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ELECTRICITY RATE TRUNCATION BY EMPHASIZING THE MAXIMUM PEAK

1.INTRODUCTION

The electric bill – it comes once a month. Most of us glance at the balance due, and make plans to pay that amount. But the electric bill is more than just the amount owed. The bill is full of information that can be useful in helping you better understand your electric usage. The information on the bill can also help consumers gain a better understanding of charges.

Units Consumed (Unit rates of each State): Units consumed is the number of kWh (Kilo-Watt-Hour) consumed in a month.This is the total monthly consumption by all the appliances that are connected to the meter. This is the value that needs to come down in order to reduce the electricity bill.

1.1.PROBLEM STATEMENT:

- Energy consumption is the main concern of the society.

- Usage of power and the amount of power dissipateddecides the cost of our board.

- Displaying the maximum rate and the units consumed by the individuals dwelling in a apartment could createawareness and cut off extra changes due to frequentusage or being unaware of the devices running idle.And suitable suggestion will be given to reduce the cost of electricity bill.

1.2.OBJECTIVES:

- To calculate the electricity bill of all households in an apartment

- To find the household with maximum electricity bill

- To use easy python concepts to solve our problem

- To suggest some important or useful ideas to reduce the electricity bill.

1.3.EXISTING MODELS:

The existing models give the name of the owner,members of the house and their electricity bill of a single household.

1.4.ISSUES IN EXISTING MODELS:

The existing models give electricity bill of a single household.We tried giving electricity bills of multiple households in an apartment and we find the household with higher electicity bill and suggest some ideas to reduce the cost.And the existing models use complicated set of python programs.We used simple python concepts to solve this problem.

2.USAGE OF PYTHON CONCEPTS TO IMPLEMENT THE PROJECT
The python concepts used are,

- File-Excel(openpyxl)

- Functions

- Append

- Plot(matplotlib)

- Class-Pass

3.IMPLEMENTATION(CODE):

```python
import openpyxl
import matplotlib.pyplot as plt
from openpyxl import Workbook
lst = []
billList=[]
appartment=22
graph_list=[]
n = int(input("Enter number of elements : "))
for i in range(0, n):
        ele = int(input())
        lst.append(ele)
print(lst)
for units in lst:
   if(units < 50):
      amount = units * 2.60
      surcharge = 25
   elif(units <= 100):
      amount = 130 + ((units - 50) * 3.25)
      surcharge = 35
```

```python
    elif(units <= 200):

        amount = 130 + 162.50 + ((units - 100) * 5.26)

        surcharge = 45

    else:

        amount = 130 + 162.50 + 526 + ((units - 200) * 8.45)

        surcharge = 75

    total = amount + surcharge

    print("\nElectricity Bill = %.2f"  %total)

    billList.append(total)


'''..........Write to Excel............'''

def WriteToxcel(lis,index_1,column_no):

    for i in lis:

        cellref=sheet.cell(row=index_1, column=column_no)

        cellref.value=i

        index_1=index_1+1

book = openpyxl.load_workbook("C:\\Users\\Administrator\\Desktop\\Book.xlsx")

sheet = book.active


'''..........Function Call ..............'''

WriteToxcel(lst,index_1=2,column_no=3)

WriteToxcel(billList,index_1=2,column_no=4)

book.save("C:\\Users\\Administrator\\Desktop\\Book.xlsx")
```

```python
print("Max value element : ", max(billList))

book = openpyxl.load_workbook("C:\\Users\\Administrator\\Desktop\\Book.xlsx")

sheet = book.active

for i in range(2,appartment):

    cellref=sheet.cell(row=i, column=1)

    element=cellref.value

    graph_list.append(element)

#print("Graph list",graph_list)

#print("Graph list",billList)


class Plot:

    pass

fig = plt.figure()

plt.bar(graph_list[0:appartment], billList[0:appartment])

plt.title('Maximum Electricity Bill Consumption Bar Chart')

plt.xlabel("House Owner's Names")

plt.ylabel('Electricity Bill')

plt.show()
```

4.RESULTS & DISCUSSION:

Intially all the house owner's details are stored in the excel sheet,that is given in the first excel picture.After the program is executed,the results will be automatically stored in excel sheet,that is shown in second picture.

	A	B	C	D
1	NAME	ADDRESS	UNITS	ELECTRICITY BILL
2	Ravi	10A/21		
3	Bala	12B/80		
4	Kumar	7D/24		
5	John	4A/19		
6	Kevin	1C/5		
7	Mohammed	12B/46		
8	Kavin	10C/45		
9	Subbaiah	7B/9		
10	Karupaya	4A/12		
11	David	10A/3		
12	Sudhagar	7B/11		
13	Batcha	4C/20		
14	Velmurugan	7D/22		
15	Richard	12A/10		
16	Manikandan	12B/55		
17	Rajendran	4D/4		
18	Balu	4C/23		
19	Muthupandi	10A/32		
20	Ramesh	12B/25		
21	Idiot	13B/696		

	A	B	C	D
1	NAME	ADDRESS	UNITS	ELECTRICITY BILL
2	Ravi	10A/21	123	458.48
3	Bala	12B/80	147	584.72
4	Kumar	7D/24	258	1383.6
5	John	4A/19	369	2321.55
6	Kevin	1C/5	789	5870.55
7	Mohammed	12B/46	456	3056.7
8	Kavin	10C/45	159	647.84
9	Subbaiah	7B/9	753	5566.35
10	Karupaya	4A/12	963	7340.85
11	David	10A/3	248	1299.1
12	Sudhagar	7B/11	862	6487.4
13	Batcha	4C/20	795	5921.25
14	Velmurugan	7D/22	100	327.5
15	Richard	12A/10	200	863.5
16	Manikandan	12B/55	420	2752.5
17	Rajendran	4D/4	359	2237.05
18	Balu	4C/23	120	442.7
19	Muthupandi	10A/32	360	2245.5
20	Ramesh	12B/25	333	2017.35

As we all know,bar graphs are used to compare things between different groups.Here the graph is plotted between House Owner's name and electricity bill.Therefore by this bar chart,maximum consumption of electricity bill can be identified.

Maximum Electricity Bill Consumption Bar Chart
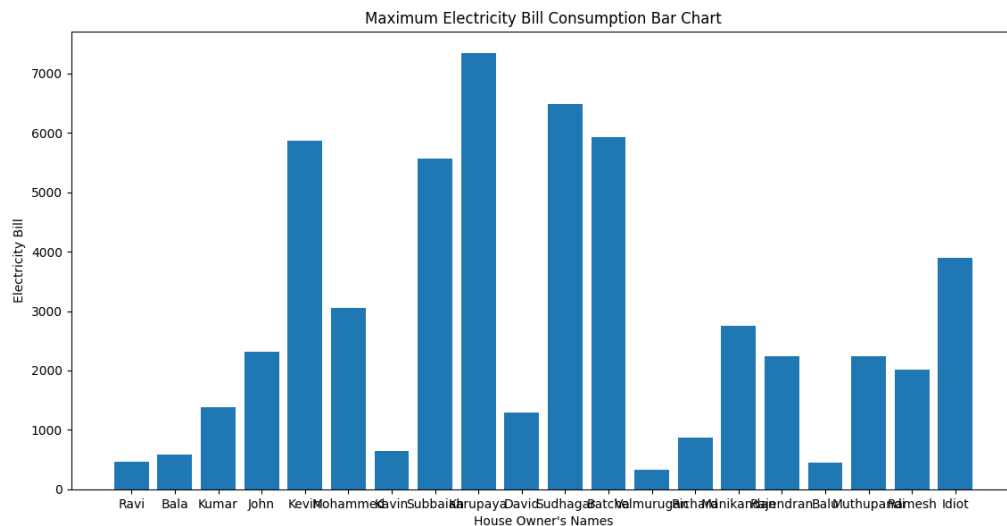
5.CONCLUSION:

Our idea is all about developing a real time solution for the existing electrical problem. Electricity bill is one of the main concerns of the people that it's quite unpredictable. People of all forms of living from single household to a multi-

storey apartment pay the bill, being unaware of the exact calculative amount nonetheless.

Limited package of ideas existed in a way that mere electricity bill is calculated. The idea of truncating the bill by emphasising the maximum peak (rate) among the households in an apartment could cut off extra charges due to various futile usages. Maximum electricity saving could benefit our national economy in a plethora of ways.

Presently, TANGEDCO has four major coal based Thermal power stations with a total power capacity of 4060 MW and four gas based power plants with a total capacity of 516 MW.

In Tamilnadu, the bill amount is calculated by providing full subsidy for the first 100 units ,Rs.2/- in the range 101 – 200 units, Rs.4.60/- in the range 201 – 500 units and Rs.6.60/- in the range 501 –620 units. Continuous usage of appliances not only burns the wallet but also depletes the sources to a great extent.

It is wise to switch off the devices running unnecessarily than switching over to alternate sources and start depleting it. The reparations of the renewable energy sources cannot be tallied. Individual contributions in possible ways can make a nation economically and even electrically wealthy.

6.INFERENCE:

Electricity that comes to our daily usage is fluctuating in nature. This fluctuation causes the electric current to dissipate in the form of heat which results not only in wastage but also in the vandalism of equipment. Various implementations have been taken by the electrical society and even by the people who are technically aware to curb the electrical consumption pamphlet, the so-called electricity bill. Finitely, some devices outperform the objective of cutting off the charge at an incredible rate.

- Power saver

- Energy audit

POWER SAVER:

It is a device which plugs in to power socket. Apparently, just by keeping the device connected, it reduces the power consumption. It saves between 25% and 40%.

ENERGY AUDIT:

It is a survey on the energy flows for conservation in a building. It finds a way to reduce the energy input without negatively affecting the output. It mainly pinpoints the place where the energy is being lost so that measures could be taken accordingly.

ELECTRIC VEHICLE:

The use of the electric vehicle (EV) battery to supply part of the electrical load of the house (when the EV is parked at home) during on-peak hours under time-of-use (TOU) electrical tariff is shown. The EV battery is charged by buying electricity from the AC grid during off-peak hours (at low price), and during on-peak hours (at high price), the battery can supply the whole load or a part, avoiding the purchase of expensive electricity from the AC grid. This use of the battery can be compatible with the normal use (supplying electricity to the wheels of the EV) and can help to reduce the electricity bill.

GSM:

The smart energy meter with reading indication using GSM it developed to decrease the electricity consumption bill by providing the energy meter reading to the user with an alert message before increasing of unit charge. The reading from Utility

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