Singapore Electricity Consumption

1. main.py

```
# Display Menu function
def displayMenu():
    print()
    # Display main menu
    print("""============================
Singapore Electricity Consumption
=============================================================================================================================================
    1.Display the monthly electricity consumptions of all dwelling types in May.
    2.The average electricity consumption in each of the 4-month periods from Apr to Jun & from Oct to Dec and the maximum electricity consumption in each of the periods and the months in which it occurred.
    3.Display the electricity consumption and the months in which the monthly electricity consumption is at least 6% higher than the annual mean electricity consumption.
    4.Display Chart
    5.Exit/Quit
=============================================================================================================================================
    """)
```

```
# Main Function
def Main():
    readData()
    while True:
        displayMenu()
        # Get Menu Input
        inputOp = input("Choose your menu : ")
        print()
        # Menu 1
        if inputOp == '1':
            option1()
        # Menu 2
        elif inputOp == '2':
            Dwtype = input("Enter dwelling type : ")
            option2(Dwtype)
        # Menu 3
        elif inputOp == '3':
            Dwtype = input("Enter dwelling type : ")
            option3(Dwtype)
        # 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/sgallelectricity_dataset.csv")))



# Menu 1 Code
def option1():
    global Dataset
    types = []
    print("The monthly consumption in May : ")
    print("----------------------------------------")
    for ind, data in enumerate(Dataset):
        if data[0] == "Month":
            types = data[1:]
        if data[0] == "May":
            val = data[1:]
            for i in range(len(types)):
                sp = 25 - len(types[i])
                sp = sp * " "
                sp = sp + "|"
                print("|", types[i], sp, val[i], "|")
    print("----------------------------------------")
```

```python
# Menu 2 Code
def option2(dwtype):
    global Dataset
    value = ""
    avg1, avg2 = np.zeros((3, 512*512), dtype=np.float32), np.zeros((3, 512*512), dtype=np.float32)
    month1 = ["Apr", "May", "Jun"]
    month2 = ["Oct", "Nov", "Dec"]
    print("-----------------------------------------------------")
    for ind, data in enumerate(Dataset):
        if data[0] == "Month":
            if dwtype in data[1:]:
                value = data.index(dwtype)
            else:
                print("Dwelling Type given not found !!")
                break

        if data[0] == "Apr":
            avg1[0:] = float(data[value])
        elif data[0] == "May":
            avg1[1:] = float(data[value])
        elif data[0] == "Jun":
            avg1[2:] = float(data[value])

        elif data[0] == "Oct":
            avg2[0:] = float(data[value])
        elif data[0] == "Nov":
            avg2[1:] = float(data[value])
        elif data[0] == "Dec":
            avg2[2:] = float(data[value])

    if value:
        print("Apr to Jun ", np.mean(avg1))
        indices = np.where(avg1 == avg1.max())
        print("Maximum", np.max(avg1), "in", month1[indices[0][0]])

        print("Oct to Dec ", np.mean(avg2))
        indices = np.where(avg2 == avg2.max())
        print("Maximum", np.max(avg2), "in", month2[indices[0][0]])
    print("-----------------------------------------------------")
```

```
# Menu 3 Code
def option3(dwtype):
    global Dataset
    value = ""
    sums = 0
    print("-----------------------------------------------------")
    for ind, data in enumerate(Dataset):
        if data[0] == "Month":
            if dwtype in data[1:]:
                value = data.index(dwtype)
            else:
                print("Dwelling Type given not found !!")
                break

        else:
            sums = sums + float(data[value])

    if value:
        annual = sums/12
        lim = (annual*6)/100
        print("Annual average for the type", dwtype, "is", annual)
        print("Months in which the monthly electricity consumption is at least 6% (" + str(lim) + ") higher than the annual mean electricity consumption: ")
        print()
        for ind, data in enumerate(Dataset):
            if data[0] != "Month":
                if float(data[value]) >= lim:
                    print("|", data[0], "|", data[value], "|")
    print("-----------------------------------------------------")
```

```
# Menu 4 Code
def option4():
    global Dataset
    # Get Chart Data
    PAC, LP, months = [], [], []
    PH, TE, TES = [], [], 0

    for ind, data in enumerate(Dataset):
        if data[0] != "Month":
            months.append(data[0])
            PAC.append(float(data[2]))
            LP.append(float(data[3]))

            PH.append(float(data[1]))
            for j in data[1:]:
                TES = TES + float(j)

            TE.append(TES)

    # Line Chart
    disp_linechart(months, PAC, LP)

    # Bar Chart
    disp_barchart(PH, TE, months)
```

```python
# Display Line Chart
def disp_linechart(months, PAC, LP):
    # Title and the x, y label
    plt.title("Private Apts/Condo, Landed Properties vs Months")
    plt.xlabel("Months")
    plt.ylabel("Electricity Consumption (GWh)")

    # Plot the line chart
    plt.plot(months, PAC, label="Private Apts/Condo")
    plt.plot(months, LP, label="Landed Properties")

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

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


# Display Bar Chart
def disp_barchart(PH, TE, months):
    X_axis = np.arange(len(months))

    plt.bar(X_axis - 0.2, PH, 0.4, label='Public Housing')
    plt.bar(X_axis + 0.2, TE, 0.4, label='Total Electricity Consumption')

    plt.xticks(X_axis, months)
    plt.xlabel("Months")
    plt.ylabel("Electricity Consumption (GWh)")
    plt.title("Total Electricity Consumption, Public Housing vs Month")
    plt.legend()
    plt.show()
```

Outputs:

```
============================
Singapore Electricity Consumption
=================================================================================================================================================
    1.Display the monthly electricity consumptions of all dwelling types in May.
    2.The average electricity consumption in each of the 4-month periods from Apr to Jun & from Oct to Dec and the maximum electricity consumption in each of the periods and the months in which it occurred.
    3.Display the electricity consumption and the months in which the monthly electricity consumption is at least 6% higher than the annual mean electricity consumption.
    4.Display Chart
    5.Exit/Quit
=================================================================================================================================================

Choose your menu : 1

The monthly consumption in May :
----------------------------------------
| Public Housing            | 385.9 |
| Private Apts, Condo       | 190 |
| Landed Properties         | 93.7 |
| Others                    | 0.9 |
----------------------------------------
```

```
============================
Singapore Electricity Consumption
=================================================================================================================================================
    1.Display the monthly electricity consumptions of all dwelling types in May.
    2.The average electricity consumption in each of the 4-month periods from Apr to Jun & from Oct to Dec and the maximum electricity consumption in each of the periods and the months in which it occurred.
    3.Display the electricity consumption and the months in which the monthly electricity consumption is at least 6% higher than the annual mean electricity consumption.
    4.Display Chart
    5.Exit/Quit
=================================================================================================================================================

Choose your menu : 2

Enter dwelling type : Public Housing
-----------------------------------------------------
Apr to Jun  387.0001
Maximum 400.5 in Jun
Oct to Dec  362.60007
Maximum 380.2 in Oct
-----------------------------------------------------
```

```
============================
Singapore Electricity Consumption
=================================================================================================================================================
    1.Display the monthly electricity consumptions of all dwelling types in May.
    2.The average electricity consumption in each of the 4-month periods from Apr to Jun & from Oct to Dec and the maximum electricity consumption in each of the periods and the months in which it occurred.
    3.Display the electricity consumption and the months in which the monthly electricity consumption is at least 6% higher than the annual mean electricity consumption.
    4.Display Chart
    5.Exit/Quit
=================================================================================================================================================

Choose your menu : 3

Enter dwelling type : Others
-----------------------------------------------------
Annual average for the type Others is 0.8500000000000001
Months in which the monthly electricity consumption is at least 6% (0.051000000000000004) higher than the annual mean electricity consumption:

| Jan | 0.8 |
| Feb | 0.8 |
| Mar | 0.8 |
| Apr | 0.9 |
| May | 0.9 |
| Jun | 0.9 |
| Jul | 0.8 |
| Aug | 0.8 |
| Sep | 0.9 |
| Oct | 0.9 |
| Nov | 0.9 |
| Dec | 0.8 |
-----------------------------------------------------
```

```
============================
Singapore Electricity Consumption
=============================================================================================================================================================
    1.Display the monthly electricity consumptions of all dwelling types in May.
    2.The average electricity consumption in each of the 4-month periods from Apr to Jun & from Oct to Dec and the maximum electricity consumption in each of the periods and the months in which it occurred.
    3.Display the electricity consumption and the months in which the monthly electricity consumption is at least 6% higher than the annual mean electricity consumption.
    4.Display Chart
    5.Exit/Quit
=============================================================================================================================================================

Choose your menu : 4
```