

Recipe Book Website

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Date of presentation: 05/11/2022

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Introduction

1. To contribute to open source Recipe book website taken from github which consists of different kinds of recipes which is just displayed as a list.
2. This website needs a login and registration page and Machine Learning to recommend related recipes.



Review of Literature

Sr. no	Title	Methodology	Gaps/ Future scope
1.	Recipe Recommendation System using Content-Based Filtering	In this system, The input given to the model is in the form of text. Content-based filtering is used to give recommendations based on user preferences based on the user profile and are based on item descriptions. It enables recommendation recipes to people based on the attributes (ingredients) the user provides. It then outputs the top-N most similar recipes, along with their ingredients for the user to choose from.	To use Image Processing to detect substances. Advanced machine learning algorithms to assist consumers in more intelligently discovering new recipes utilizing readily available ingredients.

Review of Literature

Sr. no	Title	Methodology	Gaps/ Future scope
2.	Recipe Recommendation Method by Considering the User's Preference and Ingredient Quantity of Target Recipe	Our method estimates a user's food preferences from his/her past actions,such as through their recipe browsing and cooking history.We have proposed a recipe recommendation method based on the user's food preferences, that breaks down into their ingredients and scores them on the basis of the frequency of use and specificity of the ingredients.	We will try to consider the aspects for calculating recipe score in our future work. It also lacks health related concerns regarding food ingredients.

Review of Literature

Sr. no	Title	Methodology	Gaps/ Future scope
3.	RECIPE RECOMMENDATION SYSTEM BASED ON FOOD INGREDIENTS	In this paper, input is taken from user and the BMI is calculated after taking inputs of height and weight. After that if you select food preferences then the recipes list will be generated.Knn (K nearest Neighbor) algorithm is used to design this approach.	Only takes height and weight as the input which is not sufficient. In the future, various medical inputs like diabetic or not can be taken and accordingly recipes can be recommended.

Problem Definition

To contribute to recipe book website in order to improve the current websites features like GUI, add login page , provide recommendation using Machine Learning.



Project Objectives

The objective of our project is to contribute towards an interactive website for recipe book.

We are using ML Algorithm “KNN” to predict recipes using food items from the drop down menu.



Scope of Project

The scope of the project is to recommend recipe based on ingredients.

Based on the ingredients the user will be able cook recipe according to available food items in the drop down menu of the website.

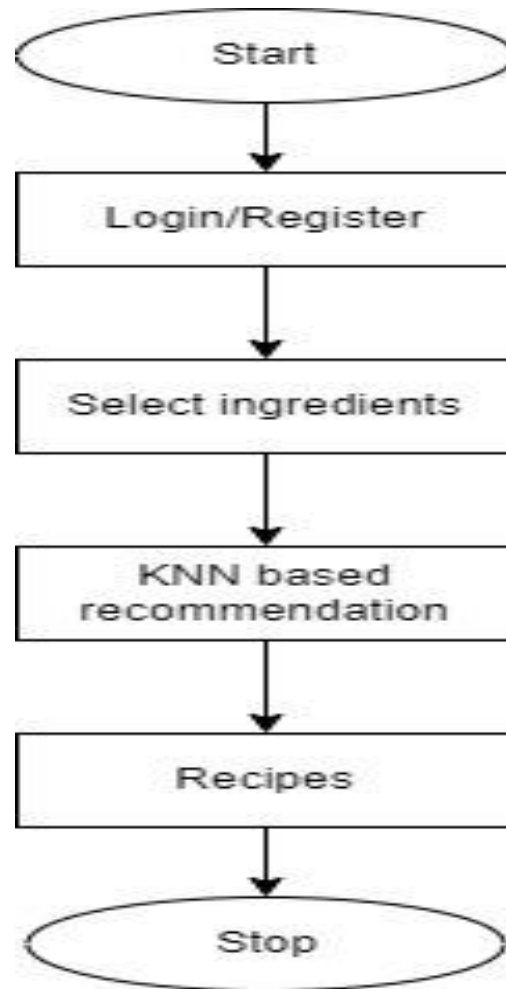


Proposed Solution

1. To add Bootstrap for better alignment of provided recipes.
2. To create login/sign up page to keep track on users.
3. To recommend recipes to user using Machine learning algorithm like “KNN” algorithm.



System Description



Hardware & Software Requirements

Hardware :-

64-bit PC/Laptop
2/4/8 GB RAM
i3/i5 processor

Software :-

Backend-

OS: Windows 7 or above
Browser: Chrome/Firefox/Edge/Brave
Application: VS code, MySQL Database

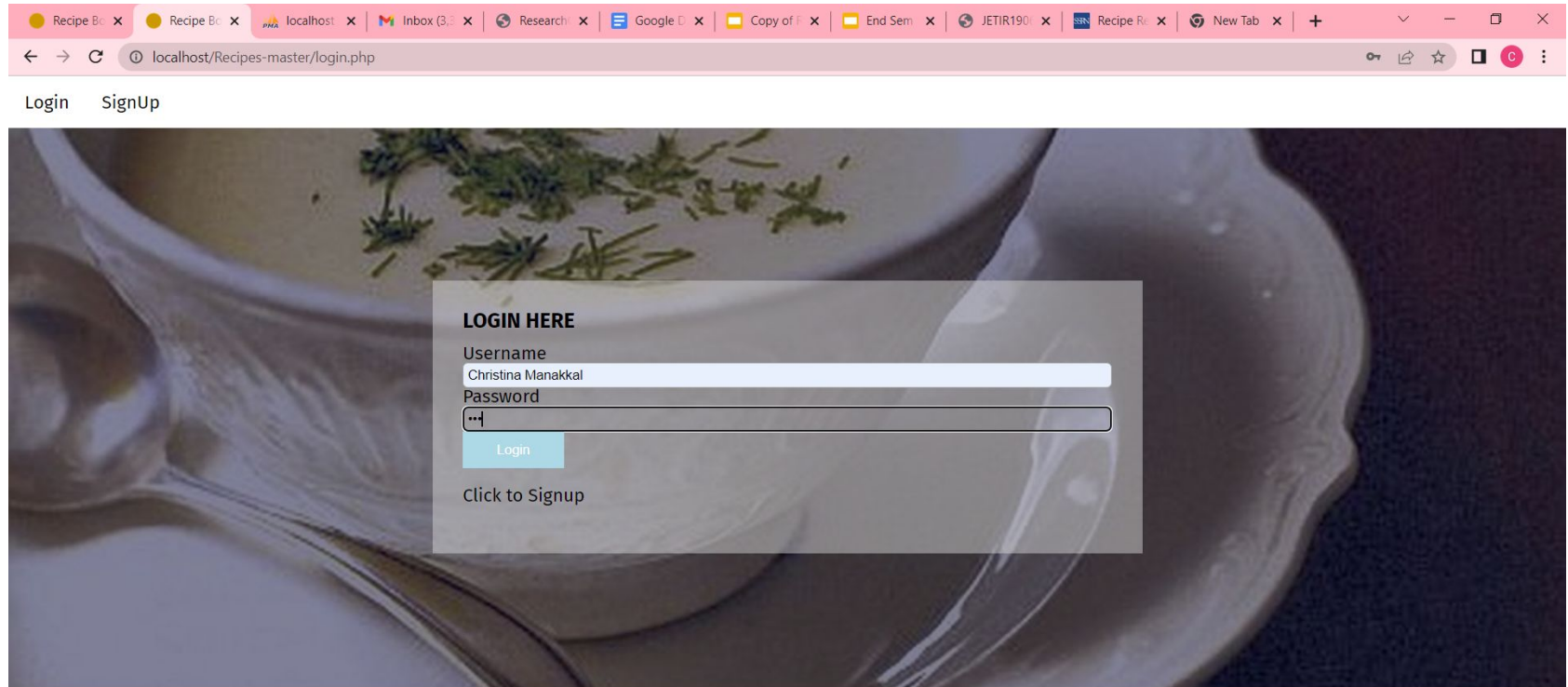
Frontend-

HTML
CSS
PHP
Bootstrap



Implementation

Login Page



Recipe B x Recipe B x localhost x Inbox (3 x Research x Google x Copy of x End Sem x JETIR190 x Recipe R x New Tab x +

localhost/Recipes-master/login.php

Login SignUp

LOGIN HERE

Username
Christina Manakkal

Password
[Masked]

Login

[Click to Signup](#)

Implementation

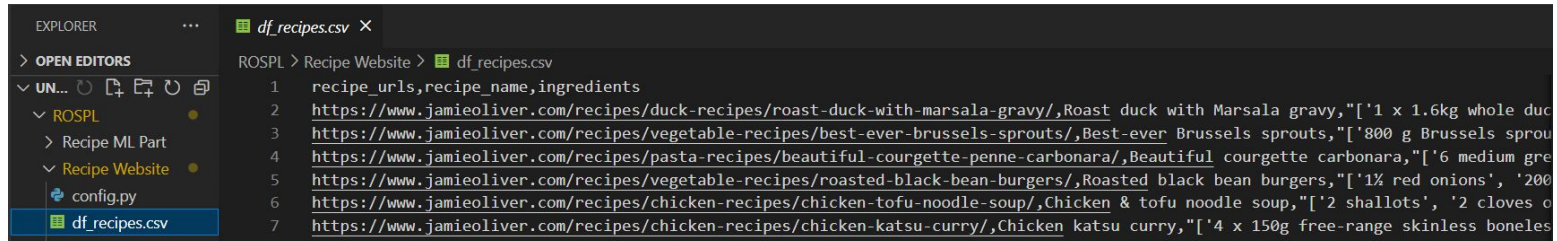
Using BeautifulSoup library from bs4 module to extract html data from original website.

```
ROSPL > Recipe Website > main.py > ...
1  # Import the required libraries
2  import pandas as pd
3  from bs4 import BeautifulSoup
4  import requests
5  import time
6
7  import numpy as np
8  import re
9
10 # Define the url in python
11 url = "http://jeffreythompson.org/recipes/"
12
13 # Fetching html from the website
14 page = requests.get(url)
15
16
17 # Initializing DataFrame to store the scraped URLs
18 recipe_url_df = pd.DataFrame()
19
20 # BeautifulSoup enables to find the elements/tags in a webpage
21 soup = BeautifulSoup(page.text, "html.parser")
22 #print(soup)
23
```



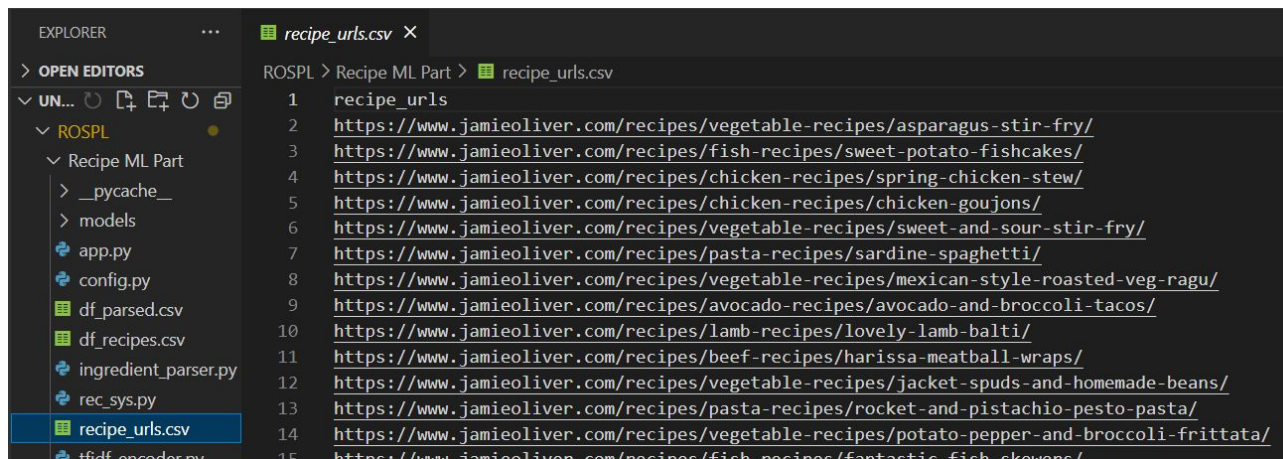
Implementation

Scraping and saving data from website into .csv files.



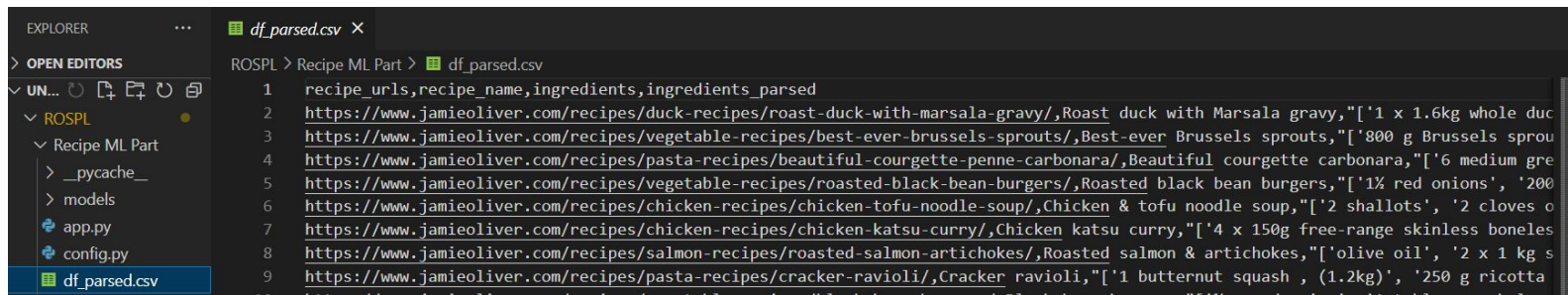
The screenshot shows the VS Code Explorer on the left with the file tree expanded to 'Recipe Website' > 'df_recipes.csv'. The Editor on the right displays the contents of 'df_recipes.csv' with the following data:

recipe_urls	recipe_name	ingredients
https://www.jamieoliver.com/recipes/duck-recipes/roast-duck-with-marsala-gravy/	Roast duck with Marsala gravy	['1 x 1.6kg whole duc
https://www.jamieoliver.com/recipes/vegetable-recipes/best-ever-brussels-sprouts/	Best-ever Brussels sprouts	['800 g Brussels sprou
https://www.jamieoliver.com/recipes/pasta-recipes/beautiful-courgette-penne-carbonara/	Beautiful courgette carbonara	['6 medium gre
https://www.jamieoliver.com/recipes/vegetable-recipes/roasted-black-bean-burgers/	Roasted black bean burgers	['1½ red onions', '200
https://www.jamieoliver.com/recipes/chicken-recipes/chicken-tofu-noodle-soup/	Chicken & tofu noodle soup	['2 shallots', '2 cloves o
https://www.jamieoliver.com/recipes/chicken-recipes/chicken-katsu-curry/	Chicken katsu curry	['4 x 150g free-range skinless boneles



The screenshot shows the VS Code Explorer on the left with the file tree expanded to 'Recipe ML Part' > 'recipe_urls.csv'. The Editor on the right displays the contents of 'recipe_urls.csv' with the following data:

recipe_urls
https://www.jamieoliver.com/recipes/vegetable-recipes/asparagus-stir-fry/
https://www.jamieoliver.com/recipes/fish-recipes/sweet-potato-fishcakes/
https://www.jamieoliver.com/recipes/chicken-recipes/spring-chicken-stew/
https://www.jamieoliver.com/recipes/chicken-recipes/chicken-goujons/
https://www.jamieoliver.com/recipes/vegetable-recipes/sweet-and-sour-stir-fry/
https://www.jamieoliver.com/recipes/pasta-recipes/sardine-spaghetti/
https://www.jamieoliver.com/recipes/vegetable-recipes/mexican-style-roasted-veg-ragu/
https://www.jamieoliver.com/recipes/avocado-recipes/avocado-and-broccoli-tacos/
https://www.jamieoliver.com/recipes/lamb-recipes/lovely-lamb-balti/
https://www.jamieoliver.com/recipes/beef-recipes/harissa-meatball-wraps/
https://www.jamieoliver.com/recipes/vegetable-recipes/jacket-spuds-and-homemade-beans/
https://www.jamieoliver.com/recipes/pasta-recipes/rocket-and-pistachio-pesto-pasta/
https://www.jamieoliver.com/recipes/vegetable-recipes/potato-pepper-and-broccoli-frittata/
https://www.jamieoliver.com/recipes/fish-recipes/fantastic-fish-skewers/



The screenshot shows the VS Code Explorer on the left with the file tree expanded to 'Recipe ML Part' > 'df_parsed.csv'. The Editor on the right displays the contents of 'df_parsed.csv' with the following data:

recipe_urls	recipe_name	ingredients	ingredients_parsed
https://www.jamieoliver.com/recipes/duck-recipes/roast-duck-with-marsala-gravy/	Roast duck with Marsala gravy	['1 x 1.6kg whole duc	
https://www.jamieoliver.com/recipes/vegetable-recipes/best-ever-brussels-sprouts/	Best-ever Brussels sprouts	['800 g Brussels sprou	
https://www.jamieoliver.com/recipes/pasta-recipes/beautiful-courgette-penne-carbonara/	Beautiful courgette carbonara	['6 medium gre	
https://www.jamieoliver.com/recipes/vegetable-recipes/roasted-black-bean-burgers/	Roasted black bean burgers	['1½ red onions', '200	
https://www.jamieoliver.com/recipes/chicken-recipes/chicken-tofu-noodle-soup/	Chicken & tofu noodle soup	['2 shallots', '2 cloves o	
https://www.jamieoliver.com/recipes/chicken-recipes/chicken-katsu-curry/	Chicken katsu curry	['4 x 150g free-range skinless boneles	
https://www.jamieoliver.com/recipes/salmon-recipes/roasted-salmon-artichokes/	Roasted salmon & artichokes	['olive oil', '2 x 1 kg s	
https://www.jamieoliver.com/recipes/pasta-recipes/cracker-ravioli/	Cracker ravioli	['1 butternut squash, (1.2kg)', '250 g ricotta	
https://www.jamieoliver.com/recipes/vegetable-recipes/black-bean-burgers/	Black bean burgers	['1½ x red onion', '11 tablespoons black	



Implementation

- This application simply consists of text data and there is no kind of ratings available, so we can not use matrix decomposition methods, such as SVD and correlation coefficient-based methods.
- So we used 'Cosine similarity' to get a score.

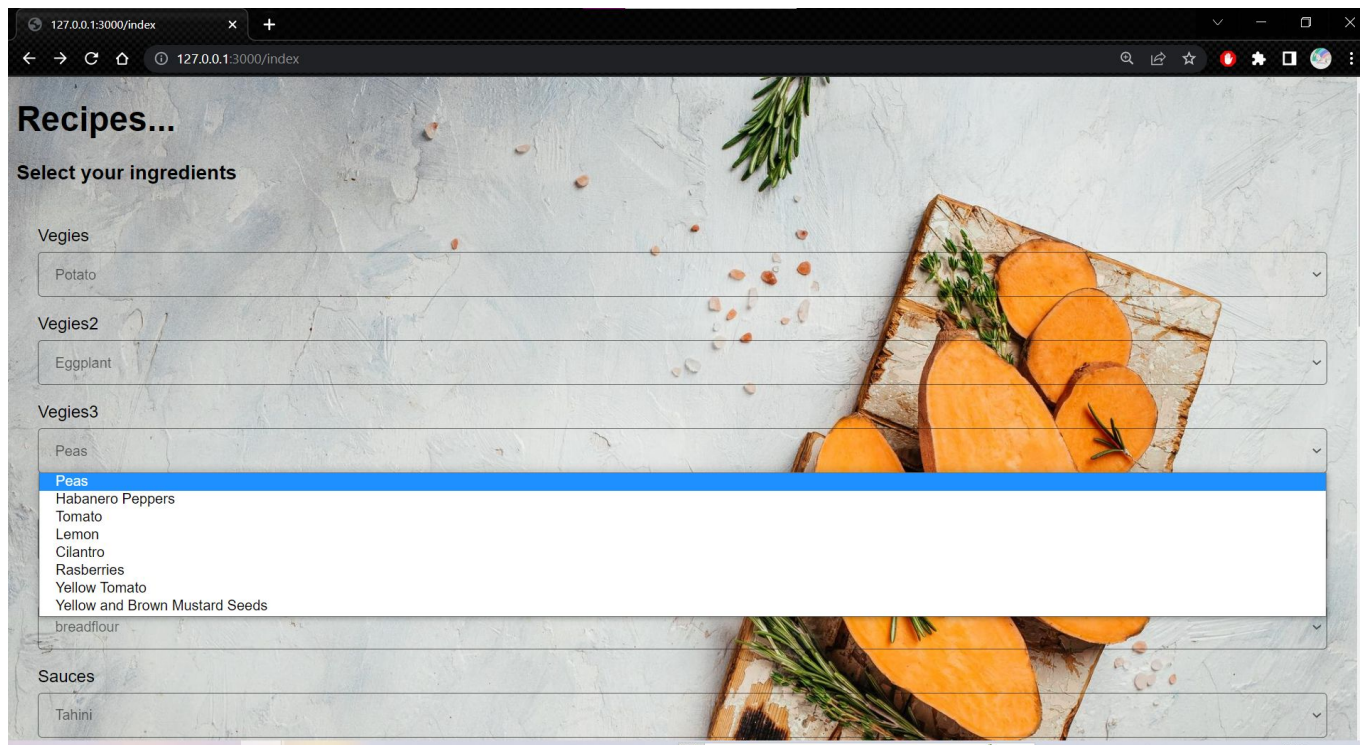
$$\text{cosine similarity} = S_C(A, B) := \cos(\theta) = \frac{\mathbf{A} \cdot \mathbf{B}}{\|\mathbf{A}\| \|\mathbf{B}\|} = \frac{\sum_{i=1}^n A_i B_i}{\sqrt{\sum_{i=1}^n A_i^2} \sqrt{\sum_{i=1}^n B_i^2}},$$



Implementation

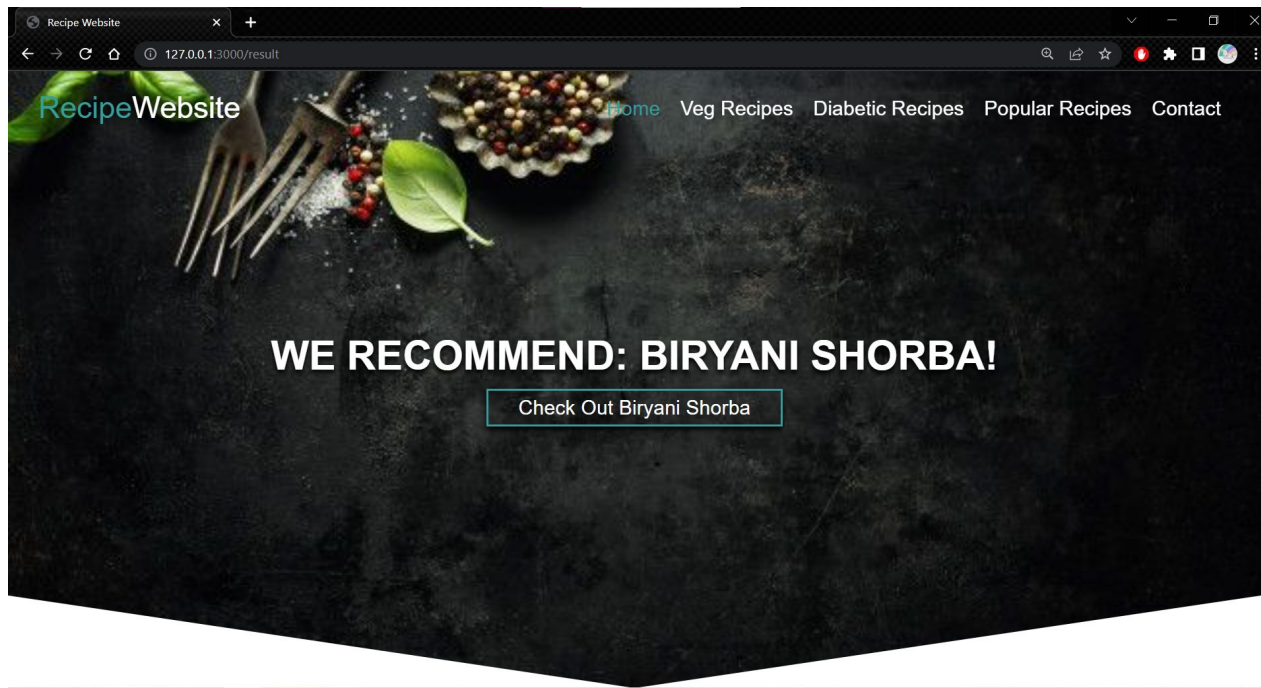
Display data on webpage.

Users can enter the ingredients to get recommended recipes which contain those ingredients.



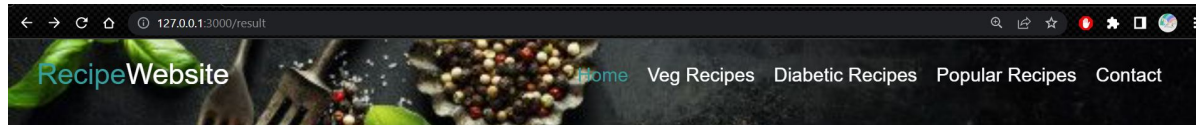
Implementation

Process input given by user, apply KNN algorithm and display recommendations.



Implementation

Display various tabs



Vegetarian Recipes



Diabetic Recipes



Featured Recipes



Conclusion

We contributed to a recipe book website from github by making it more efficient by adding HTML/CSS to the website, Login/sign up page and ML based recommendation system for recommending recipes using KNN algorithm.



References

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<https://github.com/jeffThompson/Recipes>
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3. M. Ueda, S. Nakajima, Y. Miyawaki, and S. Nakajima, “Cooking Recipe Recommendation Method Focusing on the Relationship Between User Preference and Ingredient Quantity.” *Transactions on Engineering Technologies*, vol. 1, pp. 385-395, Mar. 12, 2014, doi: 10.1007/978-94-017-9588-3_29.
4. R. Potdar, and S. Patil, “RECIPE RECOMMENDATION SYSTEM BASED ON FOOD INGREDIENTS,” *Journal of Emerging Technologies and Innovative Research (JETIR)*, vol. 6, no. 6, pp. 678–685, Jun. 2019.



Questions??

Thank You!