P10-Recipe Management System

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Introduction and Description of our idea

Our project is a recipe management system where we have used the data structure linked list with the inputting data from a csv file, having simple functionalities like recipe addition of a particular recipe in the database, displaying a particular recipe details, displaying all recipe in the database, searching recipe we can make using a particular ingredient, finding the recipe of a particular category (eg:Indian food, Italian food), a meal planner to plan the three meals for the day, a meal decider a special function to provide you a random meal if you are confused according to the kind of food you want to eat.

GitHub Link

https://github.com/kaushal0123/Recipe-Management-System/

PseudoCode

Define a class recipe:

Members:

name:string

ingredients: array of string

calories: integer

category: string

n1: integer

next: pointer to next node

recipe* head: a class pointer to point at the first node of the class recipe* tail: a class pointer to point at the last node of the class

Define function add(recipe* temp):

We add the address of the temp to the next pointer of tail

We reset tail to temp after the first step

Define the function disp(recipe* current):

Print recipe name

Iterate through ingredients:

Print ingredients

Print calories

Print category

Define function display():

Iterate through recipes:

Print recipe name

Iterate through ingredients: Print ingredients Print calories Print category Define function dis(recipe): Iterate through recipes: If recipe name matches: Print name Iterate through ingredient: Print ingredients Print calories Print category If recipe name not found: Print "Recipe not in our database" Define function search(ingredient) Iterate through recipes: Iterate through ingredients: If ingredient is in recipe: Call dis(recipe name) Set flag to true If flag is false: Print "There is no recipe with this ingredients in our database" Define function category(category):

```
Iterate through recipes:
              If recipe category matches:
                     Call dis(recipe name)
                     Set flag to true
      If flag is false:
              Print "There is no recipe with this ingredients in our database"
Define function meal_planner():
      Ask the user to enter three recipe name he/she wants to eat in a day
       Call dis(recipe name1)
      Call dis(recipe name2)
      Call dis(recipe name3)
Define function meal_decider():
      Input the range of calories
      Input the category of food
      Iterate through recipes:
              If calories in range and category matches in recipe:
                     Call dis(recipe name)
                     Set flag to true
      If flag is false:
              Print "There is no recipe with this ingredients in our database"
Define the main function:
      Open the csv file
```

Read each line in the file:

Parse the line to extract details

Create a new recipe object with the details

Call the function add() to add to linked list

Close the file

Prompt user for input

While input is not 0:

Based on the input:

Call the corresponding function

Prompt the user again for input

Time Complexity for each functionality

add(recipe* temp):has a time complexity of O(1)

display():has a time complexity of O(n2)

dis(string s1):has a time complexity of O(n2)

disp(recipe* current):has time complexity O(n)

search(string s):has a time complexity of O(n²)

category(string s):has a time complexity of O(n²)

meal_planner():has a time complexity of O(n²)

meal_decider():has a time complexity of O(n2)

main():has a time complexity while working on the csv file is O(n²)

Space complexity for each functionality

```
add(recipe* temp):has a space complexity of O(n)
display():has a space complexity of O(n)
dis(string s1):has a space complexity of O(1)
disp(recipe* current):has space complexity O(1)
search(string s):has a space complexity of O(1)
category(string s):has a space complexity of O(1)
meal_planner():has a space complexity of O(1)
meal_decider():has a space complexity of O(1)
main():has a space complexity while working on the csv file is O(n)
```

Reason for using this data structure Linked List

We have used the linked list because we needed to store the data which was dynamic and their can be no limitations in the number of recipes you can add which refrained us from using array related data structures their was another way where we could have used vectors which was a very easy option but we wanted to challenge ourselves by not using any premade library, which made this project look direct and too easy because of its functionalities. We as a group used the linked list as we can easily traverse through it which could help us with each functionality like in the add() function we can directly add the node at the end with the time complexity of O(1).Linked List helped ensuring us that there's some new thing we can add in our project like the function meal_decider() which is a unique feature we added where if anyone is confused the user can find the type of meal he/she wants. Other functions can also be easily implemented using the linked list and other description for using this is given in the intro and description.

Csv file

Milkshake,3,Milk,Sugar,Icecream,100,Indian

Rice, 2, Rice, Salt, 50, Indian

Noodles,2,Noodles,Masala,124,Chinese

Pizza,3,Base,Cheese,Sauce,356,Italian

Tomato_Soup,4,Tomato,Onion,Broth,Seasoning,250,Western

Grilled_Cheese,3,Bread,Cheese,Butter,300,Western

Caeasar_Salad,5,Romaine_Lettuce,Dressing,Chicken,Parmesan_Cheese,Crout ons,400,Western

Chocolate_Cookies,8,Flour,Butter,Sugar,Eggs,Chocolate_Chips,Baking_Soda,Salt,Vanilla_Extract,300,Western

Spaghetti,4,Pasta,Sauce,Meat,Cheese,500,Italian

Lasagna,8,Pasta_Sheets,Ricotta_Cheese,Mozzarella_Cheese,Marinara_Sauce, Meat,Vegetables,Parmesan_Cheese,Spices,500,Italian

Burrito, 6, Tortilla, Rice, Beans, Protein, Salsa, Guacamole, 500, Mexican

Tacos,5,Tortilla,Meat,Cheese,Lettuce,Pico de gallo,350,Mexican

Guacamole,4,Avocado,Lime_Juice,Salt,Onion,250,Mexican

Pad_Thai,7,Rice_Noodles,Eggs,Vegetables,Protein,Sauce,Oil,Lime_Wedge,500, Thai

Dhokla,5,Semolina,Yogurt,Ginger-green_chili_paste,Eno,Water,200,Indian

Upma,8,Semolina,Onion,Mustard_seeds,Curry_leaves,Cashew_nuts,Oil,Water,Salt,300,Indian

Chole_Bhature,10,Chickpeas,Maida,Yogurt,Onion,Ginger-garlic_paste,Tomato_puree,Spices,Baking_Soda,Oil,Salt,500,Indian

Pani_Puri,11,Puri_Shells,Potatoes,Onion,Tomato,Coriander_Leaves,Tamarind_Water,Mint Chutney,Cilantro Chutney,Water,Chickpeas,Spices,300,Indian

Aloo_Gobi,8,Potatoes,Cauliflower,Onion,Tomato,Ginger-garlic_paste,Spices,Oil, Salt,250,Indian

Chicken_Tikka_Masala,10,Chicken,Yogurt,Ginger-garlic_paste,Tandoori_Masala,Onion,Tomato,Cream,Spices,Oil,Salt,400,Indian

Palak_Paneer,8,Paneer,Spinach,Onion,Ginger-garlic_paste,Cream,Spices,Oil,Salt,350,Indian

Dal_Makhani,8,Black_Lentils,Rajma,Onion,Tomato,Butter,Cream,Spices,Salt,300,Indian

Vegetable_Biryani,7,Rice,Vegetables,Onion,Yogurt,Oil,Spices,Salt,400,Indian

Samosa,7,Maida,Potatoes,Peas,Onion,Spices,Oil,Salt,300,Indian

Spring_Rolls,7,Spring_Roll_Wrappers,Vegetables,Protein,Noodles,Sauce,Oil,Salt,300,Chinese

Cake,3,Batter,Chocolate,Eggs,300,Indian

Screenshots

Original csv file

```
Capestone_Project
        C·· main.cpp M
                                  file.csv M X
          file.csv
             1 Milkshake, 3, Milk, Sugar, Icecream, 100, Indian
                   Rice, 2, Rice, Salt, 50, Indian
                  Noodles,2,Noodles,Masala,124,Chinese
                  Pizza, 3, Base, Cheese, Sauce, 356, Italian
                   Tomato_Soup,4,Tomato,Onion,Broth,Seasoning,250,Western
                  Grilled_Cheese,3,Bread,Cheese,Butter,300,Western
₹
                  Caeasar_Salad,5,Romaine_Lettuce,Dressing,Chicken,Parmesan_Cheese,Croutons,400,Western
Chocolate_Cookies,8,Flour,Butter,Sugar,Eggs,Chocolate_Chips,Baking_Soda,Salt,Vanilla_Extract,300,Western
                   Spaghetti, 4, Pasta, Sauce, Meat, Cheese, 500, Italian
品
                  Lasagna, 8, Pasta_Sheets, Ricotta_Cheese, Mozzarella_Cheese, Marinara_Sauce, Meat, Vegetables, Parmesan_Cheese, Spices, 500, Italian Burrito, 6, Tortilla, Rice, Beans, Protein, Salsa, Guacamole, 500, Mexican
                   Tacos, 5, Tortilla, Meat, Cheese, Lettuce, Pico_de_gallo, 350, Mexican
                   Guacamole,4,Avocado,Lime_Juice,Salt,Onion,250,Mexican
                  Pad_Thai, 7, Rice_Noodles, Eggs, Vegetables, Protein, Sauce, Oil, Lime_Wedge, 500, Thai
                   Dhokla, 5, Semolina, Yogurt, Ginger-green_chili_paste, Eno, Water, 200, Indian
                  Upma, 8, Semolina, Onion, Mustard_seeds, Curry_leaves, Cashew_nuts, Oil, Water, Salt, 300, Indian
           17
18
                  Chole_Bhature,10,Chickpeas,Maida,Yogurt,Onion,Ginger-garlic_paste,Tomato_puree,Spices,Baking_Soda,Oil,Salt,500,Indian
Pani_Puri,11,Puri_Shells,Potatoes,Onion,Tomato,Coriander_Leaves,Tamarind_Water,Mint_Chutney,Cilantro_Chutney,Water,Chickpeas,Spices,300,Indian
                   Aloo_Gobi,8,Potatoes,Cauliflower,Onion,Tomato,Ginger-garlic_paste,Spices,Oil,Salt,250,Indian
                  Chicken_Tikka_Masala,10,Chicken,Yogurt,Ginger-garlic_paste,Tandoori_Masala,Onion,Tomato,Cream,Spices,Oil,Salt,400,Indian
Palak_Paneer,8,Paneer,Spinach,Onion,Ginger-garlic_paste,Cream,Spices,Oil,Salt,350,Indian
Dal_Makhani,8,Black_Lentils,Rajma,Onion,Tomato,Butter,Cream,Spices,Salt,300,Indian
                  Vegetable_Biryani,7,Rice,Vegetables,Onion,Yogurt,Oil,Spices,Salt,400,Indian Samosa,7,Maida,Potatoes,Peas,Onion,Spices,Oil,Salt,300,Indian
                   Spring_Rolls,7,Spring_Roll_Wrappers,Vegetables,Protein,Noodles,Sauce,Oil,Salt,300,Chinese
                   Cake, 3, Batter, Chocolate, Eggs, 300, Indian
```

The first command to add the recipe in local database

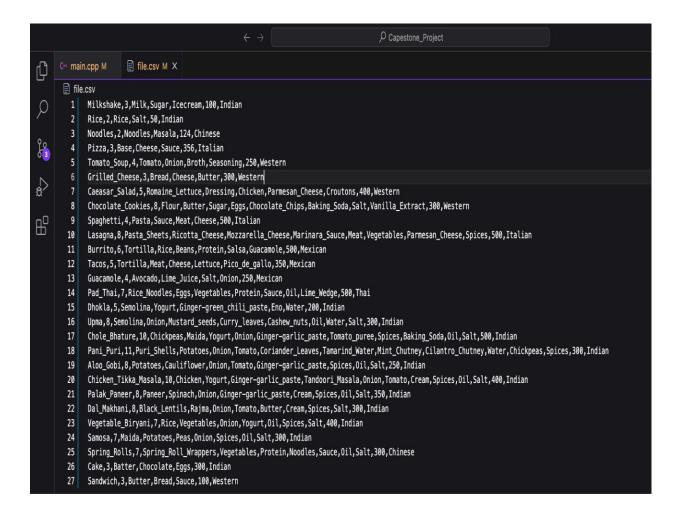
```
cd "/Users/heetshah/Desktop/Capestone_Project/" && g++ main.cpp -o main && "/Users/heetshah/Desktop/Capestone_Project/"main
heetshah@Heets-MacBook-Air Capestone_Project % cd "/Users/heetshah/Desktop/Capestone_Project/" && g++ main.cpp -o main && "/Users/heetshah/Desktop/Capestone_Project/"main
Enter 1 to add recipe
Enter 2 to display all recipe
Enter 3 to find recipe which can be made using a particular ingredient
Enter 4 to find using category
Enter 5 to find details of a particular dish
Enter 6 to plan a single meal for you if you are confused
Enter 7 to plan your meal for a day

0 to end

1
Enter recipe name to be entered: Sandwich
Enter the no of ingredients requireded: 3
Enter name of all the ingredients we need with entering enter after typing the name of each ingredients
Butter
Bread
Sauce
Enter no of calories of the recipe: 100
Enter the category ofthe dish: Western
Enter 1 to add recipe
Enter 2 to display all recipe
Enter 3 to find recipe which can be made using a particular ingredient
Enter 4 to find using category
Enter 5 to find details of a particular dish
Enter 6 to plan a single meal for you if you are confused
Enter 7 to plan your meal for a day

0 to end
```

Csv file after:



The second command of displaying all recipes

```
Enter no of calories of the recipe : 100
Enter the category of the dish : Western
Enter 1 to add recipe
Enter 2 to display all recipe
Enter 3 to find recipe which can be made using a particular ingredient
Enter 4 to find using category
Enter 5 to find details of a particular dish
Enter 6 to plan a single meal for you if you are confused
Enter 7 to plan your meal for a day
0 to end
Recipe name : Milkshake Ingredients Name : Milk, Sugar, Icecream, Calories : 100 Category : Indian
Recipe name : Rice Ingredients Name : Rice, Salt, Calories : 50 Category : Indian
Recipe name : Noodles Ingredients Name : Noodles, Masala, Calories : 124 Category : Chinese
Recipe name : Pizza Ingredients Name : Base, Cheese, Sauce, Calories : 356 Category : Italian
Recipe name : Tomato_Soup Ingredients Name : Tomato, Onion, Broth, Seasoning, Calories : 250 Category : Western
Recipe name : Grilled Cheese Ingredients Name : Bread, Cheese, Butter, Calories : 300 Category : Western
Recipe name : Caeasar Salad Ingredients Name : Romaine Lettuce, Dressing, Chicken, Parmesan Cheese, Croutons, Calories : 400 Category : Western
Recipe name : Chocolate Cookies Ingredients Name : Flour, Butter, Sugar, Eggs, Chocolate Chips, Baking Soda, Salt, Vanilla Extract, Calories : 300 Category : Western
Recipe name : Spaghetti Ingredients Name : Pasta, Sauce, Meat, Cheese, Calories : 500 Category : Italian
Recipe name : Lasagna Ingredients Name : Pasta_Sheets, Ricotta_Cheese, Mozzarella_Cheese, Marinara_Sauce, Meat, Vegetables, Parmesan_Cheese, Spices, Calories : 500 Category : Italian
Recipe name : Burrito Ingredients Name : Tortilla, Rice, Beans, Protein, Salsa, Guacamole, Calories : 500 Category : Mexican
Recipe name : Tacos Ingredients Name : Tortilla, Meat, Cheese, Lettuce, Pico de gallo, Calories : 350 Category : Mexican
Recipe name : Guacamole Ingredients Name : Avocado, Lime_Juice, Salt, Onion, Calories : 250 Category : Mexican
Recipe name : Pad_Thai Ingredients Name : Rice_Noodles, Eggs, Vegetables, Protein, Sauce, Oil, Lime_Wedge, Calories : 500 Category : Thai
Recipe name : Dhokla Ingredients Name : Semolina, Yogurt, Ginger-green_chili_paste, Eno, Water, Calories : 200 Category : Indian
Recipe name : Upma Ingredients Name : Semolina, Onion, Mustard seeds, Curry leaves, Cashew nuts, Oil, Water, Salt, Calories : 300 Category : Indian
Recipe name : Chole Bhature Ingredients Name : Chickpeas, Maida, Yogurt, Onion, Ginger-garlic paste, Tomato puree, Spices, Baking Soda, Oil, Salt, Calories : 500 Category : Indian
Recipe name : Pani_Puri Ingredients Name : Puri_Shells, Potatoes, Onion, Tomato, Coriander_Leaves, Tamarind Water, Mint_Chutney, Cilantro_Chutney, Water, Chickpeas, Spices, Calories : 300 Categ
ory : Indian
Recipe name : Aloo Gobi Ingredients Name : Potatoes, Cauliflower, Onion, Tomato, Ginger-garlic paste, Spices, Oil, Salt, Calories : 250 Category : Indian
Recipe name : Chicken Tikka Masala Ingredients Name : Chicken, Yogurt, Ginger-parlic paste, Tandoori Masala, Onion, Tomato, Cream, Spices, Oil, Salt, Calories : 400 Category : Indian
Recipe name : Palak Paneer Ingredients Name : Paneer, Spinach, Onion, Ginger-garlic paste, Cream, Spices, Oil, Salt, Calories : 350 Category : Indian
Recipe name : Dal_Makhani Ingredients Name : Black_Lentils, Rajma, Onion, Tomato, Butter, Cream, Spices, Salt, Calories : 300 Category : Indian
Recipe name : Vegetable_Biryani Ingredients Name : Rice, Vegetables, Onion, Yogurt, Oil, Spices, Salt, Calories : 400 Category : Indian
Recipe name : Samosa Ingredients Name : Maida, Potatoes, Peas, Onion, Spices, Oil, Salt, Calories : 300 Category : Indian
Recipe name : Spring Rolls Ingredients Name : Spring Roll Wrappers, Vegetables, Protein, Noodles, Sauce, Oil, Salt, Calories : 300 Category : Chinese
Recipe name : Cake Ingredients Name : Batter, Chocolate, Eggs, Calories : 300 Category : Indian
Recipe name : Sandwich Ingredients Name : Butter, Bread, Sauce, Calories : 100 Category : Western
Enter 1 to add recipe
Enter 2 to display all recipe
Enter 3 to find recipe which can be made using a particular ingredient
Enter 4 to find using category
Enter 5 to find details of a particular dish
Enter 6 to plan a single meal for you if you are confused
Enter 7 to plan your meal for a day
0 to end
```

The third command to find recipe of a particular ingredient

```
Enter 1 to add recipe
Enter 2 to display all recipe
Enter 3 to find recipe which can be made using a particular ingredient
Enter 4 to find using category
Enter 5 to find details of a particular dish
Enter 6 to plan a single meal for you if you are confused
Enter 7 to plan your meal for a day
0 to end
Enter ingredient : Onion
You can make : Tomato_Soup
Ingredients Name: Tomato, Onion, Broth, Seasoning,
Category : Western
Calories : 250
You can make : Guacamole
Ingredients Name : Avocado,Lime_Juice,Salt,Onion,
Category : Mexican
Calories: 250
You can make : Upma
Ingredients Name : Semolina,Onion,Mustard_seeds,Curry_leaves,Cashew_nuts,Oil,Water,Salt,
Category : Indian
Calories: 300
You can make : Chole_Bhature
Ingredients Name : Chickpeas, Maida, Yogurt, Onion, Ginger-garlic_paste, Tomato_puree, Spices, Baking_Soda, Oil, Salt,
Category : Indian
Calories: 500
You can make : Pani_Puri
Ingredients Name: Puri_Shells, Potatoes, Onion, Tomato, Coriander_Leaves, Tamarind_Water, Mint_Chutney, Cilantro_Chutney, Water, Chickpeas, Spices,
Category : Indian
Calories: 300
You can make : Aloo_Gobi
Ingredients Name : Potatoes, Cauliflower, Onion, Tomato, Ginger-garlic_paste, Spices, Oil, Salt,
Category : Indian
Calories: 250
You can make : Chicken_Tikka_Masala
Ingredients Name : Chicken, Yogurt, Ginger-garlic_paste, Tandoori_Masala, Onion, Tomato, Cream, Spices, Oil, Salt,
Category : Indian
Calories: 400
You can make : Palak_Paneer
Ingredients Name : Paneer, Spinach, Onion, Ginger-garlic_paste, Cream, Spices, Oil, Salt,
Category : Indian
Calories: 350
You can make : Dal_Makhani
Ingredients Name : Black_Lentils,Rajma,Onion,Tomato,Butter,Cream,Spices,Salt,
Category : Indian
Calories: 300
You can make : Vegetable_Biryani
Ingredients Name: Rice, Vegetables, Onion, Yogurt, Oil, Spices, Salt,
Category : Indian
Calories: 400
You can make : Samosa
Ingredients Name: Maida, Potatoes, Peas, Onion, Spices, Oil, Salt,
Category : Indian
Calories: 300
Enter 1 to add recipe
Enter 2 to display all recipe
```

The fourth command to find recipe according to given category

```
Enter 1 to add recipe
Enter 2 to display all recipe
Enter 3 to find recipe which can be made using a particular ingredient
Enter 4 to find using category
Enter 5 to find details of a particular dish
Enter 6 to plan a single meal for you if you are confused
Enter 7 to plan your meal for a day
0 to end
4
Enter the category: Chinese
You can make: Noodles
Ingredients Name: Noodles, Masala,
Category: Chinese
Calories: 124
You can make: Spring_Rolls
Ingredients Name: Spring_Roll_Wrappers, Vegetables, Protein, Noodles, Sauce, Oil, Salt,
Category: Chinese
Calories: 300
Enter 1 to add recipe
Enter 2 to display all recipe
Enter 2 to display all recipe
Enter 3 to find recipe which can be made using a particular ingredient
Enter 4 to find using category
Enter 5 to find details of a particular dish
Enter 6 to plan a single meal for you if you are confused
Enter 7 to plan your meal for a day
0 to end
```

The fifth command to find a particular dish details

```
Enter the name of the recipe you want to find details of : Tacos
Ingredients Name : Tortilla,Meat,Cheese,Lettuce,Pico_de_gallo,
Category : Mexican
Calories : 350
Enter 1 to add recipe
Enter 2 to display all recipe
Enter 3 to find recipe which can be made using a particular ingredient
Enter 4 to find using category
Enter 5 to find details of a particular dish
Enter 6 to plan a single meal for you if you are confused
Enter 7 to plan your meal for a day
0 to end
```

The sixth command to find a meal if you are confused

```
Enter 1 to add recipe
Enter 2 to display all recipe
Enter 3 to find recipe which can be made using a particular ingredient
Enter 4 to find using category
Enter 5 to find details of a particular dish
Enter 6 to plan a single meal for you if you are confused
Enter 7 to plan your meal for a day
Can you please enter the range of calorie in which you want to enter in this format eg: '100' '150' with space between them: 100 400
Enter the category of the food you want : Western
You can make : Tomato_Soup
Ingredients Name: Tomato, Onion, Broth, Seasoning,
Category : Western
Calories: 250
You can make : Grilled_Cheese
Ingredients Name : Bread, Cheese, Butter,
Category : Western
Calories: 300
You can make : Caeasar_Salad
Ingredients Name : Romaine_Lettuce, Dressing, Chicken, Parmesan_Cheese, Croutons,
Category : Western
Calories: 400
You can make : Chocolate_Cookies
Ingredients Name : Flour,Butter,Sugar,Eggs,Chocolate_Chips,Baking_Soda,Salt,Vanilla_Extract,
Category : Western
Calories: 300
You can make : Sandwich
Ingredients Name: Butter, Bread, Sauce,
Category: Western
Calories: 100
Enter 1 to add recipe
Enter 2 to display all recipe
Enter 3 to find recipe which can be made using a particular ingredient
Enter 4 to find using category
Enter 5 to find details of a particular dish
Enter 6 to plan a single meal for you if you are confused
Enter 7 to plan your meal for a day
0 to end
```

The seventh command to plan the meals for the day

```
Enter 1 to add recipe
Enter 2 to display all recipe
Enter 3 to find recipe which can be made using a particular ingredient
Enter 4 to find using category
Enter 5 to find details of a particular dish
Enter 6 to plan a single meal for you if you are confused
Enter 7 to plan your meal for a day
0 to end
Enter all the three meals for breakfast lunch and dinner with entering after each input
Tacos
Pizza
Cake
Breakfast description:
Ingredients Name : Tortilla,Meat,Cheese,Lettuce,Pico_de_gallo,
Category : Mexican
Calories: 350
Lunch description:
Ingredients Name : Base, Cheese, Sauce,
Category : Italian
Calories: 356
Dinner description :
Ingredients Name : Batter, Chocolate, Eggs,
Category : Indian
Calories: 300
Enter 1 to add recipe
Enter 2 to display all recipe
Enter 3 to find recipe which can be made using a particular ingredient
Enter 4 to find using category
Enter 5 to find details of a particular dish
Enter 6 to plan a single meal for you if you are confused
Enter 7 to plan your meal for a day
0 to end
```