ISIT307 Web Server Programming - Assignment 2 Report (Individual Assignment)

Student Details

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Assignment number: 2

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Introduction

CityEVChargers is a dynamic web application that manages electrical vehicle (EV) charging stations across multiple locations. The system supports two types of users: Administrators and Users. Users can register, log in, check-in/out to charge their EVs and view their charging history. Administrators can manage charging locations, monitor station availability, and oversee user activities.

This uses a MySQL database to store user info and validate logins. It also uses Object-Oriented Programming (OOP) to manage database functions in code.

Features

User

- Register and login
- Search and list EV charging locations with available stations
- Check-in for charging (with start date/time and cost info)
- Check-out from charging (with total cost notification)
- View past and current charging sessions on Dashboard

Administrator

- Register and login
- Add or edit charging locations (description, station count, cost per hour)
- Check-in and check-out for users for charging
- Search and list users
- View all locations, available stations, and full locations
- View all users who are actively checked-in on Dashboard

Database Design

- ‘users’ table: Stores user info
  (ID, name, phone, email, password (hashed), type)

- ‘locations’ table: Stores EV charging locations
  (ID, description, total_stations, cost_per_hour)

- ‘checkins’ table: Tracks charging sessions
  (id, user_id, location_id, checkin_time, checkout_time, cost)

Class Design

These classes implement the Object-Oriented interface to the database, encapsulating all logic related to users, locations, and check-ins.

- User.php – Handles user registration, login, and fetching user details.
  Methods:
  - register($name, $email, $password, $type)
  - login($email, $password)
  - getUserById($id)
- Location.php – Manages EV charging locations and availability.
  Methods:
  - getAllLocations() – Returns all locations
  - getLocationById($id) – Returns a single location.
  - getAvailableStations($location_id) – Calculates available stations.
  - editLocation(...) / addLocation(...) – Updates or adds locations.
- Checkin.php – Handles check-in/check-out logic for users.
  Methods:
  - checkin($user_id, $location_id)
  - checkout($user_id, $location_id)
  - getActiveCheckinsById($user_id) – Returns active check-ins for a user.
  - getPastCheckins($user_id) – Returns completed check-ins.
  - getAllActiveCheckins() – Returns all currently checked-in users.

Project Structure

Main folder/

- add_location.php (Admin page to add new charging locations)
- admin_checkin.php (Admin page to check-in a user manually)
- admin_checkout.php (Admin page to check-out a user manually)
- checkin.php (User check-in page)
- checkout.php (User check-out page)
- config.php (Database connection and session setup)
- dashboard.php (Main dashboard for users/admins)
- edit_location.php (Admin page to edit existing locations)
- index.php (Login/registration page)
- list_locations.php (Lists all charging locations (with filters))
- list_users.php (Admin page to list all users)
- logout.php (Logout script)
- register.php (User registration page)
- search_location.php (Search locations page)
- search_user.php (Admin search users page)
- db.sql (Database schema and sample data)
- classes/
  - Checkin.php (Check-in / Check-out logic w/ Database)
  - Location.php (Location management logic w/ Database)
  - User.php (User management logic w/ Database)
- css/
  - Styles.css (Main stylesheet - White & Green theme)

How to Run

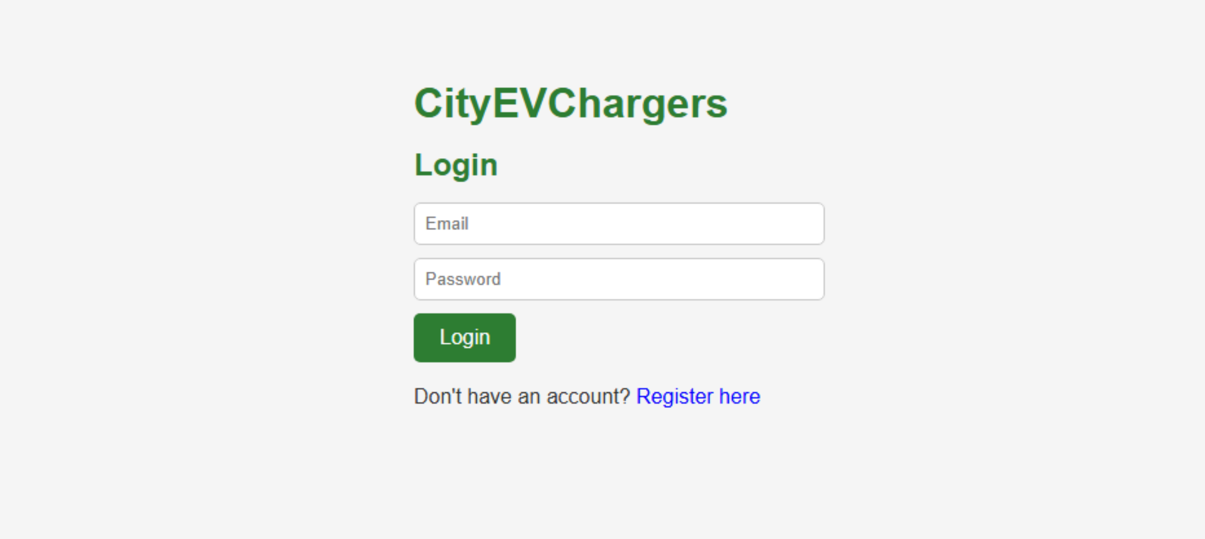
1. Make sure to have XAMPP installed
2. Launch Apache-PHP server via XAMPP
3. Launch MySQL server via XAMPP (for Database, phpmyadmin)
4. Import the provided SQL schema into phpMyAdmin (db.sql)
5. Make sure all folder files are placed in C:/xampp/htdocs/
6. Update the database connection settings (if needed) in config.php
7. Open browser and visit: https://localhost/index.php
8. Register as a user or admin to start using the app

How to Run (alternatively)

1. Make sure to have XAMPP installed
2. Launch Apache-PHP server via XAMPP
3. Launch MySQL server via XAMPP (for Database, phpmyadmin)
4. Import the provided SQL schema into phpMyAdmin (db.sql)
5. Turn off Apache-PHP server in XAMPP
6. In terminal, under your folder scope (e.g., C:/your_folder)
7. Execute command “C://xampp//php//php.exe -S localhost:8000”
8. Open browser and visit: https://localhost:8000/index.php
9. Register as a user or admin to start using the app

Files & Functionality

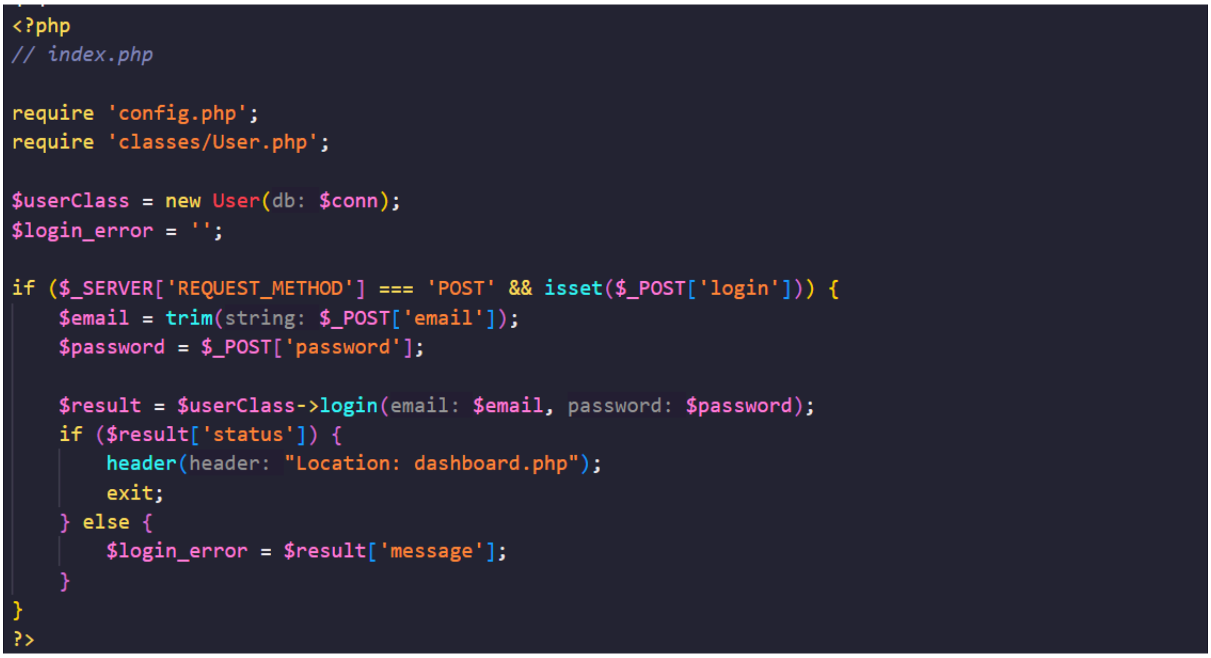
index.php



CityEVChargers

Login

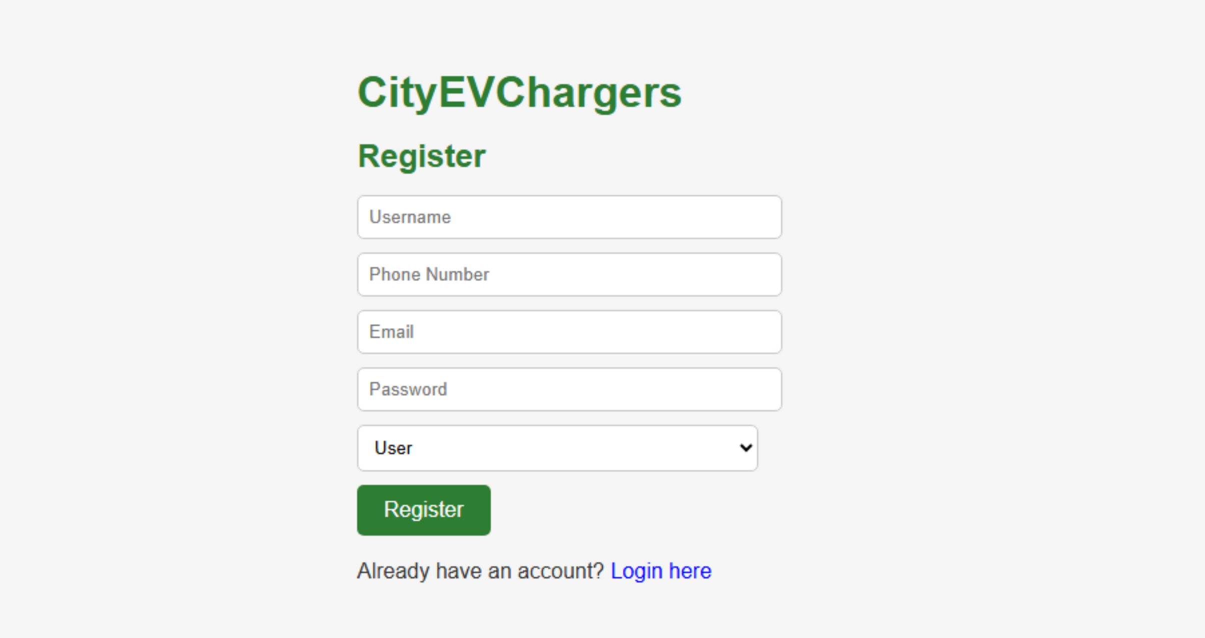
Don't have an account? Register here



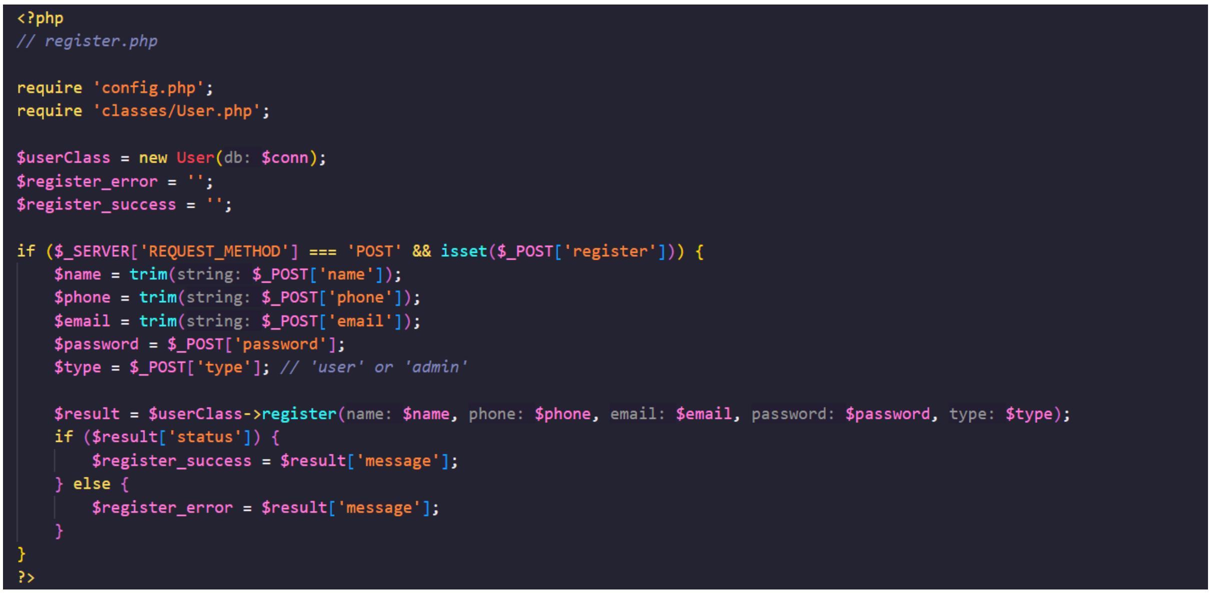
```
<?php
// index.php

require 'config.php';
require 'classes/User.php';

$userClass = new User(db: $conn);
$login_error = '';

if ($_SERVER['REQUEST_METHOD'] === 'POST' && isset($_POST['login'])) {
    $email = trim(string: $_POST['email']);
    $password = $_POST['password'];

    $result = $userClass->login(email: $email, password: $password);
    if ($result['status']) {
        header(header: "Location: dashboard.php");
        exit;
    } else {
        $login_error = $result['message'];
    }
}
?>
```

Check user info against the database and authenticate the user, redirecting to the dashboard after successful login.

register.php



Already have an account? Login here

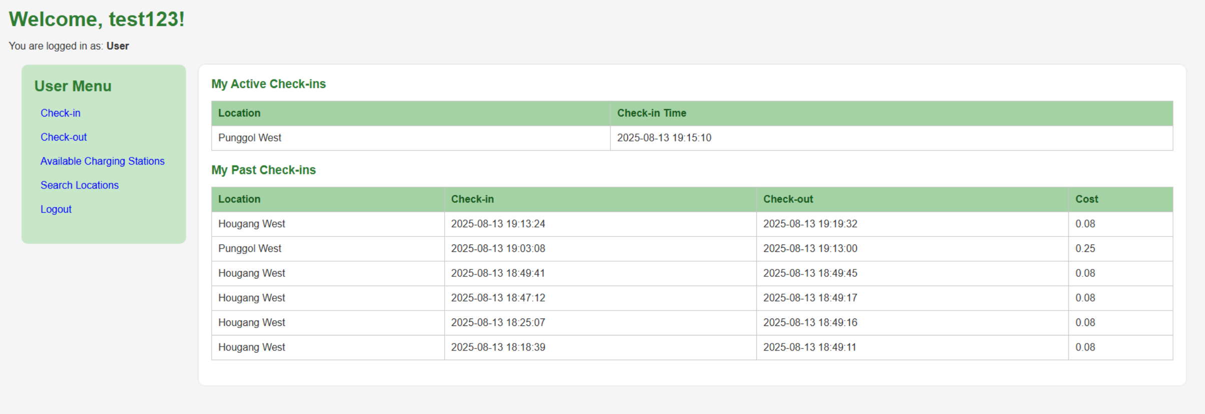


```php
<?php
// register.php

require 'config.php';
require 'classes/User.php';

$userClass = new User(db: $conn);
$register_error = '';
$register_success = '';

if ($_SERVER['REQUEST_METHOD'] === 'POST' && isset($_POST['register'])) {
    $name = trim(string: $_POST['name']);
    $phone = trim(string: $_POST['phone']);
    $email = trim(string: $_POST['email']);
    $password = $_POST['password'];
    $type = $_POST['type']; // 'user' or 'admin'

    $result = $userClass->register(name: $name, phone: $phone, email: $email, password: $password, type: $type);
    if ($result['status']) {
        $register_success = $result['message'];
    } else {
        $register_error = $result['message'];
    }
}
?>
```

First time access, user can choose to register. After successful registration, user's information is added to the database and can proceed to login.

Logging in as a User

dashboard.php



Welcome, test123!

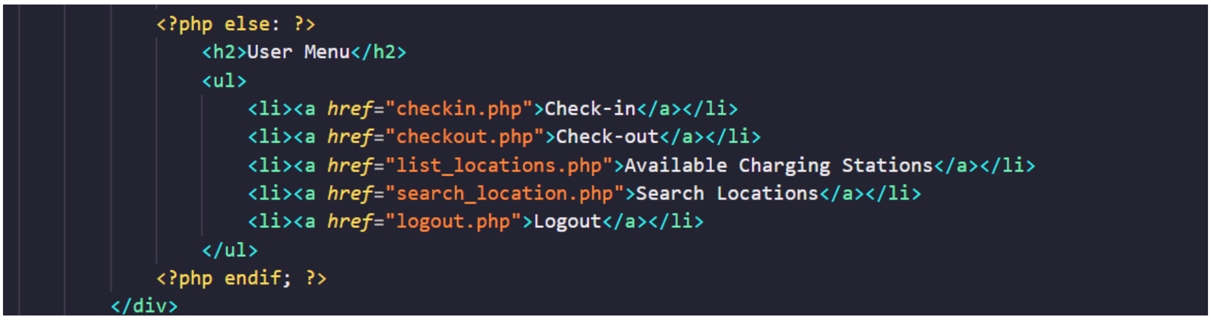
You are logged in as: **User**

My Active Check-ins

Location	Check-in Time
Punggol West	2025-08-13 19:15:10

My Past Check-ins

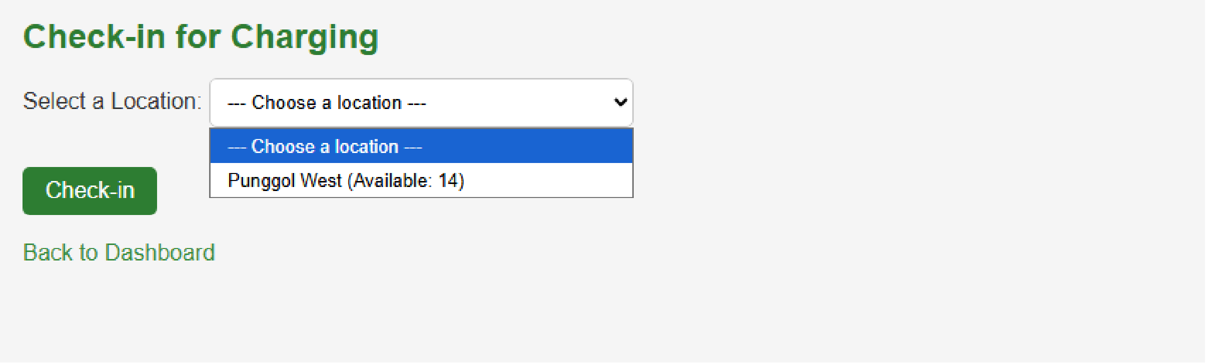
Location	Check-in	Check-out	Cost
Hougang West	2025-08-13 19:13:24	2025-08-13 19:19:32	0.08
Punggol West	2025-08-13 19:03:08	2025-08-13 19:13:00	0.25
Hougang West	2025-08-13 18:49:41	2025-08-13 18:49:45	0.08
Hougang West	2025-08-13 18:47:12	2025-08-13 18:49:17	0.08
Hougang West	2025-08-13 18:25:07	2025-08-13 18:49:16	0.08
Hougang West	2025-08-13 18:18:39	2025-08-13 18:49:11	0.08



```
        <?php else: ?>
            <h2>User Menu</h2>
            <ul>
                <li><a href="checkin.php">Check-in</a></li>
                <li><a href="checkout.php">Check-out</a></li>
                <li><a href="list_locations.php">Available Charging Stations</a></li>
                <li><a href="search_location.php">Search Locations</a></li>
                <li><a href="logout.php">Logout</a></li>
            </ul>
        <?php endif; ?>
    </div>
```

Logging into the system as a user will allow users to view all actions as a User Menu as well as information of their active check-ins and past check-ins.

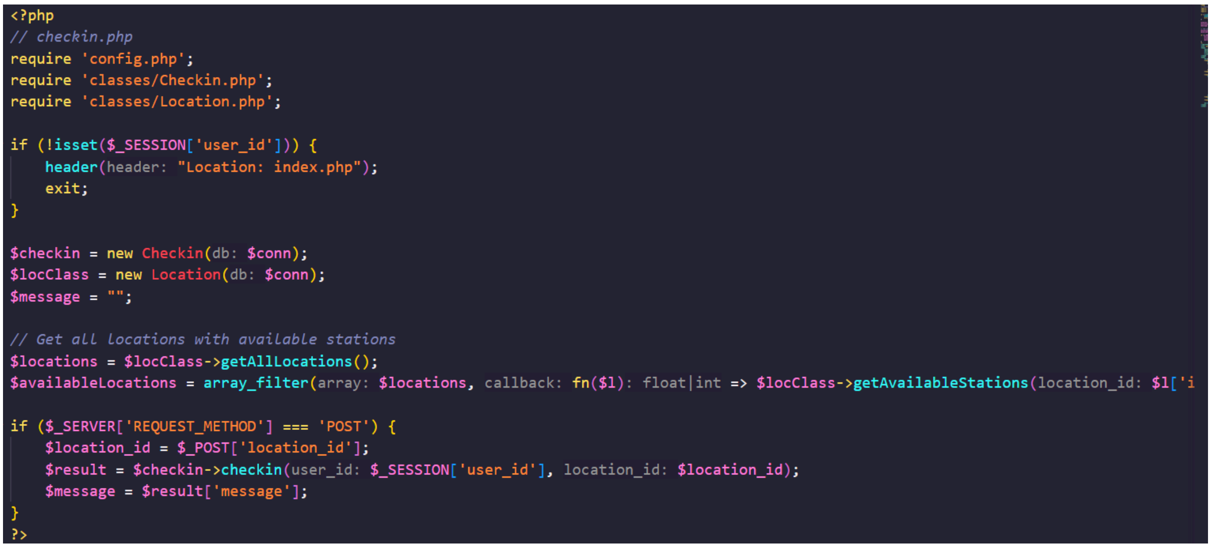
checkin.php



Check-in for Charging

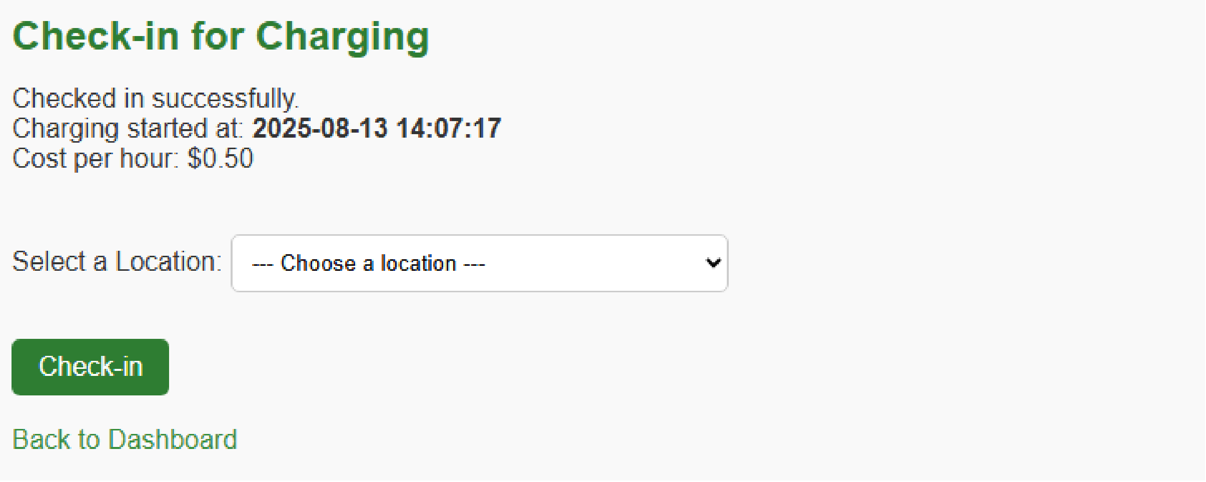
Select a Location: --- Choose a location ---

--- Choose a location ---
Punggol West (Available: 14)



```
<?php
// checkin.php
require 'config.php';
require 'classes/Checkin.php';
require 'classes/Location.php';

if (!isset($_SESSION['user_id'])) {
    header(header: "Location: index.php");
    exit;
}

$checkin = new Checkin(db: $conn);
$locClass = new Location(db: $conn);
$message = "";

// Get all locations with available stations
$locations = $locClass->getAllLocations();
$availableLocations = array_filter(array: $locations, callback: fn($l): float|int => $locClass->getAvailableStations(location_id: $l['i

if ($_SERVER['REQUEST_METHOD'] === 'POST') {
    $location_id = $_POST['location_id'];
    $result = $checkin->checkin(user_id: $_SESSION['user_id'], location_id: $location_id);
    $message = $result['message'];
}
?>
```

Users can only view available EV charging stations as a selection. Selecting a station and checking in will display relevant information as below:

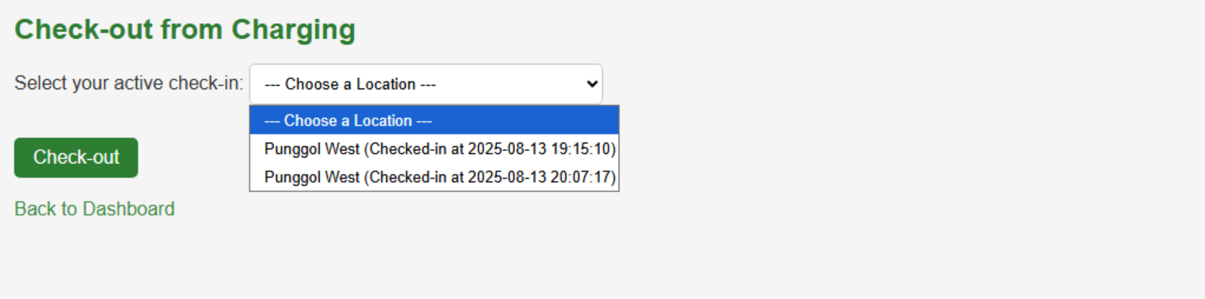


Check-in for Charging

Checked in successfully.
Charging started at: **2025-08-13 14:07:17**
Cost per hour: $0.50

Select a Location: --- Choose a location ---

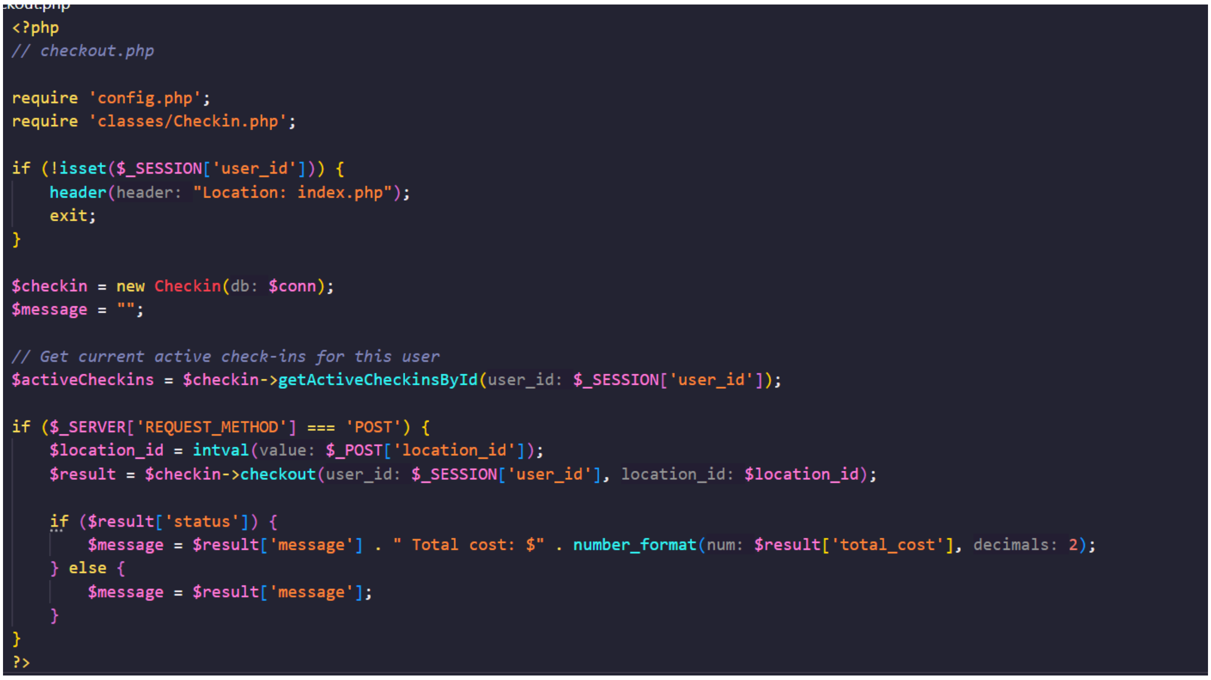
checkout.php



Check-out from Charging

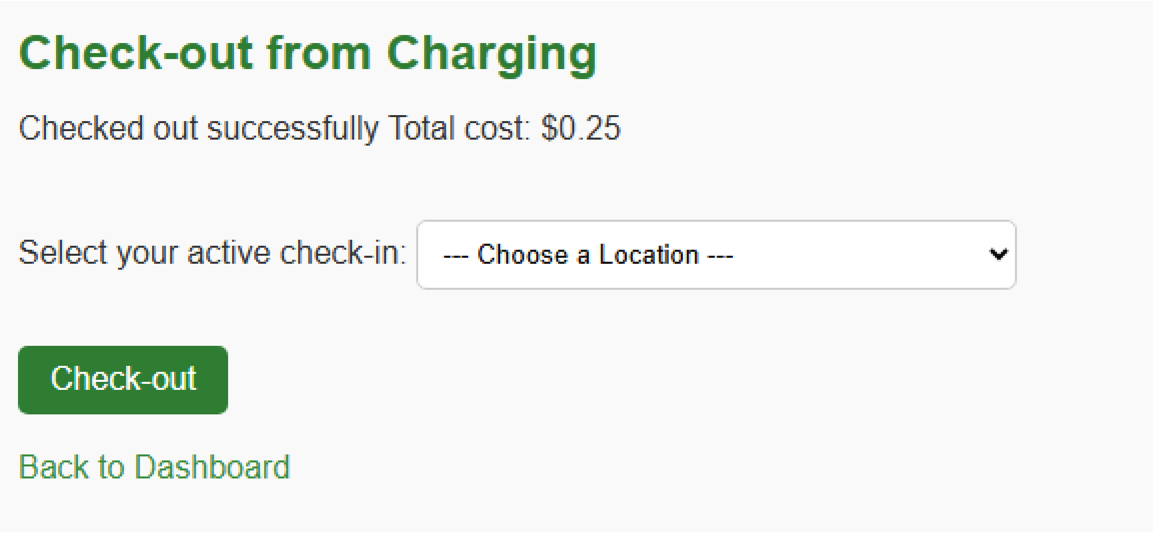
Select your active check-in: --- Choose a Location ---

--- Choose a Location ---
Punggol West (Checked-in at 2025-08-13 19:15:10)
Punggol West (Checked-in at 2025-08-13 20:07:17)
Check-out
Back to Dashboard



```php
<?php
// checkout.php

require 'config.php';
require 'classes/Checkin.php';

if (!isset($_SESSION['user_id'])) {
    header(header: "Location: index.php");
    exit;
}

$checkin = new Checkin(db: $conn);
$message = "";

// Get current active check-ins for this user
$activeCheckins = $checkin->getActiveCheckinsById(user_id: $_SESSION['user_id']);

if ($_SERVER['REQUEST_METHOD'] === 'POST') {
    $location_id = intval(value: $_POST['location_id']);
    $result = $checkin->checkout(user_id: $_SESSION['user_id'], location_id: $location_id);

    if ($result['status']) {
        $message = $result['message'] . " Total cost: $" . number_format(num: $result['total_cost'], decimals: 2);
    } else {
        $message = $result['message'];
    }
}
?>
```

To checkout, user can select from all active check-ins, displayed in the dropdown menu and select which to check out. Upon checking out, they will be informed of the total cost incurred as below:

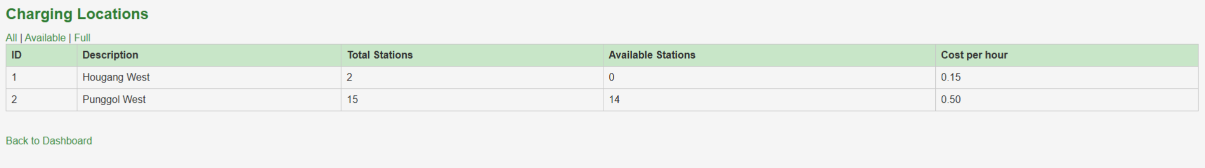


Check-out from Charging

Checked out successfully Total cost: $0.25

Select your active check-in: --- Choose a Location ---

list_locations.php

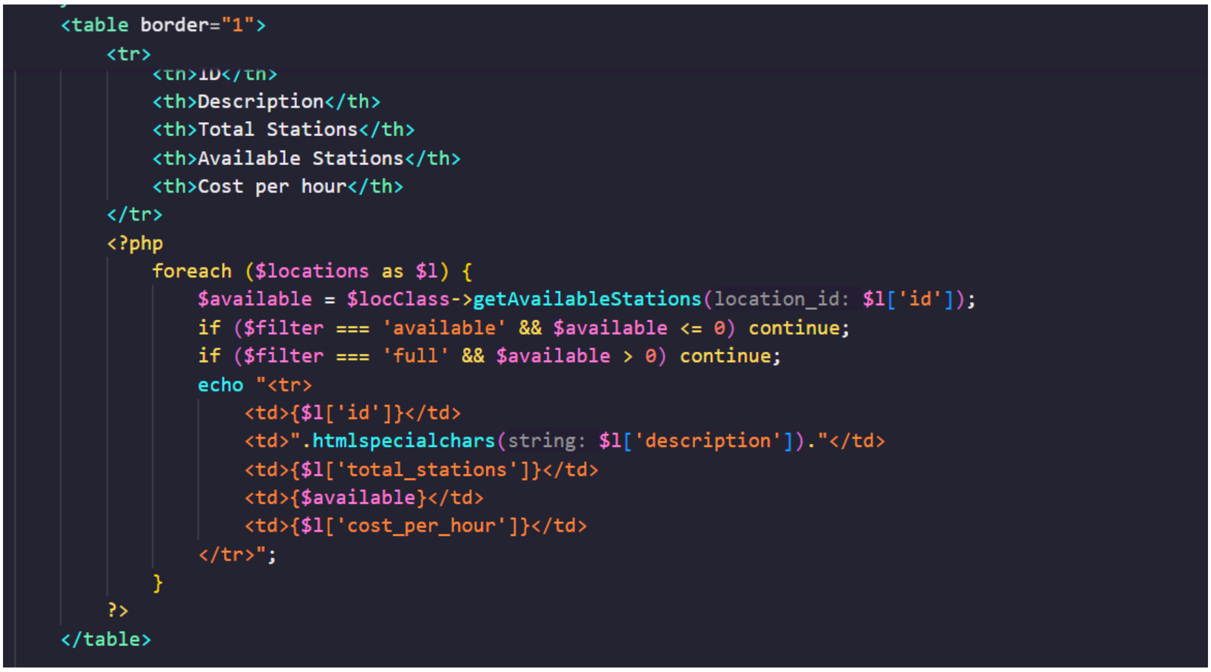


Charging Locations

All | Available | Full

ID	Description	Total Stations	Available Stations	Cost per hour
1	Hougang West	2	0	0.15
2	Punggol West	15	14	0.50

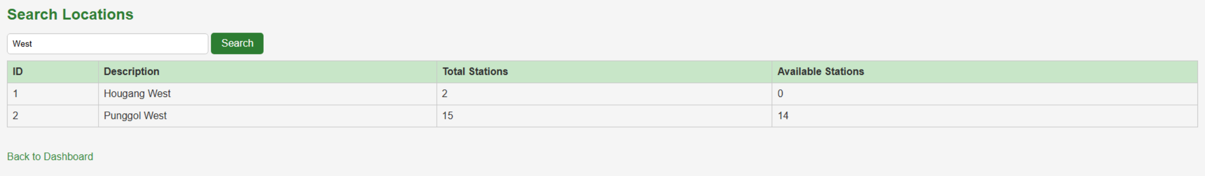
Back to Dashboard



```
<table border="1">
    <tr>
        <th>ID</th>
        <th>Description</th>
        <th>Total Stations</th>
        <th>Available Stations</th>
        <th>Cost per hour</th>
    </tr>
    <?php
        foreach ($locations as $l) {
            $available = $locClass->getAvailableStations(location_id: $l['id']);
            if ($filter === 'available' && $available <= 0) continue;
            if ($filter === 'full' && $available > 0) continue;
            echo "<tr>
                <td>{$l['id']}</td>
                <td>".htmlspecialchars(string: $l['description'])."</td>
                <td>{$l['total_stations']}</td>
                <td>{$available}</td>
                <td>{$l['cost_per_hour']}</td>
            </tr>";
        }
    ?>
</table>
```

Displays all EV Charging locations, and can be filtered between “All”, “Available” or “Full”.

search_location.php

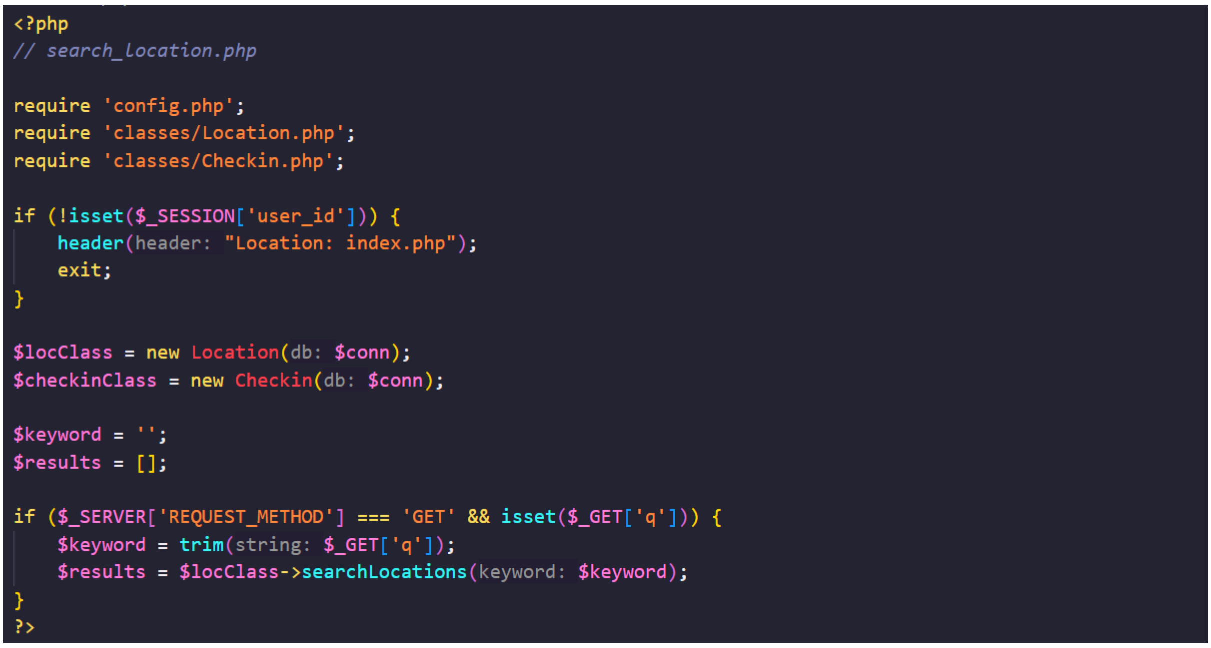


Search Locations

West

ID	Description	Total Stations	Available Stations
1	Hougang West	2	0
2	Punggol West	15	14

Back to Dashboard

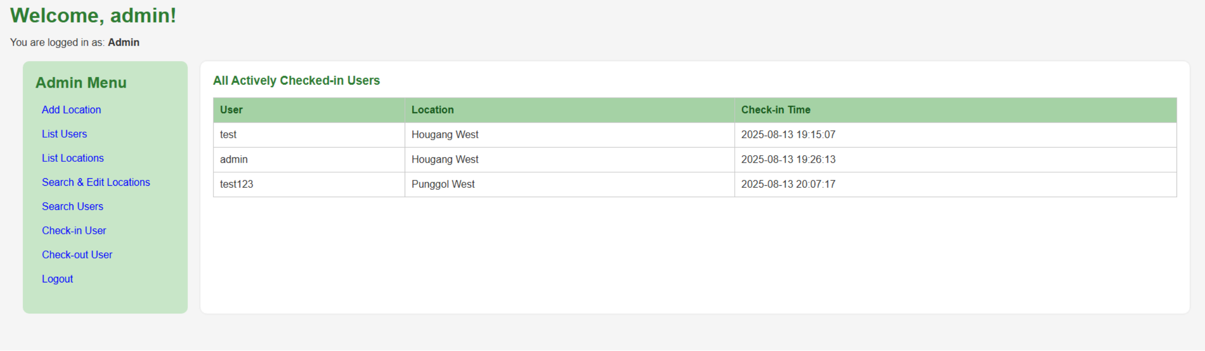


```php
<?php
// search_location.php

require 'config.php';
require 'classes/Location.php';
require 'classes/Checkin.php';

if (!isset($_SESSION['user_id'])) {
    header(header: "Location: index.php");
    exit;
}

$locClass = new Location(db: $conn);
$checkinClass = new Checkin(db: $conn);

$keyword = '';
$results = [];

if ($_SERVER['REQUEST_METHOD'] === 'GET' && isset($_GET['q'])) {
    $keyword = trim(string: $_GET['q']);
    $results = $locClass->searchLocations(keyword: $keyword);
}
?>
```

User can choose to search for locations by their ID or their description. It will display all existing charging locations.

Logging in as an Administrator

dashboard.php



Welcome, admin!

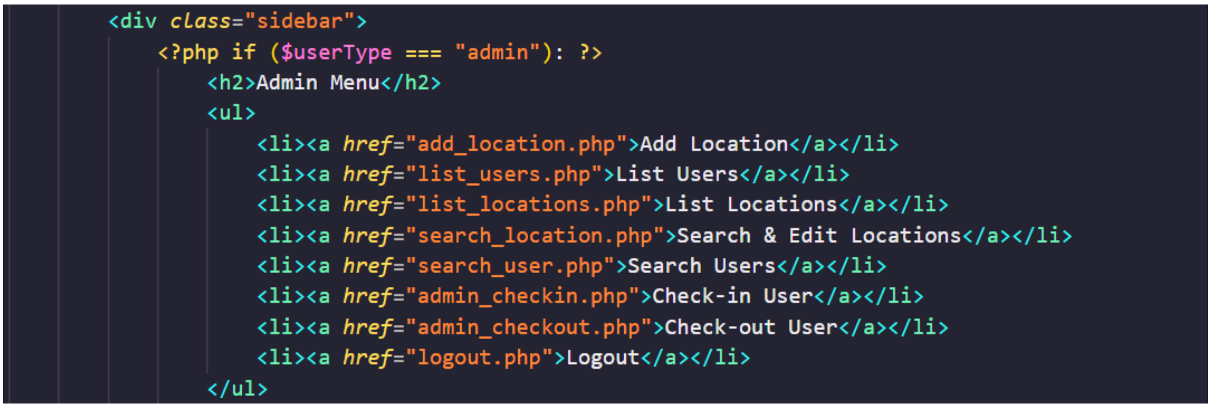
You are logged in as: **Admin**

Admin Menu

- Add Location
- List Users
- List Locations
- Search & Edit Locations
- Search Users
- Check-in User
- Check-out User
- Logout

All Actively Checked-in Users

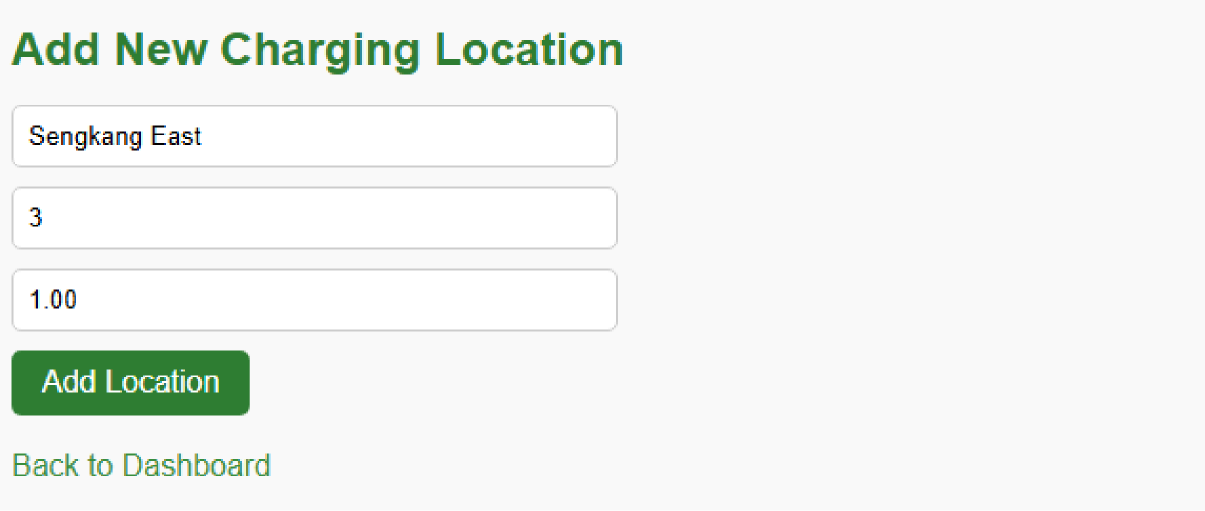
User	Location	Check-in Time
test	Hougang West	2025-08-13 19:15:07
admin	Hougang West	2025-08-13 19:26:13
test123	Punggol West	2025-08-13 20:07:17



```
<div class="sidebar">
    <?php if ($userType === "admin"): ?>
        <h2>Admin Menu</h2>
        <ul>
            <li><a href="add_location.php">Add Location</a></li>
            <li><a href="list_users.php">List Users</a></li>
            <li><a href="list_locations.php">List Locations</a></li>
            <li><a href="search_location.php">Search & Edit Locations</a></li>
            <li><a href="search_user.php">Search Users</a></li>
            <li><a href="admin_checkin.php">Check-in User</a></li>
            <li><a href="admin_checkout.php">Check-out User</a></li>
            <li><a href="logout.php">Logout</a></li>
        </ul>
```

An Admin will be greeted by the Admin Menu when logging in, with all the actions that can be performed as an Administrator. Admins are also able to view all users who are actively checked-in to a charging station.

add_location.php

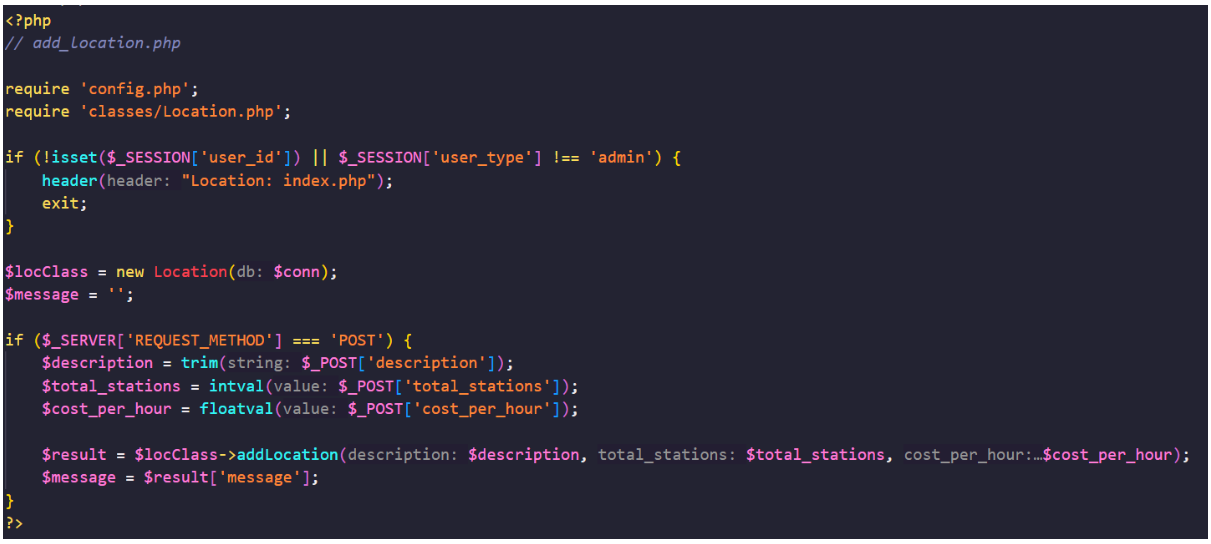


Add New Charging Location

Sengkang East

3

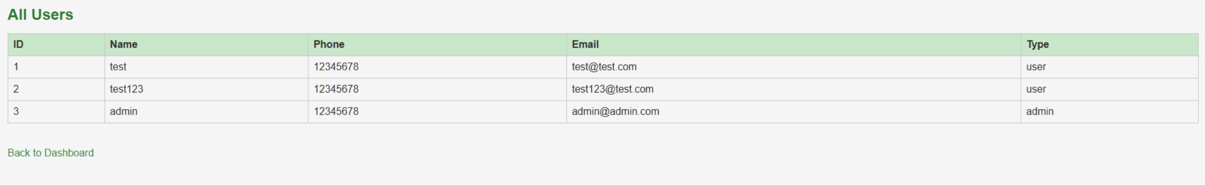
1.00



```php
<?php
// add_location.php

require 'config.php';
require 'classes/Location.php';

if (!isset($_SESSION['user_id']) || $_SESSION['user_type'] !== 'admin') {
    header(header: "Location: index.php");
    exit;
}

$locClass = new Location(db: $conn);
$message = '';

if ($_SERVER['REQUEST_METHOD'] === 'POST') {
    $description = trim(string: $_POST['description']);
    $total_stations = intval(value: $_POST['total_stations']);
    $cost_per_hour = floatval(value: $_POST['cost_per_hour']);

    $result = $locClass->addLocation(description: $description, total_stations: $total_stations, cost_per_hour:…$cost_per_hour);
    $message = $result['message'];
}
?>
```

Admins can add new locations into the system with information like the location description, total stations and cost per hour.

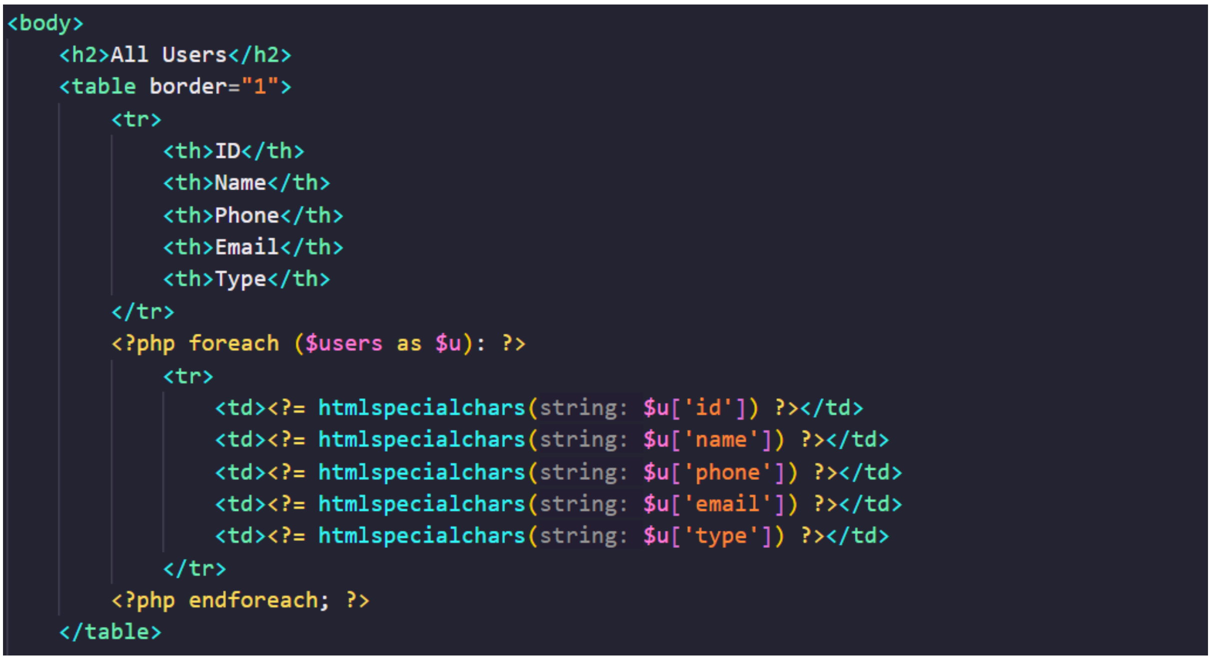
list_users.php



All Users

ID	Name	Phone	Email	Type
1	test	12345678	test@test.com	user
2	test123	12345678	test123@test.com	user
3	admin	12345678	admin@admin.com	admin

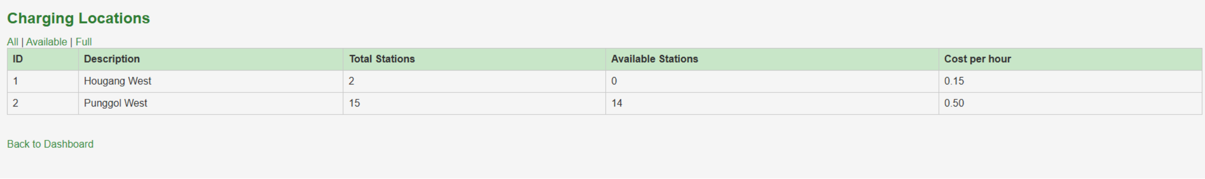
Back to Dashboard



```
<body>
    <h2>All Users</h2>
    <table border="1">
        <tr>
            <th>ID</th>
            <th>Name</th>
            <th>Phone</th>
            <th>Email</th>
            <th>Type</th>
        </tr>
        <?php foreach ($users as $u): ?>
            <tr>
                <td><?= htmlspecialchars(string: $u['id']) ?></td>
                <td><?= htmlspecialchars(string: $u['name']) ?></td>
                <td><?= htmlspecialchars(string: $u['phone']) ?></td>
                <td><?= htmlspecialchars(string: $u['email']) ?></td>
                <td><?= htmlspecialchars(string: $u['type']) ?></td>
            </tr>
        <?php endforeach; ?>
    </table>
```

An admin is able to view all user information of users registered to the system, organized in a table.

list_locations.php

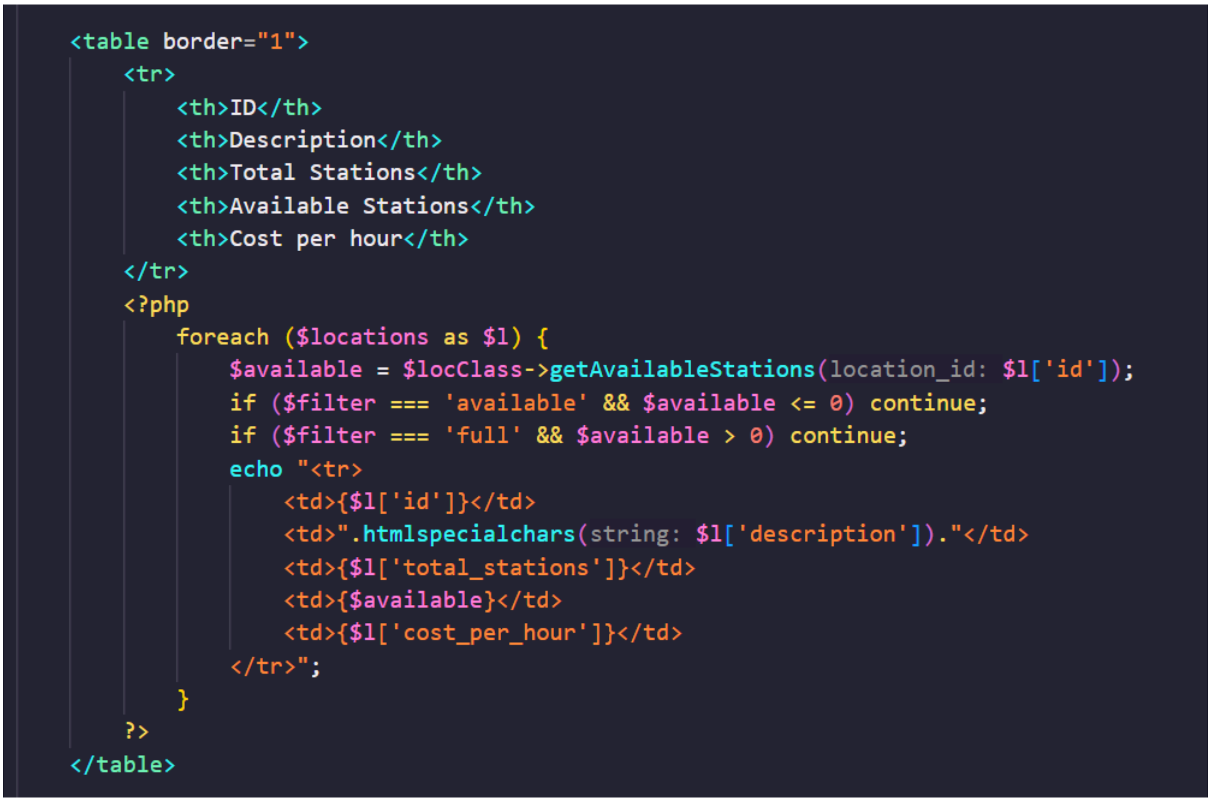


Charging Locations

All | Available | Full

ID	Description	Total Stations	Available Stations	Cost per hour
1	Hougang West	2	0	0.15
2	Punggol West	15	14	0.50

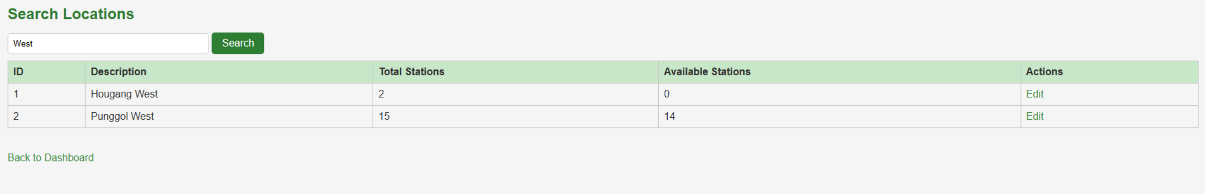
Back to Dashboard



```
<table border="1">
    <tr>
        <th>ID</th>
        <th>Description</th>
        <th>Total Stations</th>
        <th>Available Stations</th>
        <th>Cost per hour</th>
    </tr>
    <?php
        foreach ($locations as $l) {
            $available = $locClass->getAvailableStations(location_id: $l['id']);
            if ($filter === 'available' && $available <= 0) continue;
            if ($filter === 'full' && $available > 0) continue;
            echo "<tr>
                <td>{$l['id']}</td>
                <td>".htmlspecialchars(string: $l['description'])."</td>
                <td>{$l['total_stations']}</td>
                <td>{$available}</td>
                <td>{$l['cost_per_hour']}</td>
            </tr>";
        }
    ?>
</table>
```

An admin can view all existing charging stations and can filter between “All”, “Available” or “Full”.

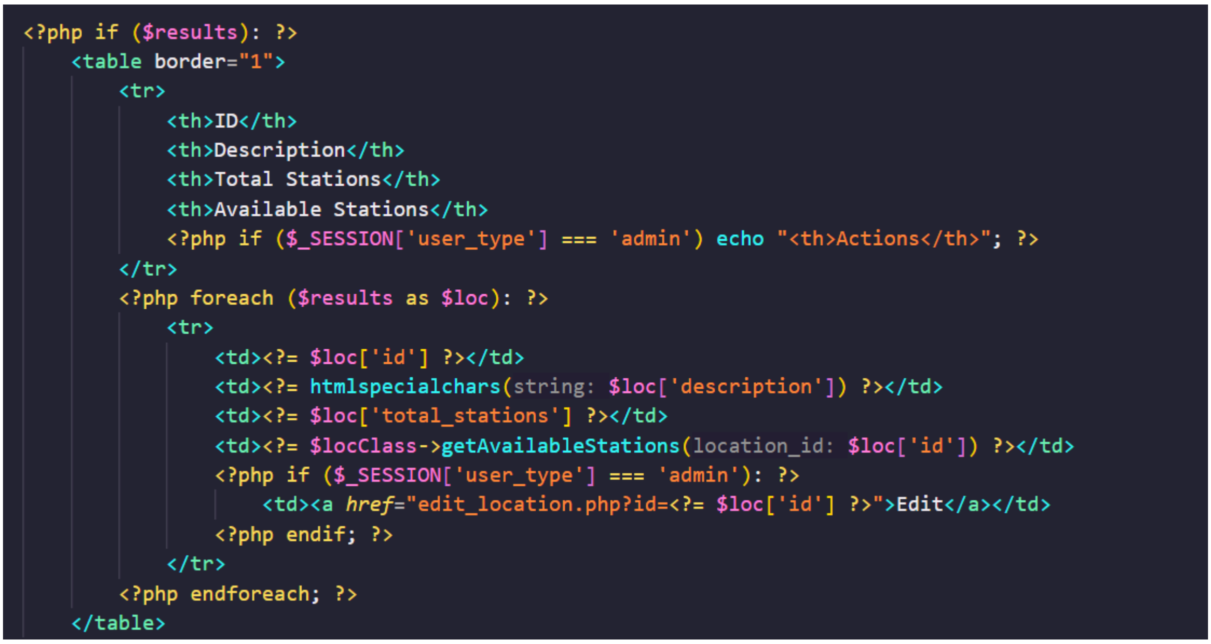
search_location.php



Search Locations

West

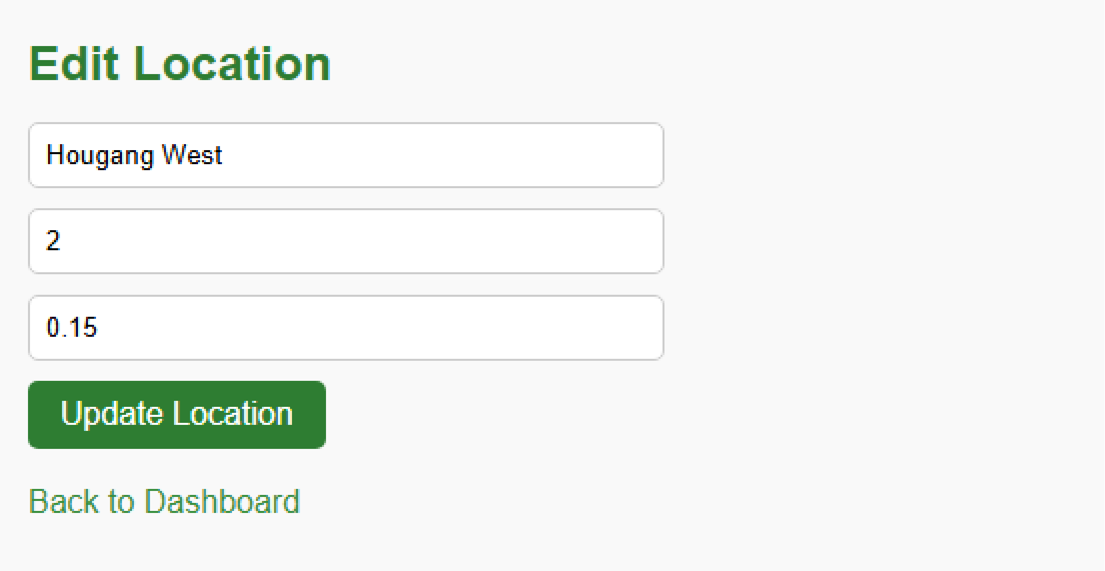
ID	Description	Total Stations	Available Stations	Actions
1	Hougang West	2	0	Edit
2	Punggol West	15	14	Edit



```
<?php if ($results): ?>
    <table border="1">
        <tr>
            <th>ID</th>
            <th>Description</th>
            <th>Total Stations</th>
            <th>Available Stations</th>
            <?php if ($_SESSION['user_type'] === 'admin') echo "<th>Actions</th>"; ?>
        </tr>
        <?php foreach ($results as $loc): ?>
            <tr>
                <td><?= $loc['id'] ?></td>
                <td><?= htmlspecialchars(string: $loc['description']) ?></td>
                <td><?= $loc['total_stations'] ?></td>
                <td><?= $locClass->getAvailableStations(location_id: $loc['id']) ?></td>
                <?php if ($_SESSION['user_type'] === 'admin'): ?>
                    <td><a href="edit_location.php?id=<?= $loc['id'] ?>">Edit</a></td>
                <?php endif; ?>
            </tr>
        <?php endforeach; ?>
    </table>
```

An admin can search for specific locations based on their ID or description, they are able to then choose to edit these locations’ information.

edit_location.php



Edit Location

Hougang West

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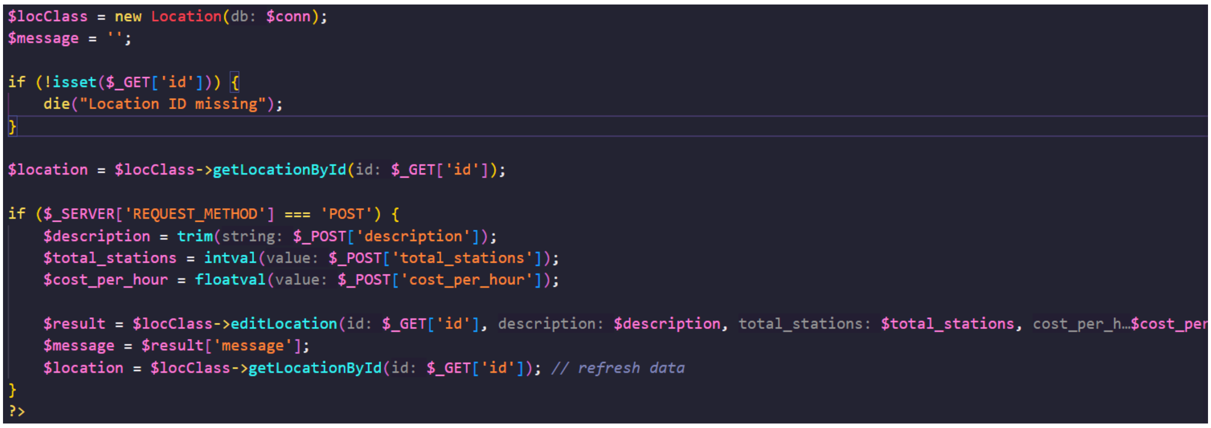
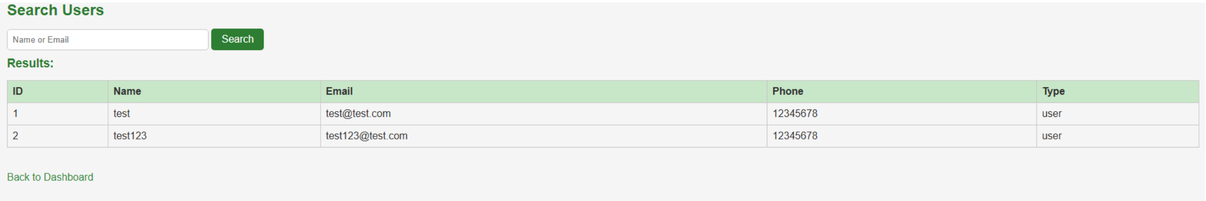
0.15



```php
$locClass = new Location(db: $conn);
$message = '';

if (!isset($_GET['id'])) {
    die("Location ID missing");
}

$location = $locClass->getLocationById(id: $_GET['id']);

if ($_SERVER['REQUEST_METHOD'] === 'POST') {
    $description = trim(string: $_POST['description']);
    $total_stations = intval(value: $_POST['total_stations']);
    $cost_per_hour = floatval(value: $_POST['cost_per_hour']);

    $result = $locClass->editLocation(id: $_GET['id'], description: $description, total_stations: $total_stations, cost_per_h…$cost_per
    $message = $result['message'];
    $location = $locClass->getLocationById(id: $_GET['id']); // refresh data
}
?>
```

An admin can choose to edit a specific location’s details and update the information.

search_user.php

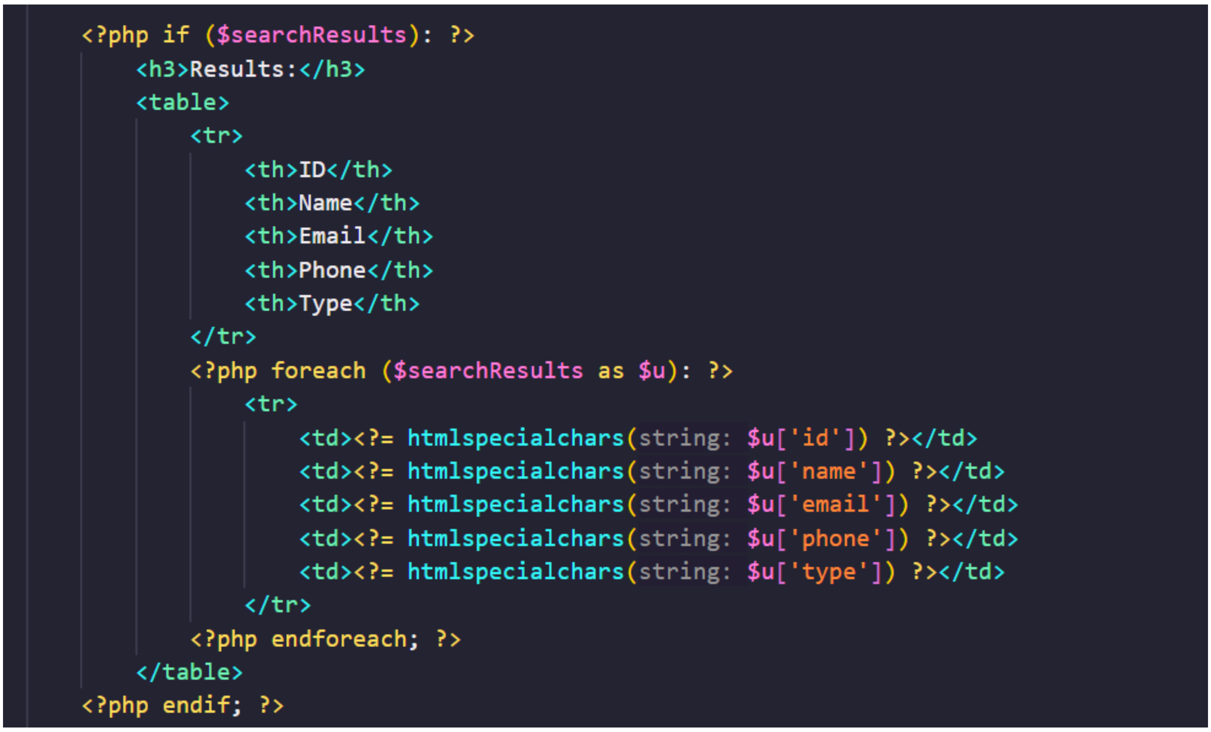


Search Users

Results:

ID	Name	Email	Phone	Type
1	test	test@test.com	12345678	user
2	test123	test123@test.com	12345678	user

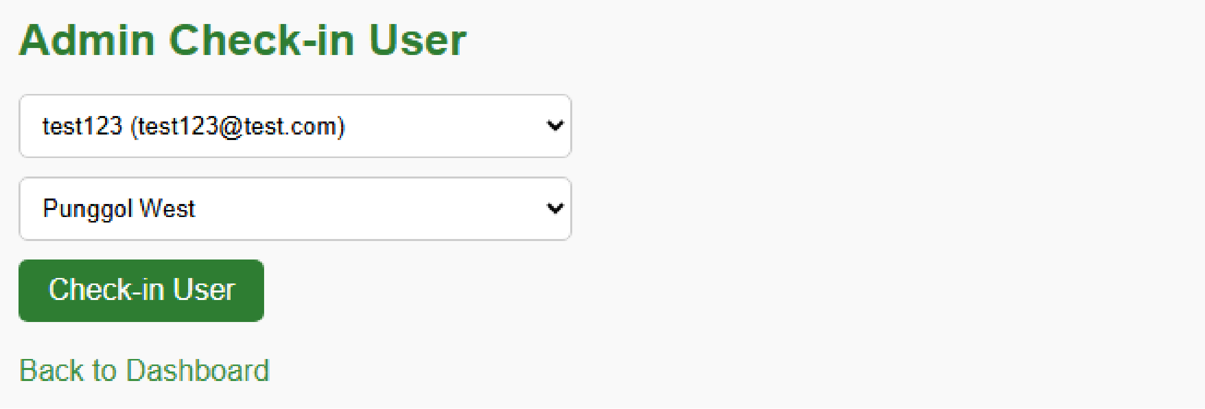
Back to Dashboard



```
<?php if ($searchResults): ?>
    <h3>Results:</h3>
    <table>
        <tr>
            <th>ID</th>
            <th>Name</th>
            <th>Email</th>
            <th>Phone</th>
            <th>Type</th>
        </tr>
        <?php foreach ($searchResults as $u): ?>
            <tr>
                <td><?= htmlspecialchars(string: $u['id']) ?></td>
                <td><?= htmlspecialchars(string: $u['name']) ?></td>
                <td><?= htmlspecialchars(string: $u['email']) ?></td>
                <td><?= htmlspecialchars(string: $u['phone']) ?></td>
                <td><?= htmlspecialchars(string: $u['type']) ?></td>
            </tr>
        <?php endforeach; ?>
    </table>
<?php endif; ?>
```

An admin can choose to search users by their name or email, and view a list of their information matching the search.

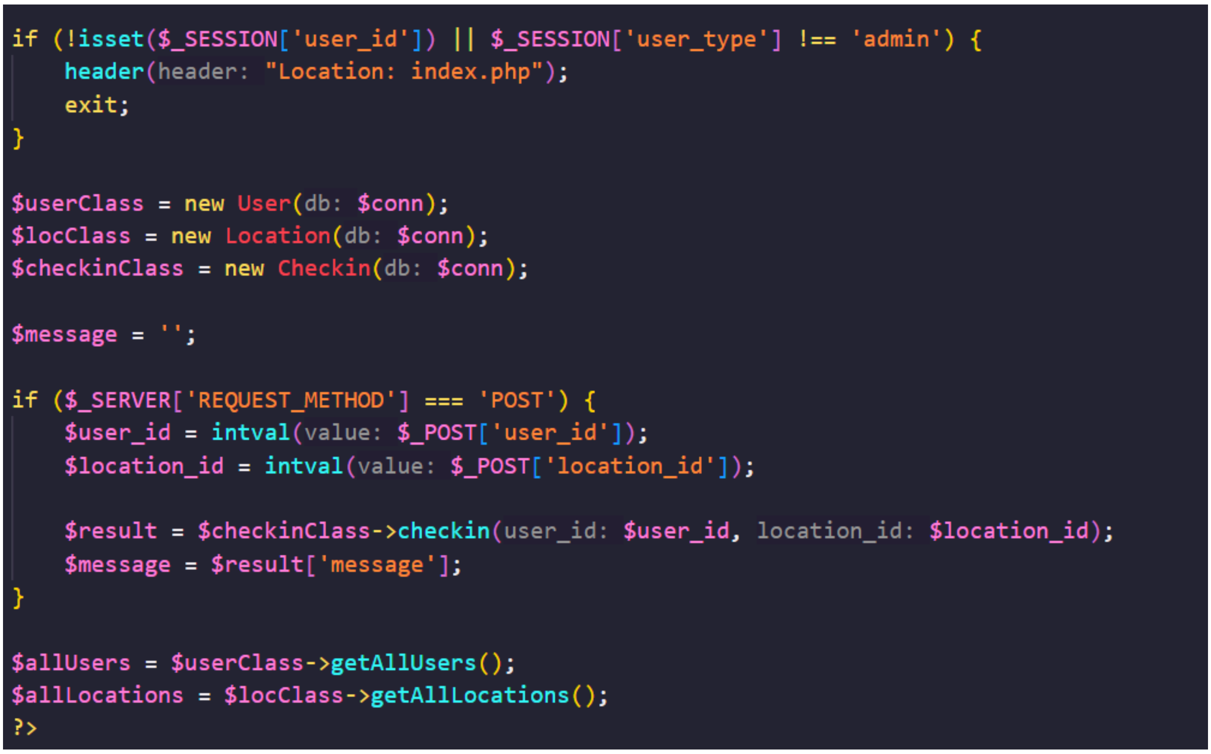
admin_checkin.php



Admin Check-in User

test123 (test123@test.com)

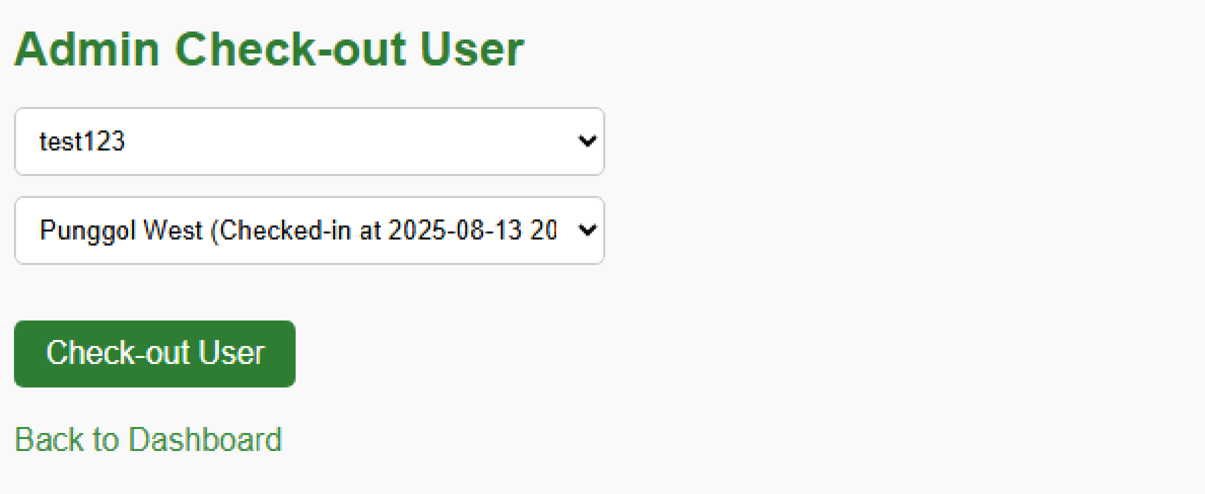
Punggol West



```php
if (!isset($_SESSION['user_id']) || $_SESSION['user_type'] !== 'admin') {
    header(header: "Location: index.php");
    exit;
}

$userClass = new User(db: $conn);
$locClass = new Location(db: $conn);
$checkinClass = new Checkin(db: $conn);

$message = '';

if ($_SERVER['REQUEST_METHOD'] === 'POST') {
    $user_id = intval(value: $_POST['user_id']);
    $location_id = intval(value: $_POST['location_id']);

    $result = $checkinClass->checkin(user_id: $user_id, location_id: $location_id);
    $message = $result['message'];
}

$allUsers = $userClass->getAllUsers();
$allLocations = $locClass->getAllLocations();
?>
```

An admin can decide to check in to the charging station on a user’s behalf, selecting the user’s name + email and the location to check them in to. This is helpful if there are any errors on the user’s side.

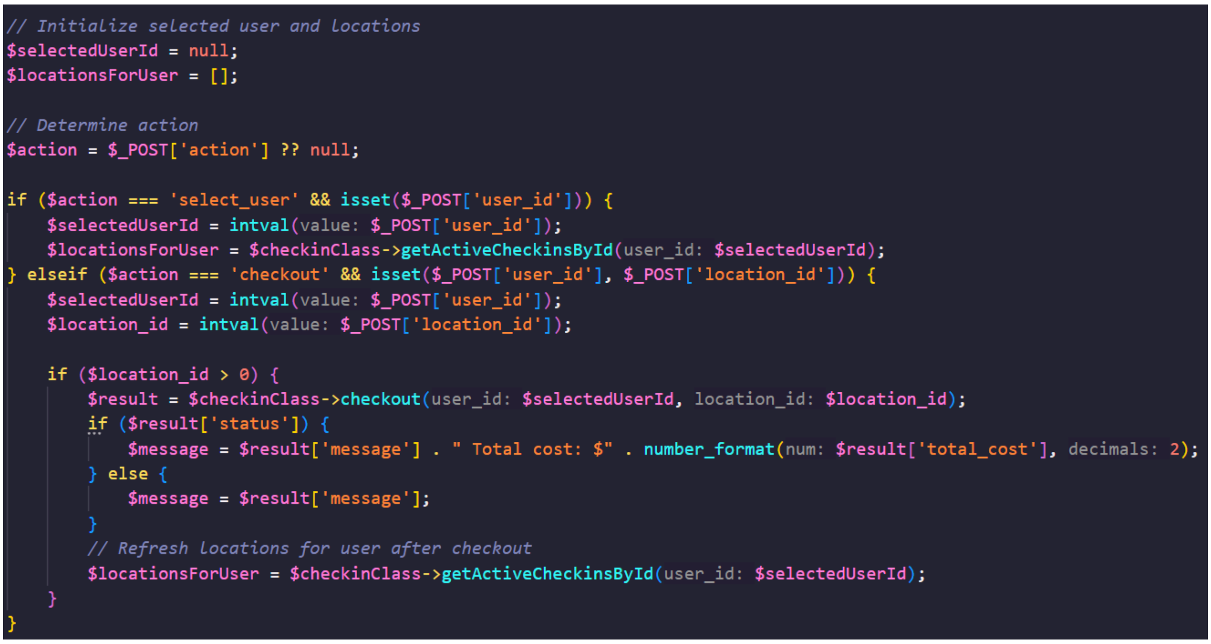
admin_checkout.php



Admin Check-out User

test123

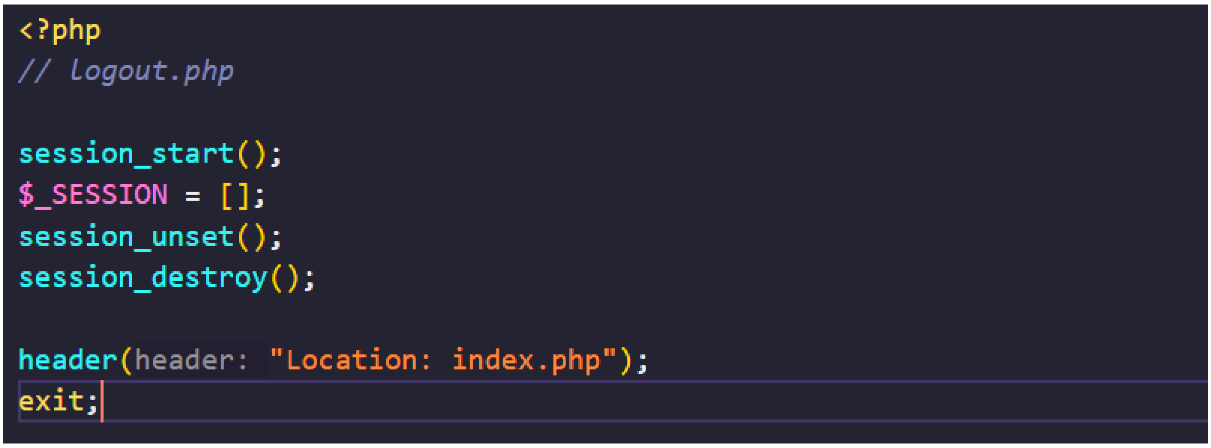
Punggol West (Checked-in at 2025-08-13 20



```php
// Initialize selected user and locations
$selectedUserId = null;
$locationsForUser = [];

// Determine action
$action = $_POST['action'] ?? null;

if ($action === 'select_user' && isset($_POST['user_id'])) {
    $selectedUserId = intval(value: $_POST['user_id']);
    $locationsForUser = $checkinClass->getActiveCheckinsById(user_id: $selectedUserId);
} elseif ($action === 'checkout' && isset($_POST['user_id'], $_POST['location_id'])) {
    $selectedUserId = intval(value: $_POST['user_id']);
    $location_id = intval(value: $_POST['location_id']);

    if ($location_id > 0) {
        $result = $checkinClass->checkout(user_id: $selectedUserId, location_id: $location_id);
        if ($result['status']) {
            $message = $result['message'] . " Total cost: $" . number_format(num: $result['total_cost'], decimals: 2);
        } else {
            $message = $result['message'];
        }
        // Refresh locations for user after checkout
        $locationsForUser = $checkinClass->getActiveCheckinsById(user_id: $selectedUserId);
    }
}
```

An admin can also decide to check out a user from a charging station on their behalf. It will populate the location selection with locations that the user is already checked in to.

logout.php



```php
<?php
// logout.php

session_start();
$_SESSION = [];
session_unset();
session_destroy();

header(header: "Location: index.php");
exit;
```

When a user or administrator is done using the system, they can choose to logout, which will redirect them back to the login page and end their session.