Houseplant Assistant Web Application
Project Planning Report

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Project Overview

During the COVID-19 pandemic, many people turned to gardening as a hobby while spending more time at home. However, they soon found that taking care of a plant can be more challenging than it seems. Post-pandemic, people became busier, leading to plant neglect despite their best intentions and desire to maintain the hobby. Globally, experienced and new gardeners shared a common challenge : conveniently obtaining information about plants [1]. *The Houseplant Assistant* is a web app designed to help individuals manage their houseplants, allowing busy users to effortlessly keep up with plant care even with a hectic lifestyle. The app makes gardening less intimidating by allowing users to learn about detailed plant care techniques and houseplants' needs to smoothly start their plant journey.

Chosen APIs

Perenuals Plant API : This is a RESTful API that provides an extensive database of plant species, care guides, and images. It also offers valuable resources for niche categories such as tropical houseplants, and medicinal herbs. This API will be used as a plant database for this project, where information on a searched plant, including images of the plant, watering frequency and light intensity, will be presented to users upon search.

- Feature 1: Provide plant images.
  This feature offers a collection of images for each plant, including photos of the plant in different growth stages and seasons. It helps users match plant names to their appearances or compare them to what they see in their own environments, enhancing the user experience through visual aids.

- Feature 2: Detailed plant care guide.
  This feature provides care information, including sunlight, watering, soil type, and humidity requirements.etc for each plant. Users can learn how to care for their plants with accurate guidelines, helping them maintain plant health and avoid over- or under-watering.

- Feature 3: Toxicity Information.
  This feature provides information on whether the plant is toxic to human or common

house pets so pet owners or families with children can use this information to select safe plants for their homes.

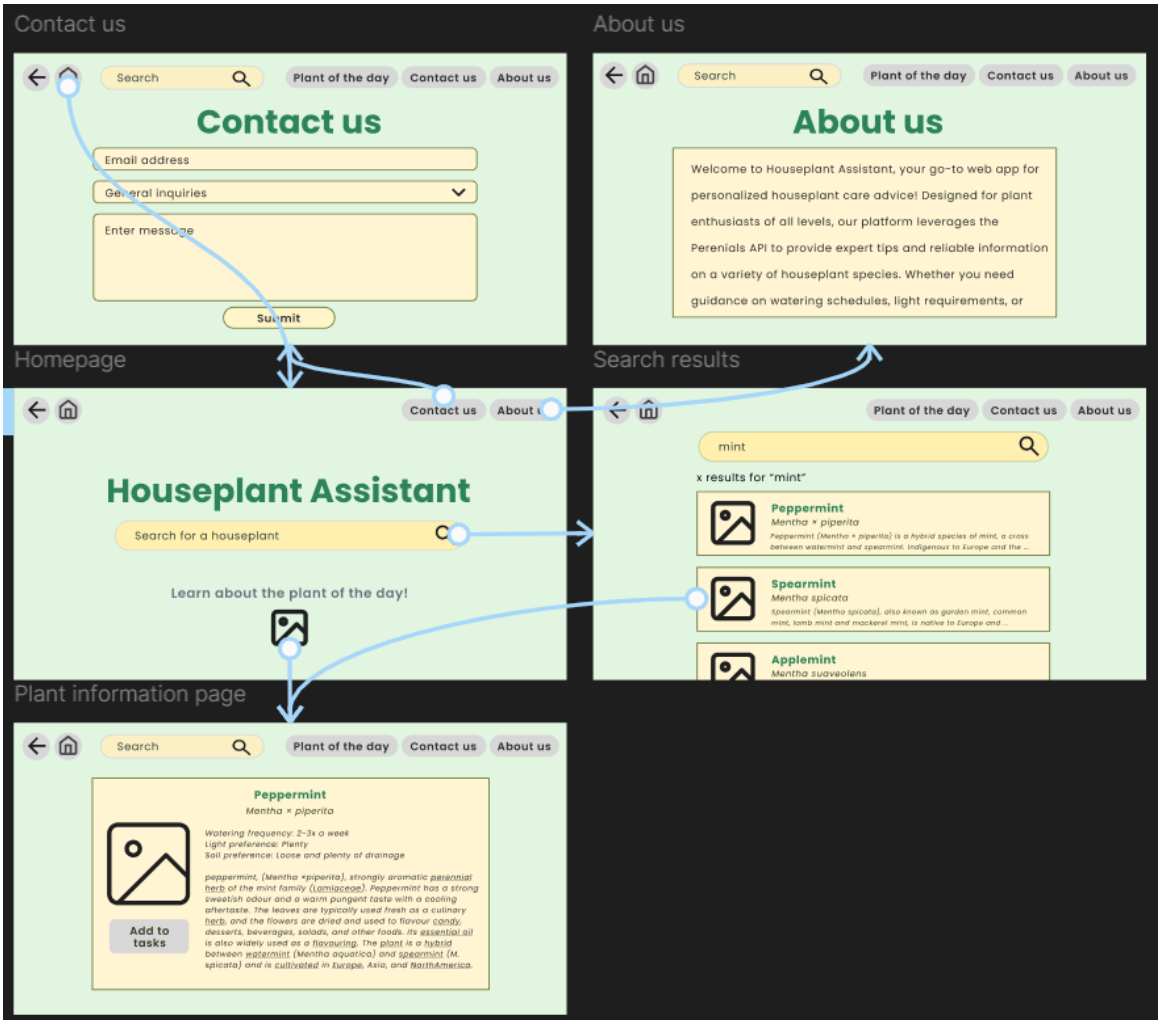
Google Tasks API: This RESTful API allows users to create and manage a list of tasks. In this project, users can use this feature to create one-time or recurring tasks for future plant care on specific dates, including watering and fertilization.

- Feature 1: Creation of single or recurring plant care reminders.
  When users search for and select a plant, they can click the 'Add to Task' option to create a task in their Google Tasks account. This allows them to customize the task title, add notes, and set due dates for both one-time and ongoing recurring plant care. Users will receive reminders directly from Google Tasks without having to go to the project site, helping them keep up with their care routines.

- Feature 2: Automatic prompts to reschedule missed tasks.
  Google Tasks prompts users to reschedule any tasks that have not been checked off by the end of the day. This ensures that essential care tasks are postponed to a time that is acceptable for the users, rather than being forgotten, helping them stay on top of all their plant needs.

- Feature 3: Arrangement of tasks based on different priority levels.
  This feature allows users to prioritize important tasks by placing them at the top of the list, making urgent plant care needs more visible. For instance, a particular plant may require extra attention during a specific period. This visual prioritization helps users quickly spot and address critical plant care needs.

Mid-Fidelity Prototype



Chosen SDLC Model

We have chosen the Waterfall model as our SDLC process because it fits well with the structure of our project. Our project has specific, straightforward requirements, and customer feedback is not part of our development process.

Work breakdown Structure (WBS)

Task	Assigned to	# Estimated Hours	# Actual Hours
1. Project Planning			
1.1 Meeting Group Members			
1.1.1 Determine group availabilities	All	0.5	1
1.1.2 Assign member roles	All	2	4
1.1.3 Fill out group contract	All	3	6
1.1.4 Complete Meeting Group Members		5.5	11
1.2 Project Proposal			
1.2.1 Research project topics	All	4	5
1.2.2 Choose project topic	All	2	3
1.2.3 Identify project scope	All	1	4
1.2.4 Identify project objectives	All	3	4
1.2.5 Identify key features and functionalities	All	2	4
1.2.6 Identify key features and functionalities	All	2	2
1.2.7 Complete Project Proposal		14	22
1.3 Determine Project APIs			
1.3.1 Research possible APIs	All	4	8
1.3.2 Analyze API documentation and usage limits	All	2	4
1.3.3 Create a list of possible APIs and their info	All	2	4
1.3.4 Finalize on two APIs	All	1	2
1.3.5 Determine Project APIs		9	18
1.4 Set project milestones and deadlines			
1.4.1 Set up WBS on excel	All	3	4
1.4.2 Discuss and input project milestones	All	1	2
1.4.3 Break down and assign each task to members and group	All	1	2
1.4.4 Finalize timings of hard deadlines	All	1	3
1.4.5 Set project milestones and deadlines		6	11
1.5 Complete Project Planning		**34.5**	**62**

Task	Assigned to	# Estimated Hours	# Actual Hours
2. UI/UX Design			
2.1 Wireframes and Storyboards			
2.1.1 Set Up Project Folder and Files	All	3	
2.1.2 Create Basic HTML Structure	All	1	
2.1.3 Link Files Together	All	0.5	
2.1.4 Add placeholders for Essential Elements	All	2	
2.1.5 Complete Wireframes and Storyboards		6.5	0
2.2 High-fidelity prototypes			
2.2.1 Home page (Search for Plant)	Euluna	1	
2.2.2 Search Results	Euluna	1	
2.2.3 Plant Details	Euluna	1	
2.2.4 About Us page	Euluna	1	
2.2.5 Contact Us page	Euluna	1	
2.2.6 Complete High-fidelity prototypes		5	0
2.3 Design Review			
2.3.1 Gather in a Discord Meeting	All	0.5	
2.3.2 Conduct a review on UI/UX	All	3	
2.3.3 Provide necessary feedbacks	All	3	
2.3.4 Complete Design Review		6.5	0
2.4 Complete UI/UX Design		**18**	**0**

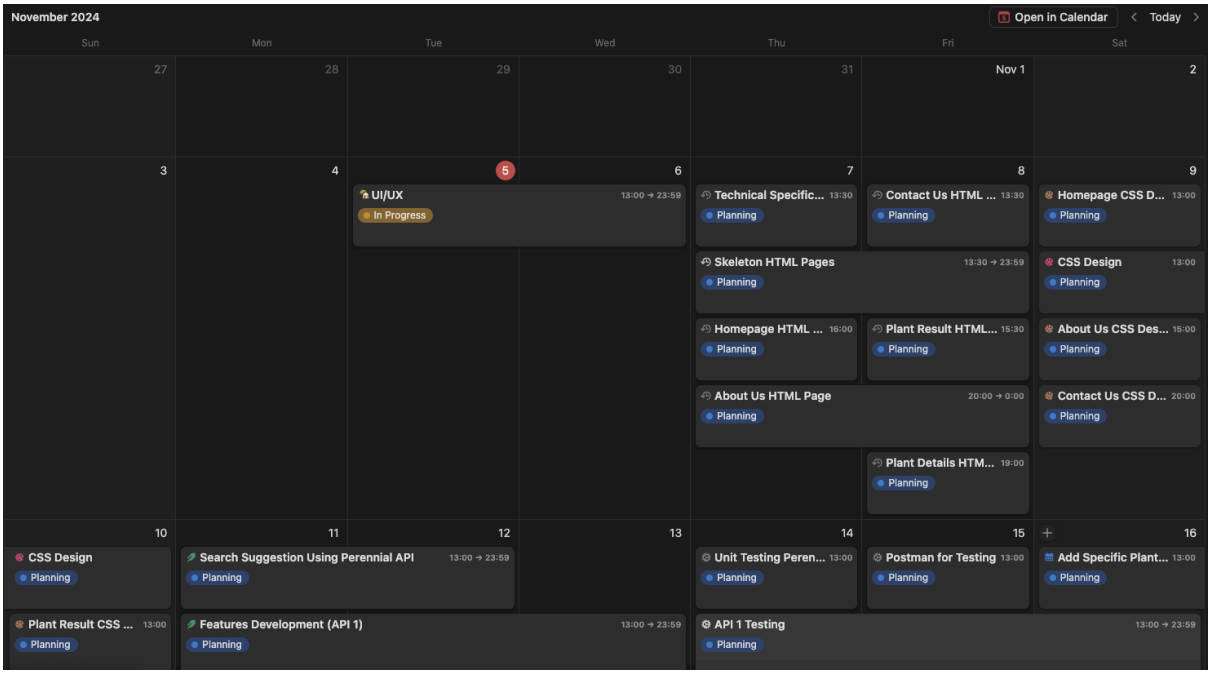
Task	Assigned to	# Estimated Hours	# Actual Hours
3. Frontend Development			
3.1 Technical Specifications			
3.1.1 Choose programming language	All	1	
3.1.2 Install necessary packages and libraries	All	1	
3.1.3 Set up Work Environment and Git	All	1	
3.1.4 Complete Technical Specifications		3	0
3.2 Layout			
3.2.1 Search bar	Stephanie	5	
3.2.2 Search results list with images and plant names	Jethro	5	
3.2.3 Plant details page layout	Euluna	7	
3.2.4 Add to Calendar button integration	Stephanie	3	
3.2.5 About Us page	Soumya	2	
3.2.6 Contact Us page	Jethro	2	
3.2.7 Complete Layout		24	0
3.3 Graphics			
3.3.1 Style search bar	Euluna	2	
3.3.2 Style results list	Jethro	2	
3.3.3 Style Plant details page	Soumya	2	
3.3.4 Style Add to Calendar button	Stephanie	2	
3.3.5 About Us Page	Soumya	2	
3.3.6 Contact Us page	Soumya	2	
3.3.7 Complete Graphics		12	0
3.4 Complete Frontend Development		**39**	**0**

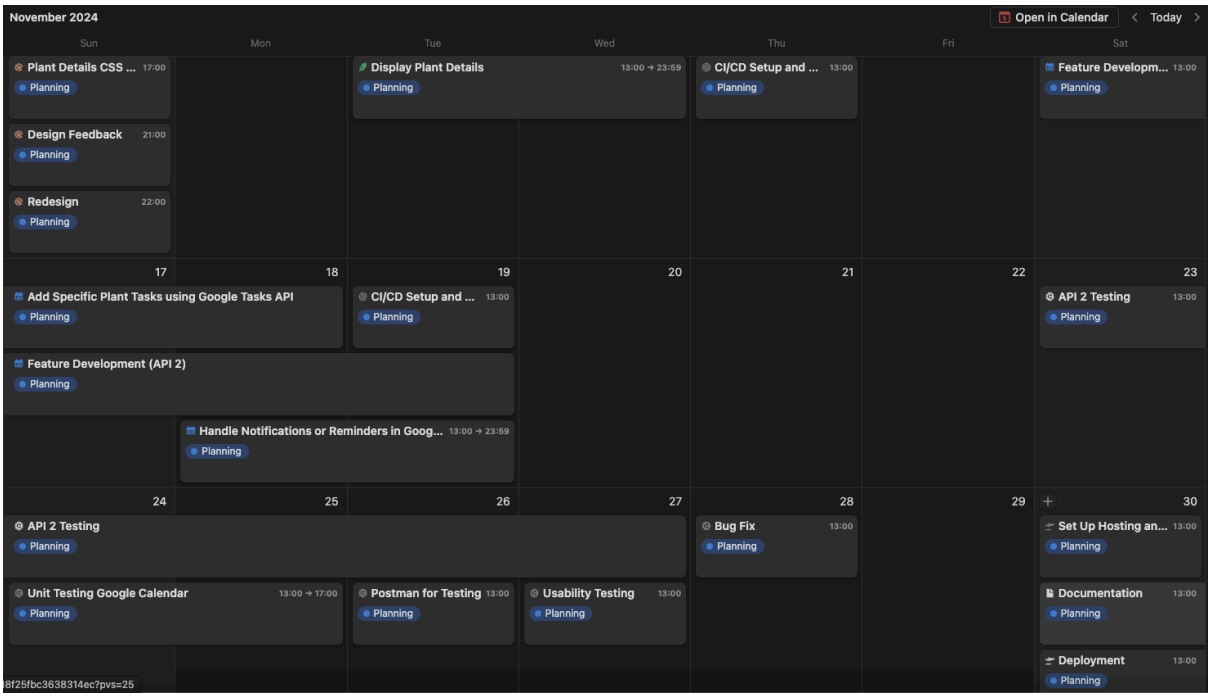
Task	Assigned to	# Estimated Hours	# Actual Hours
4. Backend Development			
4.1 API Integration			
4.1.1 Integrate Penenuals API to fetch plant information	Stephanie	8	
4.1.2 Integrate Google Calendar API for event creation	Euluna	7	
4.1.3 Complete API Integration		15	0
4.2 API calls			
4.2.1 Fetch plant details based on search queries	Jethro	8	
4.2.2 Send plant watering schedules to Google Calendar	Soumya	7	
4.2.3 Complete API calls		15	0
4.3 Complete Backend Development		**30**	**0**
5. Feature Development			
5.1 Search and Suggestion			
5.1.1 Develop search functionality to query plants from Penenuals API	Jethro	6	
5.1.2 Implement plant suggestion feature	Soumya	4	
5.1.3 Complete Search and Suggestion		10	0
5.2 Plant Details Page			
5.2.1 Display plant details (light, water, temperature, etc.)	Soumya	5	
5.2.2 Implement "Add to Calendar" feature	Stephanie	5	
5.2.3 Handle notifications or reminders in Google Calendar	Jethro	5	
5.2.4 Complete Plant Details Page		15	0
5.3 Static Pages			
5.3.1 Create About Us content	Euluna	2	
5.3.2 Set up Contact Us links (Twitter, Instagram, etc.)	Euluna	2	
5.3.3 Complete Static Pages		4	0
5.4 Complete Feature Development		**29**	**0**

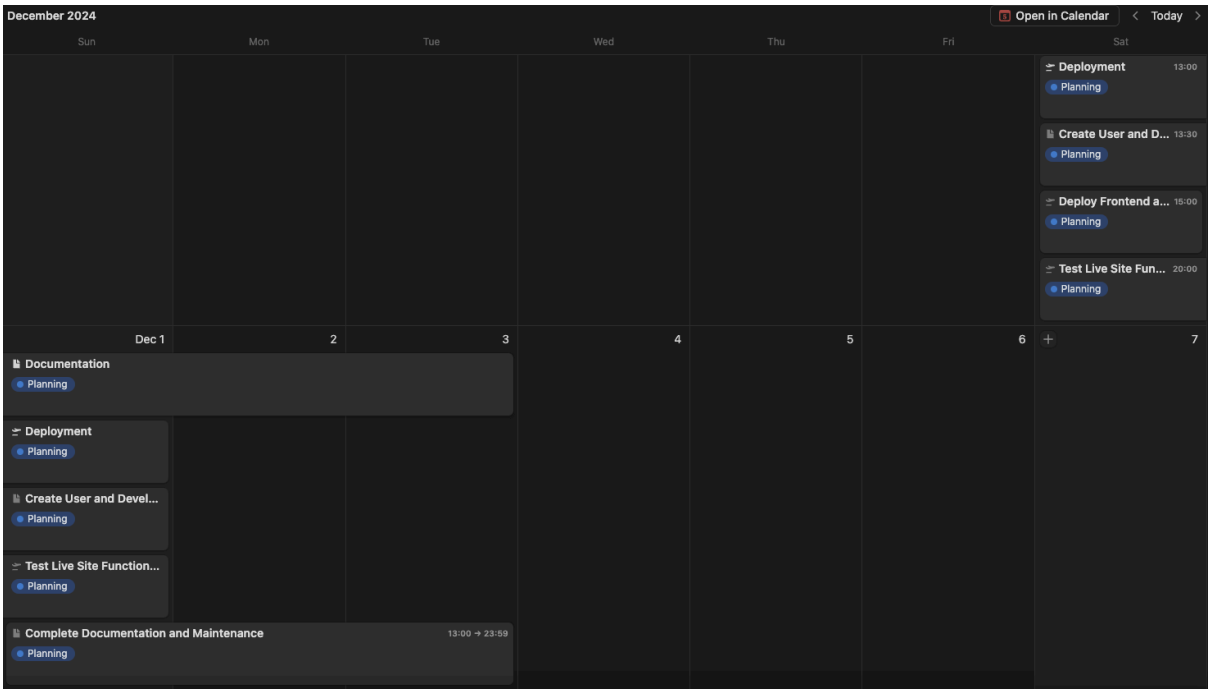
Task	Assigned to	# Estimated Hours	# Actual Hours
6. Testing			
6.1 Unit testing			
6.1.1 Write tests for individual components	All	8	
6.1.2 Ensure all tests pass successfully	All	8	
6.1.3 Complete Unit Testing		16	0
6.2 Usability testing			
6.2.1 Conduct tests with users to identify navigation issues	All	4	
6.2.2 Gather feedback from users	All	8	
6.2.3 Implement user feedback	All	8	
6.2.4 Complete Usability testing		20	0
6.3 Debugging			
6.3.1 Review code for any bugs from testing	All	3	
6.3.2 Address reported bugs from testing	All	3	
6.3.3 Complete Debugging		6	0
6.4 Complete Testing		**42**	**0**
7. Deployment			
7.1 Hosting			
7.1.1 Research on hosting providers	All	4	
7.1.2 Choose a hosting provider	All	5	
7.1.3 Set up the domain	All	3	
7.1.4 Complete Hosting		12	0
7.2 Deploy			
7.2.1 Follow deployment procedures for the chosen hosting provider	All	4	
7.2.2 Deployment frontend	Soumya and Stephanie	4	
7.2.3 Deployment backend	Jethro and Luna	4	
7.2.4 Complete Deploy		12	0
7.3 Testing site			
7.3.1 Conduct end-to-end testing to ensure all features work on the live site	Luna and Stephanie	4	
7.3.2 Debugging	Jethro and Soumya	4	
7.3.3 Address bugs from site live	All	4	
7.3.4 Complete Testing site		12	0
7.4 Complete Deployment		**36**	**0**

Task	Assigned to	# Estimated Hours	# Actual Hours
8. Documentation and Maintenance			
8.1 Documentation			
8.1.1 Write a README file	Soumya	1	
8.1.2 Write a user navigation guide	Stephanie	4	
8.1.3 Create a document	Jethro	1	
8.1.4 Report to document	All	8	
8.1.5 Edit README file	All	4	
8.1.6 WBS	Soumya	3	
8.1.7 Project Plan	Jethro	3	
8.1.8 Project Limitations	Stephanie	2	
8.1.9 Sample output	Euluna	1	
8.1.10 Complete Documentation		27	0
8.2 Maintenance			
8.2.1 Updates based on team feedback	All	5	
8.2.2 Polish/Edit	All	2	
8.2.3 Complete Maintenance		7	0
8.3 Complete Documentation and Maintenance		**34**	**0**
Total		**262.5**	**62**

Project Schedule with Milestones and Deadlines







Risk Assessment

Low risk:

- Issue: Error in git while collaborating
  Mitigation: Ensure all members follow good Git practices, such as branching and pull requests, to reduce merge conflicts.

- Issue: Bugs in the user interface
  Mitigation: Test the UI often during development, especially after updates, to catch and fix bugs as soon as possible.

- Issue: User experience issues
  Mitigation: Get feedback from people not involved in the project to make sure that the UI is intuitive.

- Issue: Miscommunication during implementation
  Mitigation: Have important information be written or typed out in the group chat. Have regular meetings to make sure everyone is on the same page.

- Issue: Reached google task 50,000 query limit
  Mitigation: Monitor our usage to make sure that it does not reach the limit.

Medium risk:

- Issue: Privacy concerns
  Mitigation: Use OAuth2 user authorization to ensure that the user only grants the app the permissions needed, and allows them to revoke access anytime.

- Issue: Being behind schedule
  Mitigation: Create a realistic project timeline and have buffer time to account for problems or issues that come up during development.

- Issue: Data inaccuracy from Perenual API
  Mitigation: Have a disclaimer indicating that we rely on a third-party API for the information shown.

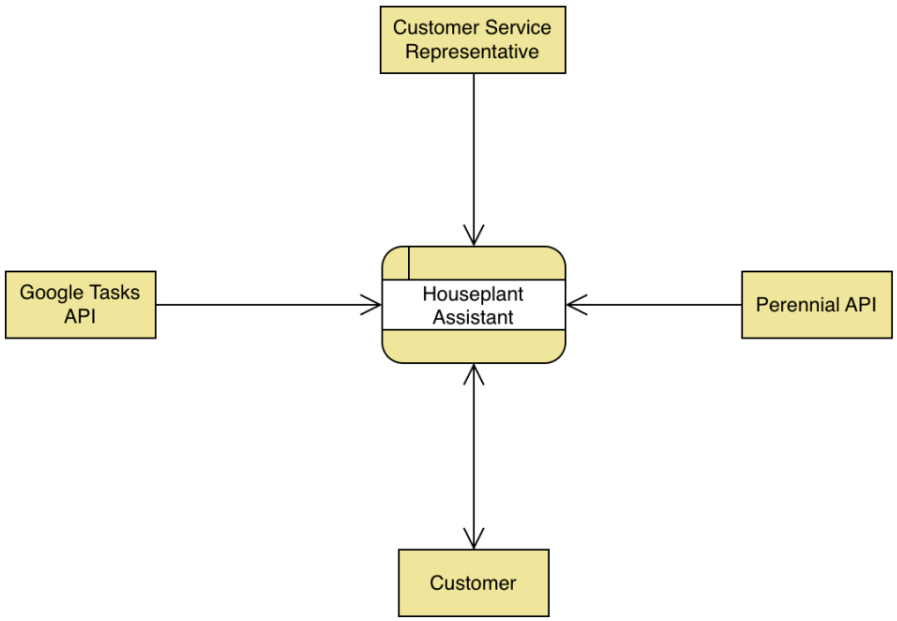
High risk:

- Issue: Perenual API/Google Task API fail to work or are down.
  Mitigation: Have back up alternative API's. Notify the user that the API is currently down, and that the app is unavailable.

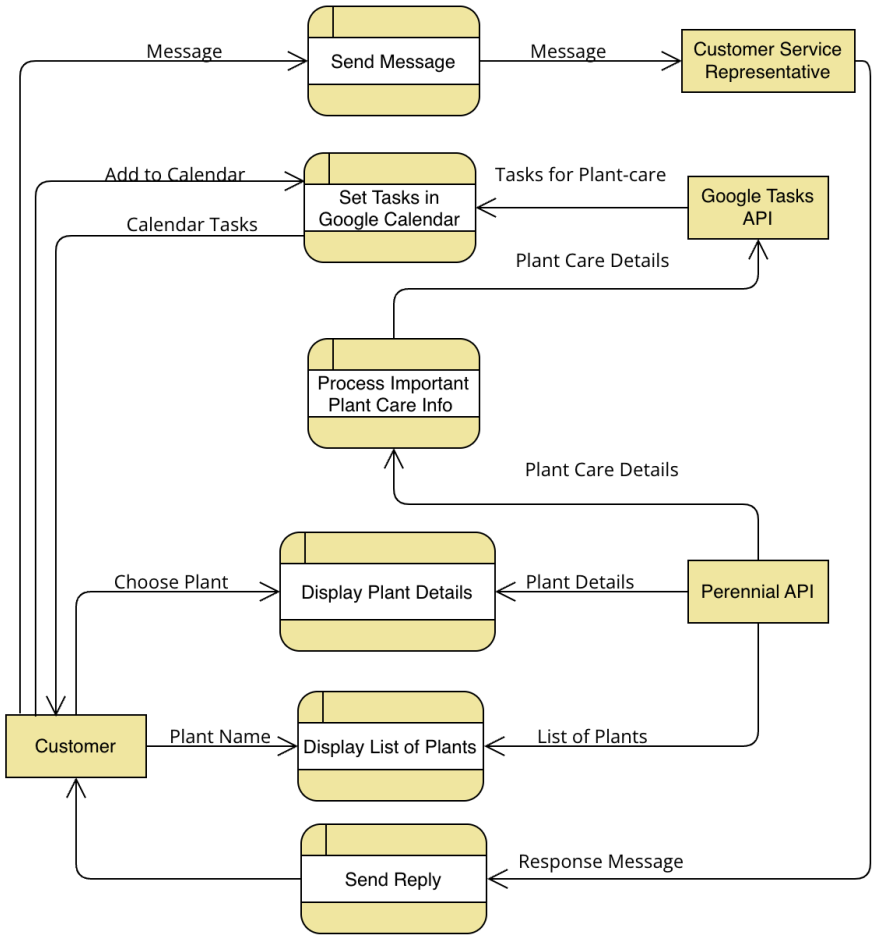
- Issue: Performance issues with the API
  Mitigation: Test the web app extensively after feature updates to make sure it runs smoothly. Implement error handling to reduce failed API requests.

Data Flow Diagram (DFD)

Data Flow Diagram Level 0:

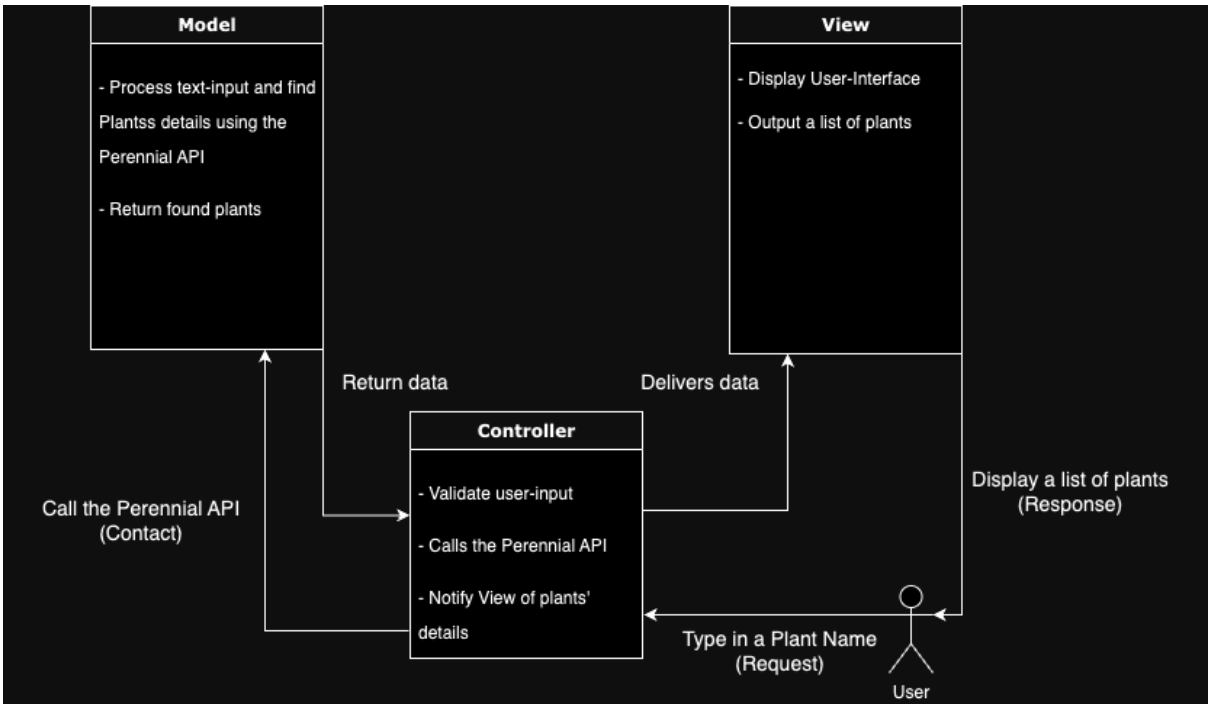


Data Flow Diagram Level 1:

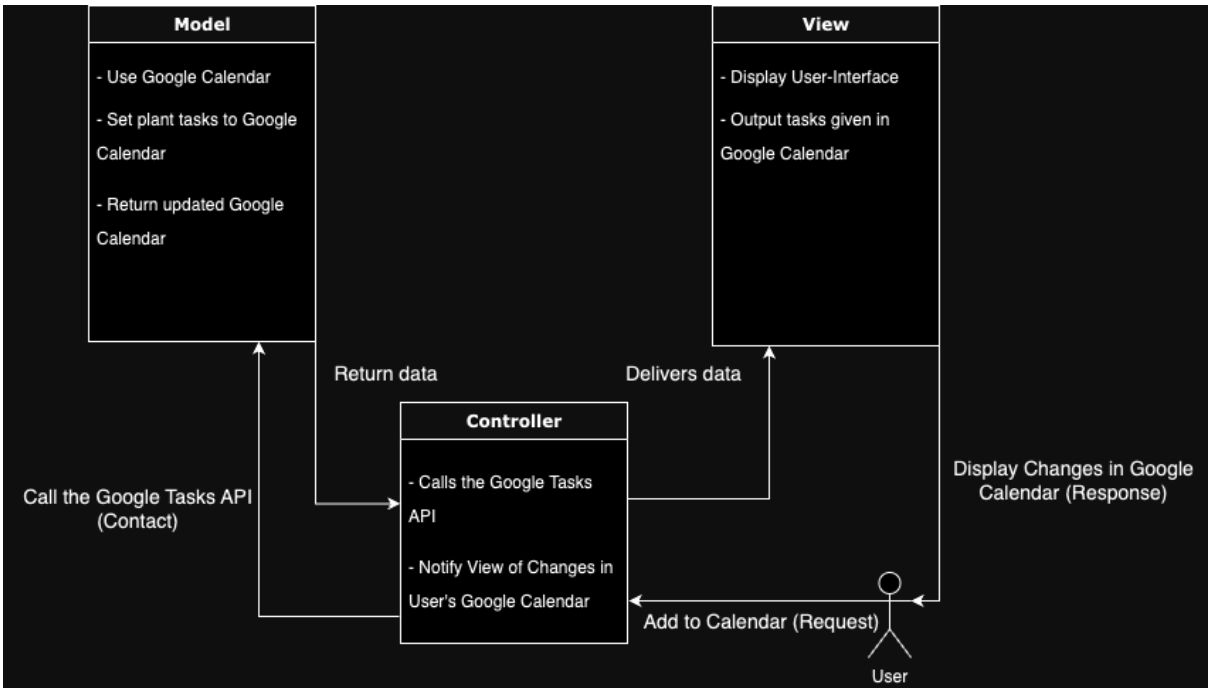


MVC Model

MVC for Perennial API



MVC for Google Tasks API



References

[1] S. Cortez, L. Diekmann, M. Egerer, J. Kingsley, B. Lin, P. March and A. Ossola, “Gardening during COVID-19: Experiences from Gardeners around the World,” *UC Agriculture and Natural Resources*, March 2022. Available : https://doi.org/10.3733/ucanr.6720.