

## Border Crossing Vehicles 2

### 1. main.py

```
# Display Menu function
def displayMenu():
    print()
    # Display main menu
    print("""=====
Border Crossing Vehicles 2
=====
1.Display the number of Bus Passengers crossing the border in 2006.
2.Mean value for the travelers in different types of transport mode for each of the two 5-year spans of 2004 to 2008 and 2006 to 2010 and the minimum number of travelers in different types of transport mode in each of the periods and the years that the minimum occurs.
3.Find the mean number of travelers for the whole 11-year period. Display the travelers in different types of transport mode and the corresponding years that are lower than the mean value.
4.Display Chart
5.Exit/Quit
=====
""")
    return
```

*# Main Function*

```
def Main():
    readData()
    inputOp = True
    while inputOp:
        displayMenu()

        # Get Menu Input
        inputOp = input("Choose your menu : ")
        print()

        # Menu 1
        if inputOp == '1':
            option1()

        # Menu 2
        elif inputOp == '2':
            type_main = input("Enter Type : ")
            option2(type_main)

        # Menu 3
        elif inputOp == '3':
            type_main = input("Enter Type : ")
            option3(type_main)

        # Menu 4
        elif inputOp == '4':
            option4()

        # Menu 5
        elif inputOp == '5':
            quest = input("Are you sure ? (Y/N) : ")
            if quest == "Y":
                exit()

        # If nothing matches continue the loop
        else:
            continue
```

```
if __name__ == '__main__':
    Main()
```

## 2. data.py

```
import csv
import numpy as np
import matplotlib.pyplot as plt

Dataset = ""

# Read data from dataset and store it in a list
def readData():
    global Dataset
    Dataset = list(csv.reader(open("data/brdrxingusc_dataset (5).csv")))

# Menu 1 Code
def option1():
    global Dataset
    print("Number of Bus Passengers crossing the border in 2006 : ")
    print("-----")
    for i in enumerate(Dataset):
        if i[0] == 1:
            print(i[1][7], i[1][0])

    print("-----")

# Menu 2 Code
def option2(types):
    global Dataset
    type_list = []
    for i in enumerate(Dataset):
        if i[1][0] == types:
            type_list = i[1][1:]
            break
    type_list = [int(i) for i in type_list]
    if len(type_list) > 0:
        year = Dataset[0][1:]
        y1 = year[4:9]
        y2 = year[6:11]

        print("-----")
        print("Mean for 2004 to 2008 for " + types + " = ", np.mean(type_list[4:9]))
        print("Mean for 2006 to 2010 for " + types + " = ", np.mean(type_list[6:11]))
        print()
        print("The minimum number of travelers in different types of transport mode in each of the periods and the years that the minimum occurs : ")
        for mode in enumerate(Dataset):
            if mode[0] == 0:
                continue
            main_list = mode[1][1:]
            main_list = [int(i) for i in main_list]
            m1_min = np.amin(main_list[4:9])
            m2_min = np.amin(main_list[6:11])
            print("Minimum in 2004 to 2008 for " + mode[1][0] + " = ", m1_min, " in ", y1[main_list[4:9].index(m1_min)])
            print("Minimum in 2006 to 2010 for " + mode[1][0] + " = ", m2_min, " in ", y2[main_list[6:11].index(m2_min)])
        print("-----")
    else:
        print("Given Type Not Found !!")
```

# Menu 3 Code

```
def option3(types):
    global Dataset
    type_list = []
    for i in enumerate(Dataset):
        if i[1][0] == types:
            type_list = i[1][1:]
            break
    type_list = [int(i) for i in type_list]
    print("-----")
    if len(type_list) > 0:
        year = Dataset[0][1:]
        avg_val = np.mean(type_list)
        print("Mean number of travelers from 2000 to 2012 for {} is: {}".format(types, avg_val))
        print()
        for mode in enumerate(Dataset):
            if mode[0] == 0:
                continue
            print("Travellers in {} that are less than the mean value {}".format(mode[1][0], avg_val))
            c = 0
            for travel in enumerate(mode[1][1:]):
                if float(travel[1]) < avg_val:
                    print("{} in {}".format(travel[1], year[travel[0]]))
                    c = c + 1

            if c == 0:
                print("None")

    else:
        print("Given Type Not Found !!")

    print("-----")
```

```

# Menu 4 Code
def option4():
    global Dataset
    # Get Chart Data

    # get all years
    year = retDatafromds(0)
    # get Personal Vehicles
    PV = retDatafromds(3)
    # get Loaded Trucks
    LT = retDatafromds(4)
    # get Bus Passengers
    BP = retDatafromds(1)
    # get Bus
    Bus = retDatafromds(2)

    # Line Chart
    disp_linechart(year, BP, Bus)
    # Bar Chart
    disp_barchart(year, PV, LT)

# Return data for a given dataset pattern
def retDatafromds(position):
    global Dataset
    temp_list = []
    for i in enumerate(Dataset):
        if i[0] == position:
            temp_list = i[1][1:]

    for i in range(len(temp_list)):
        temp_list[i] = int(temp_list[i])

    return temp_list

```

```

# Display Line Chart
def disp_linechart(year, BP, Bus):
    # Title and the x, y label
    plt.title("Bus Passengers, Bus vs Year")
    plt.xlabel("Year")
    plt.ylabel("Income")

    # Plot the line chart
    plt.plot(year, BP, label="Bus Passengers")
    plt.plot(year, Bus, label="Bus")

    # Display the year as x axis label
    plt.xticks(year)

    plt.legend(loc="upper left")
    plt.show()

# Display Bar Chart
def disp_barchart(year, PV, LT):
    bar_width = 0.3

    # Title and the x, y label
    plt.title("Personal Vehicles, Loaded Trucks vs Year")
    plt.xlabel("Year")
    plt.ylabel("Value")

    # plot the bar
    plt.bar(np.arange(len(PV)), PV, width=bar_width, label="Personal Vehicles")
    plt.bar(np.arange(len(LT)) + bar_width, LT, width=bar_width,
            label="Loaded Trucks")

    # Display the year as x axis label
    plt.xticks(np.arange(len(LT)) + (bar_width / 2), year)

    plt.legend(loc="upper left")
    plt.show()

```

## Outputs:

```
=====
Border Crossing Vehicles 2
=====
1.Display the number of Bus Passengers crossing the border in 2006.
2.Mean value for the travelers indifferent types of transport mode for each of the two 5-year spans of 2004 to 2008 and 2006 to 2010 and the minimum number of travelers in different types of transport mode in each of the periods and the years that the minimum occurs.
3.Find the mean number of travelers for the whole 15-year period. Display the travelers in different types of transport mode and the corresponding years that are lower than the mean value.
4.Display Chart
5.Exit/Quit
=====

Choose your menu : 1

Number of Bus Passengers crossing the border in 2006 :
-----
294028 Bus Passengers
-----

=====
Border Crossing Vehicles 2
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4.Display Chart
5.Exit/Quit
=====

Choose your menu : 2

Enter Type : Buses
-----
Mean for 2004 to 2008 for Buses = 8333.8
Mean for 2006 to 2010 for Buses = 8480.8

The minimum number of travelers in different types of transport mode in each of the periods and the years that the minimum occurs :
Minimum in 2004 to 2008 for Bus Passengers = 277018 in 2004
Minimum in 2006 to 2010 for Bus Passengers = 282949 in 2009
Minimum in 2004 to 2008 for Buses = 8124 in 2007
Minimum in 2006 to 2010 for Buses = 8124 in 2007
Minimum in 2004 to 2008 for Personal Vehicles = 948008 in 2008
Minimum in 2006 to 2010 for Personal Vehicles = 948008 in 2008
Minimum in 2004 to 2008 for Loaded Trucks = 240367 in 2008
Minimum in 2006 to 2010 for Loaded Trucks = 240367 in 2010
-----

=====
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4.Display Chart
5.Exit/Quit
=====

Choose your menu : 3

Enter Type : Bus Passengers
-----
Mean number of travelers from 2000 to 2012 for Bus Passengers is: 312675.23076923075

Travellers in Bus Passengers that are less than the mean value 312675.23076923075
291421 in 2001
282939 in 2002
234420 in 2003
277018 in 2004
294390 in 2005
294028 in 2006
306898 in 2007
306006 in 2008
282949 in 2009
Travellers in Buses that are less than the mean value 312675.23076923075
11729 in 2000
10374 in 2001
10415 in 2002
11298 in 2003
8345 in 2004
8465 in 2005
8317 in 2006
8124 in 2007
8419 in 2008
8565 in 2009
8980 in 2010
9544 in 2011
9935 in 2012
Travellers in Personal Vehicles that are less than the mean value 312675.23076923075
None
Travellers in Loaded Trucks that are less than the mean value 312675.23076923075
267813 in 2009
260367 in 2010
250686 in 2011
245442 in 2012
-----

=====
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3.Find the mean number of travelers for the whole 15-year period. Display the travelers in different types of transport mode and the corresponding years that are lower than the mean value.
4.Display Chart
5.Exit/Quit
=====

Choose your menu : 4
```

