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# Applied Data Science 1
"""
Assignment 1: Visualization: Task is to apply three types of visualization
method(s) to extract meaning from information
"""

# Question 1

# importing packages
import pandas as pd
import matplotlib.pyplot as plt

def terrorism_fatality(eu_terrorism_fatalities_by_country):
    """
    define a function to produce a line plot showing multiple lines
    with proper labels and legend.
    """
    # Read the csv file
    terrorism_by_country = pd.read_csv("eu_terrorism_fatalities_by_country.csv")
    print(terrorism_by_country)

    # Assigning variables
    x = terrorism_by_country['year']
    y = terrorism_by_country['United Kingdom']
    y1 = terrorism_by_country['Spain']
    y2 = terrorism_by_country['Italy']
    y3 = terrorism_by_country['Greece']

    # set figure size
    plt.figure(figsize=(8, 6))

    # plotting Line Plot
    plt.figure()
    plt.plot(x, y, '-', label="United Kingdom")
    plt.plot(x, y1, '-', label="Spain")
    plt.plot(x, y2, ':', label="Italy")
    plt.plot(x, y3, '--', label="Greece")

    # add legend and title
    plt.legend()
    plt.title("Terrorism Fatality in some Countries")

    # display plot and save
    plt.savefig("line plot.png")
    plt.show()
    return()

# Using the function
terrorism_fatality("eu_terrorism_fatalities_by_country.csv")

# Question 2

def Murder_case(murder_2015_final):
    """
    define a function to produce a bar chart for murder cases in the United States
    in the year 2014.
    """
    # read csv file
    Murder_Case = pd.read_csv("murder_2015_final.csv")

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print(Murder_Case)

# Data to plot on bar chat
Number_state = Murder_Case[['state', '2014_murders']]

# creating bar chart
plt.figure(figsize=(12, 6)) # figure size
plt.bar(Number_state['state'], Number_state['2014_murders'])
plt.xlabel("state")
plt.ylabel("Number of Murders (2014)")
plt.title("Number of Murder Cases by State in 2014")

# for better readability
plt.xticks(rotation=90, fontsize=10, fontstyle='italic', fontweight='bold')

plt.tight_layout() # to prevent clipping labels

# display plot and save
plt.savefig("Barchat.png")
plt.show()
return()

# Using the function
Murder_case("murder_2015_final.csv")

def Murder_case(murder_2015_final):
    """
    define a function to product a pie chart for the murders that occurred in
    selected states in US in the year 2015
    """
    # read csv file
    Murder_Case = pd.read_csv("murder_2015_final.csv")
    print(Murder_Case)

    #using pie chart to analyse 2015 muder distributiion across 6 states
    Murder_Case = Murder_Case.groupby('state')['2015_murders'].sum().reset_index()

    # selecting six preferred state
    Murder_dist = Murder_Case.loc[0:5]

    # create pie chart
    plt.figure()
    plt.pie(Murder_dist["2015_murders"], labels=Murder_dist["state"],\
            autopct='%d%%', startangle=140)
    plt.title("Murder case distribution 2015")
    plt.axis("equal")

    # display plot and save
    plt.savefig("Piechart.png")
    plt.show()
    return()

# Using the function
Murder_case("murder_2015_final.csv")

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