PlanYourPlate - Meal Planning System

GitHub Repository: https://github.com/CMPT-276-FALL-2024/project-10-streams

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PROJECT OVERVIEW

PlanYourPlate is a website optimized for a desktop environment designed to help users with planning their meals. Planning meals is something most individuals must do on a daily basis. Many individuals find this to be time-consuming and mentally strenuous leading these individuals to resort to the same recipes repeatedly. Many individuals also find it difficult to curate meals that fit their nutritional goals and incorporate the ingredients they already have on hand. Our application aims to make the process of finding recipes simple, relieving some of the strain this process causes. It will allow users to find recipes suited to their needs in a variety of ways. A user will be able to input ingredients they have available and it will suggest recipes curated based on those ingredients. A user can also receive suggested recipes based on their dietary preferences, allergies or desired amounts of macro-nutrients and calories. Furthermore, a user will be able to input foods they have already consumed and the website will provide nutritional information about those foods. Another element of this project is a calculator that will suggest the amount of calories and distribution of macro-nutrients one should consume based on one's health and fitness goals.

As University students, finding the time to plan our meals is often a struggle. With our busy schedules, we often resort to freezer meals or take-out food since trying to plan a recipe, buy ingredients, cook the meal and clean up afterwards takes up time we just don't have. When we do have the time to cook, we often resort to the same recipes over and over. This problem led us to the creation of PlanYourPlate. One of our main potential users is university students like us. Our application will be able to simplify the planning phase of meal preparation, allowing users to find recipes that suit their needs by incorporating ingredients they already have. This simplification will save crucial time for students and will help them find new recipes they may not have encountered before.

Fitness enthusiasts are another potential user group for our application. Many fitness enthusiasts have specific dietary preferences and need to create recipes according to specific constraints. Our application will allow these individuals to input their desired calorie intake, macro-nutrient goals as well as specifications such as "High-Protein" or "Low-Carb". This process will make it simple for fitness enthusiasts to find a variety of recipes to help them maintain their fitness goals.

Another potential user group is busy parents who need to plan meals that their children will eat while providing them with the necessary nutrients quickly. Our application will allow these busy parents to input the foods their children will eat and select nutrients they need such as protein. Our system will then form recipes according to these specifications, taking away some of the stress that comes with meal time.

Individuals trying to improve their health are another potential user of PlanYourPlate. These individuals may not know where to start or what they need to consume to meet their goals. Our application will provide resources on getting started on their journey. It will also allow these individuals to input information such as their goal weight and it will provide suggestions on calorie consumption and how much of each nutrient they should consume to achieve their goals. Our application will then be able to provide recipe suggestions that align with their goals.

Individuals with dietary restrictions or allergies are another potential user group. These individuals need to find recipes excluding ingredients they are allergic to or want to avoid. Our application allows these individuals to input these restrictions and it will provide only recipes that avoid these items. This will save them the trouble of reading through a recipe, only to find out they are allergic or avoiding one of the ingredients.

A final potential user group is individuals who are new to cooking. Individuals who are starting to cook meals for the first time often struggle with finding ways to combine ingredients to create delicious and nutritious meals. These individuals can input something they want to cook with, for example, chicken, and our application will suggest recipes incorporating chicken. This will make the process of learning to cook easier and may encourage these individuals to experiment with meal choices.

Persona's

Name/Age: **Bruce**, 26.
Education: High School Diploma
Occupation: Personal Trainer
Family: N/A
Background:

- Lives in a suburban area, bikes to work/gym every day.
- Focused on expanding his brand

Characteristics:

- Determined to grow his business
- Goes above and beyond to help his clients

Goals:

- Wants to further instruct his clients to focus on their diet plans.
- Expand his value as an asset to people

Challenges:

- Wastes time trying to create meal plans for all his clients with different health issues and requirements.
- Clients don't want to follow a strict meal plan

Behaviors:

- Not a tech-strong person
- Constantly not being able to provide a diverse meal plan for clients

Quotes & Motivations:

- "They(clients) need something simple that will help them follow broad guidelines."
- Motivation: Business, Pursuing client success.

Name/Age: **Megan**, 32.
Education: Bachelor's degree in Psychology
Occupation: Therapist
Family: Married with 3 kids(6, 8, 11)
Background:

- Lives in the city
- Short on time between work and family

Characteristics:

- Very understanding and adjustable
- Values thoroughness and success.

Goals:

- To create healthy and nutrient full meals for her kids that are different than usual
- Satisfy her picky kids with applicable meals

Challenges:

- Kids are picky so she needs options to adjust.
- Has no time to create a plan ahead of time

Behaviors:

- Intelligent, won't cut corners on her kids
- Usually forces her children to eat what they don't like, despite her desires.

Quotes & Motivations:

- "They just don't like what I make anymore. I need new recipe's but I don't have the time to research!"
- Motivation: Family prosperity, children's health, time-saving.

Name/Age: **George**, 19.
Education: Attending SFU
Occupation: Dishwasher at Cactus Club Cafe
Family: Only child in a family of 3
Background:

- Mom always cooked for him

Characteristics:

- Not confident in the kitchen
- Has no clue what ingredients to shop for

Goals:

- To plan and make his own meals
- Eat healthy even away from home

Challenges:

- It's easier for George to go to McDonald's
- Has little understanding to ??

Behaviors:

- Prefers to sleep rather than meal plan
- Doesn't know what to buy when grocery shopping

Quotes & Motivations:

- "I just buy stuff without thinking if it's good for me or not"
- Motivations: Health, School.

Name/Age: **Jamal**, 29
Education: Bachelor's in business
Occupation: Walmart Manager
Family: Fiance.
Background:

- Grew up eating whatever was on his plate
- Football linebacker

Characteristics:

- Quite overweight, looking to turn his physical state around
- Is determined.

Goals:

- To lose weight, be within the healthy guidelines constructed by his doctor.
- Have a successful diet where he doesn't stay hungry throughout the day.

Challenges:

- Trying to restrict his calorie intake on his own has left him hungry throughout the day
- Doesn't know what meals are filling yet low calorie

Behaviors:

- Familiar with technology and websites
- Groceries are easy to grab since he works at walmart

Quotes & Motivations:

- “I just need some guidance, something to help me stay full and on track.”
- Motivations: Health, future.

Name/Age: **Amanda**, 52.
Education: Bachelor in Education
Occupation: Teacher
Family: Husband, children, grandchildren
Background:

- Grew up cooking only certain meals due to her allergies
- Never knew what exactly her allergy was until recently she got tests done.

Characteristics:

- With new knowledge of her allergies, she’s looking to explore new meals
- Very organized with her cookbooks
- Keen on keeping up with her health

Goals:

- Wants to explore new meals
- Keep healthy

Challenges:

- Has certain allergies she needs to avoid

Behaviors:

- Plans efficiently with cookbooks/calendars
- Very good at cooking

Quotes & Motivations:

- “I’m so excited to try all these different meals without the fear of having a reaction!”
- Motivations: Taste, new experiences.

API 1: Edamam Recipe Search API - Primary

Edamam Recipe Search API can be used to find recipes based on a variety on constraints from its database of over 2.3 million recipes. It contains recipes from over 500 sources and organizes the recipes in order of quality. It contains over 80 filters to allow for personally tailored recipes. It is equipped with a Natural Language Processing (NLP) engine to automate nutrition analysis.

Feature 1: Searching Recipes by Allergies

Edamam Recipe Search API can provide recipes that avoid allergens. For example, it can provide recipes that are gluten-free, soy-free, peanut-free and much more. It can also incorporate requested ingredients into the allergen-free recipes.

User Story: As the mother of a child with a peanut allergy, I want to be able to search for recipes that do not contain peanuts so I can provide my child with a variety of meals that are safe for his consumption.

Feature 2: Searching Recipes by Calorie Limit

Edamam Recipe Search API can provide recipes that fit within a certain amount of calories. Given an inputted list of ingredients and a maximum amount of calories, it will provide meal suggestions that contain the given ingredients that are less than the specified calories. For example, inputting “chicken, bread, cucumber” and ”250kcal” provides recipes such as a “Sesame Ginger Chicken Sandwich” which contains 211 kcal per serving.

User Story: As someone in a calorie deficit, I want to be able to search for creative recipes that are within my calorie goals for a meal so that I can achieve my weight loss goals.

Feature 3: Searching Recipes by Nutrient Amounts

Edamam Recipe Search API can provide recipes with desired amounts of nutrients such as fat, sugars, protein, fiber, sodium and more. Given a list of desired ingredients and nutrient constraints, recipes will be shown that meet these constraints.

User Story: As a fitness enthusiast I want to be able to find recipes that contain lots of protein in order to build muscle.

A Recipe API with 2 Mllion Recipes—Recipe Search API - Edamam. (n.d.). Retrieved October 14, 2024, from https://developer.edamam.com/edamam-recipe-api

API 2: The MealDB API - Primary

The MealDB API is a robust tool for searching meal recipes from the extensive database, allowing users to filter and find recipes based on a variety of preferences. The API enables access to a wide range of international recipes, offering features that cater to specific dietary needs or ingredient-based search options.

Feature 1: Searching for International Dishes

The MealDB API provides a wide range of recipes from various cuisines, enabling users to explore international dishes by filtering meals based on their country or cultural origin. This feature is particularly valuable for individuals from diverse cultural backgrounds, including students and expatriates, as it allows them to recreate authentic dishes using locally available ingredients. It ensures that users can experience flavours reminiscent of home while adapting to local ingredient availability.

User Story: As an international student living away from home, I want to be able to find recipes from my country that can be made with local ingredients, so that I can enjoy familiar, authentic flavours despite being in a different part of the world.

Feature 2: Filter by Main Ingredient

The MealDB API allows users to search for recipes by specifying a main ingredient, making it easy to find dishes based on what is available in the kitchen. This feature is particularly useful for reducing food waste, planning meals, and accommodating personal preferences or dietary needs. By focusing on a specific ingredient, users can discover new recipes that highlight or make the most of what they already have. Additionally, this feature is invaluable for individuals with dietary restrictions, enabling them to find suitable recipes that align with their specific needs.

User Story: As someone looking to reduce food waste/save money, I want to search for recipes based on a main ingredient I have at home so that I can use up ingredients efficiently and avoid letting food spoil/out of budget.

Feature 3: Show Random Meal

The MealDB API offers a feature that displays random meal suggestions to users. This can be particularly helpful for individuals who are short on time and need quick meal ideas without having to spend time planning. Additionally, it is beneficial for beginners or those with limited cooking experience, as it provides them with simple, randomized meal options to try without the pressure of making decisions about what to cook.

User Story: As a busy professional/student with limited time to plan meals, I want to receive random meal suggestions so that I can quickly decide what to cook without having to spend time searching for recipes.

TheMealDB, "TheMealDB API," [Online]. Available: https://www.themealdb.com/api.php. [Accessed: Oct. 17, 2024].

API 3: TastyAPI

TastyAPI is used to get food recipes in both video and textual formats. Recipes can be searched by name, ingredients, and several recipe categories. A user can also request for similar recipes to a specific recipe. Upon retrieving a recipe, various details about the recipe can be displayed, such as preparation time and nutritional value.

Feature 1: Choose from recipe list

One feature that can be implemented using TastyAI is the ability for a user to choose from a list of recipes that pertain to their preferences, such as ingredients or nutritional value, and view them in a quick and effective way.

User Story: As a busy user with limited ingredients, I want to find meal recipes quickly with what I have so I can focus on other aspects of my life while still being able to eat healthy.

Feature 2: Suggest similar recipes

Another feature is the ability to suggest other recipes similar to the user's chosen recipes. This allows for a more efficient customized search while remaining quick and effective. This makes it accessible for a variety of users who share the same goal of healthy eating.

User Story: As someone new to cooking with limited ingredients, I want to find meal recipes quickly and beginner-friendly so I can begin to eat healthy at home.

Feature 3: Return recipes based on calorie count

Lastly, a third feature that can be implemented using TastyAPI is the ability to return a list of recipes based on the user's recommended calorie intake. After using PlanYourPlate's calorie calculator, the user is able to get a list of recipes within their calorie intake range. Allowing the user to search for recipes within their calorie intake range allows users to spend less time planning and researching, and more time actively eating healthy.

User Story: As someone who is working on being fit, I want to find recipes that pertain to my specific calorie intake so I can focus on being healthy and spend less time looking for recipes.

RapidAPI, T. (2021, June 8). How to use the tasty API with Java, python, PHP, Ruby & JavaScript examples. Rapid Blog.
https://rapidapi.com/blog/tasty-api-with-java-python-php-ruby-javascript-examples/

API 4: CalorieNinjas(Nutrition Facts Recipe API)

CalorieNinjas is an API that offers detailed nutritional information for a wide range of foods. It uses a large database to pull its data from; information on calories, macronutrients and other dietary information. This makes it a valuable tool for someone trying to filter through meals to make themselves an applicable meal plan.

Feature 1: Find meal from user input

Its first useful feature that we'd implement is its accessible database. Through input, whether it be a common meal or from a restaurant, we can collect and use important information depending

on what the user is looking for. This is key for the diversity we are looking to provide on our website. If a user comes across multiple dietary restrictions as well as limiting themselves in other categories like calories or trying to maximize protein, it would require a lot of meal options.

User Story: As someone who is looking to diversify in the kitchen, I need to have a lot of meal options at my fingertips.

Feature 2: Multiple search options

Another feature to use is its search method, which gives the user a couple of options as to how they want to find their meal. The user can either type out what they had eaten and get nutrition data, the user can upload an image to get results from, in case they don't know exactly what a meal was, or the user can search directly for a recipe. These options allow the user to find what they're looking for no matter what scenario they are in. This is a key aspect of meal planning, is finding fitting meals for your plan.

User Story: As someone who likes to cook certain things that I find, it's useful to be able to search for meals through pictures or recipes.

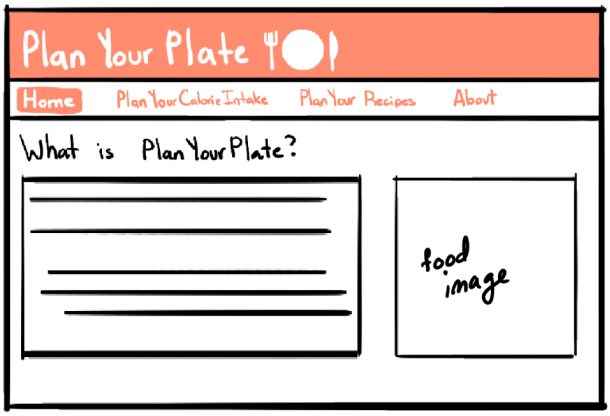
Feature 3: Nutrition Analysis

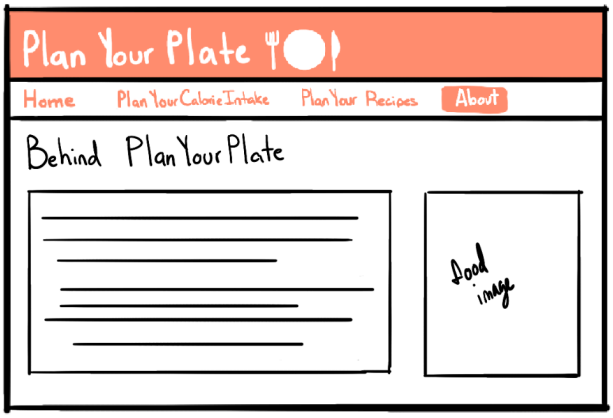
The last feature is its nutrition analysis, which provides the information to a user whether or not the data will fit their needs or goals. This would be implemented for helping people with specific dietary requirements because they could be assured that what they are consuming is along the guidelines of both their nutrient and allergy needs.

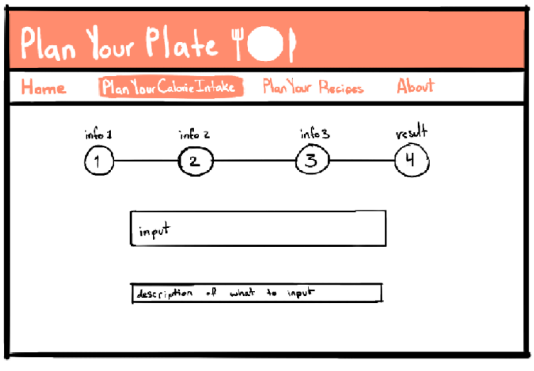
User Story: As someone who has a lot of allergies, but also is trying to lose weight, a thorough nutritional analysis allows me to fulfill my meal plans.

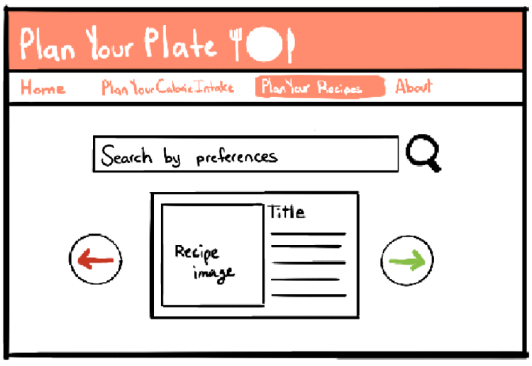
Free nutrition facts recipe API. CalorieNinjas. (n.d.). https://calorieninjas.com/

Low-fi Storyboard:





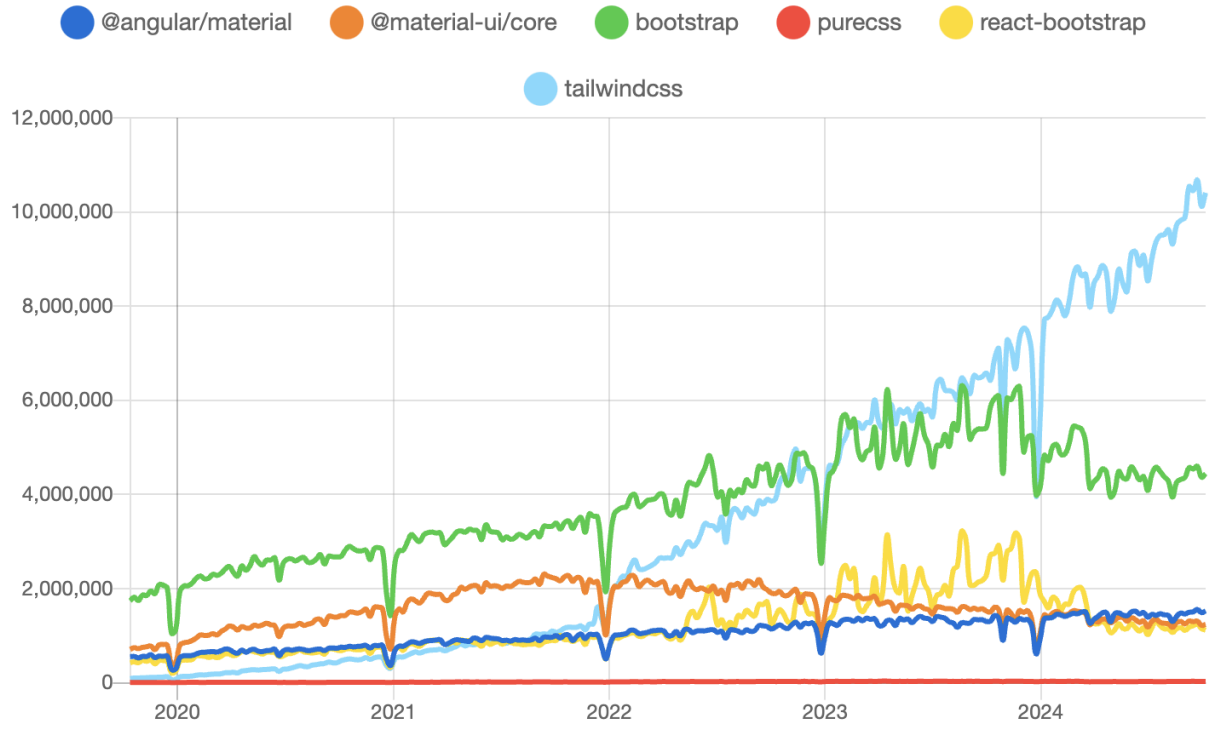




Framework

1. HTML+CSS: Tailwind

Tailwind, introduced in 2017, has quickly gained popularity as a viable alternative to Bootstrap. While Bootstrap offers widely-used, pre-defined components, its design often adheres to a standard mold. In contrast, Tailwind provides developers with greater customization capabilities, embracing a utility-first approach that enhances flexibility and speeds up the styling process. This approach allows developers to craft unique designs more efficiently, adapting the CSS to specific project needs.

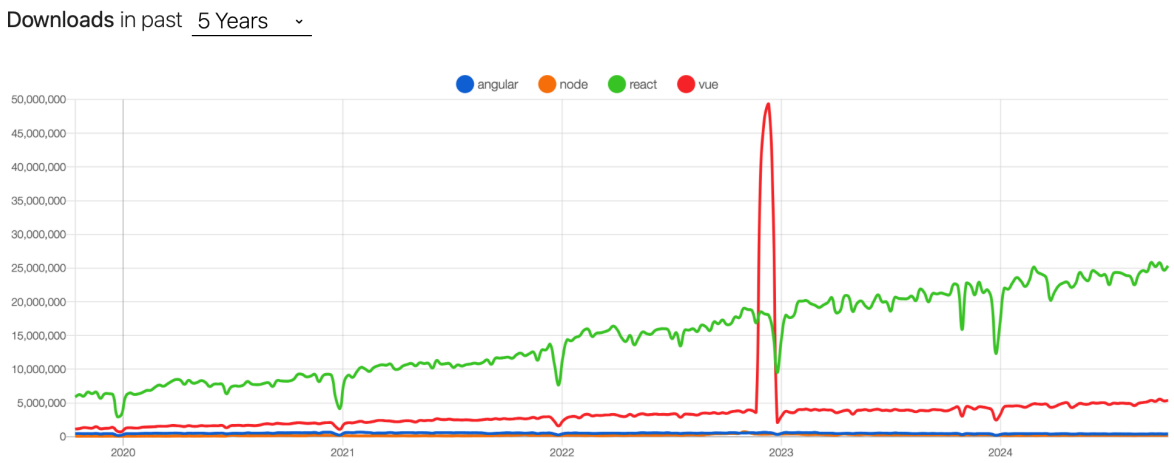


Npmtrends, "@angular/material vs @material-ui/core vs Bootstrap vs PureCSS vs React Bootstrap vs TailwindCSS," [Online]. Available: https://npmtrends.com/@angular/material-vs-@material-ui/core-vs-bootstrap-vs-purecss-vs-react-bootstrap-vs-tailwindcss. [Accessed: Oct. 17, 2024].

According to the trends displayed on NPM Trends, the demand for Tailwind is growing rapidly. Given our plan to implement a 'Swipe' gesture as a key feature, Tailwind proves to be a solid choice, offering the versatility and control required to support such an interaction effectively.

2. JavaScript: React.js

   Tailwind and React work exceptionally well together. Tailwind's utility-first approach complements React's component-based structure, allowing utility classes to be applied directly within React components. This integration enhances both productivity and maintainability, as it reduces the need for separate CSS files and simplifies the styling process.

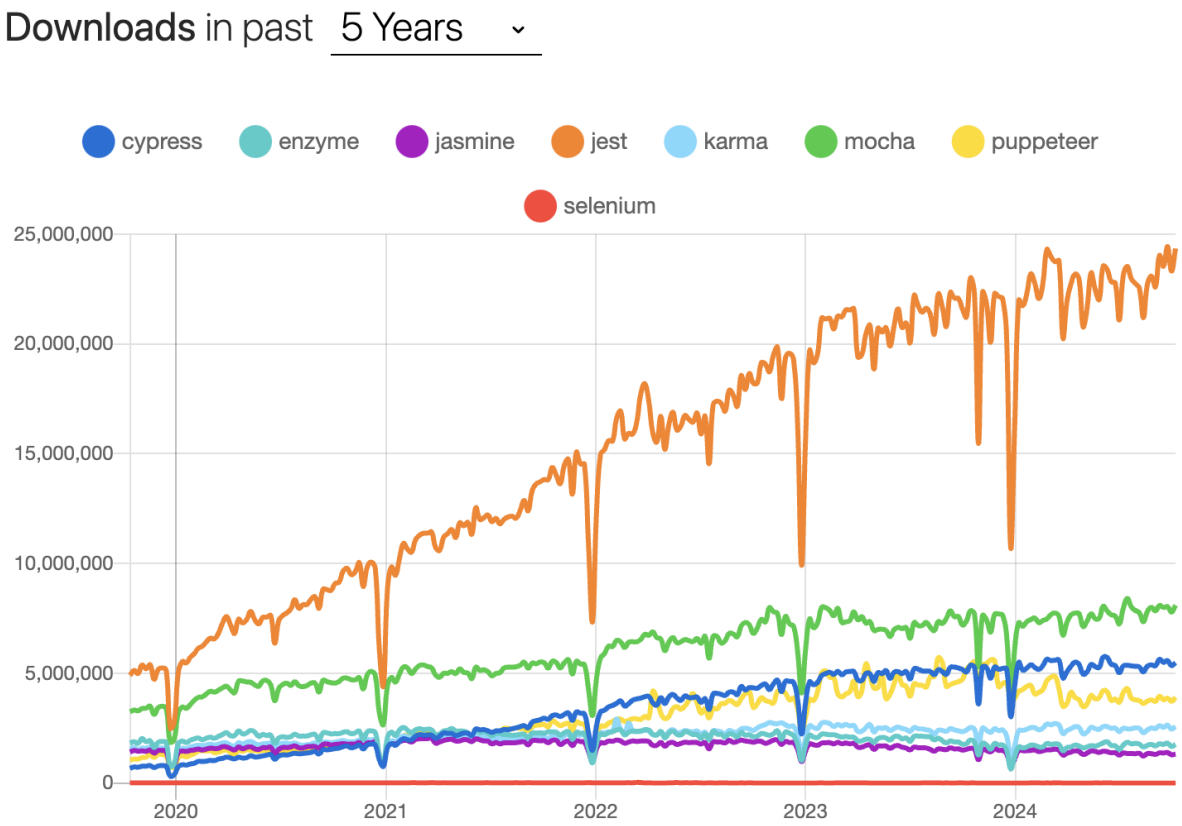


Npmtrends, "Angular vs Node vs React vs Vue," [Online]. Available: https://npmtrends.com/angular-vs-node-vs-react-vs-vue. [Accessed: Oct. 17, 2024].

   According to the trends displayed on NPM Trends, React is currently the most widely used framework. This makes React a solid choice for our project, ensuring long-term relevance and providing valuable experience for future development practices.

3. Javascript Testing: Jest

   Jest is a solid choice for unit and integration testing. Given that we have chosen React and Tailwind for our project, we prioritized finding a testing framework that integrates seamlessly with both. We concluded that Jest is the most suitable option. Its strong compatibility with React, along with its growing popularity in the development community, makes it a reliable and future-proof solution for our testing needs.



Npmtrends, "Cypress vs Enzyme vs Jasmine vs Jest vs Karma vs Mocha vs Puppeteer vs Selenium," [Online]. Available: https://npmtrends.com/cypress-vs-enzyme-vs-jasmine-vs-jest-vs-karma-vs-mocha-vs-puppeteer-vs-selenium. [Accessed: Oct. 17, 2024].

4. CI/CD Pipelines: Github Actions

   CI (Continuous Integration) is the practice of integrating code changes into a shared repository frequently. When developers push code, tools like GitHub Actions automatically build the project, run tests, and alert developers to any issues. This helps detect bugs and integration problems early, reducing the risk of conflicts in the codebase.

   CD (Continuous Deployment) ensures that every change that passes the automated tests is deployed to production without the need for manual intervention. This allows for rapid iteration and seamless deployment of new features.

As our team is working in a small group with a shared repository already set up, we have decided to use GitHub Actions for our CI/CD pipeline. This will streamline our development and deployment process, ensuring smooth collaboration and faster delivery of updates.

5. Web Hosting: Netlify
   Since our project focuses primarily on frontend development, we considered both Vercel and Netlify. However, Netlify offers a straightforward setup and is well-suited for hosting static websites. Given these advantages, we decided to use Netlify for our web hosting needs.