



Inspiring Excellence

CSE370 : Database Systems

Project Report

Project Title : Electricity Bill Management System

Group No : <u>09</u> , CSE370 Lab Section : <u>13</u> , Summer 2024		
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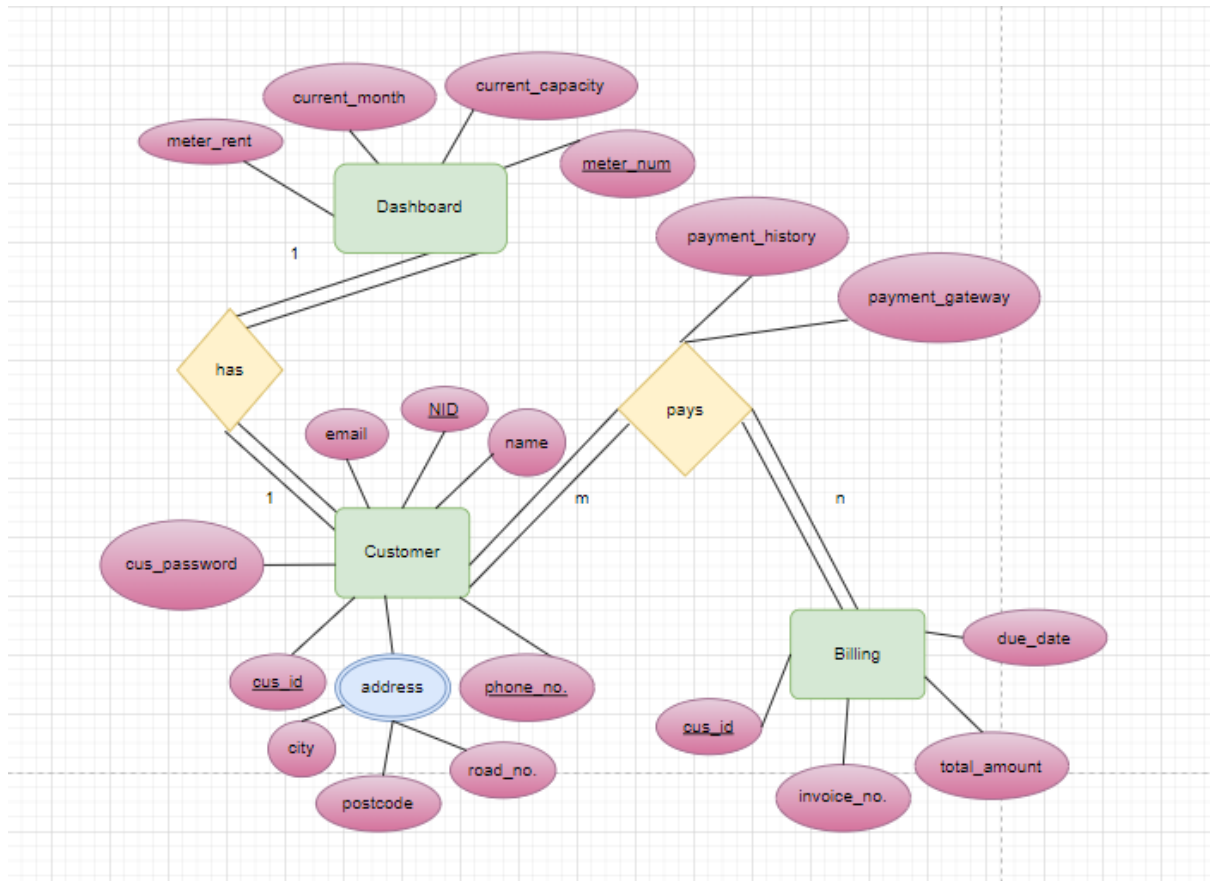
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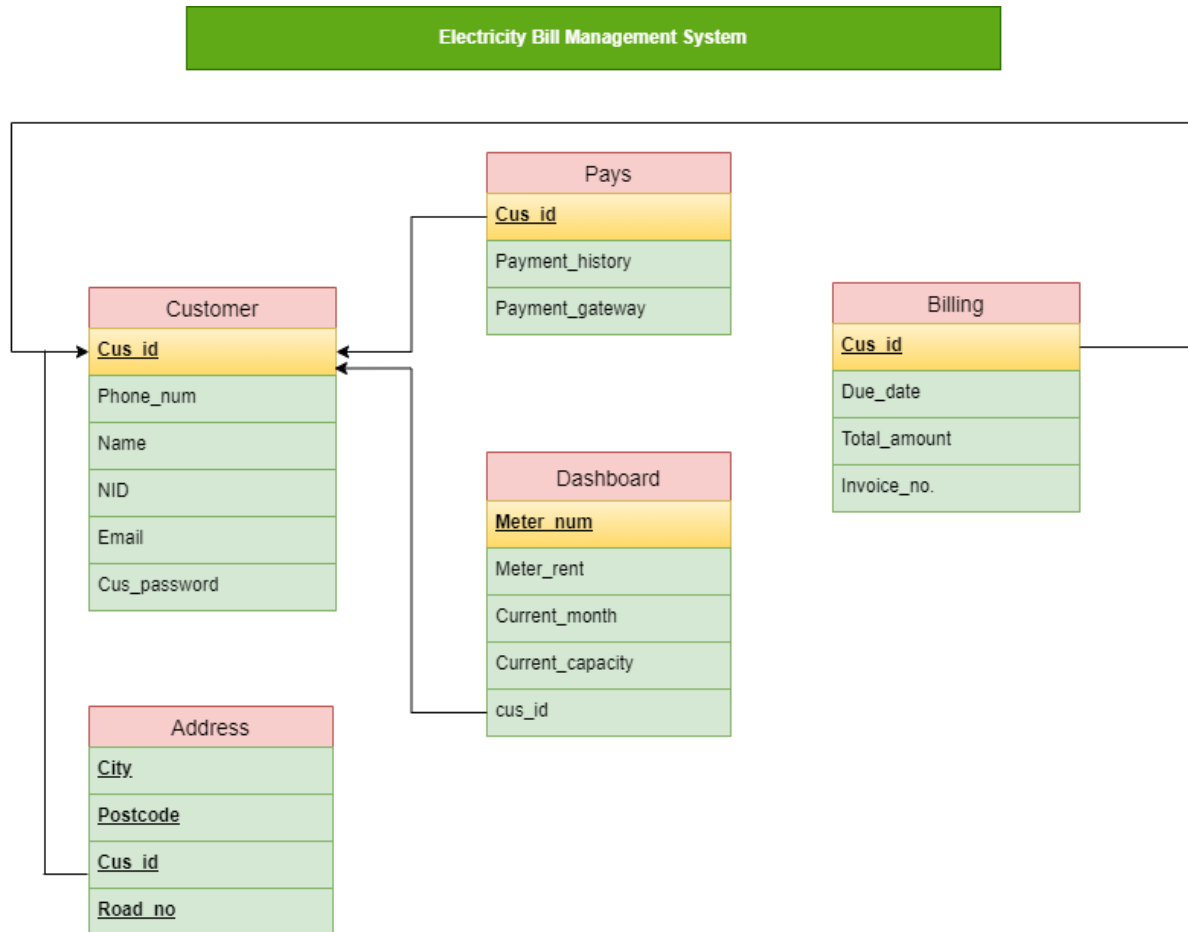
Introduction

Electricity Bill Management System is a web-based project aimed at automating and simplifying the electricity billing process. It offers an efficient platform for utility providers and customers to handle various billing operations, including generating, tracking, and paying electricity bills. The system provides features like automated bill generation based on electricity consumption, payment reminders, and secure online transactions. Additionally, it helps reduce manual errors, improves user convenience, and enhances the overall efficiency of the billing process. This project is ideal for modernizing energy utility management and improving customer satisfaction through seamless digital solutions.

ER Diagram



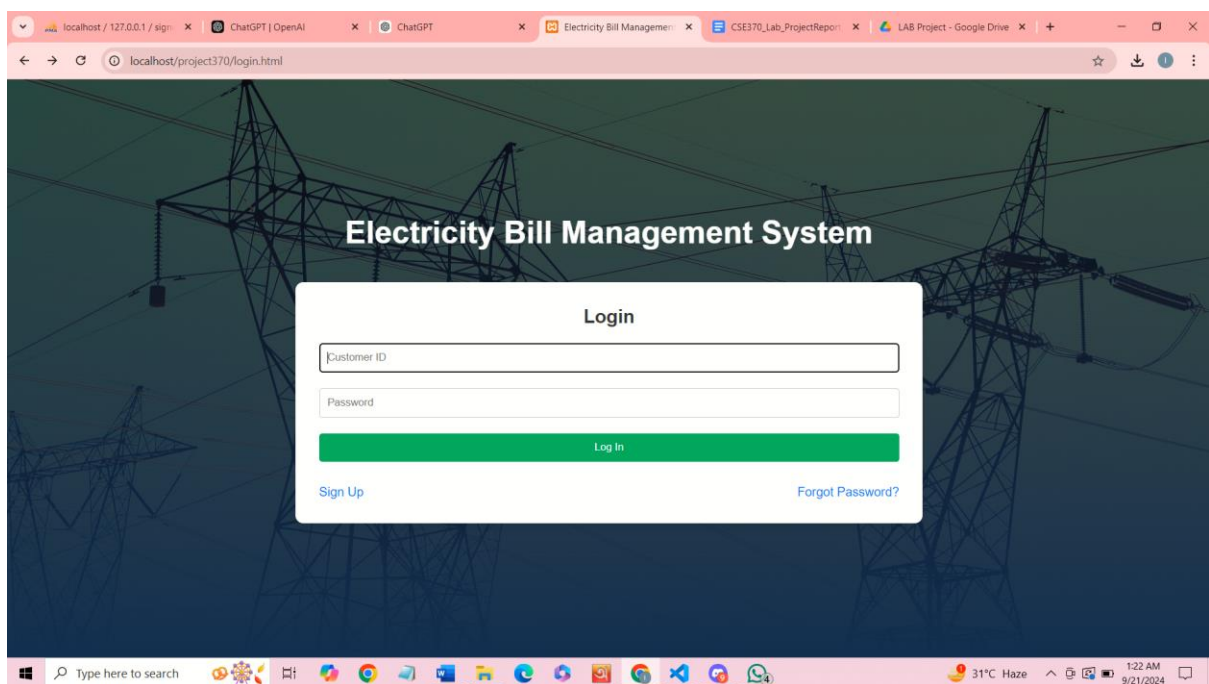
Schema Diagram



Front End Development

In the development of the **Electricity Bill Management System**'s frontend, we used **HTML** and **CSS** to create a clean, responsive, and user-friendly interface. HTML was utilized to structure the web pages, while CSS was applied to style and format the layout, ensuring consistency and an intuitive user experience across different devices. Additionally, we incorporated a small amount of **JavaScript** to handle dynamic functionalities, such as pop-up messages for notifications and alerts, as well as password validation for user registration and login forms. This combination of technologies helped us build a simple yet effective interface, enhancing both usability and visual appeal.

Login Page:



Signup page:

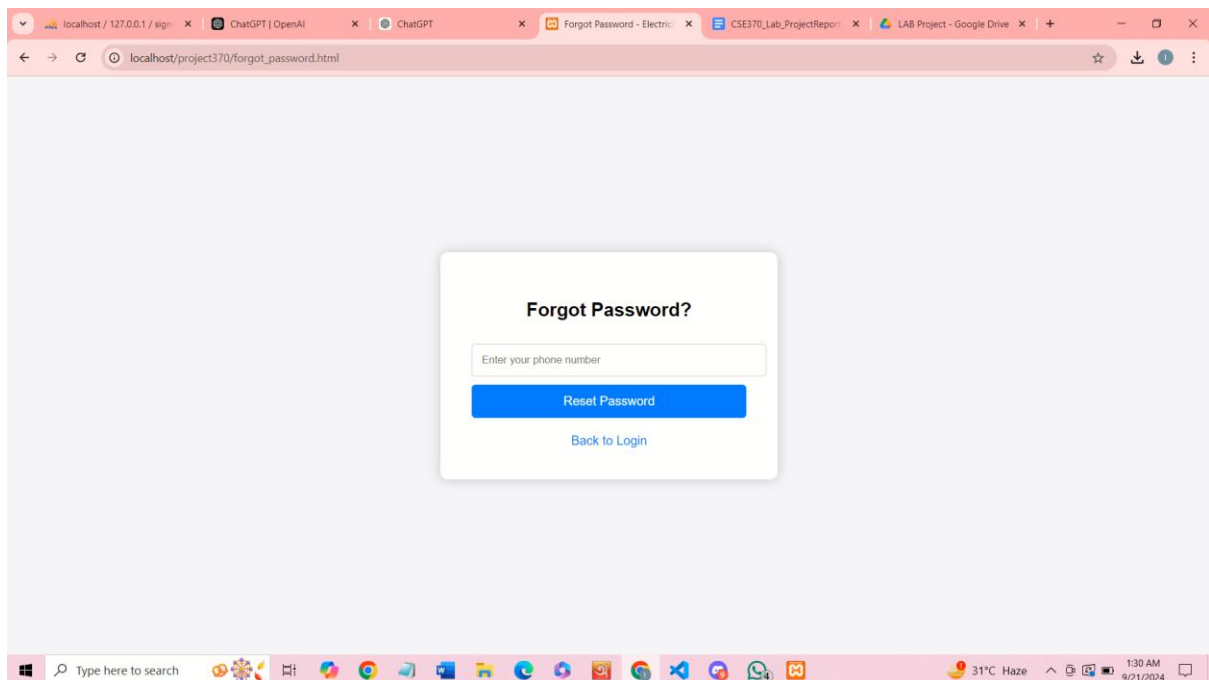
The screenshot shows a web browser window with multiple tabs. The active tab is titled 'Sign Up - Electricity Mana...'. The address bar shows the URL 'localhost/project370/signup.html'. The main content area displays a 'Sign Up' form with the following fields:

- Name
- Customer_id
- Phone_number
- Password
- Confirm Password

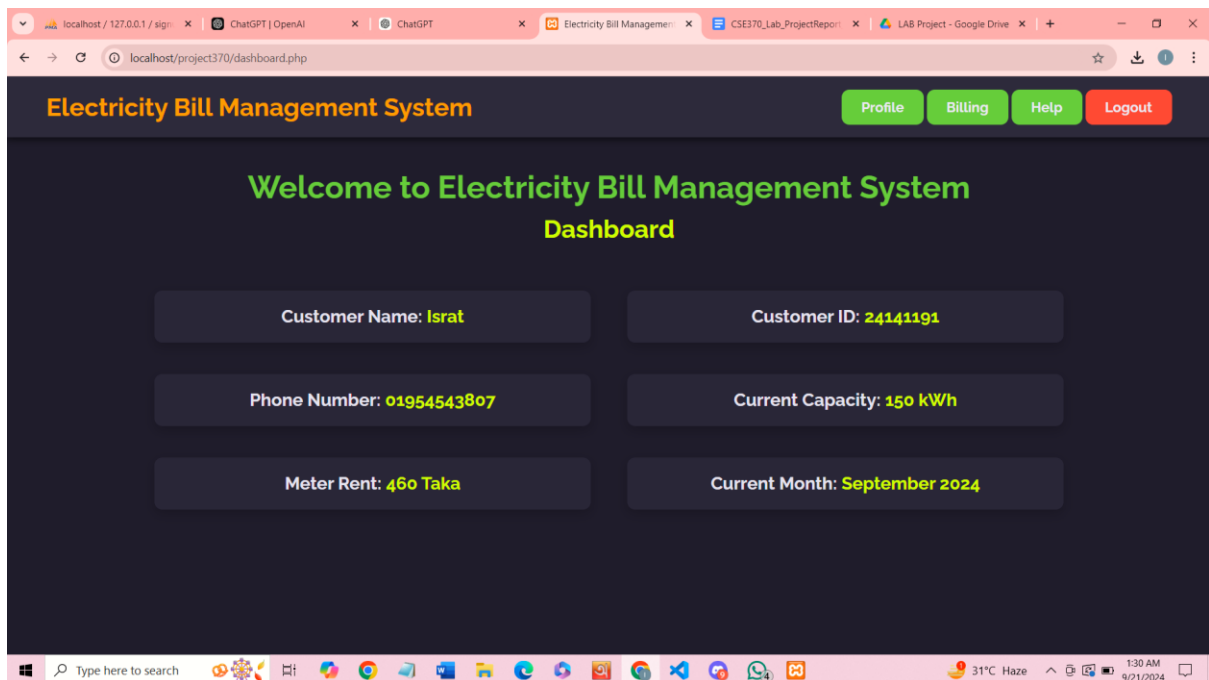
Below the fields is a green button labeled 'Create Account'.

The Windows taskbar at the bottom shows the search bar with the text 'Type here to search', several application icons, and the system tray displaying '31°C Haze' and the time '1:23 AM 9/21/2024'.

Forgot Password Page:



Dashboard:



Profile:

The screenshot shows the 'Your Profile' page of the Electricity Bill Management System. The page has a dark blue header with the system name and navigation buttons: Dashboard, Billing, Help, and Logout. The profile information is displayed in a light blue box with the following details:

- Customer ID:** 24141191
- Name:** Israt
- NID:** 221313142323523
- Address:** 95/1 West, Morul, Badda, Dhaka
- Phone Number:** 01954543807
- Email:** isratkayesh@gmail.com

A 'Save Changes' button is located at the bottom of the profile box. The browser's address bar shows 'localhost/project370/profile.php'.

Billing:

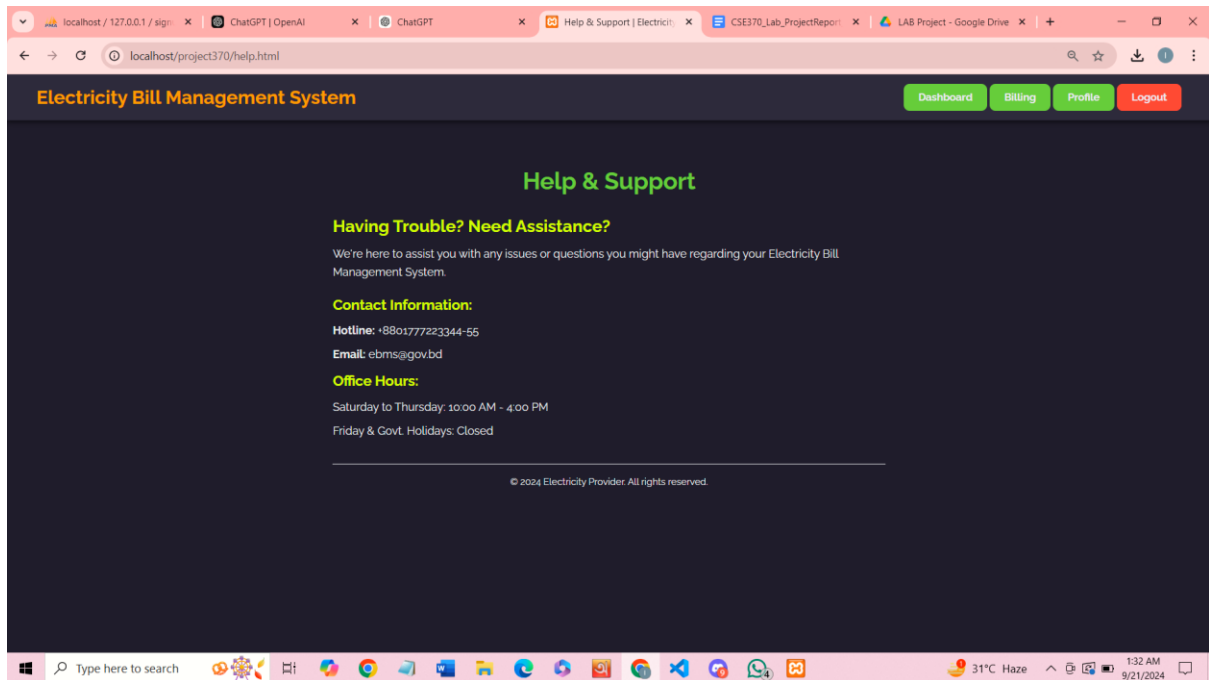
The screenshot shows the 'Billing Overview' page of the Electricity Bill Management System. The page has a dark blue header with the system name and navigation buttons: Dashboard, Profile, Help, and Logout. The billing information is displayed in a light blue box with the following details:

- Bill to Pay:**
 - Amount Due: 3000 BDT
 - Current Month: September, 2024
 - Due Date: September 30, 2024
- Payment History:**

Date	Amount Paid	Transaction ID
August 1, 2024	2534 BDT	TXN123456
July 1, 2024	2879 BDT	TXN654321
- Pay Bill:** Click Here to Pay Now
- Generate Invoice:** Generate Invoice

A copyright notice at the bottom reads: © 2024 Electricity Provider. All rights reserved. The browser's address bar shows 'localhost/project370/billing.html'.

Help:



Back End Development

For the backend development of the **Electricity Bill Management System**, we utilized **PHP** to handle server-side logic and manage interactions between the frontend and the database. PHP enabled us to process user requests, manage sessions, and dynamically generate content based on user input. We integrated a **SQL** database to store and retrieve critical data, such as user details, consumption records, and billing information. The SQL queries were used to efficiently fetch, insert, update, and delete data from the backend, ensuring seamless communication between the system's interface and the database. This setup provided a robust, secure, and efficient backend to support the application's functionality.

PHP file of log in:

```
File Edit Selection View Go Run Terminal Help project370
login.php
1 <?php
2 session_start();
3
4 // Database connection details
5 $host = "localhost";
6 $dbname = "signup";
7 $username = "root";
8 $password = "";
9
10 $conn = new mysqli($host, $username, $password, $dbname);
11
12 // Check connection
13 if ($conn->connect_error) {
14     die("Connection failed: " . $conn->connect_error);
15 }
16
17 // Process login form data
18 if ($_SERVER["REQUEST_METHOD"] == "POST") {
19     $customer_id = $_POST['customer_id'];
20     $password = $_POST['password'];
21
22     $sql = "SELECT * FROM signup WHERE Customer_id = ?";
23     $stmt = $conn->prepare($sql);
24     $stmt->bind_param("i", $customer_id);
25     $stmt->execute();
26     $result = $stmt->get_result();
27
28     if ($result->num_rows > 0) {
29         $user = $result->fetch_assoc();
30         if (password_verify($password, $user['Password'])) {
31             $SESSION['customer_id'] = $user['Customer_id']; // Set session variable
32             header("Location: dashboard.php");
33             exit();
34         } else {
35             echo "<script>alert('Incorrect password!'); window.location.href='login.html';</script>";
36         }
37     } else {
38         echo "<script>alert('Customer ID not found!'); window.location.href='login.html';</script>";
39     }
40
41     $stmt->close();
42     $conn->close();
43 }
44 }>
```

PHP file of Profile:

```
File Edit Selection View Go Run Terminal Help project370
profile.php
1 <?php
2 session_start();
3
4 // Check if the user is logged in
5 if (!isset($SESSION['customer_id'])) {
6     header("Location: login.php"); // Redirect to login page if not logged in
7     exit();
8 }
9
10 // Database connection
11 $host = "localhost";
12 $dbname = "signup";
13 $username = "root";
14 $password = "";
15
16 $conn = new mysqli($host, $username, $password, $dbname);
17
18 // Check connection
19 if ($conn->connect_error) {
20     die("Connection failed: " . $conn->connect_error);
21 }
22
23 // Fetch the customer data from the session and database
24 $customer_id = $SESSION['customer_id'];
25
26 $sql = "SELECT * FROM signup WHERE Customer_id = ?";
27 $stmt = $conn->prepare($sql);
28 $stmt->bind_param("i", $customer_id);
29 $stmt->execute();
30 $result = $stmt->get_result();
31 $user = $result->fetch_assoc();
32
33 // Update profile information in both tables
34 if ($_SERVER["REQUEST_METHOD"] == "POST") {
35     $name = $_POST['name'];
36     $phone_number = $_POST['phone_number'];
37     $address = $_POST['address'];
38     $email = $_POST['email'];
39
40     // Update profile information in both tables
41     $update_profile_sql = "UPDATE signup SET name = ?, phone_number = ?, address = ?, email = ? WHERE Customer_id = ?";
42     $stmt = $conn->prepare($update_profile_sql);
43     $stmt->bind_param("sssssi", $name, $phone_number, $address, $email, $customer_id);
44     $stmt->execute();
45
46     // Update signup table for name and phone number
47     $update_signup_sql = "UPDATE signup SET name = ?, phone_number = ? WHERE Customer_id = ?";
48     $stmt = $conn->prepare($update_signup_sql);
49     $stmt->bind_param("ssi", $name, $phone_number, $customer_id);
50     $stmt->execute();
51
52     echo "<script>alert('Profile updated successfully!'); window.location.href='profile.php';</script>";
53 }
54
55 $conn->close();
56 }>
```

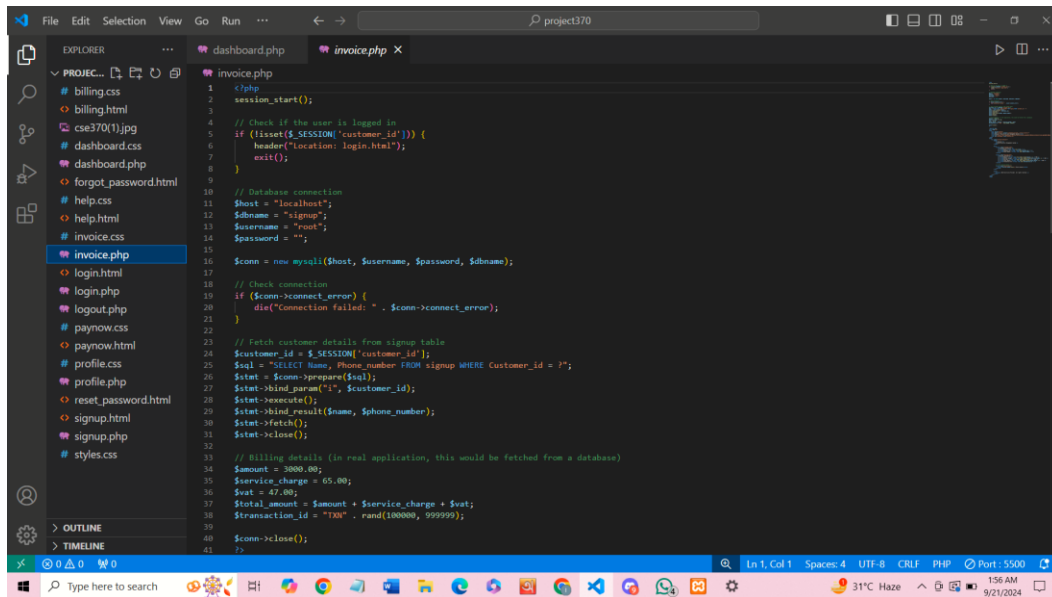
PHP file of signup:

```
File Edit Selection View Go Run Terminal Help project370
signup.php
1 <?php
2 // Database connection details
3 $host = "localhost"; // or your database host
4 $dbname = "signup"; // replace with your database name
5 $username = "root"; // replace with your database username
6 $password = ""; // replace with your database password
7
8 // Create a connection
9 $conn = new mysqli($host, $username, $password, $dbname);
10
11 // Check the connection
12 if ($conn->connect_error) {
13     die("Connection failed: " . $conn->connect_error);
14 }
15
16 // Process form data when the form is submitted
17 if ($_SERVER["REQUEST_METHOD"] == "POST") {
18     // Retrieve form input data
19     $name = $_POST['name'];
20     $customer_id = $_POST['id'];
21     $phone_number = $_POST['phone_number'];
22     $password = $_POST['password'];
23     $confirm_password = $_POST['confirm_password'];
24
25     // Validate password and confirm password
26     if ($password != $confirm_password) {
27         echo "<script>alert('Passwords do not match!'); window.location.href='signup.html';</script>";
28         exit();
29     }
30
31     // Hash the password for security
32     $hashed_password = password_hash($password, PASSWORD_DEFAULT);
33
34     // Insert the data into the signup table
35     $sql = "INSERT INTO signup (name, Customer_id, Phone_number, Password) VALUES (?, ?, ?, ?)";
36
37     // Prepare and bind the SQL statement
38     $stmt = $conn->prepare($sql);
39     $stmt->bind_param("iss", $name, $customer_id, $phone_number, $hashed_password);
40
41     // Execute the query
42     if ($stmt->execute()) {
43         // Redirect to success message
44         echo "<script>alert('Account created successfully!'); window.location.href='login.html';</script>";
45     } else {
46         echo "<script>alert('Error: " . $stmt->error . "'); window.location.href='signup.html';</script>";
47     }
48
49     // Close the statement and connection
50     $stmt->close();
51     $conn->close();
52 }
53 }
54 }
55 }
```

PHP file of Dashboard:

```
File Edit Selection View Go Run ... project370
dashboard.php
1 <?php
2 session_start();
3
4 // Check if the user is logged in by verifying the session
5 if (!isset($_SESSION['customer_id'])) {
6     header("Location: login.html"); // Redirect to login page if not logged in
7     exit();
8 }
9
10 // Database connection
11 $host = "localhost";
12 $dbname = "signup";
13 $username = "root";
14 $password = "";
15
16 $conn = new mysqli($host, $username, $password, $dbname);
17
18 // Check connection
19 if ($conn->connect_error) {
20     die("Connection failed: " . $conn->connect_error);
21 }
22
23 // Get the customer data from the database using the session customer_id
24 $customer_id = $_SESSION['customer_id'];
25 $sql = "SELECT name, Customer_id, Phone_number FROM signup WHERE Customer_id = ?";
26 $stmt = $conn->prepare($sql);
27 $stmt->bind_param("i", $customer_id);
28 $stmt->execute();
29 $stmt->store_result(); // Make sure to store the result
30
31 if ($stmt->num_rows > 0) {
32     $stmt->bind_result($name, $customer_id, $phone_number);
33     $stmt->fetch();
34 } else {
35     echo "No user found with this ID.";
36 }
37 $stmt->close();
38 $conn->close();
39 }
40 }
41 }
```

PHP file of Invoice:



```
1 <?php
2 session_start();
3
4 // Check if the user is logged in
5 if (!isset($_SESSION['customer_id'])) {
6     header("Location: login.html");
7     exit();
8 }
9
10 // Database connection
11 $host = "localhost";
12 $dbname = "signup";
13 $username = "root";
14 $password = "";
15
16 $conn = new mysqli($host, $username, $password, $dbname);
17
18 // Check connection
19 if ($conn->connect_error) {
20     die("Connection failed: " . $conn->connect_error);
21 }
22
23 // Fetch customer details from signup table
24 $customer_id = $_SESSION['customer_id'];
25 $sql = "SELECT Name, Phone_number FROM signup WHERE Customer_id = ?";
26 $stmt = $conn->prepare($sql);
27 $stmt->bind_param("i", $customer_id);
28 $stmt->execute();
29 $stmt->bind_result($name, $phone_number);
30 $stmt->fetch();
31 $stmt->close();
32
33 // Billing details (in real application, this would be fetched from a database)
34 $amount = 3000.00;
35 $service_charge = 65.00;
36 $vat = 47.00;
37 $total_amount = $amount + $service_charge + $vat;
38 $transaction_id = "TXN" . rand(100000, 999999);
39
40 $conn->close();
41
```

Source Code:

Source Code Folder

Conclusion:

In conclusion, the **Electricity Bill Management System** successfully streamlines the process of generating, managing, and paying electricity bills through an efficient, user-friendly web application. The frontend, built using **HTML**, **CSS**, and **JavaScript**, ensures a seamless user experience, while the backend, powered by **PHP** and **SQL**, securely manages data and server-side operations. This project reduces the manual workload for utility providers, minimizes errors, and enhances customer convenience by offering real-time access to billing information and secure payment options. Overall, the system delivers a modern, digital solution for efficient electricity bill management, benefiting both users and service providers.

