import pandas as pd

import matplotlib.pyplot as plt

import numpy as np

def create\_dataset():

    data = {

        "Restaurant Name": ["Sushi House", "Burger Barn", "La Fiesta", "Bella Italia", "Curry Palace",

                            "Veg Delight", "Ocean’s Catch", "Little China", "Tandoor Treats", "Green Leaf Cafe"],

        "Cuisine": ["Japanese", "American", "Mexican", "Italian", "Indian",

                    "Vegetarian", "Seafood", "Chinese", "Indian", "Vegan"],

        "Location": ["Downtown", "Uptown", "Suburb", "Downtown", "Suburb",

                     "City Center", "Waterfront", "Midtown", "Downtown", "Suburb"],

        "Price Range": ["$$", "$", "$$", "$$$", "$$", "$$", "$$$", "$", "$$", "$$"],

        "Rating": [4.5, 4.2, 4.8, 4.1, 3.9, 4.3, 4.7, 4.0, 4.6, 4.4],

        "User Preferences": ["Seafood, Gluten-Free", "Vegan, Low-Calorie", "Spicy, Dairy-Free",

                             "Vegetarian", "Vegan, Gluten-Free", "Vegan, Organic",

                             "Seafood, Low-Calorie", "Spicy, Low-Calorie", "Gluten-Free, Spicy",

                             "Organic, Low-Calorie"]

    }

    df = pd.DataFrame(data)

    df.to\_csv("restaurants.csv", index=False)

    print("Dataset created and saved as 'restaurants.csv'.")

def load\_data(file\_path):

    try:

        return pd.read\_csv(file\_path)

    except FileNotFoundError:

        print(f"Error: File not found at path: {file\_path}")

        return None

def select\_restaurants(df, restaurant\_names):

    return df[df['Restaurant Name'].isin(restaurant\_names)]

def plot\_comparisons(df):

    if df is not None and not df.empty:

        plt.figure(figsize=(8, 5))

        plt.bar(df['Restaurant Name'], df['Rating'], color='skyblue')

        plt.xlabel('Restaurant Name')

        plt.ylabel('Rating')

        plt.title('Comparison of Ratings')

        plt.show()

        preferences = ['Vegan', 'Gluten-Free', 'Low-Calorie', 'Spicy', 'Seafood', 'Dairy-Free', 'Organic']

        preference\_data = {name: [int(pref in row['User Preferences']) for pref in preferences] for name, row in df.set\_index('Restaurant Name').iterrows()}

        plt.figure(figsize=(10, 6))

        bottom = np.zeros(len(preference\_data.keys()))

        for i, pref in enumerate(preferences):

            values = [preference\_data[name][i] for name in preference\_data.keys()]

            plt.bar(preference\_data.keys(), values, label=pref, bottom=bottom)

            bottom += values

        plt.xlabel('Restaurant Name')

        plt.ylabel('Preference Count')

        plt.title('Dietary Preferences for Each Restaurant')

        plt.legend(title='User Preferences')

        plt.show()

        labels = ['Rating', 'Price Range', 'Location']

        price\_mapping = {'$': 1, '$$': 2, '$$$': 3}

        location\_mapping = {'Downtown': 3, 'Uptown': 2, 'Suburb': 1, 'City Center': 3, 'Waterfront': 2, 'Midtown': 2}

        radar\_data = []

        for \_, row in df.iterrows():

            radar\_data.append([

                row['Rating'],

                price\_mapping.get(row['Price Range'], 1),

                location\_mapping.get(row['Location'], 1)

            ])

        num\_vars = len(labels)

        angles = np.linspace(0, 2 \* np.pi, num\_vars, endpoint=False).tolist()

        angles += angles[:1]

        fig, ax = plt.subplots(figsize=(8, 8), subplot\_kw=dict(polar=True))

        for i, (name, values) in enumerate(zip(df['Restaurant Name'], radar\_data)):

            values += values[:1]

            ax.plot(angles, values, label=name)

            ax.fill(angles, values, alpha=0.25)

        ax.set\_yticklabels([])

        ax.set\_xticks(angles[:-1])

        ax.set\_xticklabels(labels)

        plt.title("Comparison of Key Attributes")

        plt.legend(loc='upper right')

        plt.show()

    else:

        print("No data available to plot.")

if \_\_name\_\_ == "\_\_main\_\_":

    create\_dataset()

    df = load\_data('restaurants.csv')

    if df is not None:

        selected\_restaurants = ["Sushi House", "La Fiesta", "Curry Palace"]

        comparison\_df = select\_restaurants(df, selected\_restaurants)

        plot\_comparisons(comparison\_df)