‘Other Meal’ Project Report

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Contents

Other meal app

Abstract

The web application is designed to provide recipe recommendations based on user ingredient selection. This process provides matching recipes.

1. Introduction

The purpose of the 'Other Meal' is to provide users with a recommendation of a recipe that is based upon ingredients that the user already likes. Searching for correlating recipes that would be a great healthy alternative.

2. Project overview

2.1. Project description

The goal of the project is to develop a web application that provides recipe recommendations to the user.

The project has machine learning algorithms applied to analyse different recipes content and user interaction recommendations. This allows the software to pick matching content to the user requirements. The algorithm is trained on great amount of recipe data to have more accurate suggestions.

2.2. Project constraints

2.2.1. Time

The time for the project's development cycle is from 2022 September 1st to January 8th, 2023. In this process it was accounted to deliver necessary documentation, research, and development.

2.2.2. Scope

The scope of the project details information regarding the constraints of the software. Defining what will the application include and exclude.

The project will include:	The project will exclude:
provide user recipe recommendations based on user inputted ingredients.	Mobile responsive web application
Notebooks containing data analysis on the data-sets contents.	Sources correlating exact measurements of nutritional values within provided recipe
Research documents regarding the used technologies social impact.	Saving any personal user information
Developing a web application including web interface and algorithms to	

2.3. Development Methodologies

The methodology followed for the project's life cycle is Agile. The agile approach allowed separation of different features into smaller parts that are easier to complete.

2.4. Development tools

Working on this project I got to use a variety of technologies to support my development.

For the back-end development I used Django, Django-Rest-framework

For the front-end development, I used JavaScript, HTML, CSS as well as making use of framework to assist the development such as React.

For the data analysis, I used python and various packages to assist the data preparation. Pandas, NumPy for data manipulation. For machine learning I used Sklearn applying KNN, random forest, decision trees. As for data plotting, I utilised Matplotlib and Seaborn.

Name of tool	Tool description
Git	Web-based version control system
API	Application programming interface
Python	Programming language used for back end
JavaScript	Programming language used for front end
React	JavaScript based Front end library
REST	Representational state transfer (REST) software architectural style

2.5. Research Questions and Results

Data preparation

How to clean data sets and prepare it for data analysis and machine learning?

It's important to prepare any raw data when working with data analysis because formatted data can be easily and accurately analysed.

For data preparation python provides a library called Pandas. Allowing developers to inspect and modify datasets of different formats. With pandas I was able to modify a recipe interaction dataset from Kaggle which contained varied user ratings and recipe data.

To fully utilize the dataset, I had to separate the null values which are undesirable for later machine learning.

- How to clean a data set and prepare it for specific use.
- What information is required for me to use to find users preference in meals.
- What data needs to be processed to provide suggestion from the AI algorithm.

Data visualization

How to inspect the existing data to determine the contents quality?

To be able to determine the data quality I used matplotlib and seaborn to inspect the quality of the formatted data. Its important to plot the data because you can visually see the possible skewing of data.

Some of the features that I believe were important to showcasing

User interface

- What would attract the user to use the software.

I was able to start working on front end where I could display the recommended recipes. I made several pages separating the recipe display components.

Machine learning

What machine learning model type I should use for recommendation system?

The main recommendation system types applicable for my project are regression and classification.

In content-based methods, the recommendation problem is casted into either a classification problem (predict if a user “likes” or not an item) or into a regression problem (predict the rating given by a user to an item)

Which both are applicable in my project.

2.6. Functional requirements

Moscow priority	Must	Should	Could	Would
Functional requirement nr.	Functional requirement description		Moscow MSCW	
Fr.1	Registration			
Fr.2	Selecting ingredients that you own			
Fr.3	Meal recommendation			
Fr.4	Meal search by name			
Fr.5	Meal search by ingredients			
Fr.6	Selection tracking			

- System allows user to register.
- System requests the user to select main ingredients.
- System recommends user meals from the ingredient preference.
- System should be able to find meals via name or ingredient.
- System should recommend user meals based on their viewing habits.
- Setting up a user profile based on preferred recipes and ingredients they would like.

2.7. Current situation

Status	Finished	In-complete

Functional requirement nr.	Functional requirement description	Status
Fr.1	Registration	
Fr.2	Selecting ingredients that you own	
Fr.3	Meal recommendation	
Fr.4	Meal search by name	
Fr.5	Meal search by ingredients	
Fr.6	Selection tracking	

Most of the features for the application are incomplete or not started due to focusing on delivering accurate machine learning. Ignoring important feature which hindered the development process in not completing functional aspects of the website app.

3. Conclusion And Takeaways

For this project I did learn a lot about python and data analysis as well on machine learning. I did get to practice and play around with different machine learning models and complete some tutorials that showed how machine learning works. Sadly, due to underestimating the difficulty of the personal project I got myself distracted on trying to fix unrelated problems putting too much focus on data preparation. Leaving the development process on functional requirements un-accessed.

For future projects I believe I should work more methodologically on a project. Where I would have to reconsider my capabilities instead of wanting to deliver a software with impressive features. And consider the time frame that is given to deliver a project is limited as well to focus on the problems in smaller steps. Because the amount of data that I was working with

4. References