**Project Team 12 - Electricity Billing System**

Team Members:

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**Context:**

The Electricity Billing System will give a single platform to customers through which they can pay and view their bills of any service provider listed in the system

**Objective:**

The main objective of the project is to develop a database system that will help a customer to register under a service provider, view and pay electricity bill. Apart from this a customer can also change service provider, upgrade to use solar net metering, view historic payments, peak and off peak hours and billing cycle.

**Scope:**

1. **Customer Registration**: Customer register under the system under a specific service provider for smart meter or solar net meter.
2. **View and Pay bills**:
3. Customer can pay and view historic bills.
4. Customer can check the unit consumption of the selected period.
5. Customer can view the off peak and peak hours for the area.
6. **Stop or Change the connection**: Customer can switch to other service provider and customer can deregister from the system.
7. **Admin can add Service Provider/ Customer:** Admin can add any new service provider or new customer.
8. **Admin modify the tariff rates:**

a. Admin can modify the tariff rates of any service provider.

b. Admin can modify the peak and off peak hours corresponding to any service provider in any area.

## **ENVIRONMENT SETUP:**

We are using MySQL Database management System. For making connection to MySQL server we are using mysql-workbench-community-8.0.12-winx64 client. For user interface and database connectivity we are using javax.swing api and jdbc.odbc 7.0 version. We will use Java 8 for our project.

## **HIGH LEVEL REQUIREMENTS:**

**Initial User Roles:**

|  |  |
| --- | --- |
| **Role** | **Description** |
| Customer | New customer can register under a service provider for the electricity billing system. Existing customer can view and pay electricity bills, change service provider, can see unit consumption, can see peak and off peak hours for any specific area. |
| Admin | System admin who can modify the tariff rate, Register/Deregister a customer, Register/Deregister a Service Provider. |

### **Initial user story descriptions:**

|  |  |
| --- | --- |
| **Story ID** | **Story Description** |
| US1 | As a customer I want to register under a service provider. |
| US2 | As a registered customer I want to view bill of any selected month. |
| US3 | As a registered customer I want to pay the bills. |
| US4 | As a customer I want to view the tariff rates of any area offered by various service providers already listed. |
| US5 | As a customer I want to change a service provider. |
| US6 | As a customer I want to deregister. |
| US7 | As an admin I want to change the tariff rates of service provider. |
| US8 | As an admin I want to add a customer in the electricity billing system. |
| US9 | As an admin I want to remove a customer from the electricity billing system. |
| US10 | As an admin I want to add a service provider. |

**High level conceptual design:**

**Entities:**

Customer

Admin

Service\_Provider

Electricity\_Bill

Tariff\_Details

**Relationships:**

Customer has connection under a single Service\_Provider.

Customer pays Electricity\_Bill.

Customer changes a Service\_Provider.

Admin updates Tariff\_Details.

Service\_Provider maintains area specific Tariff\_Details.

# **Sprint 1**

## ***REQUIREMENTS:***

|  |  |
| --- | --- |
| **Story ID** | **Story Description** |
| US1 | As a customer I want to register under a service provider. |
| US2 | As a customer I want to login into the system. |
| US3 | As a registered customer I want to view all electricity bills. |
| US4 | As an admin I want to view all registered customers. |
| US5 | As a customer I want to view number of units consumed. |
| US6 | As a registered customer I want to view bill of any selected month. |
| US7 | As a registered customer I want to pay the bills. |
| US8 | As a customer I want to view the tariff rates of any area offered by various service providers already listed. |
| US9 | As a customer I want to change a service provider. |
| US10 | As a customer I want to deregister. |
| US11 | As an admin I want to change the tariff rates of service provider. |
| US12 | As an admin I want to add a customer in the electricity billing system. |
| US13 | As an admin I want to remove a customer from the electricity billing system. |
| US14 | As an admin I want to add a service provider. |

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## ***CONCEPTUAL DESIGN***

Entity:**Customer**

Attributes:

customer\_id

login\_email\_id

login\_password

ssn

name[composite]

first\_name

last\_name

address[composite]

address\_line\_1

address\_line\_2

city

state

zipcode

phone\_number[multivalued]

service\_provider\_name

register\_date

meter\_type

customer\_id- this customer id is generated whenever a user registers under a service provider.

Entity: **Electricity\_Billing\_Details**

Attributes:

electricity\_bill\_id

bill\_generated\_date

bill\_due\_date

billing\_cycle\_start\_date

number\_of\_billing\_days

Payment\_amount

amount\_due

last\_meter\_reading

present\_meter\_reading

Entity: **Admin**

Attributes:

login\_id[Email id of Admin]

login\_password

name[composite]

first\_name

last\_name

address[composite]

address\_line\_1

address\_line\_2

city

state

zipcode

phone\_no[multivalued]

Relationship: **Customer** has **Electricity\_Billing\_Details**

Cardinality: One to Many

Participation:

Customer has partial participation

Electricity\_Billing\_Details have total participation

***LOGICAL DESIGN***

Table: **Customer**

Columns:

customer\_id

login\_email\_id

login\_password

ssn

first\_name

last\_name

address\_line\_1

address\_line\_2

city

country

zipcode

phone\_number\_primary

phone\_number\_secondary

service\_provider\_name

register\_date

meter\_type

Table: **Electricity\_Billing\_Details**

Columns:

electricity\_bill\_id

customer\_id [foreign key;references customer\_id of Customer table]

bill\_generated\_date

bill\_due\_date

billing\_cycle\_start\_date

number\_of\_billing\_days

payment\_amount

amount\_due

last\_meter\_reading

present\_meter\_reading

Note:

last\_meter\_reading and present\_meter\_reading are in kWH

Here we have foreign key approach for the Customer to Electricity\_Billing\_Details table as we have One to Many Relationship.

Table: **Admin**

Columns:

login\_id[Email id of Admin]

login\_password

first\_name

last\_name

address\_line\_1

address\_line\_2

city

state

zipcode

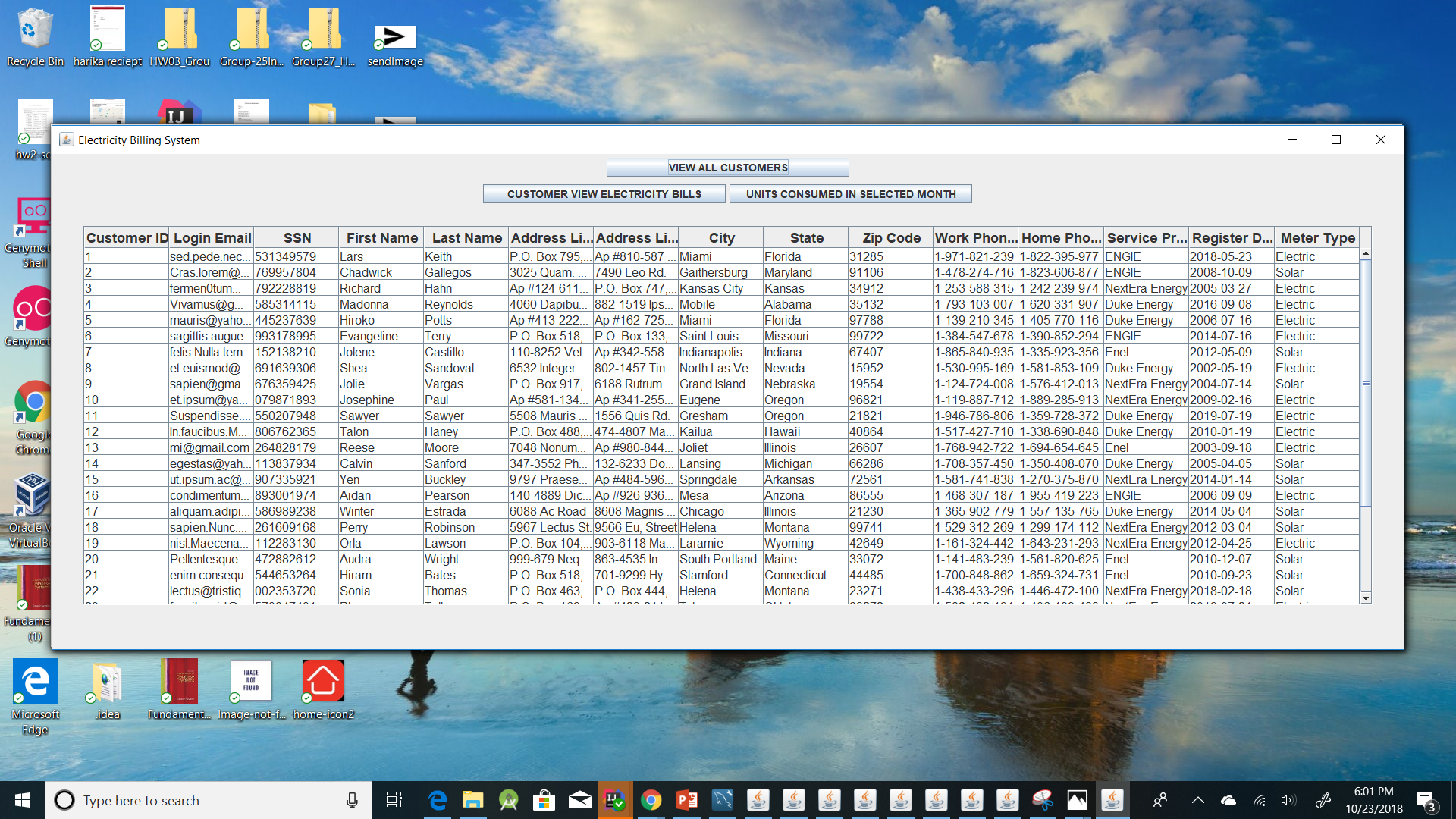
phone\_no\_primary

phone\_no\_secondary

**Queries:**

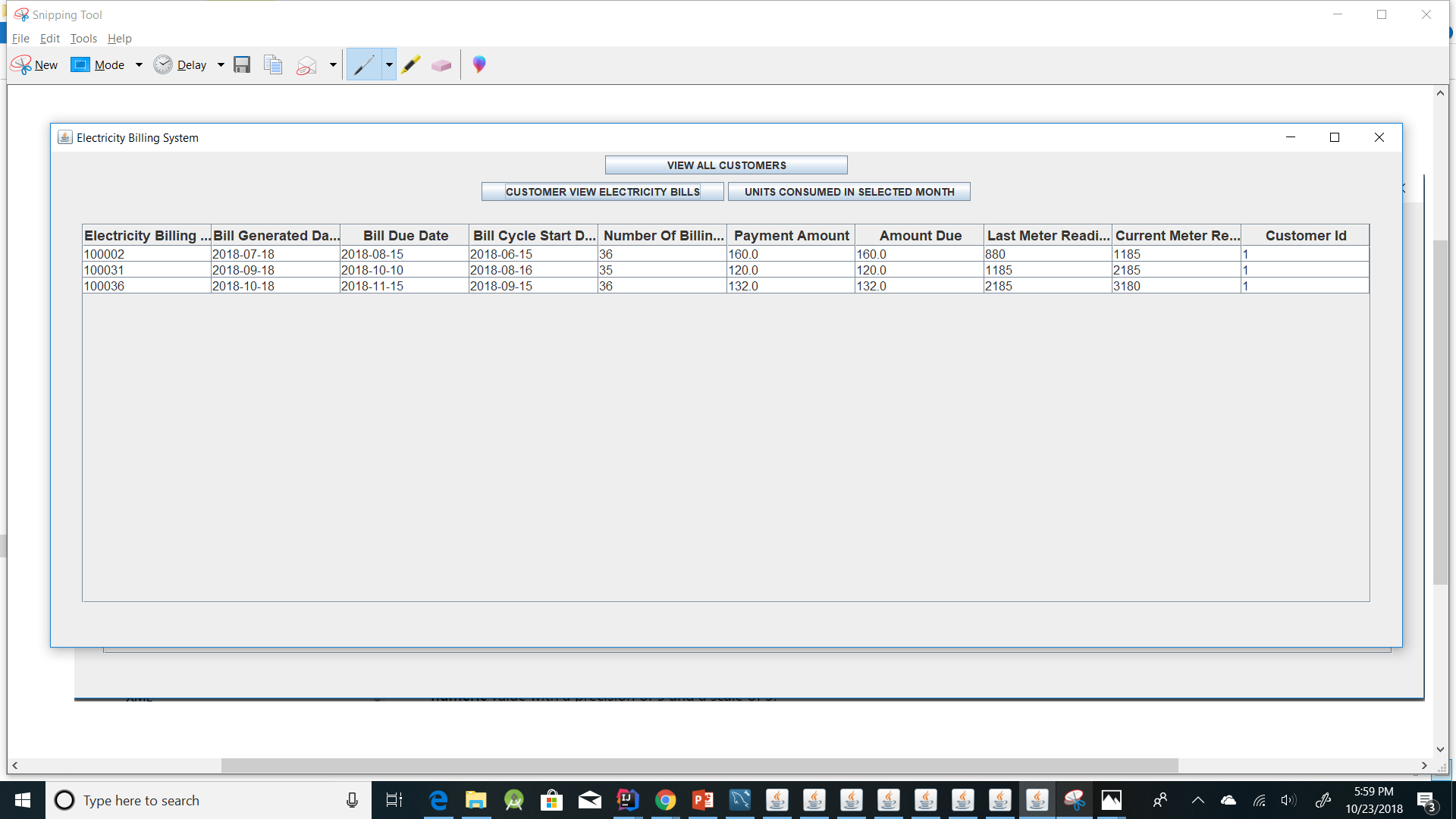
1. Customer Details

**SELECT \* FROM Customer;**



1. Electricity Billing Details of any customer, here for showing we have taken customer having customer\_id 1.

**SELECT \* FROM Electricity\_Billing\_Details where customer\_id=1;**



3. Customer view number of units consumed in any selected month. Here we have taken customer having customer\_id 1.

**SELECT Electricity\_Billing\_Details.customer\_id, Electricity\_Billing\_Details.electricity\_bill\_id, Electricity\_Billing\_Details.billing\_cycle\_start\_date, last\_meter\_reading, Electricity\_Billing\_Details.present\_meter\_reading, Electricity\_Billing\_Details.number\_of\_billing\_days, (Electricity\_Billing\_Details.present\_meter\_reading-Electricity\_Billing\_Details.last\_meter\_reading) as Units\_Consumed FROM Electricity\_Billing\_Details where customer\_id=1 AND MONTH(billing\_cycle\_start\_date)=9 AND YEAR(billing\_cycle\_start\_date)=2018;**

