

# Meal Plan

July 11, 2024

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[1]: # Personalized Meal Plan Generator_Palanichamy Naveen

# 1. Setting up the Environment

# pip install pandas numpy scikit-learn

# 2. Creating the Dataset

import pandas as pd

# Create a synthetic dataset
data = {
    'MealID': range(1, 21),
    'MealName': ['Grilled Chicken Salad', 'Vegetable Stir Fry', 'Beef Tacos', 'Quinoa Salad', 'Spaghetti Bolognese',
    'Tofu Curry', 'Chicken Wrap', 'Vegetable Soup', 'Steak and Vegetables', 'Fruit Smoothie',
    'Oatmeal with Berries', 'Egg and Avocado Toast', 'Turkey Sandwich', 'Lentil Soup',
    'Salmon and Asparagus', 'Chickpea Salad', 'Beef Burger', 'Greek Yogurt with Honey', 'Pasta Primavera', 'Chicken Fajitas'],
    'DietaryPreference': ['Low Carb', 'Vegan', 'High Protein', 'Vegan', 'High Protein',
    'Vegan', 'Low Carb', 'Vegan', 'High Protein', 'Low Carb',
    'Low Carb', 'Low Carb', 'Low Carb', 'Vegan',
    'High Protein', 'Vegan', 'High Protein', 'Low Carb', 'Low Carb', 'Low Carb'],
    'Calories': [350, 250, 450, 300, 550, 400, 320, 200, 600, 150, 180, 220, 300, 280, 500, 350, 700, 200, 400, 450],
    'Protein': [30, 10, 25, 8, 20, 15, 25, 10, 35, 5, 6, 10, 18, 12, 40, 14, 35, 12, 15, 25],
    'Fat': [15, 8, 20, 12, 22, 10, 18, 5, 25, 1, 4, 12, 10, 7, 30, 10, 40, 5, 10, 20],
    'Carbohydrates': [20, 30, 40, 50, 60, 45, 30, 35, 50, 30, 25, 20, 35, 40, 30, 50, 50, 20, 45, 40]
}
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meals_df = pd.DataFrame(data)

print(meals_df.head())

# 3. Building the Recommendation System - Content Based Filtering

def recommend_meals(dietary_preference, max_calories=None, min_protein=None,
    ↪max_fat=None, max_carbs=None, num_recommendations=5):
    # Filter meals based on dietary preference
    preferred_meals = meals_df[meals_df['DietaryPreference'] ==
    ↪dietary_preference]

    # Apply additional filters for calories, protein, fat, and carbs
    if max_calories is not None:
        preferred_meals = preferred_meals[preferred_meals['Calories'] <=
    ↪max_calories]

    if min_protein is not None:
        preferred_meals = preferred_meals[preferred_meals['Protein'] >=
    ↪min_protein]

    if max_fat is not None:
        preferred_meals = preferred_meals[preferred_meals['Fat'] <= max_fat]

    if max_carbs is not None:
        preferred_meals = preferred_meals[preferred_meals['Carbohydrates'] <=
    ↪max_carbs]

    # Select top recommendations
    recommended_meals = preferred_meals.head(num_recommendations)

    return recommended_meals

# Example usage
dietary_preference = 'Vegan'
recommendations = recommend_meals(dietary_preference, max_calories=400,
    ↪min_protein=10, max_fat=15, max_carbs=50)

print(recommendations)

# 4. Visualizing the Recommendations

import matplotlib.pyplot as plt

def visualize_recommendations(recommendations):

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plt.figure(figsize=(10, 6))
plt.bar(recommendations['MealName'], recommendations['Calories'],
color='blue')
plt.xlabel('Meal Name')
plt.ylabel('Calories')
plt.title('Recommended Meals')
plt.xticks(rotation=45)
plt.show()

# Visualize the recommendations
visualize_recommendations(recommendations)

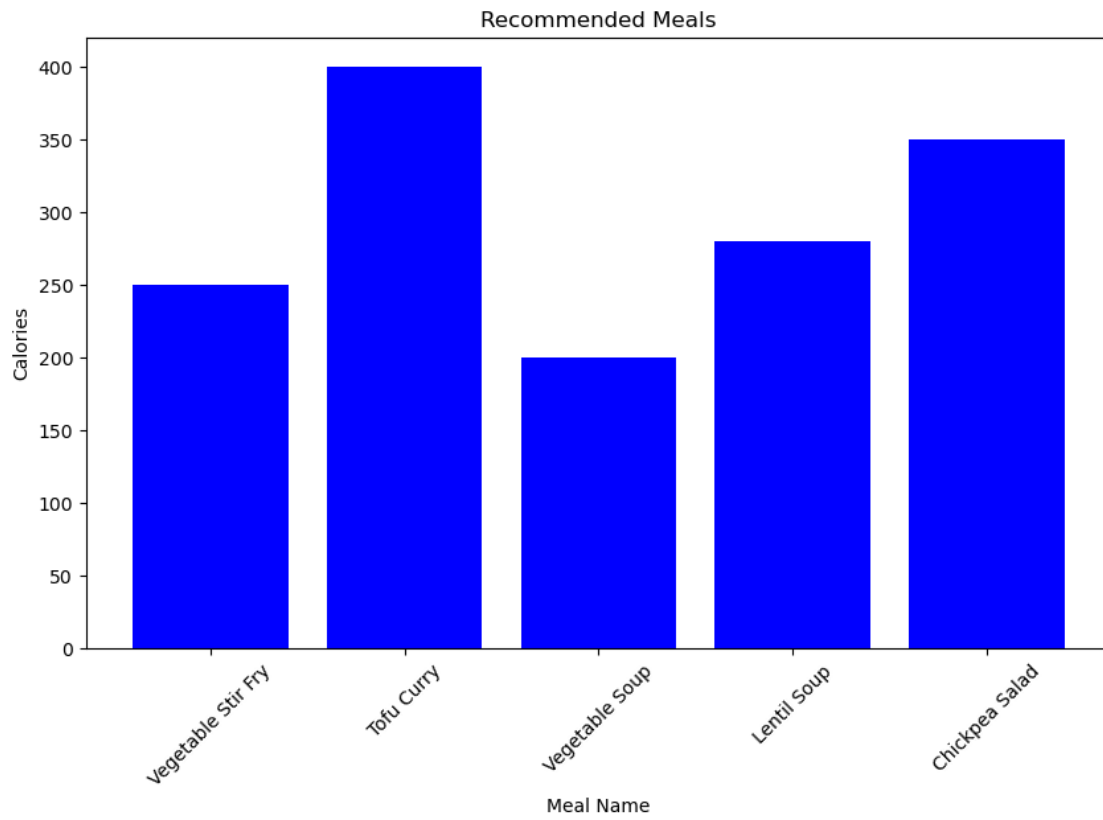
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	MealID	MealName	DietaryPreference	Calories	Protein	Fat	\
0	1	Grilled Chicken Salad	Low Carb	350	30	15	
1	2	Vegetable Stir Fry	Vegan	250	10	8	
2	3	Beef Tacos	High Protein	450	25	20	
3	4	Quinoa Salad	Vegan	300	8	12	
4	5	Spaghetti Bolognese	High Protein	550	20	22	

	Carbohydrates
0	20
1	30
2	40
3	50
4	60

	MealID	MealName	DietaryPreference	Calories	Protein	Fat	\
1	2	Vegetable Stir Fry	Vegan	250	10	8	
5	6	Tofu Curry	Vegan	400	15	10	
7	8	Vegetable Soup	Vegan	200	10	5	
13	14	Lentil Soup	Vegan	280	12	7	
15	16	Chickpea Salad	Vegan	350	14	10	

	Carbohydrates
1	30
5	45
7	35
13	40
15	50



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