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ELECTRICITY BILLING AND ANALYSIS SYSTEM

Project Statement :-

Objective :-

The main objective of our project is to create an admin-user interface for managing electricity consumption data and billing system , where admins can manage data and the users can obtain information about their electricity consumption .

Portals available :

- Common portal :-
  Provides option to access admin or user interface

- Admin portal :-
  Admins must log in using their credentials and they get access to various options
  - ➔ Viewing data
  - ➔ Inserting data
  - ➔ Updating data
  - ➔ Deleting data
  - ➔ Visualise the data (bar graphs)
- User portal :-
  Users must log in with their ID Number and the password assigned to them and can access various options
  - ➔ Viewing Consumption Data
  - ➔ Viewing Bill amount along with due date for payment
  - ➔ Generating a bill

Tables Used :-

1. Table customer:
    - Contains information about users
    - Database: electricity
    - Creation Code :-

```
CREATE TABLE CUSTOMER(

ID_NUMBER INT(4),

CUSTOMER_NAME VARCHAR(50),

ADDRESS VARCHAR(75),

PHONE_NUMBER CHAR(10));
```

    - Table Data

id_number	CUSTOMER_NAME	ADDRESS	PHONE_NUMBER
1,001	SHIVA	ARUNDALE STREET,MYLAPORE	7905668276
1,002	SURYA	MUTHU STREET,MYLAPORE	6383256879
1,003	SHANKAR	SILVA ROAD	9894855667
1,004	SUBRAMANIAM	KARPAGAM AVENUE,MYLAPORE	9940181165
1,005	SANTHOSH	ADAM STREET,MYLPAORE	9924567895
1,007	STELLA	SANTHOME CHURCH,SANTHOME	7805863276
1,008	SKANDA	T.S.K ROAD,MYLAPORE	9947171175
1,009	SATHYA	ROHINI GARDENS,MYLAPORE	9894855544
1,006	SAM	NACHIYAPPAN STREET,MYLAPORE	9840057501

2.Table current_consumption:

- Contains information about consumption of electricity by customers
- Database: electricity
- Creation Code :-

```
CREATE TABLE CURRENT_CONSUMPTION(

ID_NUMBER CHAR(4),

PREVIOUS_MONTH_READING CHAR(5),

PRESENT_MONTH_READING CHAR(5),

UNITS_CONSUMED CHAR(5));
```

- Table Data

ID_NUMBER	PREVIOUS_MONTH_READING	PRESENT_MONTH_READING	UNITS_CONSUMED
1,001	1,000	1,500	500
1,002	1,500	2,500	1,000
1,003	2,000	2,700	700
1,004	2,500	2,850	350
1,007	1,000	1,500	500
1,008	2,500	2,750	250
1,005	3,000	4,000	1,000
1,006	2,000	3,000	1,000
1,009	3,000	4,000	1,000

3.Table electricity_bill:

- Contains information about electricity bill to be paid and the due date for payment
- Database: electricity
- Creation Code :-

```
CREATE TABLE ELECTRICITY_BILL(

ID_NUMBER CHAR(4),

UNITS_CONSUMED CHAR(5),

RATE_PER_UNIT INT(5),

BILL_AMOUNT INT(8),

PERCENTAGE_OF_ADDITIONAL_TAXES FLOAT,

TOTAL_AMOUNT INT(10),

DUE_DATE DATE);
```

- Table Data

id_number	UNITS_CONSUMED	RATE_PER_UNIT	BILL_AMOUNT	PERCENTAGE_OF_ADDITIONAL_TAXES	TOTAL_AMOUNT	DUE_DATE
1,001	500	9	4,500	10	4,950	2022-01-14
1,002	1,000	9	9,000	10	9,900	2022-01-14
1,003	200	9	1,800	10	1,980	2022-01-17
1,004	350	9	3,150	10	3,465	2022-01-17
1,005	1,000	9	9,000	10	9,900	2022-01-21
1,006	1,000	9	9,000	10	9,900	2022-01-17
1,007	500	9	4,500	10	4,950	2022-01-25
1,008	250	9	2,250	10	6,000	2022-02-04
1,009	1,000	9	9,000	10	9,900	2022-02-03

Source Code :-

```
import tkinter as tk
import pandas as pd
import mysql.connector as ms
import matplotlib.pyplot as plt
import datetime
from datetime import date
today=date.today()
#storing username and password
det_df=pd.DataFrame({'Username':['rithesh','1001','1002','1003','1
004','1005','1006','1007','1008','1009'],

'Password':['RIT_adm_1','u_1','u_2','u_3','u_4','u_5','u_6','u_7','u_
8','u_9']})
l_adm=[]
l_user=[]
for i in range(3):

l_adm.append([det_df.loc[i,'Username'],det_df.loc[i,'Password']])
for j in range(3,12):

l_user.append([det_df.loc[j,'Username'],det_df.loc[j,'Password']])

#defining admin commands
def adm():
    #creating admin portal
    ad_portal=tk.Tk()
    ad_portal.title('Admin portal')
    wina_width=600
    wina_height=700
    sca_width=ad_portal.winfo_screenwidth()
```

```
    sca_height=ad_portal.winfo_screenheight()
    center_xa=int(sca_width/2-wina_width/2)
    center_ya=int(sca_height/2-wina_height/2)

ad_portal.geometry(f"{wina_width}x{wina_height}+{center_xa}
+{center_ya}")
    ad_portal.configure(bg='blue')

    #adding widgets-admin portal

tk.Label(ad_portal,text='welcome',bg='blue',fg='white',height=1,f
ont=2).pack()
    tk.Label(ad_portal,text='enter
username',bg='blue',fg='white',height=1,font=1).pack()
    lp1=tk.Entry(ad_portal,width=20)
    lp1.pack()
    tk.Label(ad_portal,text='enter
password',bg='blue',fg='white',height=1,font=1).pack()
    lp2=tk.Entry(ad_portal,show='*',width=20)
    lp2.pack()
    tk.Label(ad_portal,text='    ',bg='blue').pack()
    def store_ad():
        usn=lp1.get()
        pss=lp2.get()
        list_1=[usn,pss]

con=ms.connect(host='localhost',user='root',passwd='rithesh27')
        if list_1 in l_adm :
            tk.Label(ad_portal,text='welcome '+usn+'  \nPlease select
one of the options below',bg='blue',fg='white',font=1).pack()
            tk.Label(ad_portal,text='To view the tables click
here',bg='blue',fg='white',font=1).pack()
            #view module
```

```
        def view():

con=ms.connect(host='localhost',user='root',passwd='rithesh27',d
atabase='electricity')
            mycursor=con.cursor()
            mycursor.execute('SHOW TABLES')
            print('Tables available')
            for k in mycursor:
                print(k)
            a=str(input('enter table to display '))
            b='SELECT * FROM '+a
            c=pd.read_sql(b,con)
            print(c)
            print('\n\t')
        tk.Button(ad_portal,text='View',command=view).pack()
        tk.Label(ad_portal,text='    ',bg='blue').pack()
        tk.Label(ad_portal,text='To insert new data click
here',bg='blue',fg='white',font=1).pack()
        #create module
        def insert():

con=ms.connect(host='localhost',user='root',passwd='rithesh27',d
atabase='electricity')
            mycursor=con.cursor()
            mycursor.execute('SHOW TABLES')
            print('Tables available')
            for k in mycursor:
                print(k)

con=ms.connect(host='localhost',user='root',passwd='rithesh27',d
atabase='electricity')
            mycursor=con.cursor()
```

```
            t=str(input('enter name of table which has to be
changed '))
            tg=pd.read_sql('SELECT * FROM '+t,con)
            print(tg)
            if t=='customer':
                print('enter ',tg.columns[0])
                var1=input()
                print('enter ',tg.columns[1])
                var2=input()
                print('enter ',tg.columns[2])
                var3=input()
                print('enter ',tg.columns[3])
                var4=input()
                if len(var4)!=10:
                    print('please enter valid phone number')
                    var4=input()
                s='( '+var1+',\"+var2+'\',\"+var3+'\',\"+var4+'\' )'
                mycursor.execute('INSERT INTO '+t+' VALUES '+s)
                con.commit()
                print(pd.read_sql('SELECT * FROM '+t,con))
            elif t=='current_consumption':
                print('enter ',tg.columns[0])
                var1=input()
                print('enter ',tg.columns[1])
                var2=input()
                print('enter ',tg.columns[2])
                var3=input()
                var4=str(int(var3)-int(var2))
                s='( '+var1+','+var2+','+var3+','+var4+' )'
                mycursor.execute('INSERT INTO '+t+' VALUES '+s)
                con.commit()
                print(pd.read_sql('SELECT * FROM '+t,con))
            elif t=='electricity_bill':
```

```
                print('enter ',tg.columns[0])
                var1=input()
                print('enter ',tg.columns[1])
                var2=input()
                var3='9'
                var4=str(int(var3)*int(var2))
                var5='10'
                var6=str(int(var4)+(int(var4)*int(var5)/100))
                print('enter ',tg.columns[6],' in the format of
yyyy-mm-dd ')
                var7=input()
                s='(
'+var1+','+var2+','+var3+','+var4+','+var5+','+var6+',\"+var7+'\')'
                mycursor.execute('INSERT INTO '+t+' VALUES '+s)
                con.commit()
            print('\n\t')
        tk.Button(ad_portal,text='Insert',command=insert).pack()
        tk.Label(ad_portal,text='    ',bg='blue').pack()
        tk.Label(ad_portal,text='To update the data click
here',bg='blue',fg='white',font=1).pack()
        #update module
        def update():

con=ms.connect(host='localhost',user='root',passwd='rithesh27',d
atabase='electricity')
            mycursor=con.cursor()
            mycursor.execute('SHOW TABLES')
            print('Tables available')
            for k in mycursor:
                print(k)
            t=input('enter table which has to be updated ')
            dt=pd.read_sql('SELECT * FROM '+t,con)
            print(dt)
```

```
            uvar1=input('enter field name to be updated ')
            if t=='electricity_bill' and (uvar1=='due_date' or
uvar1=='DUE_DATE'):
                v1=input('enter ID_NUMBER ')
                y_d=pd.read_sql('SELECT YEAR(DUE_DATE)
FROM ELECTRICITY_BILL WHERE ID_NUMBER='+v1,con)
                y=int(y_d.loc[0,'YEAR(DUE_DATE)'])
                m_d=pd.read_sql('SELECT MONTH(DUE_DATE)
FROM ELECTRICITY_BILL WHERE ID_NUMBER='+v1,con)
                m=int(m_d.loc[0,'MONTH(DUE_DATE)'])
                d_d=pd.read_sql('SELECT DAY(DUE_DATE)
FROM ELECTRICITY_BILL WHERE ID_NUMBER='+v1,con)
                d=int(d_d.loc[0,'DAY(DUE_DATE)'])
                v2=input('enter new due_date ')
                while True:
                    c_y=int(v2[0:4])
                    c_m=int(v2[5:7])
                    c_d=int(v2[8:])
                    if (c_y>=y):
                        if c_m>=m:
                            if c_d>=d or c_m>m:
                                mycursor.execute('UPDATE '+t+' SET
'+uvar1+'= \"+v2+'\' WHERE ID_NUMBER='+v1)
                                con.commit()
                                print(pd.read_sql('SELECT * FROM
ELECTRICITY_BILL ',con))
                                break
                            else:
                                print('invalid due_date please enter again')
                                v2=input()
                        else:
                            print('invalid due_date please enter again')
                            v2=input()
```

```
                else:
                    print('invalid due_date please enter again')
                    v2=input()
            else:
                uvar2=input('enter new data ')
                print('any conditions ? type yes or no')
                opt=input()
                if opt=='yes'or opt=='YES':
                    uvar3=input('enter field to apply conditions ')
                    uvar4=input('enter condition ')
                    mycursor.execute('UPDATE '+t+' SET '+uvar1+'=
\"+uvar2+\' WHERE '+uvar3+'= \"+uvar4+\")
                    con.commit()
                elif opt=='no'or opt=='NO':
                    mycursor.execute('UPDATE '+t+' SET '+uvar1+'=
\"+uvar2+\")
                    con.commit()
                print(pd.read_sql('SELECT * FROM '+t,con))
                print('\n\t')

tk.Button(ad_portal,text='Update',command=update).pack()
        tk.Label(ad_portal,text='    ',bg='blue').pack()
        tk.Label(ad_portal,text='To remove data click
here',bg='blue',fg='white',font=1).pack()
        #delete module
        def delete():

con=ms.connect(host='localhost',user='root',passwd='rithesh27',d
atabase='electricity')
            mycursor=con.cursor()
            mycursor.execute('SHOW TABLES')
            print('Tables available')
            for k in mycursor:
```

```
                print(k)
            t=input('enter table from which data is to be deleted ')
            dt=pd.read_sql('SELECT * FROM '+t,con)
            print(dt)
            dvar1=input('enter field in which condition is applied ')
            dvar2=input('enter condition ')
            mycursor.execute('DELETE FROM '+t+' WHERE
'+dvar1+'= \"+dvar2+'\")
            con.commit()
            print(pd.read_sql('SELECT * FROM '+t,con))
            print('\n\t')
        tk.Button(ad_portal,text='Delete',command=delete).pack()
        tk.Label(ad_portal,text='    ',bg='blue').pack()
        tk.Label(ad_portal,text='To plot a graph of the data click
here',bg='blue',fg='white',font=1).pack()
        #graph module
        def graph():

con=ms.connect(host='localhost',user='root',passwd='rithesh27',d
atabase='electricity')
            mycursor=con.cursor()
            mycursor.execute('SHOW TABLES')
            print('Tables available')
            for k in mycursor:
                print(k)
            opt='yes'
            while opt=='yes':
                a=input('enter table name ')
                if a=='current_consumption':
                    b='SELECT
ID_NUMBER,PREVIOUS_MONTH_READING,PRESENT_M
ONTH_READING FROM CURRENT_CONSUMPTION'
                    c=pd.read_sql(b,con)
```

```
                print(c)
                c.plot(kind='bar',x='ID_NUMBER')
                plt.ylabel('Units in kWh')
                plt.title('Current consumption data')
                plt.show()
            elif a=='electricity_bill':
                b='SELECT
ID_NUMBER,UNITS_CONSUMED,TOTAL_AMOUNT
FROM ELECTRICITY_BILL'
                c=pd.read_sql(b,con)
                print(c)

c.plot(kind='bar',x='ID_NUMBER',y='UNITS_CONSUMED',col
or='red')
                plt.ylabel('Units in kWh')
                plt.title('Units of current consumed by users')
                plt.show()

c.plot(kind='bar',x='ID_NUMBER',y='TOTAL_AMOUNT',color
='blue')
                plt.ylabel('Rupees')
                plt.title('Amount paid by users')
                plt.show()
            else:
                print('Please enter valid table name')
            opt=input('do you want to plot other table? ')
            if opt=='no':
                break
        tk.Button(ad_portal,text='Graph',command=graph).pack()
        tk.Label(ad_portal,text='    ',bg='blue').pack()
        def close_ad():
            ad_portal.destroy()
```

```
            tk.Label(ad_portal,text='To exit click
here',bg='blue',fg='white',font=1).pack()

tk.Button(ad_portal,text='Logout',command=close_ad).pack()
            tk.Label(ad_portal,text='    ',bg='blue').pack()
        else:
            tk.Label(ad_portal,text='Incorrect username or
password.\nPlease try again',bg='blue',fg='white',font=1).pack()
    tk.Button(ad_portal,text='Login',command=store_ad).pack()
    ad_portal.mainloop()

#defining user commands
def usr():
    #creating user portal
    us_portal=tk.Tk()
    us_portal.title('User portal')
    winu_width=600
    winu_height=600
    scu_width=us_portal.winfo_screenwidth()
    scu_height=us_portal.winfo_screenheight()
    center_xu=int(scu_width/2-winu_width/2)
    center_yu=int(scu_height/2-winu_height/2)

us_portal.geometry(f"{winu_width}x{winu_height}+{center_xu}
+{center_yu}")
    us_portal.configure(bg='blue')

    #adding widgets-user portal

tk.Label(us_portal,text='Welcome',bg='blue',fg='white',font=1).pa
ck()
    tk.Label(us_portal,text='enter
username',bg='blue',fg='white',font=1).pack()
```

```
    lu1=tk.Entry(us_portal,width=20)
    lu1.pack()
    tk.Label(us_portal,text='enter
password',bg='blue',fg='white',font=1).pack()
    lu2=tk.Entry(us_portal,show='*',width=20)
    lu2.pack()
    tk.Label(us_portal,text='    ',bg='blue').pack()
    def store_us():
        usn=lu1.get()
        pss=lu2.get()
        list_1=[usn,pss]

con=ms.connect(host='localhost',user='root',passwd='rithesh27')
        if list_1 in l_user :
            tk.Label(us_portal,text='Please select one of the options
below',bg='blue',fg='white',font=1).pack()
            tk.Label(us_portal,text='To view your electricity
consumption data click here',bg='blue',fg='white',font=1).pack()
            #consumption module
            def consume():

con=ms.connect(host='localhost',user='root',passwd='rithesh27',d
atabase='electricity')
                mycursor=con.cursor()
                b='SELECT * FROM current_consumption WHERE
ID_NUMBER='+usn
                c=pd.read_sql(b,con)
                for i in c.columns:
                    print(i,':',c.loc[0,i])
                print('\n\t')

tk.Button(us_portal,text='CNSM',command=consume).pack()
```

```
        tk.Label(us_portal,text='To view your bill amount and due
date click here',bg='blue',fg='white',font=1).pack()
        #amount module
        def bill_am():

con=ms.connect(host='localhost',user='root',passwd='rithesh27',d
atabase='electricity')
            mycursor=con.cursor()
            b='SELECT
BILL_AMOUNT,PERCENTAGE_OF_ADDITIONAL_TAXES,
TOTAL_AMOUNT,DUE_DATE FROM electricity_bill WHERE
ID_NUMBER='+usn
            c=pd.read_sql(b,con)
            for i in c.columns:
                print(i,':',c.loc[0,i])
            print('\n\t')

tk.Button(us_portal,text='AMT',command=bill_am).pack()
        tk.Label(us_portal,text='To generate a bill click
here',bg='blue',fg='white',font=1).pack()
        #bill module
        def bill():

con=ms.connect(host='localhost',user='root',passwd='rithesh27',d
atabase='electricity')
            mycursor=con.cursor()
            q1='SELECT CUSTOMER_NAME FROM
CUSTOMER WHERE ID_NUMBER='+usn
            q2='SELECT
PREVIOUS_MONTH_READING,PRESENT_MONTH_READI
NG FROM CURRENT_CONSUMPTION WHERE
ID_NUMBER='+usn
```

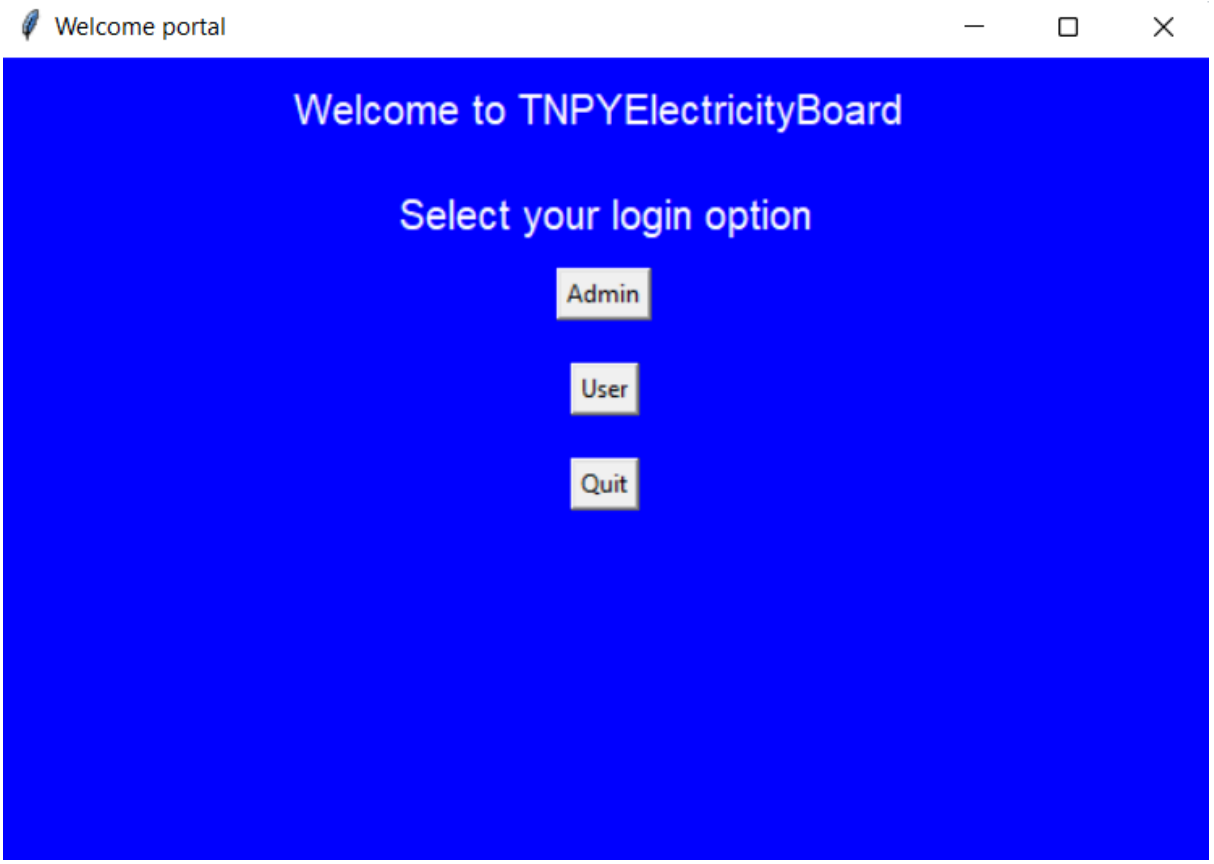
```
            q3='SELECT TOTAL_AMOUNT,DUE_DATE FROM
ELECTRICITY_BILL WHERE ID_NUMBER='+usn
            q1_d=pd.read_sql(q1,con)
            q2_d=pd.read_sql(q2,con)
            q3_d=pd.read_sql(q3,con)
            print('*'*50)
            print('\n\t{}\n'.format('TNPYElectricityBoard'))
            print('\n\t{}\n'.format('ELECTRICITY BILL'))
            print('='*50)
            print('\t{}\t\t{}'.format('ID_Number',usn))

print('\t{}\t\t\t{}'.format('Name',q1_d.loc[0,'CUSTOMER_NAM
E']))
            print('\t{}\t{}'.format('Previous
reading',str(q2_d.loc[0,'PREVIOUS_MONTH_READING'])+'
kWh'))
            print('\t{}\t\t{}'.format('Current
reading',str(q2_d.loc[0,'PRESENT_MONTH_READING'])+'
kWh'))
            print('='*50)
            print('\t{}\t\t₹{}'.format('Bill
Amount',str(q3_d.loc[0,'TOTAL_AMOUNT'])))
            print('\t{}\t{}'.format('Due date for
payment',q3_d.loc[0,'DUE_DATE']))
            print('='*50)
            print('\n\t{}\n'.format('Thank you, transaction was
succesful'))
            print('\n\t{}\n'.format('Save Electricity for a better
future!!'))
            print('*'*50)
            print('\n\t')
        tk.Button(us_portal,text='BILL',command=bill).pack()
```

```
            tk.Label(us_portal,text='To exit click
here',bg='blue',fg='white',font=1).pack()
            def close_us():
                us_portal.destroy()

tk.Button(us_portal,text='Logout',command=close_us).pack()
        else :
            tk.Label(us_portal,text='Incorrect username or
password.\nPlease try again',bg='blue',fg='white',font=1).pack()
    tk.Button(us_portal,text='Login',command=store_us).pack()
    tk.Label(us_portal,text='    ',bg='blue').pack()
    us_portal.mainloop()

#creating welcome portal
wel=tk.Tk()
wel.title('Welcome portal')
win_width=600
win_height=400
sc_width=wel.winfo_screenwidth()
sc_height=wel.winfo_screenheight()
center_x=int(sc_width/2-win_width/2)
center_y=int(sc_height/2-win_height/2)
wel.geometry(f"{win_width}x{win_height}+{center_x}+{center
_y}")
wel.configure(bg='blue')


#adding widgets-welcome portal
l1=tk.Label(text='Welcome to TNPYElectricityBoard
',width=30,height=2,font=15,bg='blue',fg='white')
l1.pack()
l2=tk.Label(text='Select your login
option',width=30,height=2,font=10,bg='blue',fg='white')
```

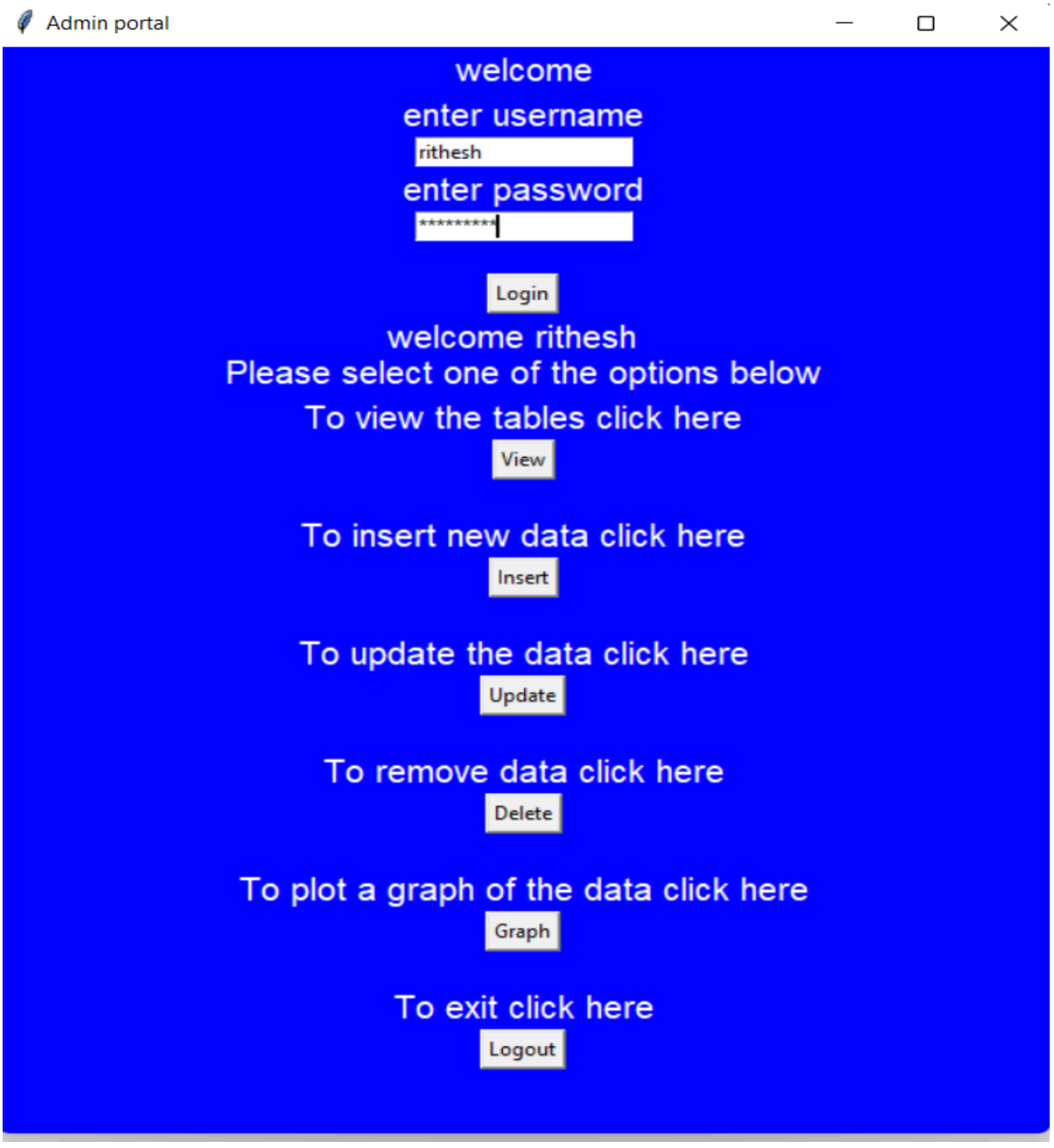
```
l2.pack()
b1=tk.Button(text='Admin',command=adm)
b1.pack()
l3=tk.Label(text='      ',bg='blue')
l3.pack()
b2=tk.Button(text='User',command=usr)
b2.pack()
tk.Label(wel,text='    ',bg='blue').pack()
def close():
    wel.destroy()
b3=tk.Button(text='Quit',command=close)
b3.pack()
wel.mainloop()
```

Project Screenshots :-

1.Welcome Portal



2. Admin Portal



2.Admin Portal :- View Module

```
Tables available
('current_consumption',)
('customer',)
('electricity_bill',)
enter table to display current_consumption
   ID_NUMBER  PREVIOUS_MONTH_READING  PRESENT_MONTH_READING  UNITS_CONSUMED
0       1001                   1000                   1500             500
1       1002                   1500                   2500            1000
2       1003                   2000                   2700             700
3       1004                   2500                   2850             350
4       1007                   1000                   1500             500
5       1008                   2500                   2750             250
6       1005                   3000                   4000            1000
7       1006                   2000                   3000            1000
8       1009                   3000                   4000            1000
```

```
Tables available
('current_consumption',)
('customer',)
('electricity_bill',)
enter table to display customer
   id_number CUSTOMER_NAME                     ADDRESS PHONE_NUMBER
0       1001         SHIVA     ARUNDALE STREET,MYLAPORE   7905668276
1       1002         SURYA        MUTHU STREET,MYLAPORE   6383256879
2       1003       SHANKAR                   SILVA ROAD   9894855667
3       1004   SUBRAMANIAM     KARPAGAM AVENUE,MYLAPORE   9940181165
4       1005      SANTHOSH         ADAM STREET,MYLPAORE   9924567895
5       1007        STELLA     SANTHOME CHURCH,SANTHOME   7805863276
6       1008        SKANDA          T.S.K ROAD,MYLAPORE   9947171175
7       1009        SATHYA      ROHINI GARDENS,MYLAPORE   9894855544
8       1006           SAM  NACHIYAPPAN STREET,MYLAPORE   9840057501
```

2.Admin Portal :- Insert Module

```
Tables available
('current_consumption',)
('customer',)
('electricity_bill',)
enter name of table which has to be changed customer
   id_number CUSTOMER_NAME                      ADDRESS PHONE_NUMBER
0       1001          SHIVA     ARUNDALE STREET,MYLAPORE   7905668276
1       1002          SURYA        MUTHU STREET,MYLAPORE   6383256879
2       1003        SHANKAR                   SILVA ROAD   9894855667
3       1004   SUBRAMANIAM     KARPAGAM AVENUE,MYLAPORE   9940181165
4       1005      SANTHOSH         ADAM STREET,MYLPAORE   9924567895
5       1007         STELLA     SANTHOME CHURCH,SANTHOME   7805863276
6       1008          SKANDA          T.S.K ROAD,MYLAPORE   9947171175
7       1009          SATHYA      ROHINI GARDENS,MYLAPORE   9894855544
8       1006             SAM  NACHIYAPPAN STREET,MYLAPORE   9840057501
enter  id_number
1010
enter  CUSTOMER_NAME
Raghav
enter  ADDRESS
Blacksmith Street
enter  PHONE_NUMBER
9120873547
   id_number CUSTOMER_NAME                      ADDRESS PHONE_NUMBER
0       1001          SHIVA     ARUNDALE STREET,MYLAPORE   7905668276
1       1002          SURYA        MUTHU STREET,MYLAPORE   6383256879
2       1003        SHANKAR                   SILVA ROAD   9894855667
3       1004   SUBRAMANIAM     KARPAGAM AVENUE,MYLAPORE   9940181165
4       1005      SANTHOSH         ADAM STREET,MYLPAORE   9924567895
5       1007         STELLA     SANTHOME CHURCH,SANTHOME   7805863276
6       1008          SKANDA          T.S.K ROAD,MYLAPORE   9947171175
7       1009          SATHYA      ROHINI GARDENS,MYLAPORE   9894855544
8       1006             SAM  NACHIYAPPAN STREET,MYLAPORE   9840057501
9       1010          Raghav            Blacksmith Street   9120873547
```

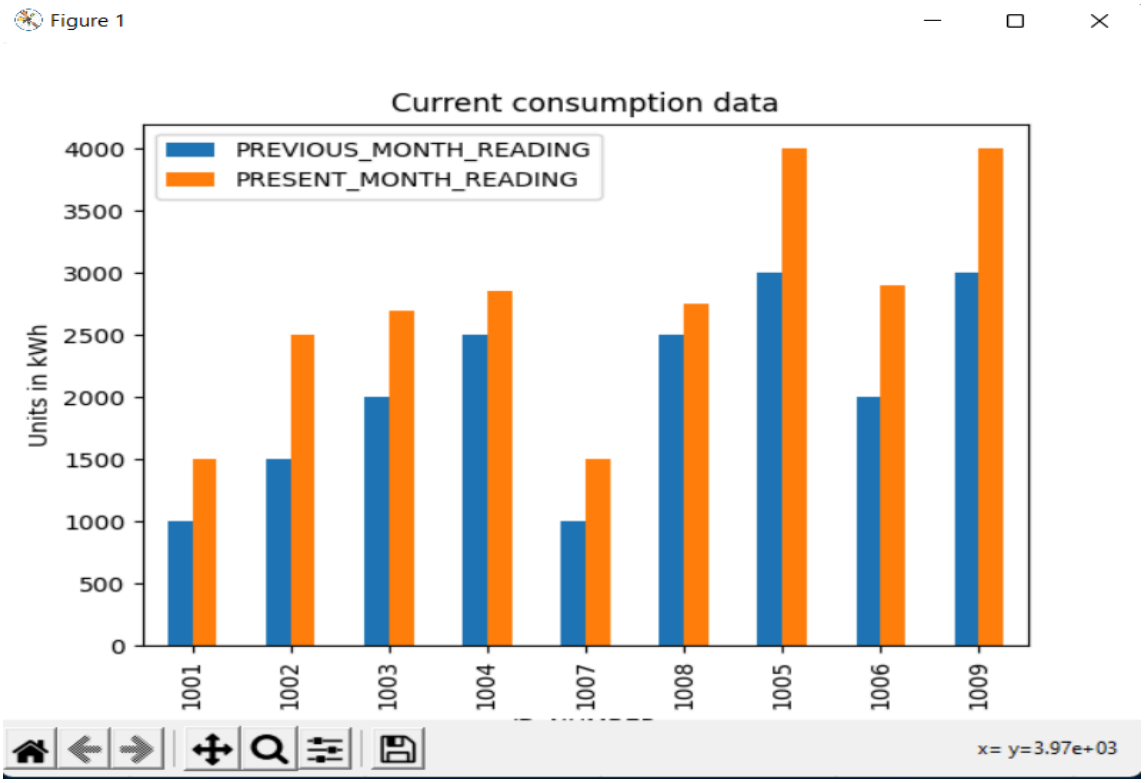
2.Admin Portal :- Update Module

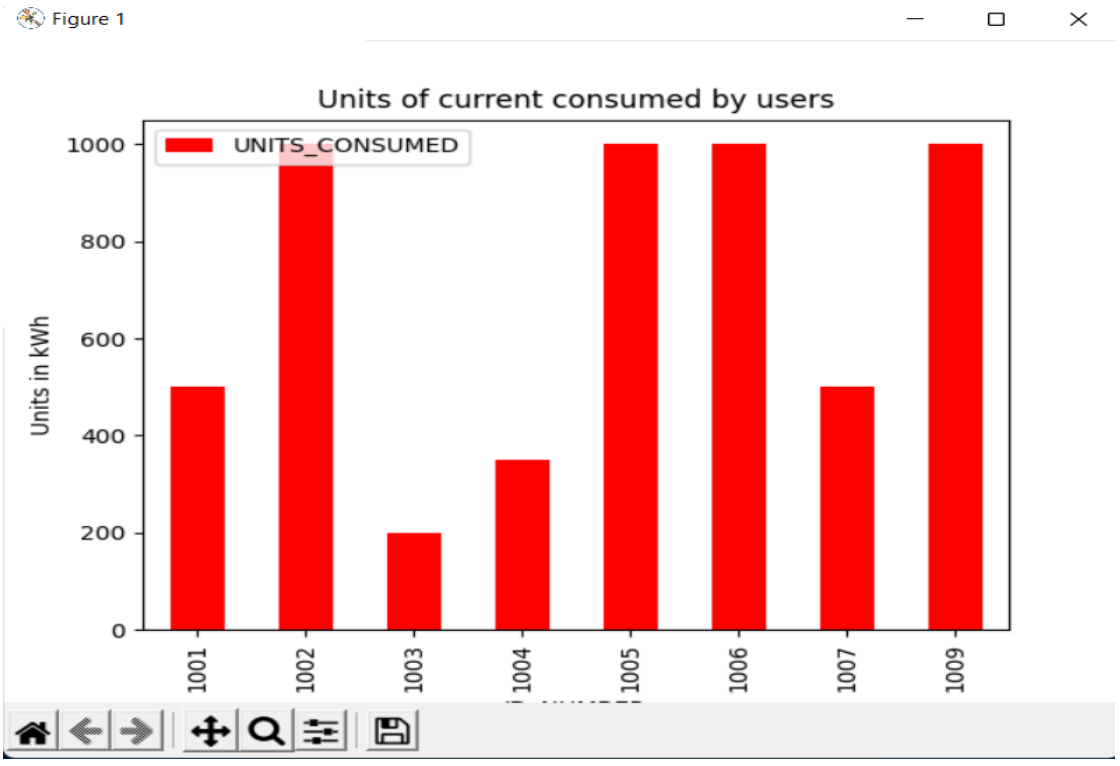
```
Tables available
('current_consumption',)
('customer',)
('electricity_bill',)
enter table which has to be updated current_consumption
   ID_NUMBER  PREVIOUS_MONTH_READING  PRESENT_MONTH_READING  UNITS_CONSUMED
0       1001                   1000                   1500             500
1       1002                   1500                   2500            1000
2       1003                   2000                   2700             700
3       1004                   2500                   2850             350
4       1007                   1000                   1500             500
5       1008                   2500                   2750             250
6       1005                   3000                   4000            1000
7       1006                   2000                   3000            1000
8       1009                   3000                   4000            1000
enter field name to be updated PRESENT_MONTH_READING
enter new data 2900
any conditions ? type yes or no
yes
enter field to apply conditions ID_NUMBER
enter condition 1006
   ID_NUMBER  PREVIOUS_MONTH_READING  PRESENT_MONTH_READING  UNITS_CONSUMED
0       1001                   1000                   1500             500
1       1002                   1500                   2500            1000
2       1003                   2000                   2700             700
3       1004                   2500                   2850             350
4       1007                   1000                   1500             500
5       1008                   2500                   2750             250
6       1005                   3000                   4000            1000
7       1006                   2000                   2900            1000
8       1009                   3000                   4000            1000
```

2.Admin Portal :- Delete Module

```
Tables available
('current_consumption',)
('customer',)
('electricity_bill',)
enter table from which data is to be deleted electricity_bill
   id_number  UNITS_CONSUMED  ...  TOTAL_AMOUNT    DUE_DATE
0       1001             500  ...          4950  2022-01-14
1       1002            1000  ...          9900  2022-01-14
2       1003             200  ...          1980  2022-01-17
3       1004             350  ...          3465  2022-01-17
4       1005            1000  ...          9900  2022-01-21
5       1006            1000  ...          9900  2022-01-17
6       1007             500  ...          4950  2022-01-25
7       1008             250  ...          6000  2022-02-04
8       1009            1000  ...          9900  2022-02-03

[9 rows x 7 columns]
enter field in which condition is applied ID_NUMBER
enter condition 1008
   id_number  UNITS_CONSUMED  ...  TOTAL_AMOUNT    DUE_DATE
0       1001             500  ...          4950  2022-01-14
1       1002            1000  ...          9900  2022-01-14
2       1003             200  ...          1980  2022-01-17
3       1004             350  ...          3465  2022-01-17
4       1005            1000  ...          9900  2022-01-21
5       1006            1000  ...          9900  2022-01-17
6       1007             500  ...          4950  2022-01-25
7       1009            1000  ...          9900  2022-02-03

[8 rows x 7 columns]
```

2. Admin Portal :- Graphs





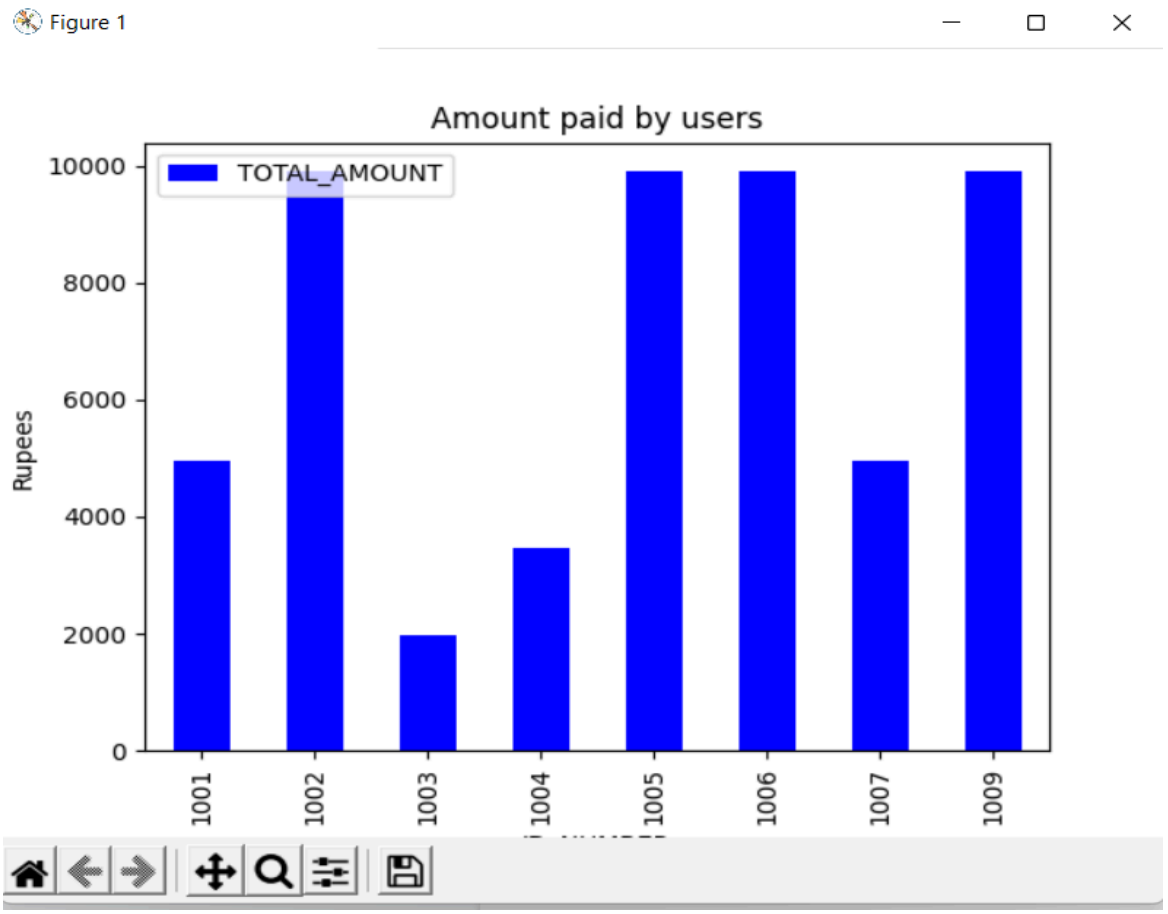
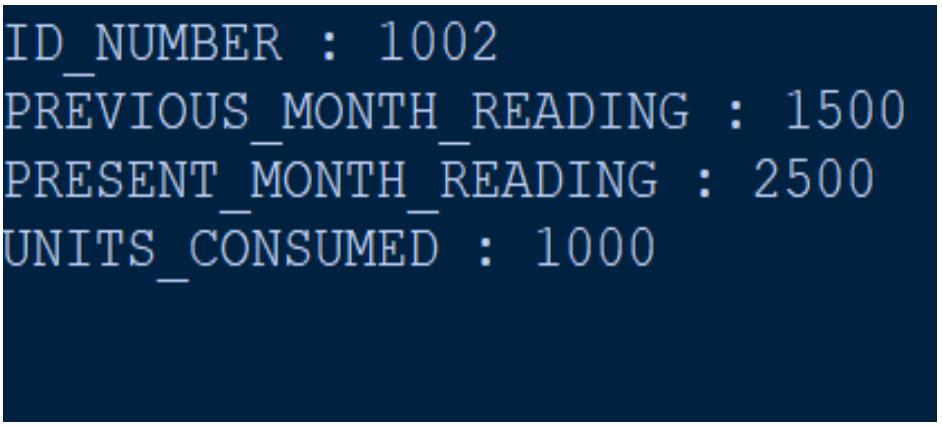


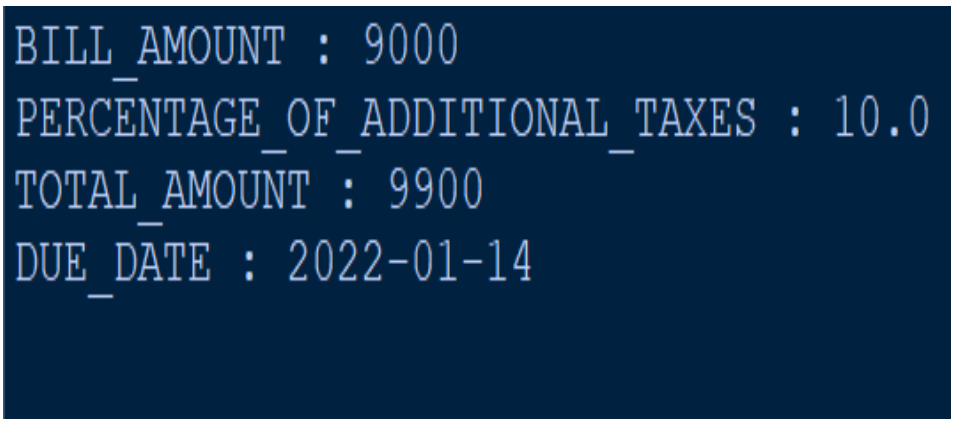
Figure 1
Amount paid by users
TOTAL_AMOUNT
Rupees
10000
8000
6000
4000
2000
0
1001
1002
1003
1004
1005
1006
1007
1009

3.User Portal

3.User Portal :- Consumption Data



3.User Portal :- Electricity bill Data



3.User Portal :- Generating Bill

```
**************************************************

        TNPYElectricityBoard


        ELECTRICITY BILL

==================================================
        ID_Number               1002
        Name                    SURYA
        Previous reading        1500 kWh
        Current reading         2500 kWh
==================================================
        Bill Amount             ₹9900
        Due date for payment    2022-01-14
==================================================

        Thank you, transaction was succesful


        Save Electricity for a better future!!

**************************************************
```

Limitations :-

- The Program does not provide any ways for transactions as it is no connected to any payment APIs
- Datasets containing reliable information on electricity billing could not be found , hence data had to be created .
- Only simple methods of calculation of electricity bills were used for the project using units consumed and rate per unit

References :-

- Class 12 IP Textbook - NCERT
- www.Stackoverflow.com
- www.pythontutorial.net
- www.tutorialspoint.com

Conclusion :-

The project titled Electricity Billing and Management System done by S K Rithesh Akash for the academic year 2021-2022 , has been completed and compiled , tested and executed successfully