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PROJECT REPORT ON

"ELECTRICITY BILLING SYSTEM"

Submitted By:

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Under The Guidance of:

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April, 2025

University Institute of Computing

Chandigarh University,

Mohali, Punjab

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CERTIFICATE

This is to certify that **Harsh (UID- 24MCA20045)**, have successfully completed the project title **"ELECTRICITY BILLING SYSTEM"** at University Institute of Computing under my supervision and guidance in the fulfilment of requirements of Second semester, Master of Computer Application. Of Chandigarh University, Mohali, Punjab.

Dr. Krishan Tuli	Dr. Sarabjeet Kaur
Head of the Department	Project Guide Supervisor
University Institute of Computing	University Institute of Computing

ACKNOWLEDGEMENT

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We shall remain grateful to **Dr. Manisha Malhotra**, Additional Director, University Institute of Technology, for providing us a strong academic atmosphere by enforcing strict discipline to do the project work with utmost concentration and dedication.

Finally, we must say that no height is ever achieved without some sacrifices made at some end and it is here where we owe our special debt to our parents and our friends for showing their generous love and care throughout the entire period.

Date: 15.04.2025

Place: Chandigarh University, Mohali, Punjab

Harsh (24MCA20045)

ELECTRICITY BILLING SYSTEM

Project Report

INTRODUCTION

The Electricity Billing System is a software-based application.

i. This project aims at serving the department of electricity by computerizing the billing system.
ii. It mainly focuses on the calculation of units consumed during the specified time and the money to be charged by the electricity offices.
iii. This computerized system will make the overall billing system easy, accessible, comfortable, and effective for consumers.

To design the billing system to be more service oriented and simple, the following features have been implemented in the project. The application has high speed of performance with accuracy and efficiency.

The software provides a facility for data sharing, it does not require any staff as in the conventional system. Once it is installed on the system only the meter readings are to be given by the admin where customers can view all details, it has the provision of security restrictions.

The electricity billing software calculates the units consumed by the customer and makes bills, it requires small storage for installation and functioning. There is provision for debugging if any problem is encountered in the system.

The system excludes the need to maintain paper electricity bill, administrator does not have to keep a manual track of the users, users can pay the amount without visiting the office. Thus, it saves human efforts and resources.

Problem Statement

The manual system is suffering from a series of drawbacks. Since whole of the bills is to be maintained with hands the process of keeping and maintaining the information is very tedious and lengthy for customers. It is a very time-consuming and laborious process because staff need to be visited the customers' place every month to give the bills and to receive the payments. For this reason, we have provided features Present system is partially automated (computerized), existing system is quite laborious as one must enter same information at different places.

Proposed Solution

- This project system excludes the need to maintain paper electricity bill as all the electricity bill records are managed electronically.
- Administrators don't have to keep a manual track of the users. The system automatically calculates the fine.
- Users don't have to visit the office for bill payment.
- There is no need for delivery boy for delivery bills to user's place.
- Thus, it saves human efforts and resources.

PROJECT OBJECTIVE

The objective of the *Electricity Billing System* project is to develop a computerized application that automates the electricity billing process. It aims to:

- Accurately calculate electricity usage based on meter readings.
- Generate bills efficiently and error-free.
- Eliminate the need for manual billing and paperwork.
- Enhance accessibility for consumers by allowing them to view and pay bills online.
- Improve the overall performance, reliability, and security of the billing process.
- Reduce human effort and administrative workload through automation.

TOOLS AND PLATFORM

a. Hardware Requirement:

This project has the following hardware requirements-

Processor	: Intel Pentium V or higher
RAM	: 16 GB
Printer	: Inkjet Matrix Printer
Monitor	: LCD Monitor
UPS	: 500kvps
Clock Speed	: 1.7 GHz or more
System Bus	: -64 bits

b. Software Requirement:

This project has the following software requirements-

Operating System: Windows 10,11.

Back-end: My SQL

Front-end: Java core/swing (NetBeans)

PROJECT STRUCTURE OVERVIEW

Project Type: Java Maven Java Application

Main Modules:

A. User Module

- Update Information
- View Information
- Pay Bill
- Bill Detail
- Generate Bill

B. Admin Module

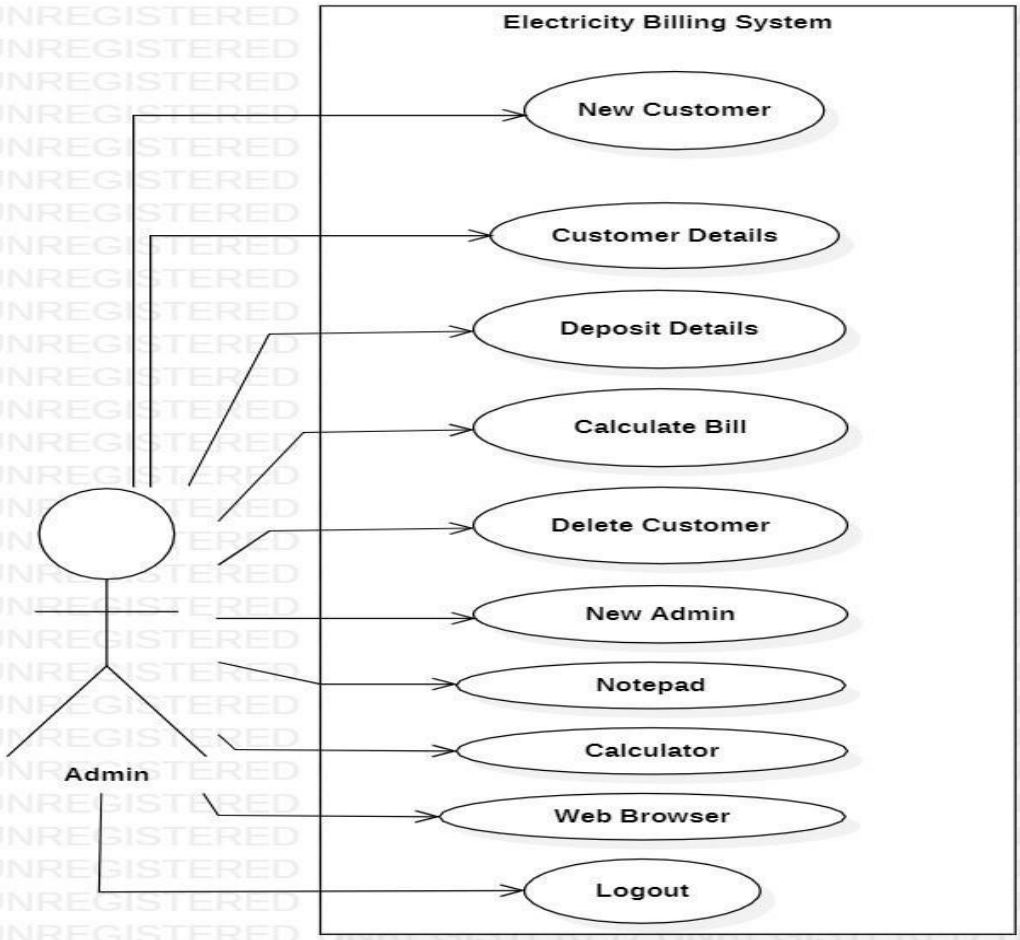
- New Customer
- Customer Details
- Deposit Detail
- Calculate Bill

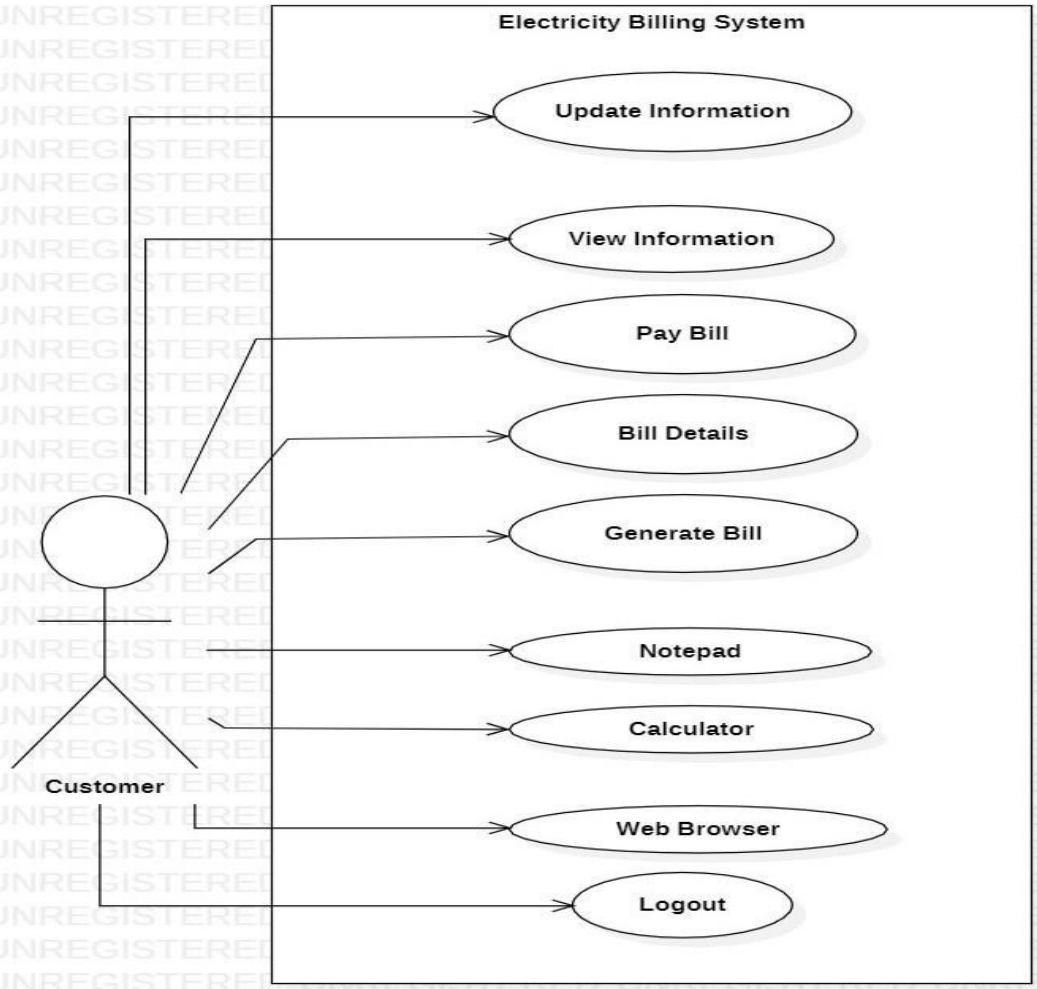
SYSTEM DESIGN AND MODELING

System design is an abstract representation of a system component and their relationship and which describe the aggregated functionally and performance of the system. It is also the plan or blueprint for how to obtain answer to the question being asked. The design specifies various type of approach.

Database design is one of the most important factors to keep in mind if you are concerned with application performance management. By designing your database to be efficient in each call it makes and to effectively create rows of data in the database, you can reduce the amount of CPU needed by the server to complete your request, thereby ensuring a faster application.

Use Case Diagrams:





IMPLEMENTATION OF OPERATIONS

- **Adding Customer:** Here admin can add new customers to the customer list who started using electricity bill system.
- **Searching Deposit Details:** Here admin can search according to meter number and month to view deposit details.
- **Viewing Details**: Here admin and user can view customer details and about details.
- **Adding Tax:** Here admin can add tax details.
- **Updating Customer:** Here customer can update his/her details by using meter_no of the customer.
- **Delete Customer:** Here admin can delete details based on meter number.

Implementation of SQL statements

Insert statement:

- The INSERT INTO statement is used to insert new records in a table.
- The INSERT INTO syntax would be as follows: INSERT INTO table_name VALUES (value1, value2, value3, ...).
- The following SQL statement insert's a new record in the "customer" table: Insert into customer VALUES ("harsh","12345", Bangalore", "Karnataka", "harsh@gmail.com", "9876543333").

Update statement:

- An SQL UPDATE statement changes the data of one or more records in a table. Either all the rows can be updated, or a subset may be chosen using a condition.
- The UPDATE syntax would be as follows: UPDATE table_name SET column_name =value, column_name=value... [WHERE condition].

The following SQL statement update's a new record in the "customer" table: UPDATE TABLE customer SET email= su@gmail.com WHERE meter_no ="12345".

Delete statement:

- The DELETE statement is used to delete existing records in a table.
- The DELETE syntax would be as follows: DELETE FROM table_name WHERE condition.

The following SQL statement delete's a record in the "customer" table: delete from customer where meter_no=12345

Create statement:

- The CREATE TABLE Statement is used to create tables to store data. Integrity Constraints like primary key, unique key, foreign key can be defined for the columns while creating the table.

- The syntax would be as follows: CREATETABLE table_name (column1datatype, column2datatype, column3 datatype, column datatype, PRIMARY KEY (one or more columns)).

  - The following SQL statement creates a table "customer" table: create table customer (name varchar (30), meter_no varchar (20) primary key, address varchar (50), city varchar (20), state varchar (30), email varchar (30), phone varchar (30));
  - The following SQL statement creates a table "login" table: create table "customer" table: create table customer (name varchar (30), meter_no. varchar(20), email varchar(20), email varchar (30), phone varchar (30));
  - The following SQL statement creates a table "tax" table: create table tax (cost per

unit(20) primary key, meter rent int(20), service_charge int(20), service_tax int(20), swach_bharat_cess int (20), gst int (20));

- The following SQL statement creates a table "bill" table: create table bill (meter_no varchar (20), foreign key(meter_no) references customer(meter_no) on delete cascade, month varchar (20), units int (20), total_bill int (20), status varchar (40));
- The following SQL statement creates a table "meter_info" table: create table meter_info (meter_no. varchar(30), foreignkey(meter_no) references customer(meter_no) on delete cascade, meter_location varchar (10), meter_type varchar (15), phase_code int (5), bill_type varchar (10), days int(5));

DISCUSSION AND SNAPSHOTS

TABLES:

The table given below is a snapshot of backend view of the localhost and the structures of the tables present in Electricity Billing System. The tables present are login, customer, tax, bill, meter_info.

- ✓ The login is used to store the details of login's admin and customer with meter_no.
- ✓ The customer is used to store details of the customer.
- ✓ The tax is used to store tax values.
- ✓ The rent is used to store rent values.
- ✓ The bill is used to store details of the bill of meter.
- ✓ The meter_info is used to store information of meter placed.

Tables_in_ebs
bill
customer
login
meter_info
tax

List of tables

Login Table:

meter_no	username	name	password	user
	harshjangid	harsh	12345	BLOB
389431	himanshu123	himanshu	12345	BLOB
605083	preety123	preety nayak	12345	BLOB
955812		mahesh		BLOB

Login table description

Customer Table:

name	meter_no	address	city	state	email	phone
rahul	912246	dharuhera	dharuhera	haryana	rahul@gmail.com	9875246130
varun	786060	Rohtak	Rohtak	haryana	varun@gmail.com	9685741235
himanshu	389431	dharuhera	rohtak	haryana	himanshu@gmail.com	9874587256
preety nayak	605083	Ludhiana	ludhiana	punjab	preety@gmail.com	9587465873
mahesh	955812	kharar	punjab	punjab	mahesh@gmail.com	5687412354

Customer table description

Tax Table:

cost_per_unit	meter_rent	service_charge	service_tax	swacch_bharat_cess	fixed_tax
9	47	22	57	6	18

Tax table description

Bill Table:

meter_no	month	units	totalbill	status
912246	January	50	600	Paid
786060	January	500	4650	Not Paid
389431	April	500	4650	Paid
912246	April	500	4650	Paid
605083	April	300	2850	Paid
786060	May	100	1050	Not Paid
389431	March	200	1950	Paid
389431	January	400	3750	Not Paid
955812	January	200	1950	Not Paid

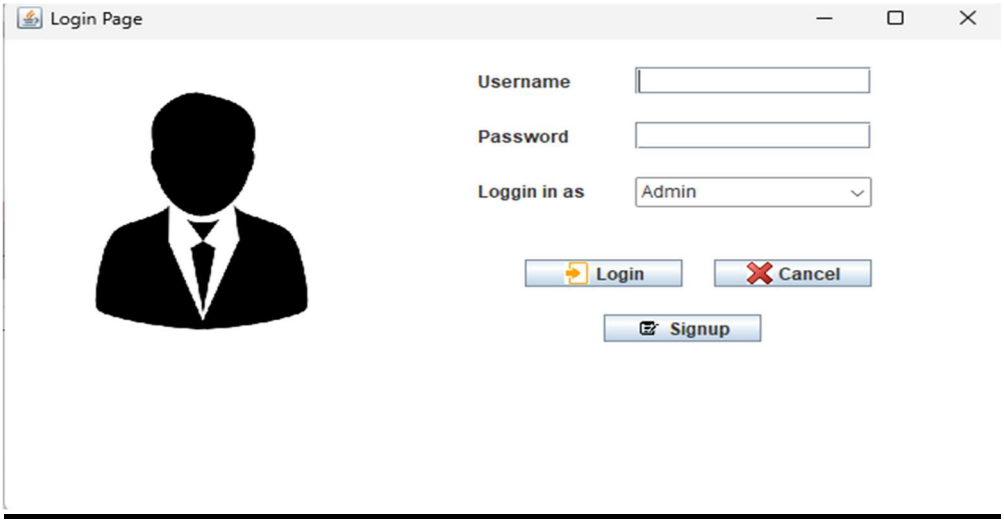
Bill table description

Meter Info Table:

meter_no	meter_location	meter_type	phase_code	bill_type	days
786060	Outside	Electric Meter	044	Normal	30
389431	Inside	Solar Meter	055	Normal	30
605083	Outside	Solar Meter	066	Normal	30
955812	Outside	Electric Meter	011	Normal	30

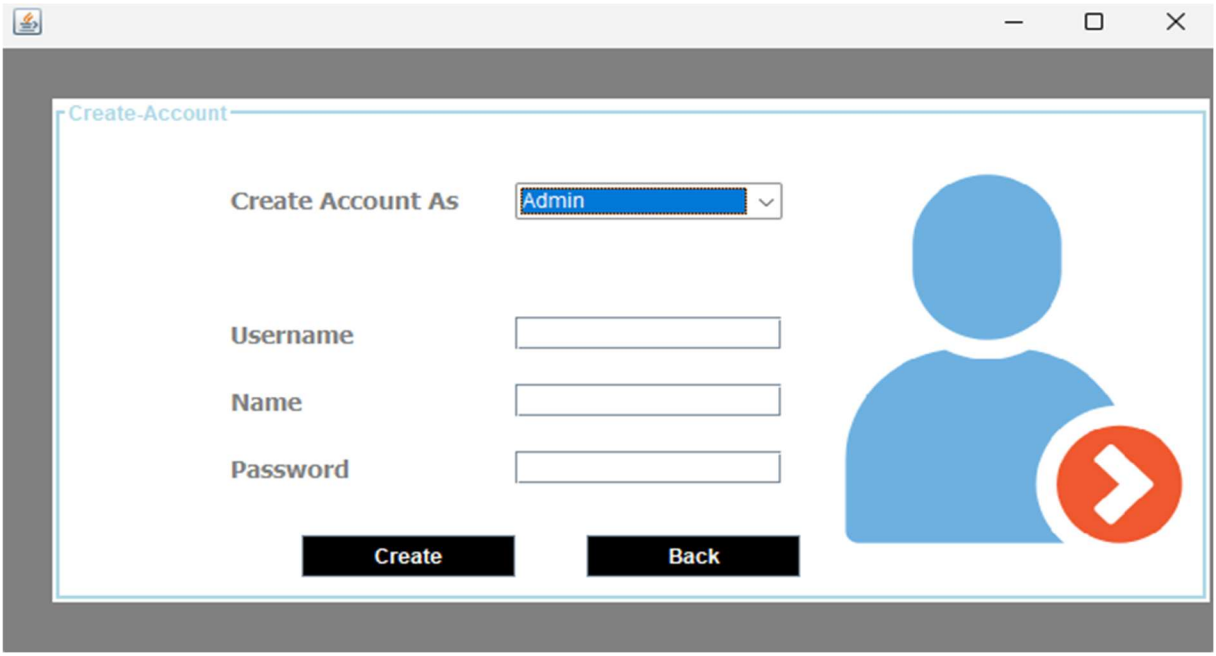
Meter info table description

SNAPSHOTS



Login Screen

Here Customer and Admin can login to their respective accounts. The dropdown menu allows to choose whether to login as an admin or as a customer.



Sign Up Screen

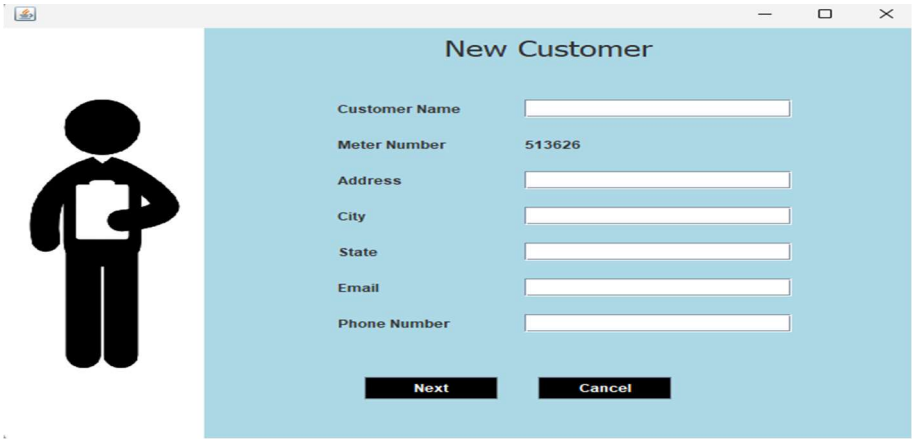
Here New customers will signup to access their accounts.

Users must enter the username, name, password.

Every user must enter their unique Meter Number to complete their signup process.

Admin's Home Screen

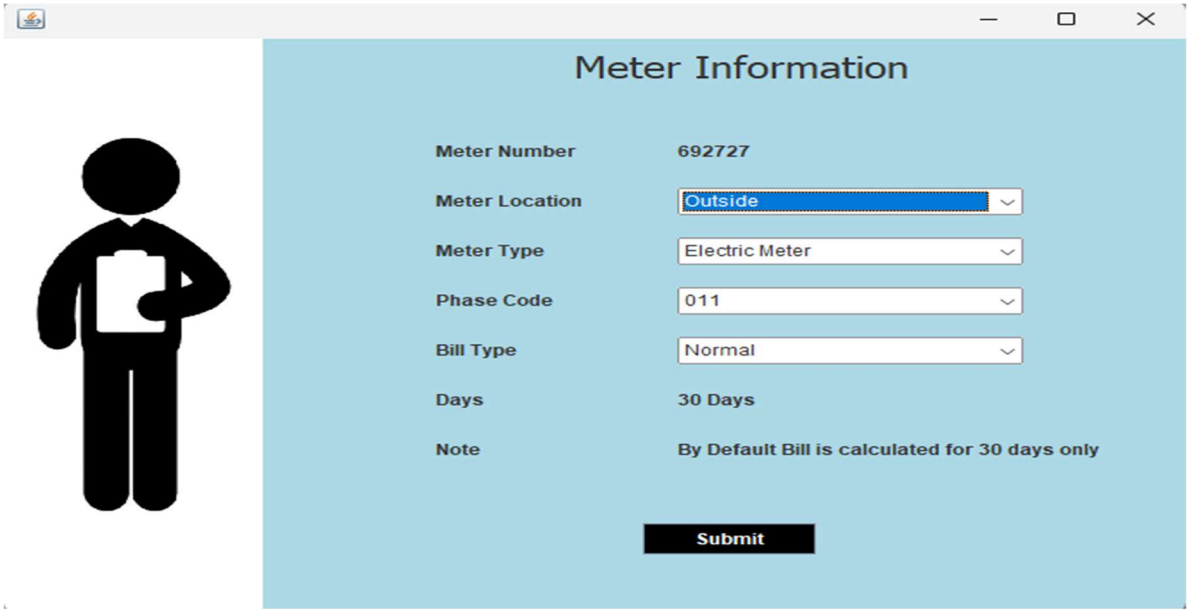
Admin lands on this page after successful login.



New Customer Screen

Here admin registers new users.

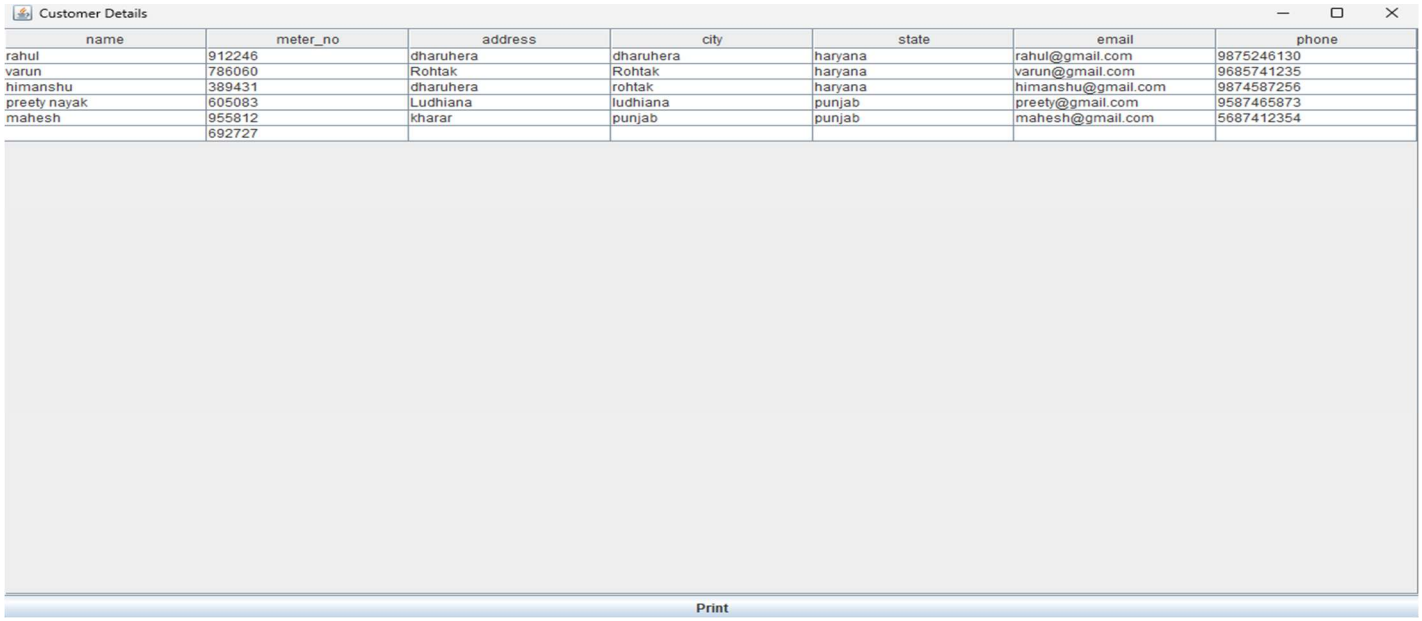
Admin enters Customer's Name, Address, City, State, Email and Phone Number.



Meter info Screen

Here Admin selects the location and type of meter installed at the customers end.

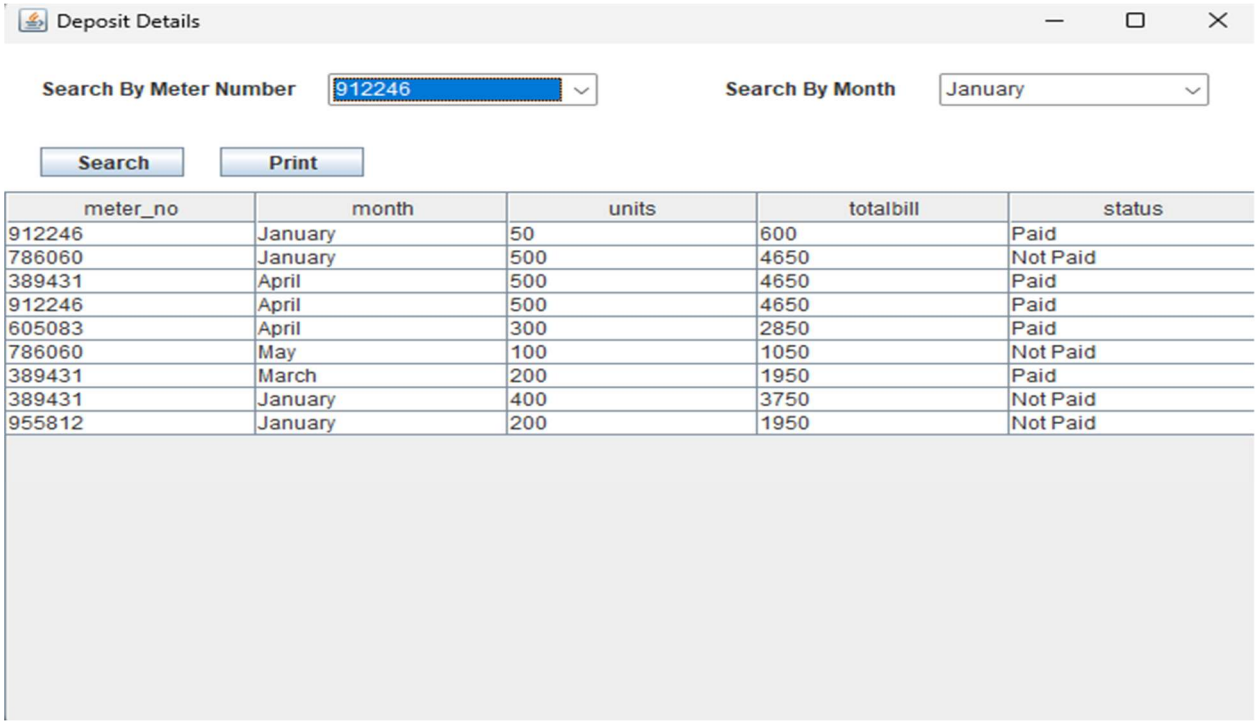
Admin also selects the phase code and Bill type i.e. Residential or Commercial/ Industrial.



name	meter_no	address	city	state	email	phone
rahul	912246	dharuhera	dharuhera	haryana	rahul@gmail.com	9875246130
varun	786060	Rohtak	Rohtak	haryana	varun@gmail.com	9685741235
himanshu	389431	dharuhera	rohtak	haryana	himanshu@gmail.com	9874587256
preety nayak	605083	Ludhiana	ludhiana	punjab	preety@gmail.com	9587465873
mahesh	955812	kharar	punjab	punjab	mahesh@gmail.com	5687412354
	692727					

Customer Details Screen

Here Admins can see the details of all registered customers. Admin can print these details in pdf format if they wish.



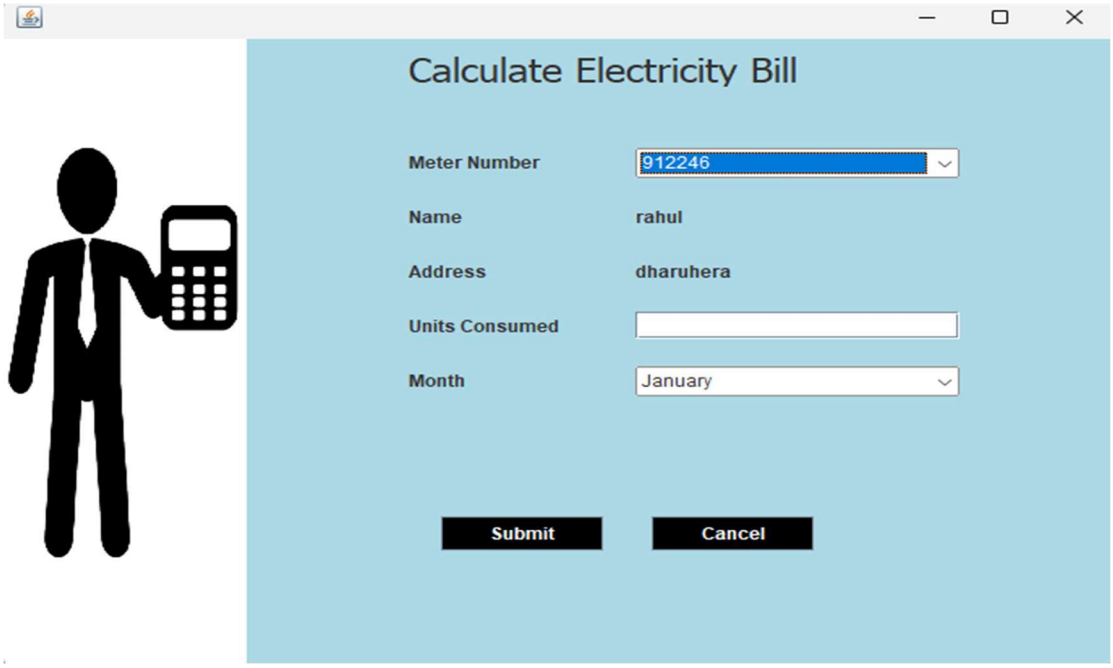
meter_no	month	units	totalbill	status
912246	January	50	600	Paid
786060	January	500	4650	Not Paid
389431	April	500	4650	Paid
912246	April	500	4650	Paid
605083	April	300	2850	Paid
786060	May	100	1050	Not Paid
389431	March	200	1950	Paid
389431	January	400	3750	Not Paid
955812	January	200	1950	Not Paid

Deposit Details Screen

Here Admin can check the status of whether customers have paid their bills or not.

His list can be sorted according to individual user's meter number or according to the month.

Admin can print these details in pdf format if they wish.

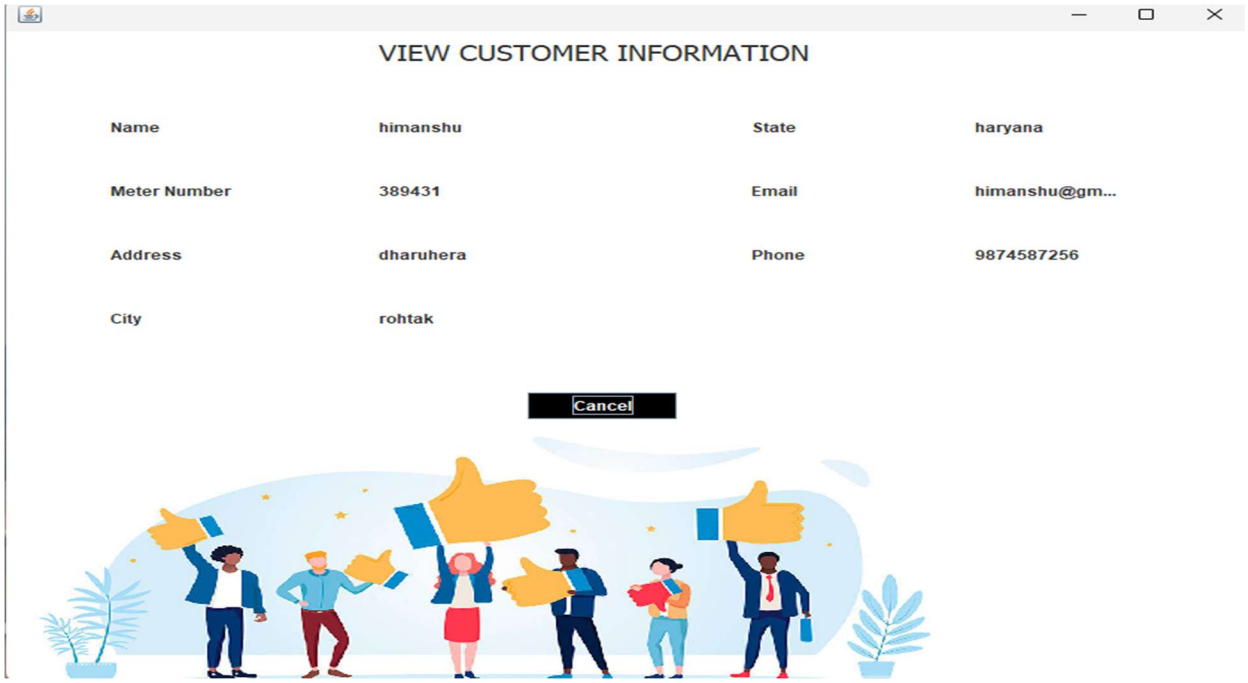


Calculate Bill Screen

Here admin calculate the bill of users by selecting appropriate meter number, units consumed and month.

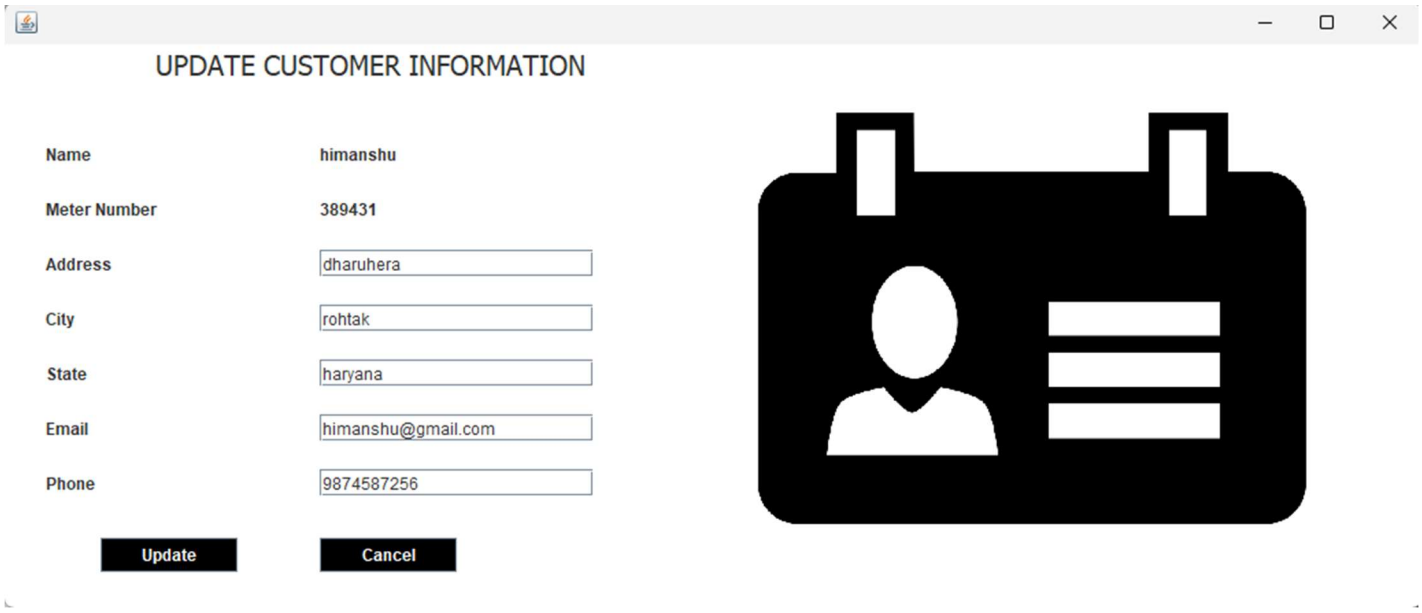
Customer's Home Screen

Customer lands on this page after successful login.



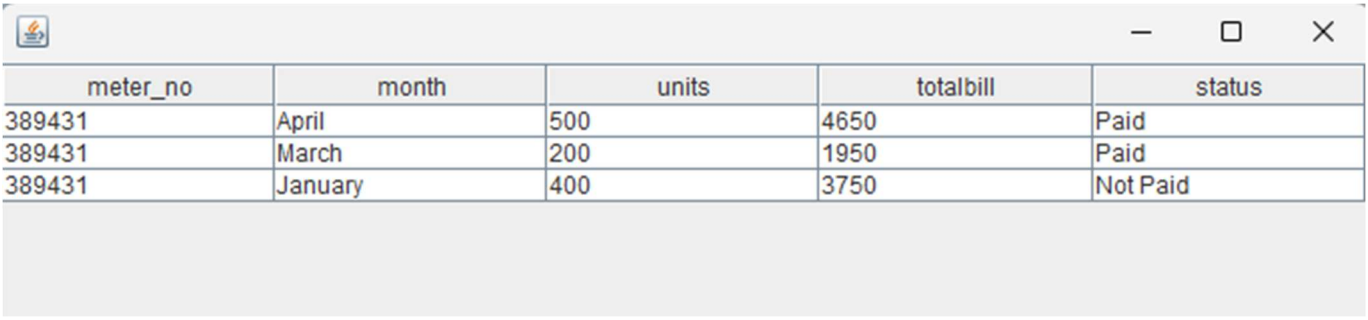
View Customer Info Screen

Here customer can see their entered information such as their name, meter number, address, city, state, email id and phone number.



Update Customer Info Screen

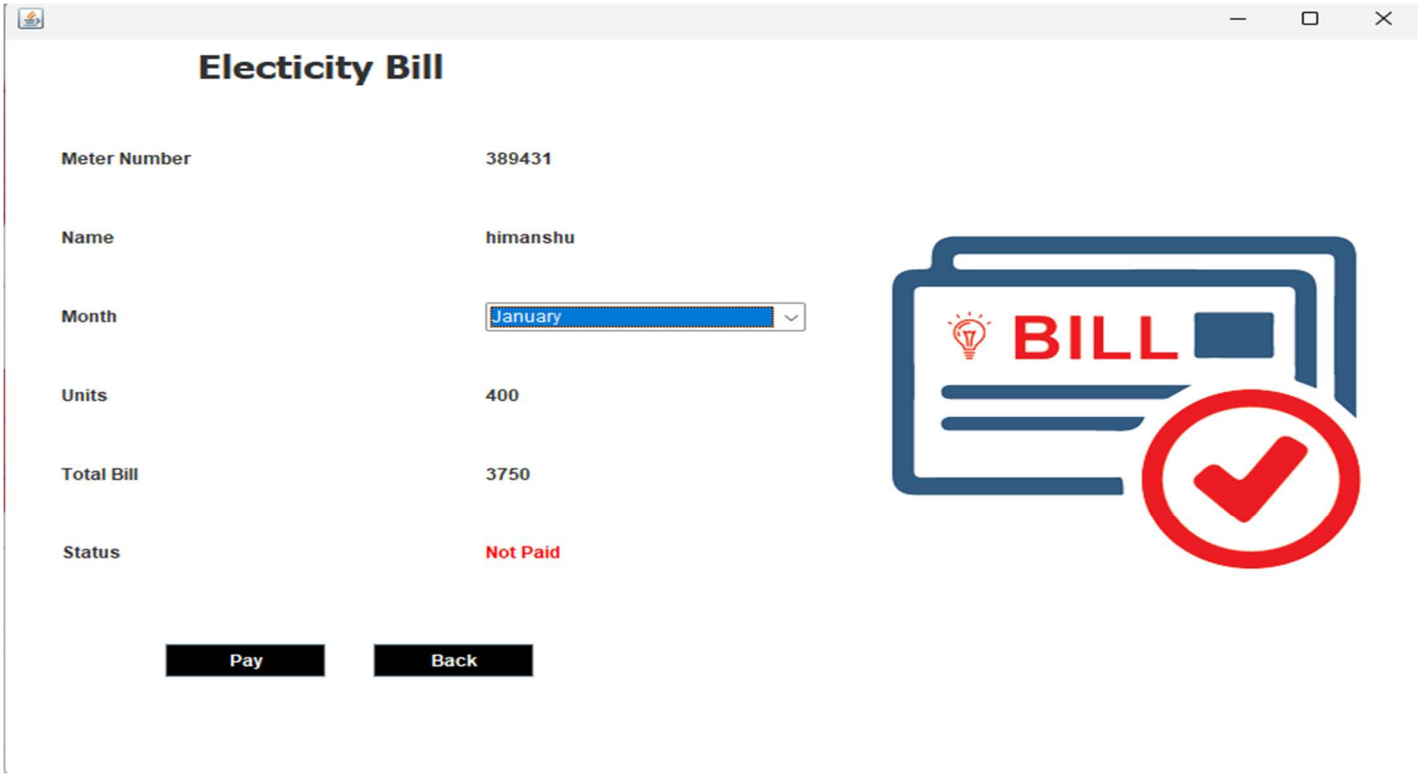
Here customers can update their entered information if any correction is needed such as their address, city, state, email address and phone number.



meter_no	month	units	totalbill	status
389431	April	500	4650	Paid
389431	March	200	1950	Paid
389431	January	400	3750	Not Paid

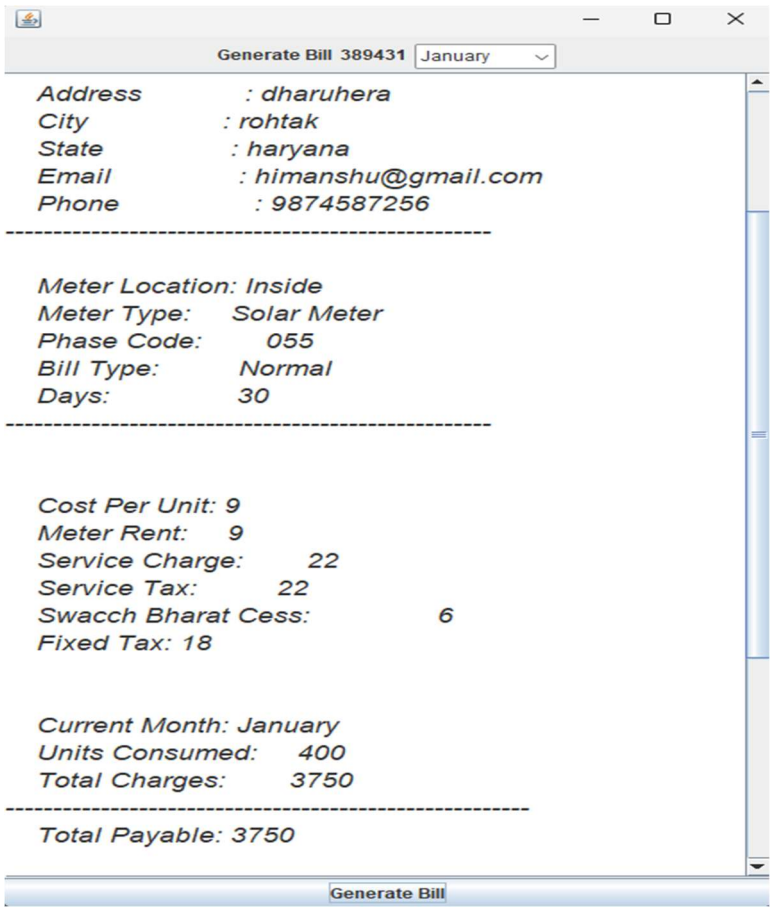
Bill Details Screen for Customers

Here every customer can check the status of their bills, whether they have paid the bills or not.



Pay Bill Screen

Here customers pay their bills by selecting the appropriate month.



Generate/Show Bill Screen

Here customers can generate / see their bill in a proper breakdown of entire amount.

Notepad Screen

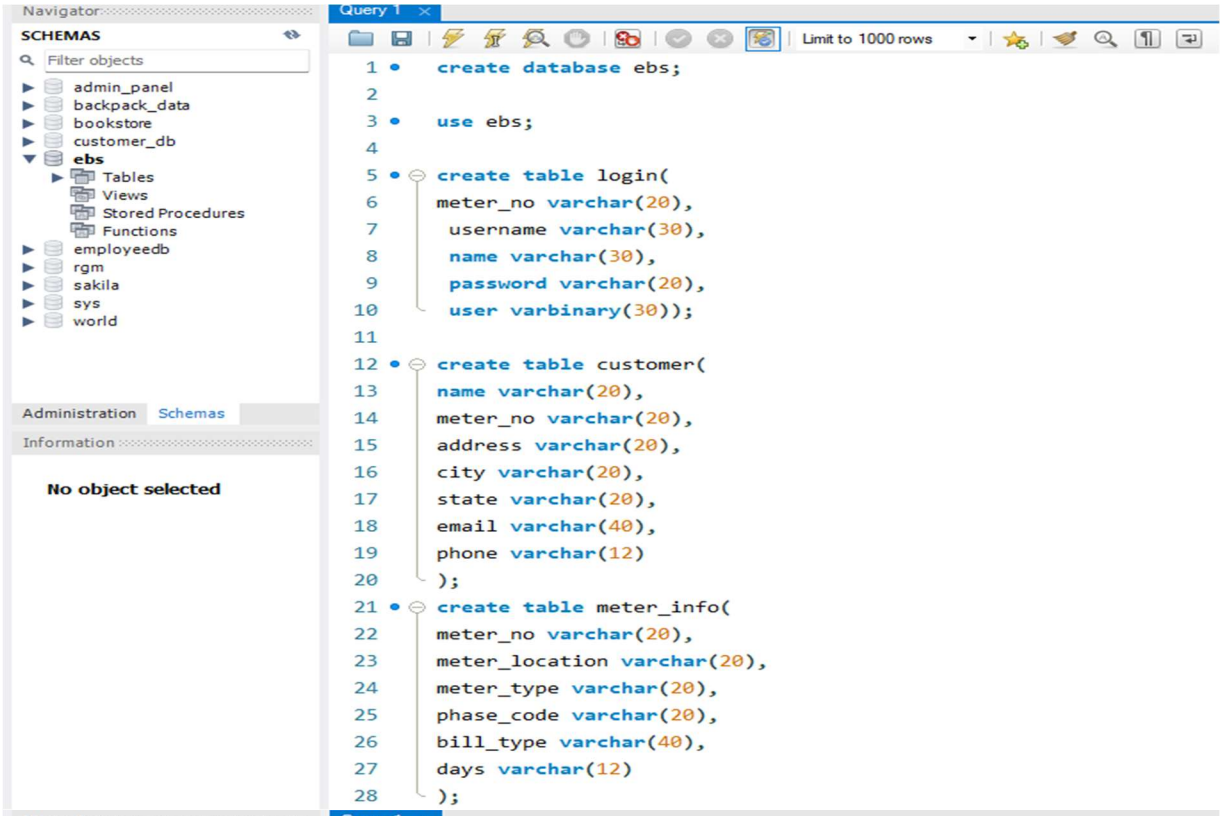
When user clicks on notepad option under utilities section, its launches the notepad.
This feature is available to both Admins and Customers.

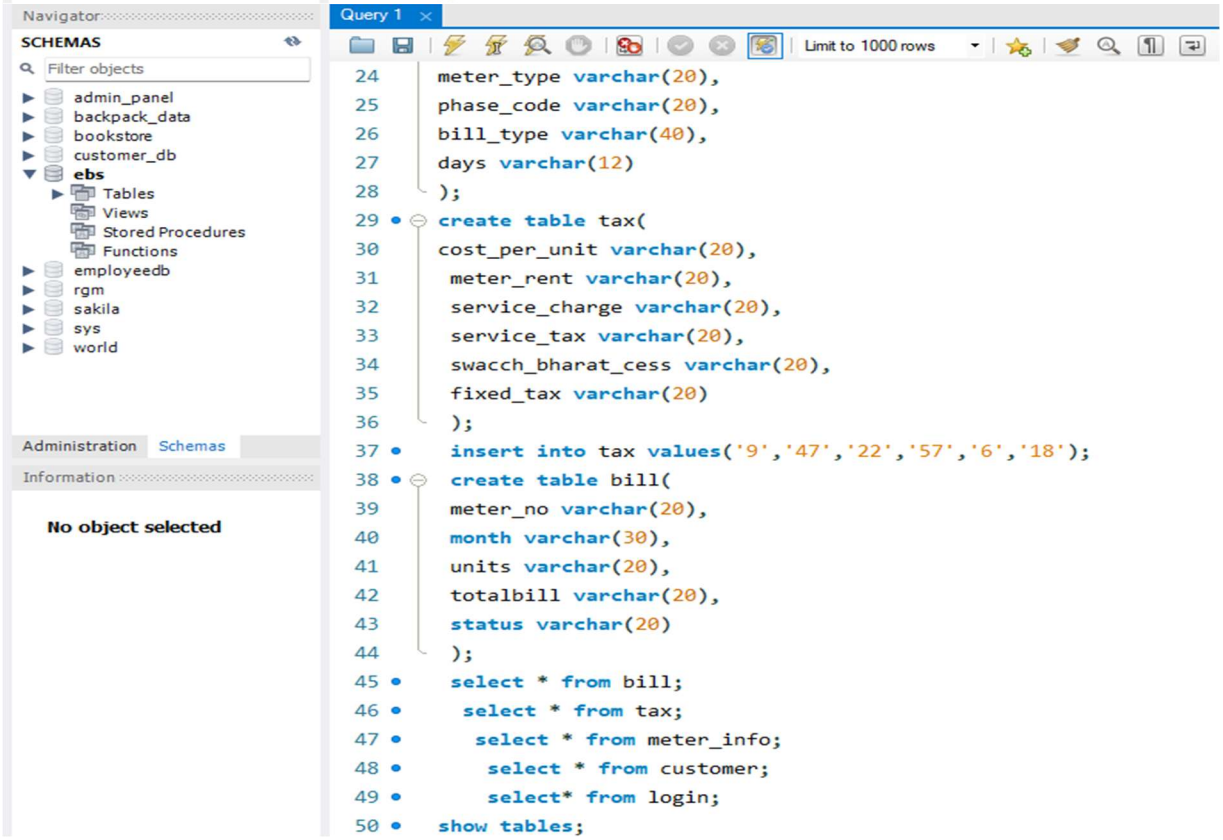
Calculator Screen

When user clicks on calculator option under utilities section, its launches the calculator.

This feature is available to both Admins and Customers.

DATABASE SNAPSHOTS





FUTURE SCOPE AND LIMITATIONS

SOFTWARE SCOPE:

• **Extensibility**: This software is extendable in ways that its original developers may not expect. The following principles enhances extensibility like hide data structure, avoid traversing multiple Links or methods avoid case statements on object type and distinguish public and private operations.

• **Reusability**: Reusability is possible as and when require in this application. We can update it next version. Reusable software reduces design, coding and testing cost by amortizing effort Over several designs. Reducing the amount of code also simplifies understanding, which increases the likelihood that the code is correct. We follow up both types of reusability:
Sharing of newly written code within a project and reuse of previously written code on new projects.
• **Understand ability:** A method is understandable if someone other than the creator of the method can understand the code (as well as the creator after a time lapse). We use the method, which small and coherent, and helps to accomplish this.
• **Cost-effectiveness:** Its cost is below the budget and make within given time period. It is desirable to aim for a system with a minimum cost subject to the condition that it must satisfy the entire requirement.
The scope of this document is to put down the requirements, clearly identifying the information needed by the user, the source of the information and outputs expected from the system.

LIMITATIONS:

This application cannot be accessed remotely.

- **This application requires knowledgeable people to use this application.**
- **This application does not have journals.**

CONCLUSION

After all the hard work is done for the electricity bill management system is here. It is a software which helps the user to work with the billing cycles, paying bills, managing different DETAILS under which they are working etc.

This software reduces the amount of manual data entry and gives greater efficiency. The User Interface of it is very friendly and can be easily used by anyone.

It also decreases the amount of time taken to write details and other modules.

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