CSE370 : Database Systems
Project Report
Project Title : Electricity Bill Management System

Group No : _09_, CSE370 Lab Section : _13_, Summer 2024		
ID	**Name**	**Contribution**
24141194	Shahadat Hossain Sagor	Everything
24141191	Israt Kayesh Ipsit	Login, Signup, Profile
23301686	Mussamut Maliha	Dashboard

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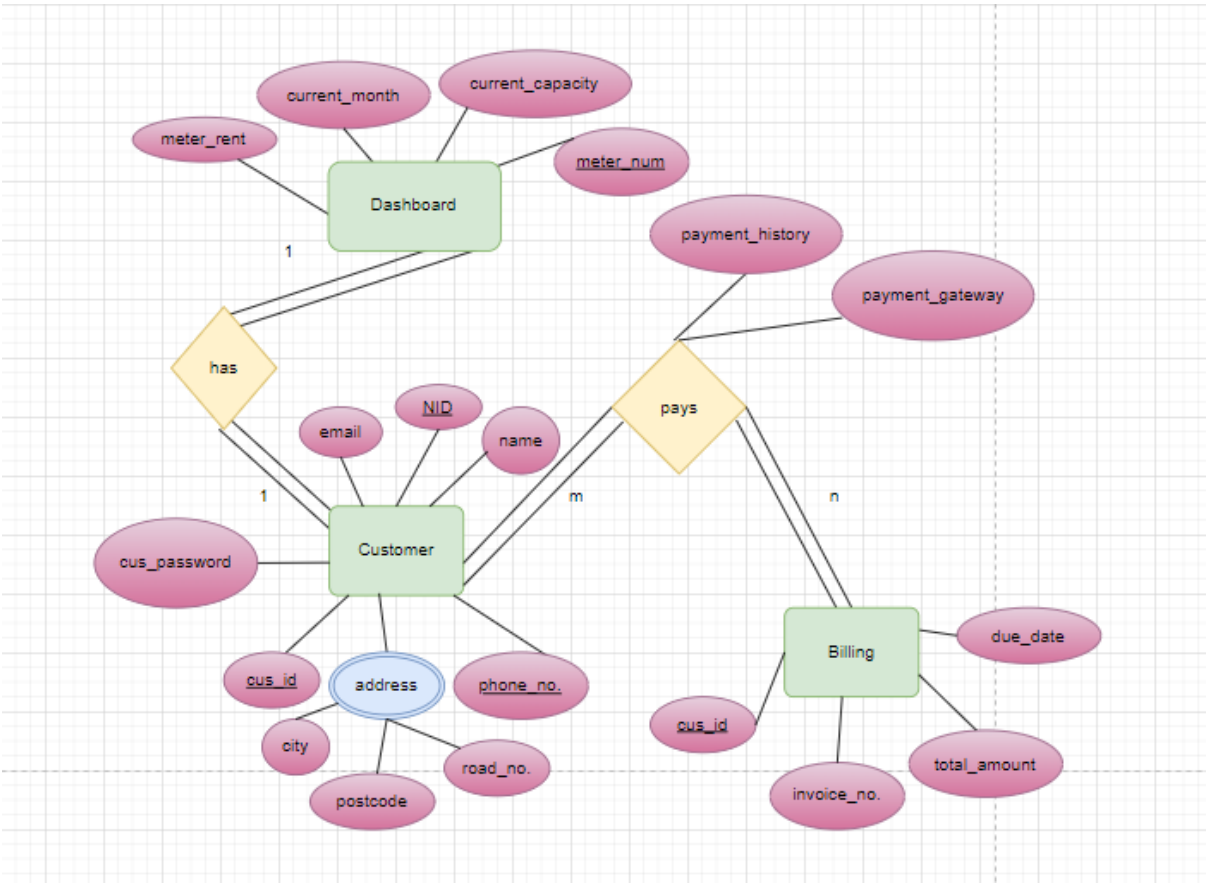
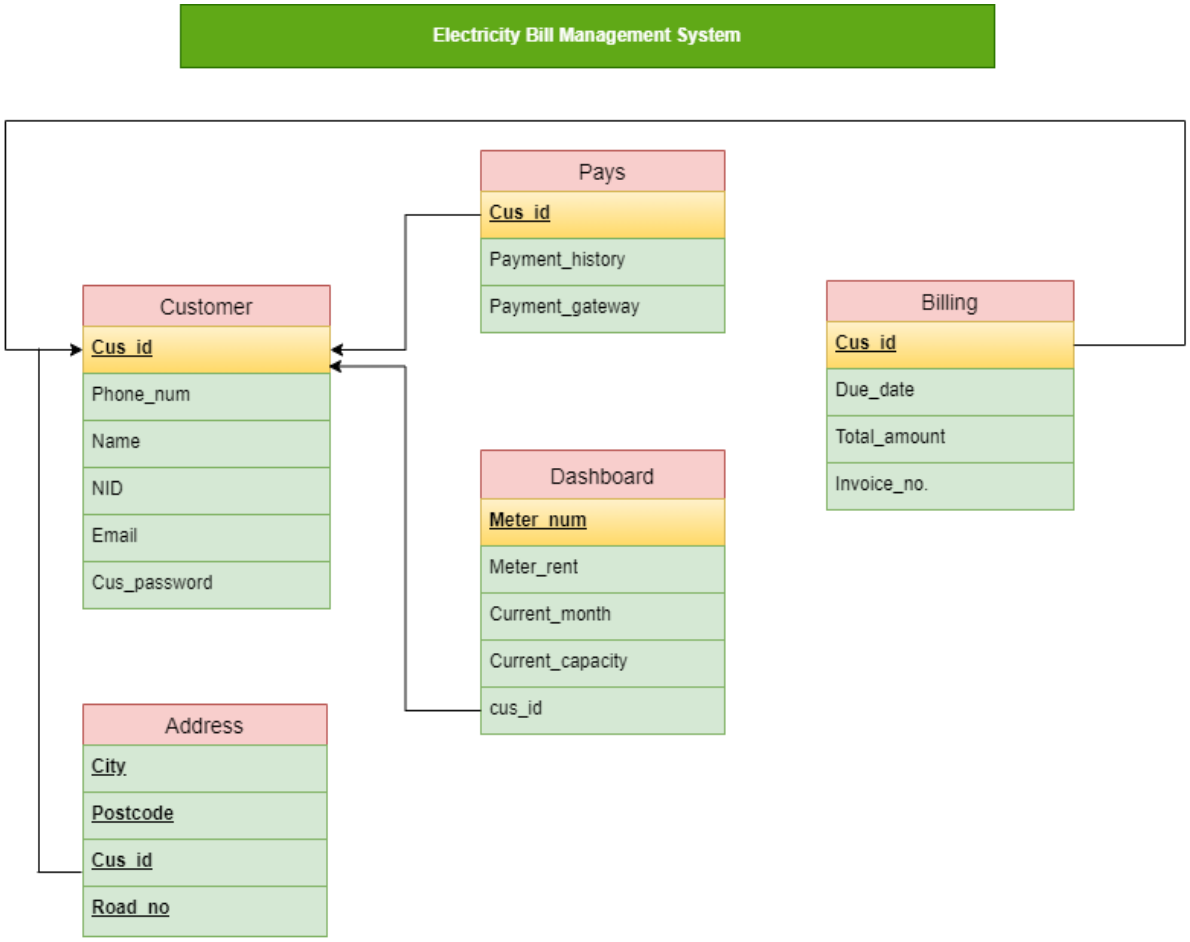
Introduction

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


current_month
current_capacity
meter_rent
meter_num
Dashboard
1
payment_history
payment_gateway
has
pays
NID
email
name
1
m
n
cus_password
Customer
Billing
due_date
cus_id
address
phone_no.
cus_id
city
road_no.
total_amount
postcode
invoice_no.

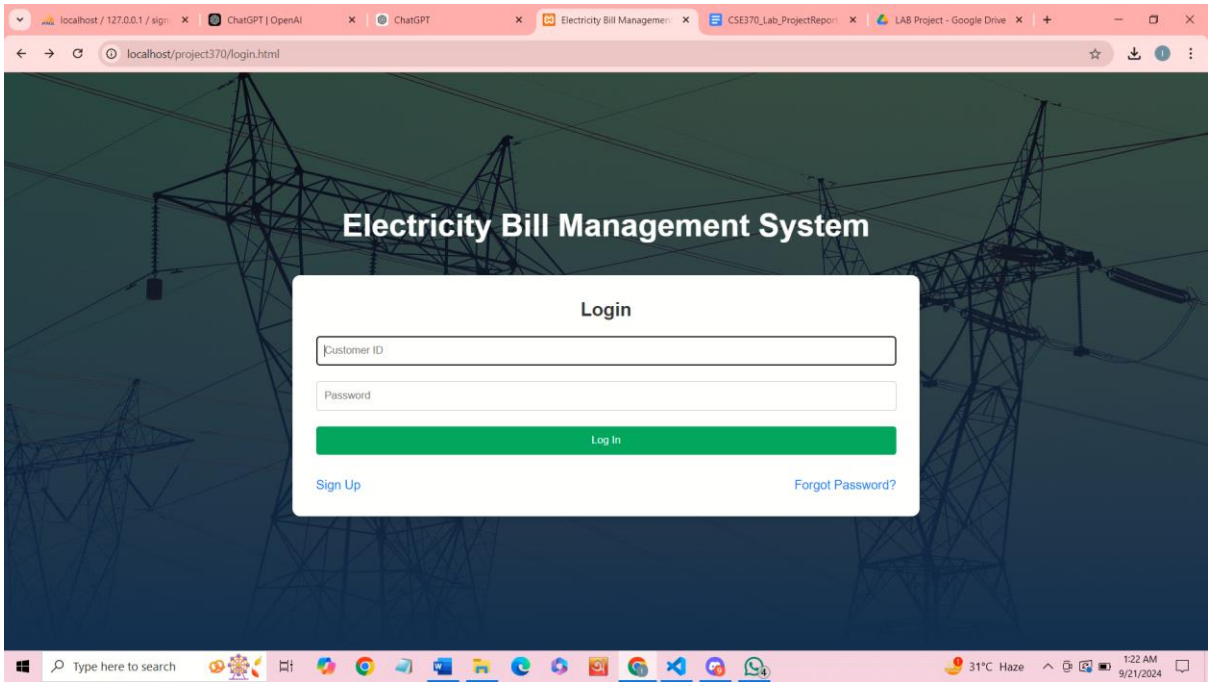
Schema Diagram



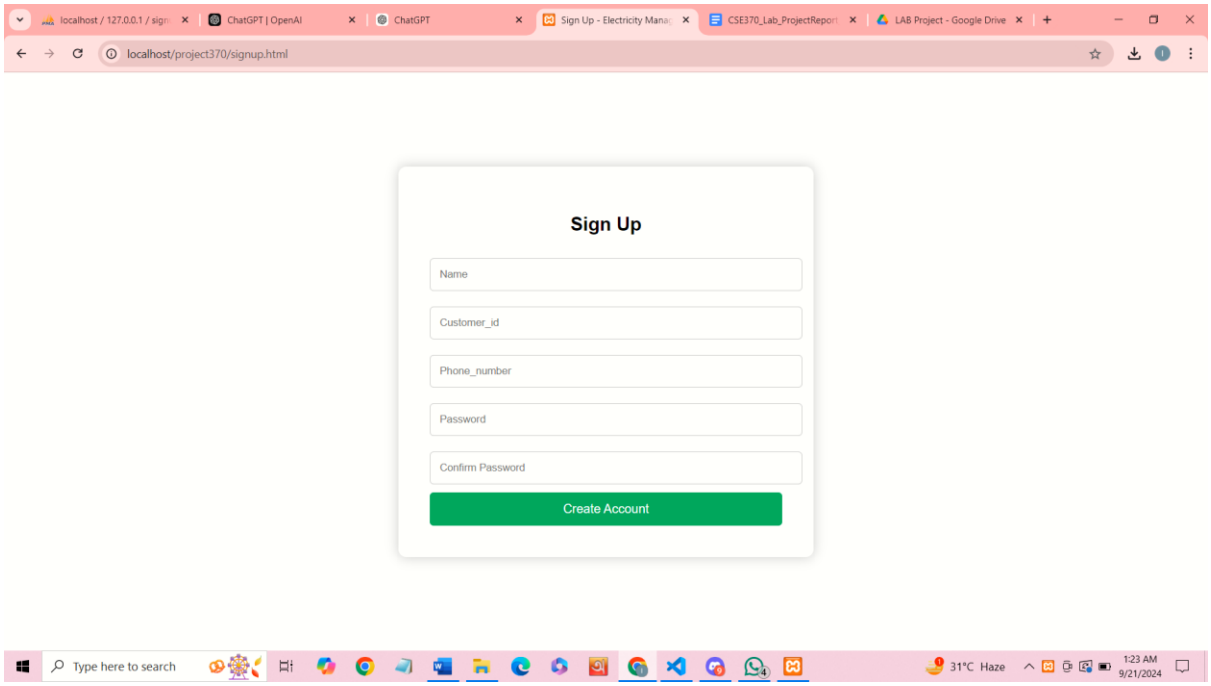
Front End Development

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.

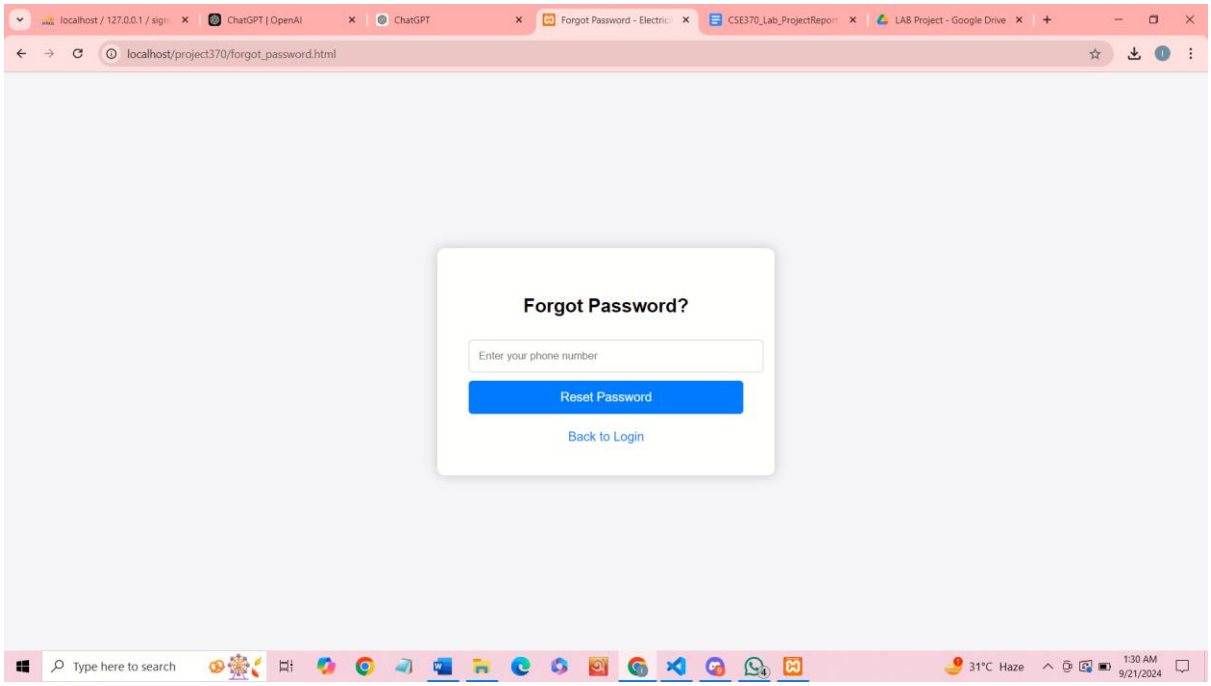
Login Page:



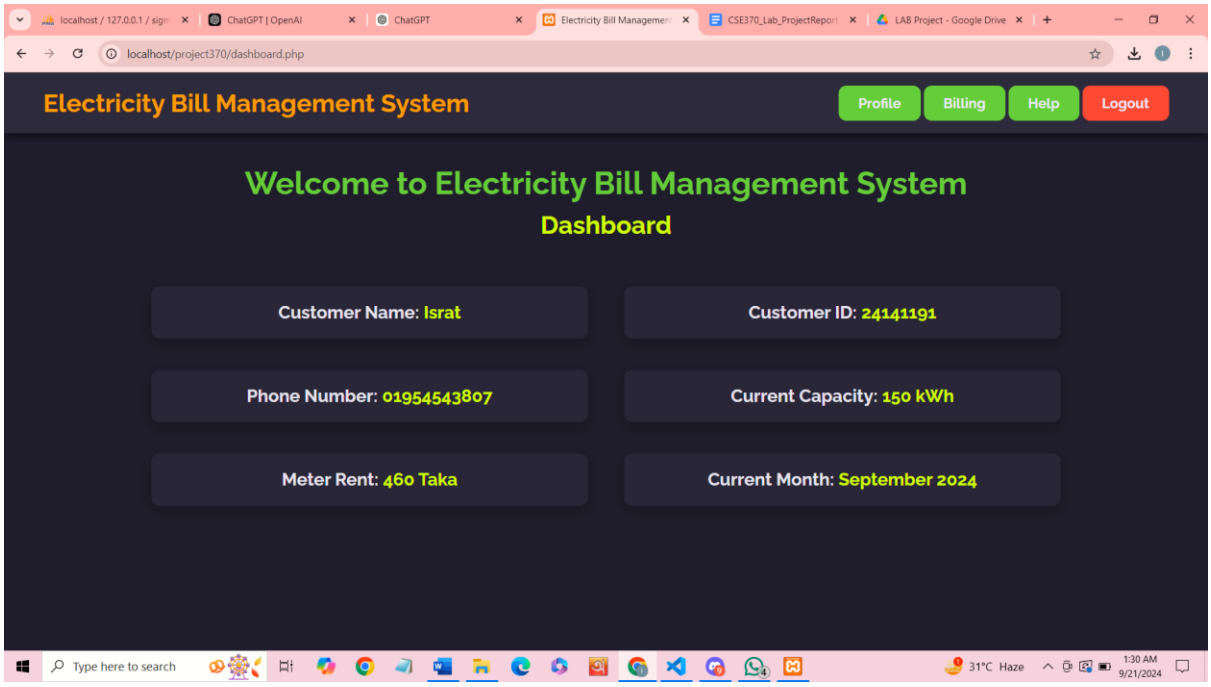
Signup page:


localhost/project370/signup.html
Sign Up
Name
Customer_id
Phone_number
Password
Confirm Password
Create Account
Type here to search
31°C Haze
1:23 AM
9/21/2024

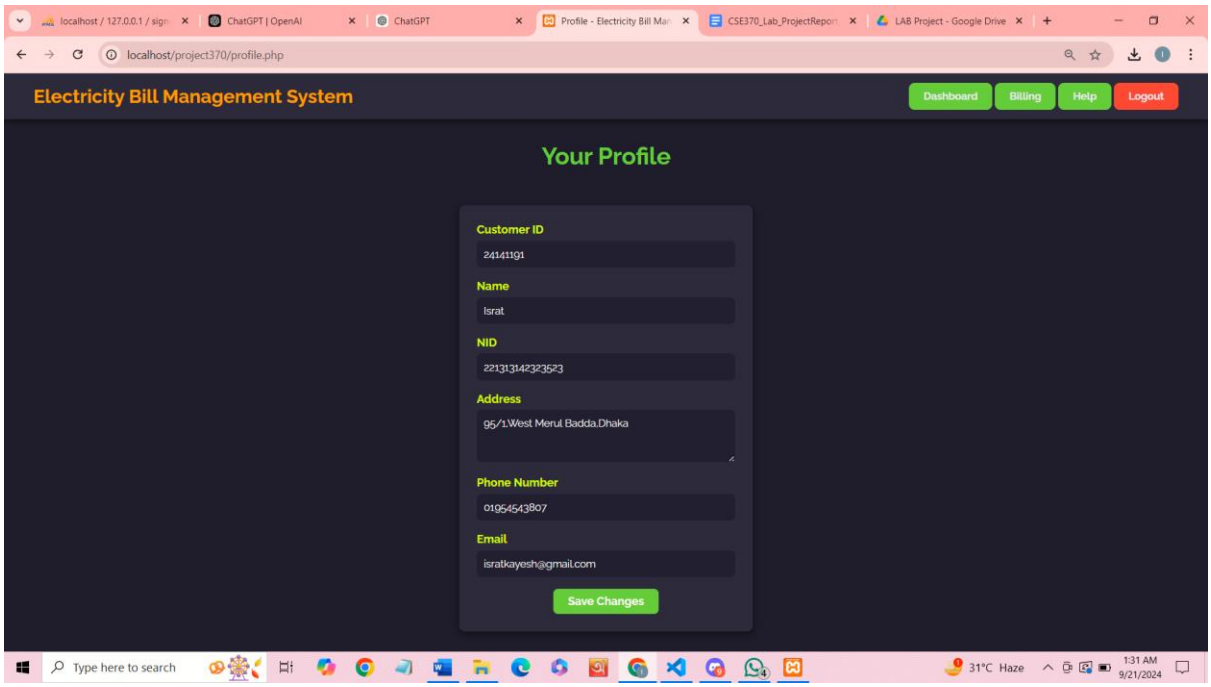
Forgot Password Page:



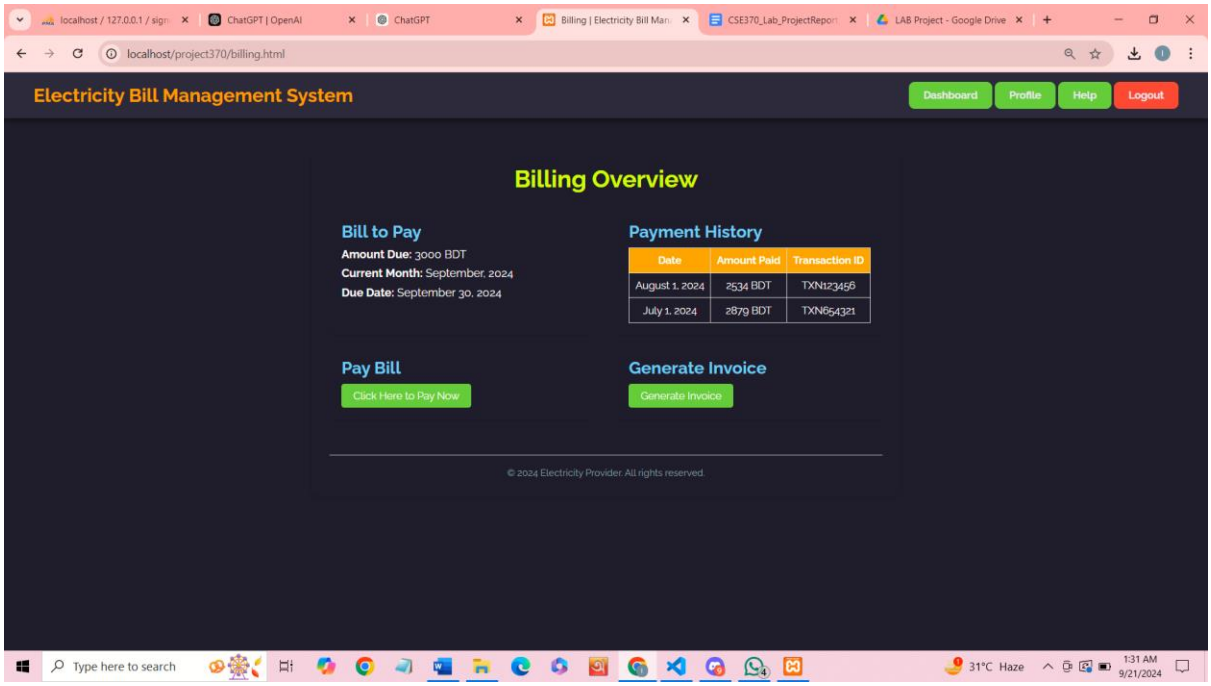
Dashboard:



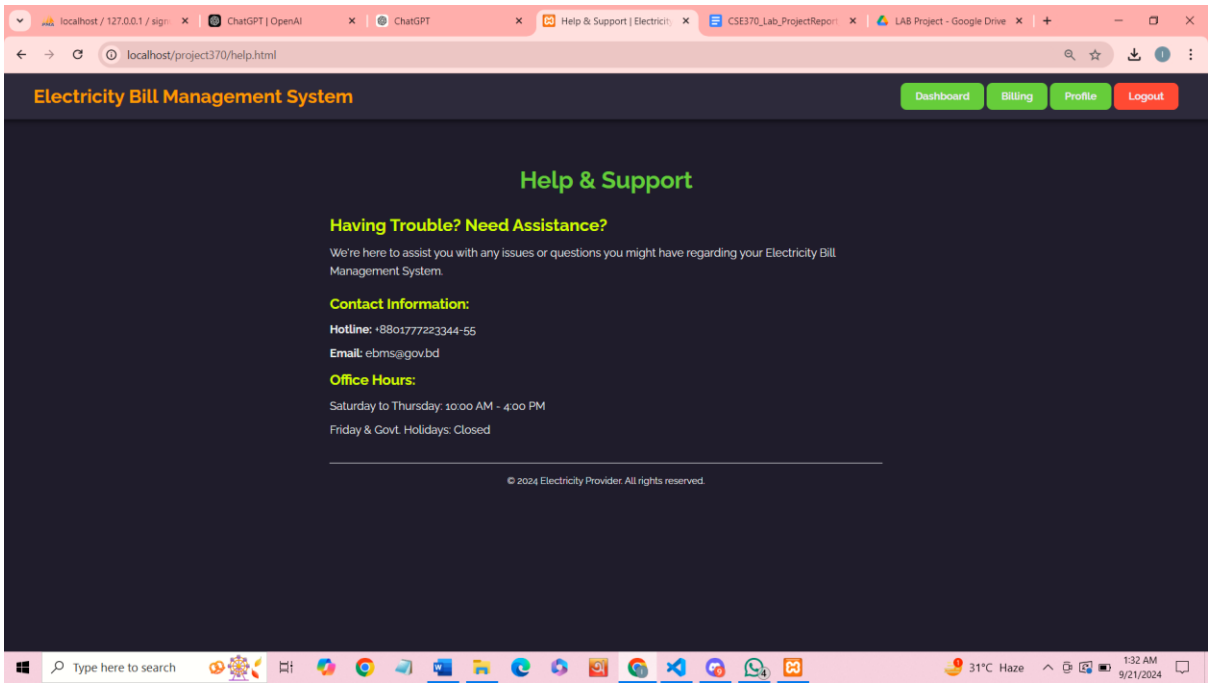
Profile:



Billing:



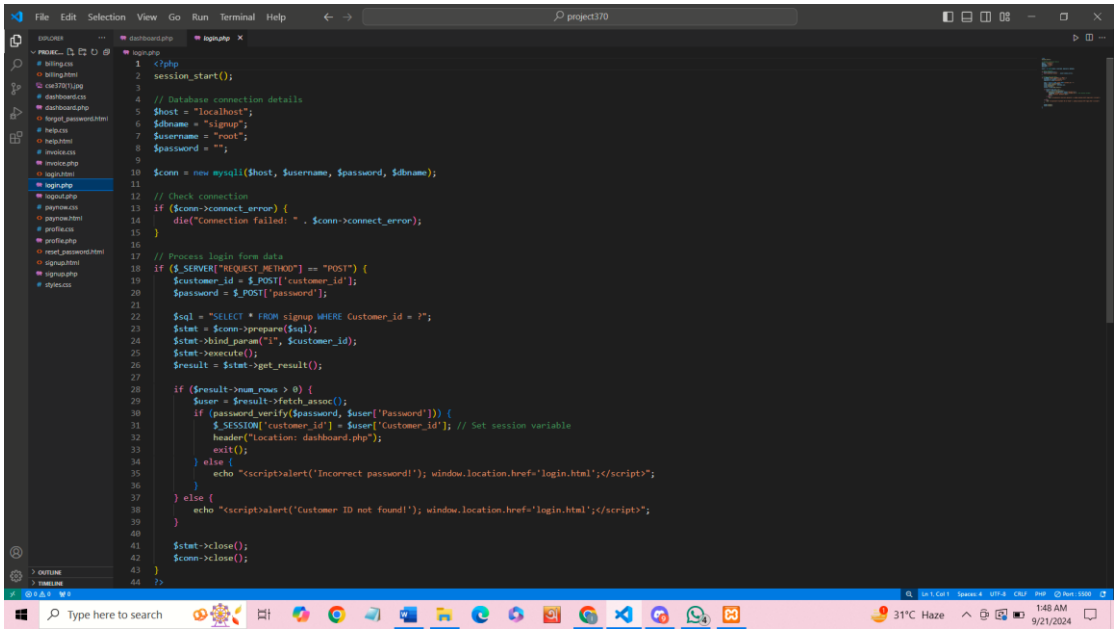
Help:



Back End Development

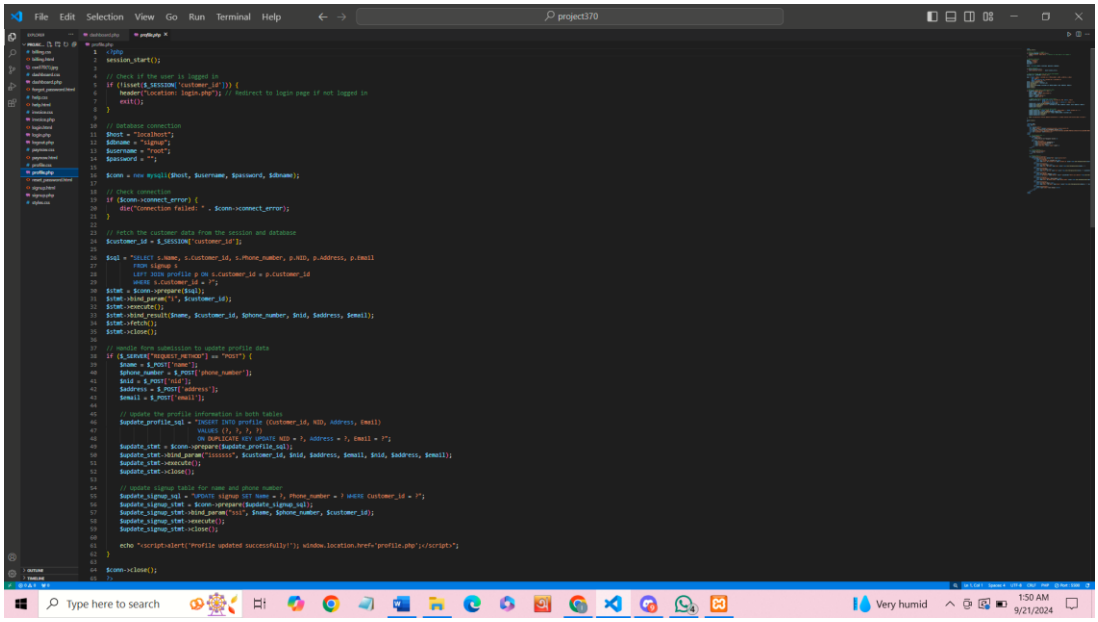
For the backend development of the **Electricity Bill Management System**, we utilized **PHP** to handle server-side logic and manage interactions between the frontend and the database. PHP enabled us to process user requests, manage sessions, and dynamically generate content based on user input. We 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:



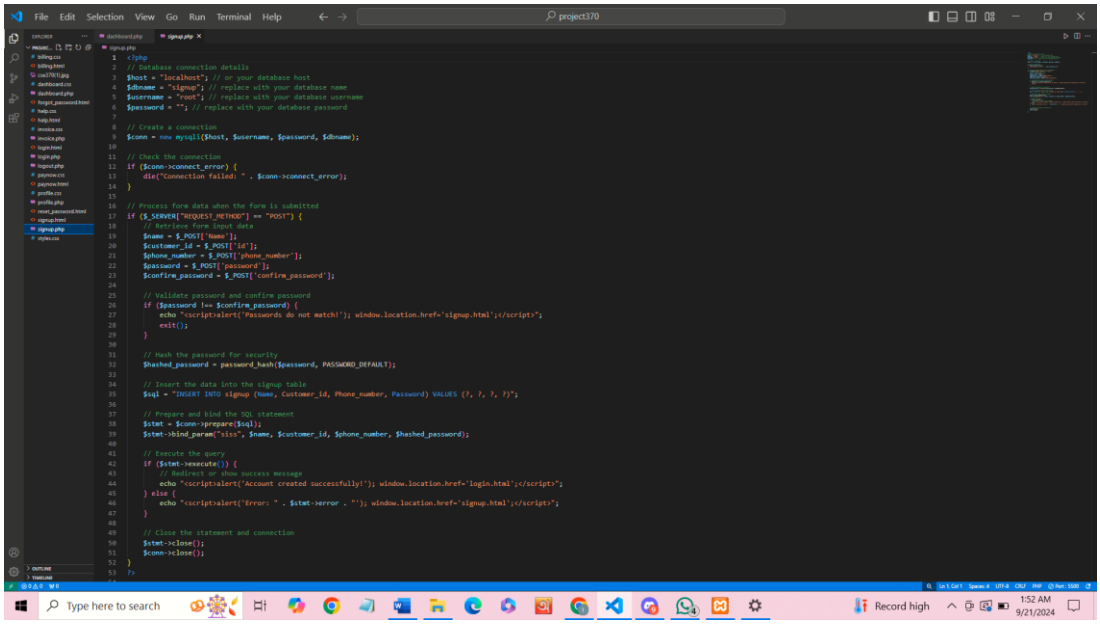
```php
<?php
session_start();

// Database connection details
$host = "localhost";
$dbname = "signup";
$username = "root";
$password = "";

$conn = new mysqli($host, $username, $password, $dbname);

// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

// Process login form data
if ($_SERVER["REQUEST_METHOD"] == "POST") {
    $customer_id = $_POST['customer_id'];
    $password = $_POST['password'];

    $sql = "SELECT * FROM signup WHERE Customer_id = ?";
    $stmt = $conn->prepare($sql);
    $stmt->bind_param("i", $customer_id);
    $stmt->execute();
    $result = $stmt->get_result();

    if ($result->num_rows > 0) {
        $user = $result->fetch_assoc();
        if (password_verify($password, $user['Password'])) {
            $_SESSION['customer_id'] = $user['Customer_id']; // Set session variable
            header("Location: dashboard.php");
            exit();
        } else {
            echo "<script>alert('Incorrect password!'); window.location.href='login.html';</script>";
        }
    } else {
        echo "<script>alert('Customer ID not found!'); window.location.href='login.html';</script>";
    }

    $stmt->close();
    $conn->close();
}
?>
```

PHP file of Profile:



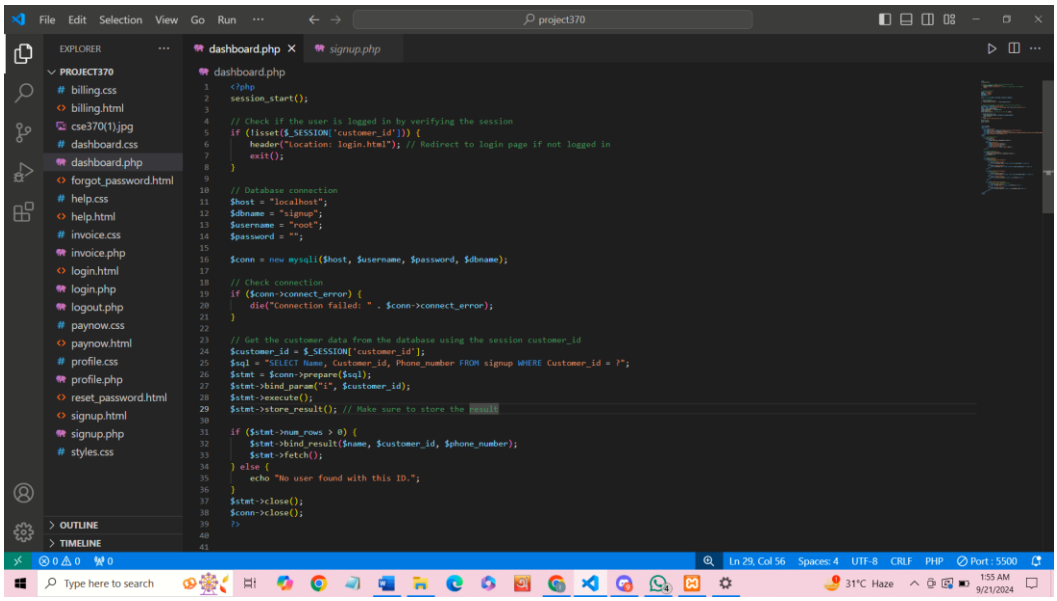
```php
<?php
session_start();

// Check if the user is logged in
if (!isset($_SESSION['customer_id'])) {
    header("Location: login.php"); // Redirect to login page if not logged in
    exit();
}

// Database connection
$host = "localhost";
$dbname = "signup";
$username = "root";
$password = "";

$conn = new mysqli($host, $username, $password, $dbname);

// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

// Fetch the customer data from the session and database
$customer_id = $_SESSION['customer_id'];

$sql = "SELECT s.Name, s.Customer_id, s.Phone_number, p.NID, p.Address, p.Email
        FROM signup s
        LEFT JOIN profile p ON s.Customer_id = p.Customer_id
        WHERE s.Customer_id = ?";
$stmt = $conn->prepare($sql);
$stmt->bind_param("i", $customer_id);
$stmt->execute();
$stmt->bind_result($name, $customer_id, $phone_number, $nid, $address, $email);
$stmt->fetch();
$stmt->close();

// Handle form submission to update profile data
if ($_SERVER['REQUEST_METHOD'] == "POST") {
    $name = $_POST['name'];
    $phone_number = $_POST['phone_number'];
    $nid = $_POST['nid'];
    $address = $_POST['address'];
    $email = $_POST['email'];

    // Update the profile information in both tables
    $update_profile_sql = "INSERT INTO profile (Customer_id, NID, Address, Email)
                           VALUES (?, ?, ?, ?)
                           ON DUPLICATE KEY UPDATE NID = ?, Address = ?, Email = ?";
    $update_stmt = $conn->prepare($update_profile_sql);
    $update_stmt->bind_param("issssss", $customer_id, $nid, $address, $email, $nid, $address, $email);
    $update_stmt->execute();
    $update_stmt->close();

    // Update signup table for name and phone number
    $update_signup_sql = "UPDATE signup SET Name = ?, Phone_number = ? WHERE Customer_id = ?";
    $update_signup_stmt = $conn->prepare($update_signup_sql);
    $update_signup_stmt->bind_param("ssi", $name, $phone_number, $customer_id);
    $update_signup_stmt->execute();
    $update_signup_stmt->close();

    echo "<script>alert('Profile updated successfully!'); window.location.href='profile.php';</script>";
}

$conn->close();
?>
```

PHP file of signup:



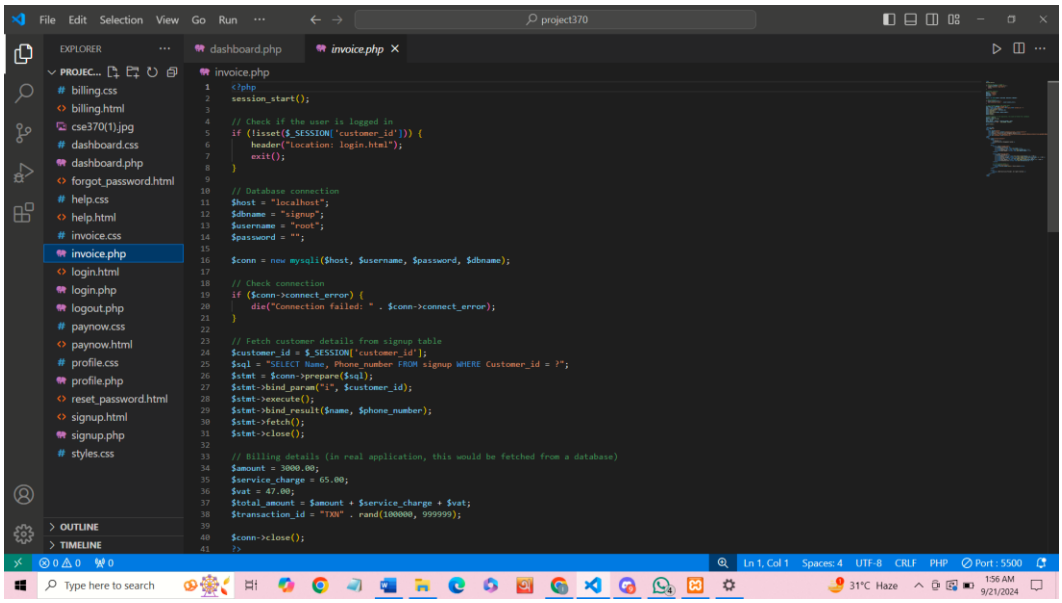
```php
<?php
// Database connection details
$host = "localhost"; // or your database host
$dbname = "signup"; // replace with your database name
$username = "root"; // replace with your database username
$password = ""; // replace with your database password

// Create a connection
$conn = new mysqli($host, $username, $password, $dbname);

// Check the connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

// Process form data when the form is submitted
if ($_SERVER["REQUEST_METHOD"] == "POST") {
    // Retrieve form input data
    $name = $_POST['Name'];
    $customer_id = $_POST['Id'];
    $phone_number = $_POST['phone_number'];
    $password = $_POST['password'];
    $confirm_password = $_POST['confirm_password'];

    // Validate password and confirm password
    if ($password !== $confirm_password) {
        echo "<script>alert('Passwords do not match!'); window.location.href='signup.html';</script>";
        exit();
    }

    // Hash the password for security
    $hashed_password = password_hash($password, PASSWORD_DEFAULT);

    // Insert the data into the signup table
    $sql = "INSERT INTO signup (Name, Customer_id, Phone_number, Password) VALUES (?, ?, ?, ?)";

    // Prepare and bind the SQL statement
    $stmt = $conn->prepare($sql);
    $stmt->bind_param("siss", $name, $customer_id, $phone_number, $hashed_password);

    // Execute the query
    if ($stmt->execute()) {
        // Redirect or show success message
        echo "<script>alert('Account created successfully!'); window.location.href='login.html';</script>";
    } else {
        echo "<script>alert('Error: " . $stmt->error . "'); window.location.href='signup.html';</script>";
    }

    // Close the statement and connection
    $stmt->close();
    $conn->close();
}
?>
```

PHP file of Dashboard:



```php
<?php
session_start();

// Check if the user is logged in by verifying the session
if (!isset($_SESSION['customer_id'])) {
    header("Location: login.html"); // Redirect to login page if not logged in
    exit();
}

// Database connection
$host = "localhost";
$dbname = "signup";
$username = "root";
$password = "";

$conn = new mysqli($host, $username, $password, $dbname);

// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

// Get the customer data from the database using the session customer_id
$customer_id = $_SESSION['customer_id'];
$sql = "SELECT Name, Customer_id, Phone_number FROM signup WHERE Customer_id = ?";
$stmt = $conn->prepare($sql);
$stmt->bind_param("i", $customer_id);
$stmt->execute();
$stmt->store_result(); // Make sure to store the result

if ($stmt->num_rows > 0) {
    $stmt->bind_result($name, $customer_id, $phone_number);
    $stmt->fetch();
} else {
    echo "No user found with this ID.";
}
$stmt->close();
$conn->close();
?>
```

PHP file of Invoice:



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.