Pantry Pal

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# **DESCRIBE THE PROBLEM**

## **SCOPE**

Everyone knows the problem. You’re staring into the empty fridge, wondering what you can cook with all the leftover ingredients you have.

Pantry Pal solves this problem conveniently for you. You enter all the ingredients you have available, and the App produces a list of delicious recipes you can make with minimal effort.

Before Pantry Pal existed, you had to look up recipes online, go through countless food blogs with bloated descriptions, just to end up ordering takeout again🙄

Traditionally, an App like this would have to access a large database or recipes. This project highlights the unique approach to this common everyday problem by using large language models to generate data. This way the recipes are highly customized to the users needs, whether dietary, nutritional or by limiting available ingredients.

Pantry Pal has three unique target audiences with their own needs. The following personalities undermine their differences:

**Jakob, the student**

The student likes to cook occasionally. When he comes back from class, he often finds himself hungry, but not having many fresh ingredients at home to cook with. Ordering takeout isn’t an option since he’s always low on budget. So he opens Pantry Pal on his iPhone to find quick recipes that he can make with what he has left. Since he’s currently going to the gym regularly, he wants meals with a high protein count. The app recommends a small selection of recipes, that Jakob likes. The detailed recipe makes it easy to cook a fresh and delicious meal, and with the added nutritional information, he can quickly know how much he still has to eat to meet his dietary goals. Jakob is really satisfied with the recipe, so he saves it to his account to make it another time.

**Frida, the mother**

When Frida comes home from work at midday, she only has half an hour before the kids come back from school. She wants to cook something fresh for them, but they are quite picky eaters. She has countless cooking books in the kitchen, but barely any of the recipes make everyone at the table happy. So grabs her Android phone to open Pantry Pal and types in what the fridge offers, and the different tastes of the kids. She’s quickly satisfied with one of the recommended recipes. With the detailed steps it’s easy to follow the recipe, even after coming home from exhausting work. And with the handy information on cooking time, Frida knows lunch will be on the table by the time the kids get home, and everyone will enjoy the meal together.

**Mikkel, the professional chef**

Mikkel has been a chef for many years now. He has his own restaurant focused on creating traditional Norwegian dishes, but incorporating elements from international cuisine into his creations. He likes to try out new combinations to find recipes that pleasantly surprise guests with meals they have never tried. When he’s out of creative ideas, he likes to open the Pantry Pal Web-App for some inspiration. He enters ingredients he thinks might fit together, and the app recommends fitting recipes. Mikkel is surprised by the creative combinations the app comes up with, and immediately goes to try out one of the recipes. Maybe one of them will be his next signature dish. He saves the other recommended recipes in his profile for later, maybe they’re also worth trying out.

The App will be built with an agile approach. Base requirements will be gathered in the beginning, and will be expanded during development while the project grows. Milestones will be:

* Initial Prototype finished
* Backend Systems finished
* User Interface finished
* Deployment finished

The project will be built using Flutter, an UI Framework for cross platform applications from a single codebase.

* *“Business objective”: Describe the project’s goal and “business impact.”*
* *How will the solution produced in the project be used? What similar solutions already exist / how is the problem solved today? How would you do the task manually without using machine learning?*
* *How will the performance be measured via “business metrics”?*
* *If your machine learning model will be part of a more extensive “pipeline” or system, describe the system’s components. Consider how changes in one part of the system may impact other parts.*
* *Describe the stakeholders of the project*
* *Describe a tentative timeline for the project. Include milestones.*
* *Define what resources, for example, computational resources and personnel, will be required to complete the project.*

## **METRICS**

To evaluate the business impact of Pantry Pal, we can look at how fast users can perform tasks in the app.

* How long does it take a user to enter four ingredients into the app, select a generated recipe, and save the recipe for later.
* How long does it take a user to go to their saved recipes and open the most recently saved one.

It’s important to get these times as low as possible as this improves user satisfaction. The app should be quick and responsive, users shouldn’t have to wait long for the recipes to be generated.

* *Describe the minimal “business metric” performance for the project to be considered a success*
* *Describe machine learning and software metrics or objectives that will be used to measure whether the system/solution is working. Here, you should use metrics that can be easily calculated. Accuracy, mean squared error, latency, and throughput are examples. Describe how they are connected to the “business objective” you described earlier.*

# **DATA**

*Describe what data and labels you will use. What kind of data is it? Where will you obtain data / how can you collect data? How much data is already available, and how much do you estimate is needed? If the problem is to be attacked using “supervised learning” methods, describe how you will get the “ground truth” labels. How will you ensure that the labels are sufficiently accurate? That they are consistent?*

*Describe any privacy issues or other relevant ethical considerations.*

*How will the data be represented for the machine learning models? Describe potential needs for data cleaning, feature engineering, scaling, and the like.*

# **MODELING**

*Describe which machine learning models you will explore. Describe how you plan to estimate baseline performance and baseline behavior. Remember that your first models should be simple. Baseline performance can typically be estimated using simple models or even non-machine learning-based solutions. You can also search for results obtained by others on the same or a similar task. You can also estimate “human-level performance” if relevant. Describe how you plan to investigate prediction mistakes and “feature importance” and how this will be used to improve your results.*

# **DEPLOYMENT**

*How will the model(s) be deployed? How will the predictions be used? What are your plans for monitoring and maintaining the machine learning system? If relevant, how do you plan to improve the system after deployment?*

# **REFERENCES**

*List sources you’ve used during the planning of the project. The list of references should indicate the feasibility of your project.*