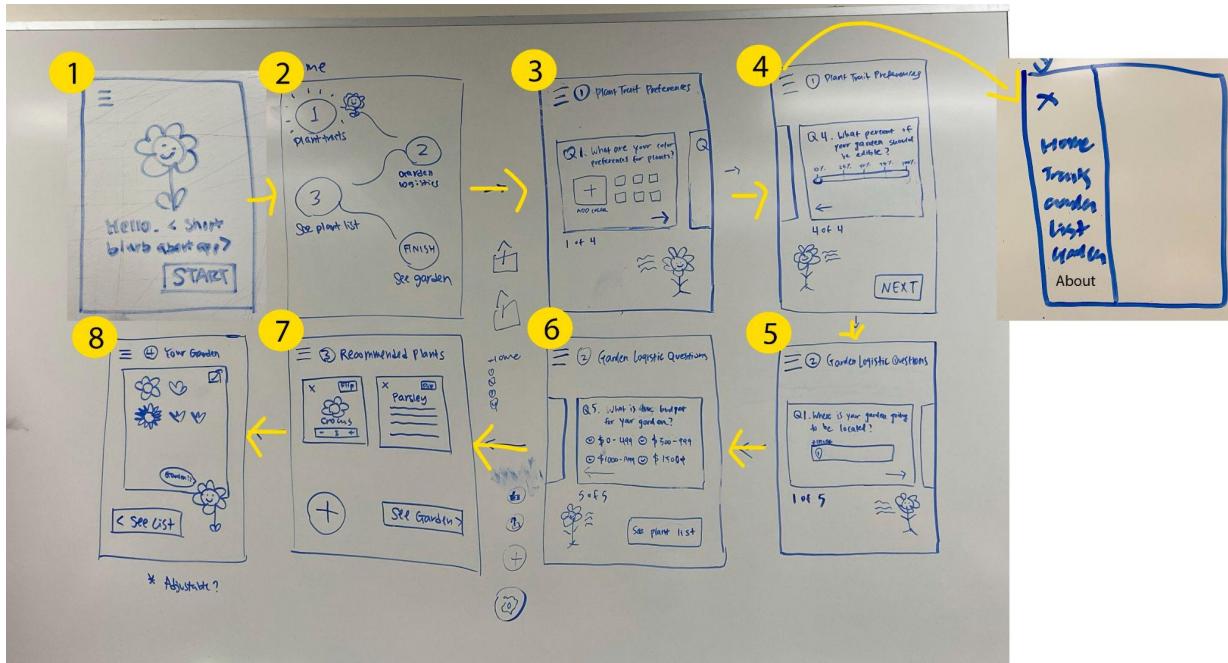
## Revisions to Prior Work

Planning phase report [HERE](#)

We made a couple revisions in the user research, scenarios, and value propositions based on feedback from milestone 2. We expanded on the user research and included our research method, plan, and interview guide. Key takeaways of each individual are also included in the user summary. In the value propositions, we have added the comparison between ours and the alternatives. For the first and third scenarios, we have revised our task to make it more direct and add more detailed information about the task.

# Final Design: Wireframes

## Mobile Application Wireframes



A welcoming screen (screen 1) with a short blurb about our app was added before screen 2 for first-time users to gain context about our app before starting the questionnaire and creating their garden. The blurb explains how this app is created by a Cornell University team and utilizes a trustworthy plant database to provide recommendations for users. We made this choice to build the trust of our users as they were wary about trusting information “on the internet.” In screen 2, we added explicit labeling for each step of the quest as we realized the number itself will not communicate anything with the user. We kept the horizontal card layout for our questionnaire but added a title that aligned with the quests on the homepage to orient the user about which step they were currently in and showed their progress on the questionnaire with phrases such as “1 of 4” beneath each card. A hamburger menu icon was added on each screen (screen 4 menu) to allow the users to go back to any step of the quest as we realized the previous “X” icon we had was communicating to users that they could exit out of each step even though the message we wanted to send through the icon was that they could return back to the home screen. Upon debate of whether the “see list” button on screen 8 should go on the left or right side of the screen, we deliberately placed the button on the left and added a directional affordance (changed to “< See List”) to communicate that they were going back to screen 7. We made this decision because placing the button on the right would miscommunicate to the user that they were progressing to an entirely new screen rather than going back to a previous screen.

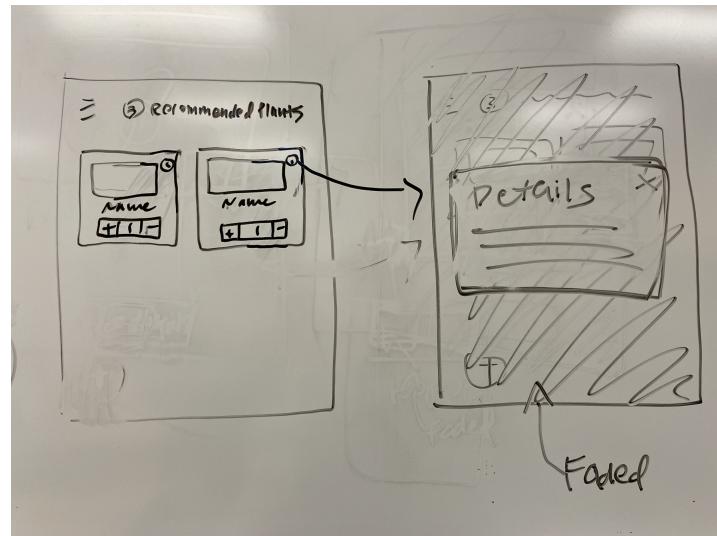
- Advanced feature

The advanced feature for our app is a garden collage generator that takes the recommended plant list from the user questionnaire and creates a realistic garden image with the recommended plants. This helps the user imagine what their garden may look like and allows the user to use it as a visual reference to plan and organize their garden.

We are going to use HTML Canvas to generate the garden collage. Since we want to create the collage dynamically, we have decided to use a 2d canvas js library (Konva.js) instead of using the built-in HTML Canvas APIs. The Konva library supports dynamic rendering, which can make our canvas to be responsive to different screen sizes. It also supports the drag and drop function, which enables our users to customize their garden by dragging an object (a plant or flower) on our virtual garden.

To be specific, the Konva APIs we are using includes:

- `getStage()` / `stage.width` / `stage.height` / `stage.scale`: To get the canvas object and its width and height, and scale it to respond to changes in screen size.
- `new Image(config)`: To create the specific plant object and make it draggable.

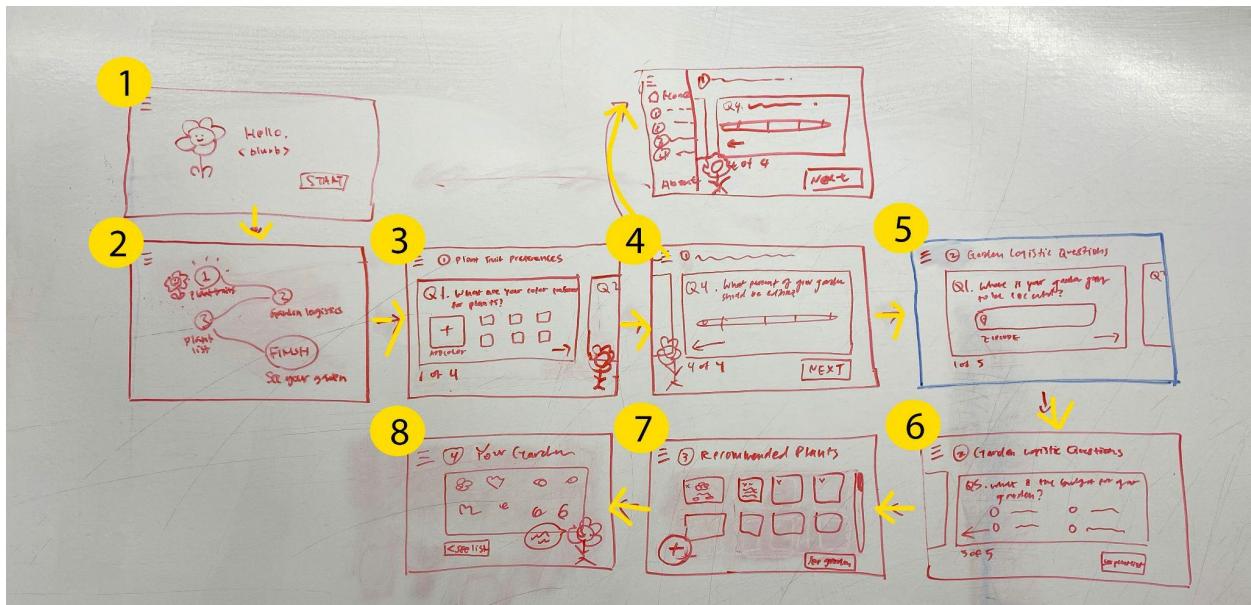


## UPDATE TO SCREEN 7 (Milestone 4)

We made an update to screen 7 to have an information “i” button on the top right corner of each plant card, which shows a popup screen with more details about the plant on a

faded background, as the flip function was not clear in the original design. We also removed the plus button, originally designed for the user to add more plants to their list, because our user, Joanne, was a novice gardener who did not have knowledge of plants, hence would not find this feature useful.

## Website Wireframes



The website wireframes are very similar to the mobile wireframes. However, we expanded the size of the quest map, questionnaire cards, recommended plant card list, and garden collage horizontally to fit the size of a typical computer screen. Unlike the columns of two for screen 7 in the mobile version, the website version screen 7 has columns of 4 to accommodate a larger screen size.

## Rationale

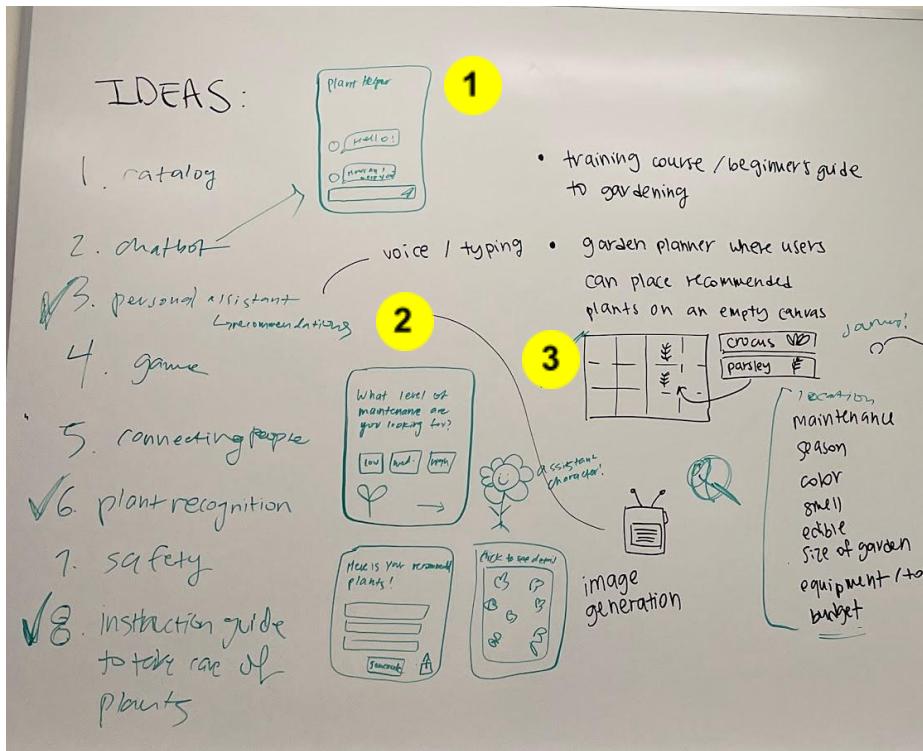
The first goal we had for our app was helping users find trusted, personalized information, tips, and information to start gardens and what to plant in it. In our scenario, Joanne moved into a new house with a backyard, wanting to plant a garden but was frustrated at the lack of trustworthy, unpersonalized information he was finding on the internet. We addressed this goal by affiliating our app with Cornell University and a trusted database, also using a questionnaire to understand the user preferences for their garden before providing suggestions as well as detailed information on how to take care of the recommended plants. The questionnaire was designed to be realistic, based

on different plant characteristics we found on the Playful Plants database and other websites with plant expertise. The questions will be portrayed realistically with all of the questions and fully interactive on the prototype itself.

Our second goal is to provide planning and design for users who are unable to plan their own gardens, and we want to reduce the cost of changing plans for our customers. Our application provides a garden collage generator that takes a list of recommended plants from a user questionnaire and creates a realistic image of a garden with the recommended plants. This helps users imagine what their garden might look like and helps them imagine what would happen to their garden if they decided to add more plants to their list from our database. Users can download this image or go back to the list of plant suggestions to make some changes and then go back to see the updated image.

The final value proposition for the product was to provide trustworthy and straightforward instructions for the novice gardener, Joanne, to grow the plants in his garden. With his list of plants and garden plan provided through this app, he wants reliable information on how much to water and fertilize his plants as well as how to care for the plants, in order to actually start building his garden. We provide this information about each plant in two parts of the app design. In the “Recommended Plant List” screen, each plant is presented in a card, the flip side of the card displays detailed information about the plant from the database. In the screen where an image of the user’s garden is generated, the user can click on each plant in the garden to view its details and care instructions. Such information allows our user, Joanne, to know exactly what he should do to seed, grow, and care for the plants he is planning to add to his new garden.

## Brainstorming



With the persona, Joanne, and the scenarios in mind, our group generated ideas in a brainstorming session. Because Joanne is a novice in gardening, we brainstormed digital products that are beginner friendly and very visual. Product ideas included a chatbot that answers users' questions about gardening, a personal assistant that recommends plants and provides garden plans, a visual instruction guide to take care of plants, a training course to gardening for beginners, and a garden planner application that allows users to place different plants on a canvas.

After discussion as a group, we created rough sketches for some of these ideas to visualize them. The first idea we sketched (annotated by number 1 in the figure above) is a plant helper chatbot, which acts as an expert that answers questions related to choosing plants and planning gardens. The interface looks like a conventional chat interface, with speech bubbles from the user and the system representing conversations. This is intended to mimic the communication between a novice user and

an experienced gardener. With this chatbot, the persona Joanne is able to receive suggestions and instructions he needs to learn about different plants and get started with building his garden.

The second idea we explored is a personal assistant. It also aims to imitate communication between the user and an expert, but is more focused in that it is obtaining information about the user's knowledge, preferences and logistics around the garden they intend to create, and uses such information to generate recommendations and garden plans. The first screen in the sketches represents the questions the system asks, where Joanne is able to input his preferences. The second screen outputs recommended plants based on his preferences and the climate of his area, and the third screen outputs a picture of how to organize these recommended plants, which Joanne can use as a guide to start building his garden in the backyard.

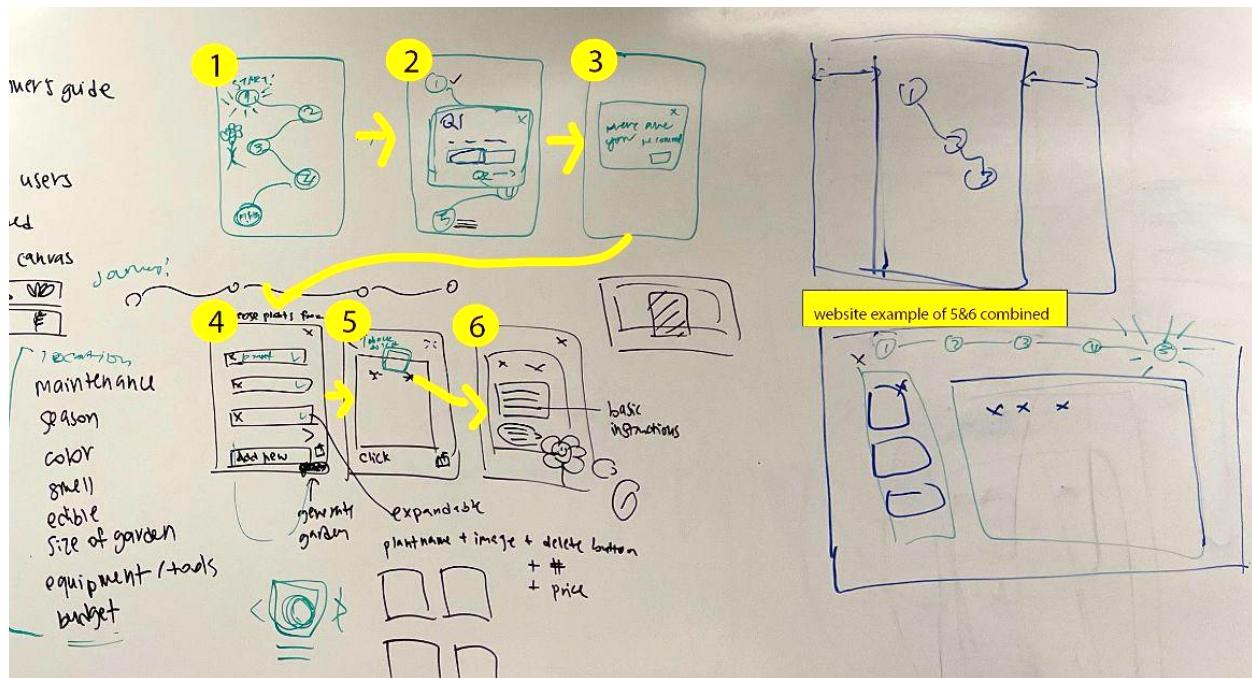
Finally, the third idea is a garden planner application. In this interface, there is an empty canvas, along with a list of common garden plants as icons. Joanne is able to see detailed information about each plant, and drag and drop the plants onto the canvas. This allows him to organize and plan out his garden, as well as understand how to care for each plant he plans to include in the garden, so he can comfortably build his garden afterwards.



Our group brainstormed and sketched ideas on a whiteboard.

# Sketches

## First Iteration Sketches



### 1. Overall flow for first iteration

We explored the personal assistant idea from our brainstorming session further in our sketches, incorporating the gaming and garden planning aspect within our design. The home screen that users first see when opening the app looks like a game quest map to show the progress of the user's garden coming together based on their preferences for plant characteristics and garden logistics. When they start the “quest” the user answers different types of questions as shown on the lower left part of the sketch to receive plant recommendations once they finish the questionnaire. With these recommendations, the app generates a collage of their potential garden to help users visualize and plan their garden in real life. When the users click specific plants on the image, a popup screen with more information about the plant is displayed. The user can exit any of the screens when they wish to go back to the original “quest” home screen.

### 2. Screen 1

The first screen looks like a game flowchart, showing the user the steps needed to customize a garden and highlighting where the user is now. The user can click on the first button labeled "Start" to get started or click on the controls for the other steps to see what has been filled out and continue to complete the customization.

### 3. Screen 2

When the user clicks the Start button, the software's interface automatically jumps to the second question screen. The background of this screen is a step-by-step diagram, and there will be a pop-up window in the middle of the screen. This window can be closed from the top right corner, and the question tab is displayed in the top left corner. In the center of the pop-up screen are the question and the options that the user can answer. Below the questions are the forward and back buttons (this screen shows the first question, so there is only a forward button).

### 4. Screen 3

When the user finishes all the questions and swipes to the last pop-up window, the user can see a small window asking the user if he wants to see the garden we designed for him. When the user clicks the OK button in the bottom right corner, it automatically jumps to the next page showing a detailed list of all the suggested plants.

### 5. Screen 4

Once the users finish the questionnaire, they will receive plant recommendations based on their preferences. In this iteration, the plant recommendations are displayed as an accordion list, where the user can click on the arrow on the right to display more detail about the specific plant (name, image, price, quantity, etc.). A delete button is displayed on the left for the user to delete the plant recommendation if they don't want it. An add button for the user to add their custom plants is on the bottom of the screen, and user can share their recommendation through the lower-right button.

### 6. Screen 5

In the final step, the app will generate a rendering image of the garden with the plant recommendations. Users can download the image through the lower-right share button. Users can also press the lower-left button to go back to the plant recommendations list to make some modifications, and go back to see the updated image.

### 7. Screen 6

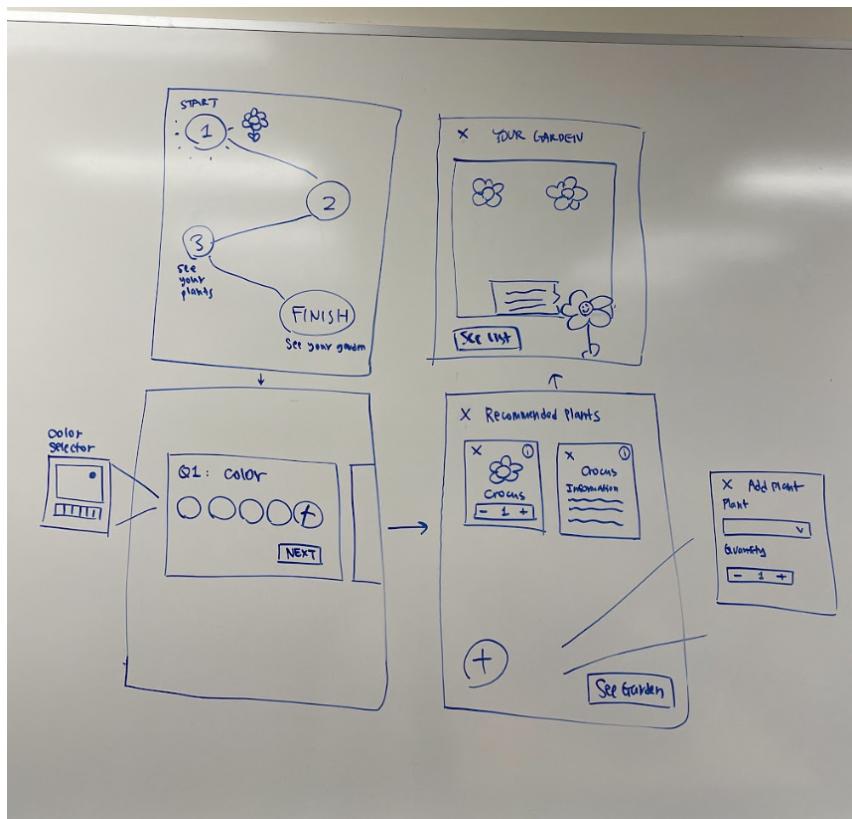
When the users click on a plant, a popup screen will show up with more detailed information about the plant. We also designed a little mascot (a daisy in the lower-right

corner) to introduce the plant details more lively. Users can click on the plant on the image and a speech bubble will show up and introduce the details of that specific plant.

## 8. Website

For the desktop version of this iteration, we don't want to make a big change to the layout. The home screen will be exactly like the mobile version but larger and be wrapped in a container that could support breakpoints and dynamic margin to make it more responsive. Unlike the mobile version, for each step, there will be a step indicator on the top of the screen and the user can click on it to switch between the current step. Also in the desktop version, the plant recommendations and the rendering image will be displayed together. Users can make a modification on the plant list and the image will be re-rendered in real-time.

### Second Iteration Sketches



For this iteration, we have explored different controls for different questionnaire questions. For the question about color, we designed a color selector to allow our users to select multiple colors they prefer instead of plain input or radio selection. We also re-designed the way to switch between the questions and applied hand gestures to make it more natural. For the plant recommendations, we changed the original list design

and use cards and a grid layout to display the plant detail. Each card contains the plant name and image, and a number selector that allows users to modify the quantity. A delete button is displayed in the upper-left corner. When the user clicks on the information button on the upper-right, the card will rotate around the middle-y-axis (with animation effects) and display more information about the plant. We also change the original plain-text add button to an icon button to make it more obvious.

## Team Contribution

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Wei

- Brainstormed and sketched ideas with the group
- Worked on the explanation of the first and second iteration
- Revised the scenarios from M2

Alice

- Brainstormed and sketched ideas with the group
- Worked on brainstorming and rationale write-ups for the report
- Revised value proposition and scenarios from M2

Annice

- Brainstormed and sketched ideas with the group
- Worked on final design and rationale write-up for the report
- Made revisions in the user research section for M2

Yunjiao

- Brainstormed and sketched ideas with the group
- Worked on the explanation of the first three sketches and rationale write-up for the report

## Appendix

Iteration sketches:

<https://drive.google.com/drive/folders/1luohf7hrmvLJB98hHFx0qf6bHAGc10G8?usp=sharing>

Milestone 2 (Planning):

[https://docs.google.com/document/d/1AEx6EiB7TeP9F4ypwRwpD9LJeitvIWRyYKUfi7v\\_uig/edit?usp=sharing](https://docs.google.com/document/d/1AEx6EiB7TeP9F4ypwRwpD9LJeitvIWRyYKUfi7v_uig/edit?usp=sharing)