Programming for Data Engineering

Hall Reservation System Report

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Project Overview

The Hall Reservation System is a complete desktop-based application developed using Python (PyQt6) for the GUI and SQLite3 for database management. The system allows users to sign up, log in, view available halls, make and manage reservations, and for administrators to manage hall listings and reservations. This project simulates a real-life booking system where multiple users interact with a program that assists them to reserve halls

Team Members and Contributions

This was a group project completed by 3 members, with tasks divided based on roles

- **Abdelfatah Alhoot – GUI Designer:**
  Responsible for designing all application windows using PyQt Drag and Drop. Implemented forms for login, registration, hall browsing, reservation, and admin controls. Ensured an engaging and user-friendly interactive interface with a professional appearance.
- **Zarif Razeen – Functional Logic Developer:**
  Integrated all button functionalities using Pycharm IDE. Connected GUI buttons with relevant methods and functions and ensured all user and admin interactions triggered appropriate behavior. Created and organized the logic for user authentication, reservation and payment processing, and navigation between windows.
- **Mamdouh Almasri – Database Manager:**
  Designed and implemented the SQLite3 database schema. Wrote SQL queries to handle user registration, login verification, hall information, reservation entries, and admin functions such as hall management. Ensured data integrity and secure storage of user credentials.

Project features

Authentication System

- **Secure login and signup interface for users.**
- **Password confirmation and input validation.**
- **Admin login access with special privileges.**

Hall Management

- **Admins can add, edit, or delete halls.**
- **Halls are stored in the database with all necessary details.**
- **Interface displays a list of halls with options to manage them.**

Reservation System

- **Users can view available halls and reserve based on time/date.**
- **Users can edit or cancel their reservations.**
- **Each reservation is tied to the specific logged-in user.**

Admin Controls

- **Admin dashboard shows all reservations.**
- **Admins can cancel or reschedule bookings.**
- **View and manage registered users.**

Payment Handling

- **A simulated payment step follows a successful reservation.**
- **Includes a payment confirmation dialog box or message.**

Implementation Details

GUI Design (Person 1)

- **Qt Designer was used to create .ui files.**
- **Each form was loaded into Python using uic.loadUi() in PyQt6.**
- **Windows are shown/hidden using .show() and .hide() methods to navigate the application.**
- **All buttons were given object names and IDs for easy signal handling.**

Functionality Integration (Person 2)

- **PyQt6 button clicks are connected to functions using .clicked.connect().**

- **Methods like handle_login(), handle_signup(), handle_reservation(), and others were written for each user interaction.**
- **Print statements were temporarily used for debugging flow before full integration.**
- **QMessageBox was used for all error and success feedback to users.**

Database Logic (Person 3)

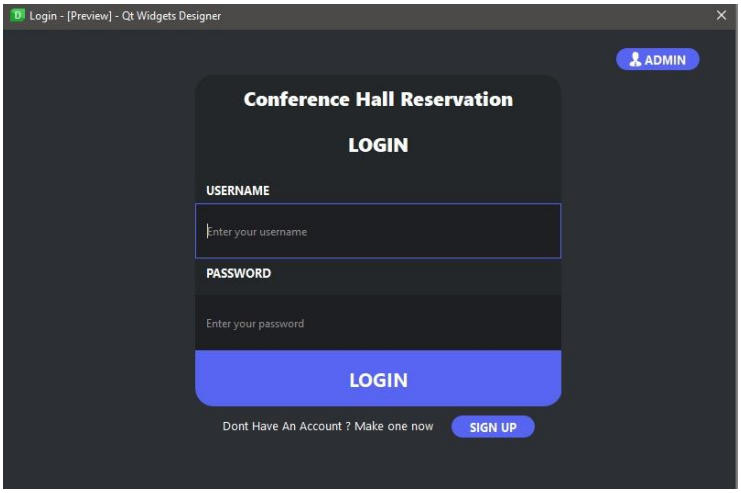
- **SQLite3 was chosen as a lightweight embedded database.**
- **Tables created: users, halls, reservations.**
- **SQL queries included: SELECT, INSERT, UPDATE, and DELETE operations.**
- **Each function like signup/login or add/edit hall is backed by a SQL query.**
- **Data is committed using conn.commit() and safely closed with conn.close().**

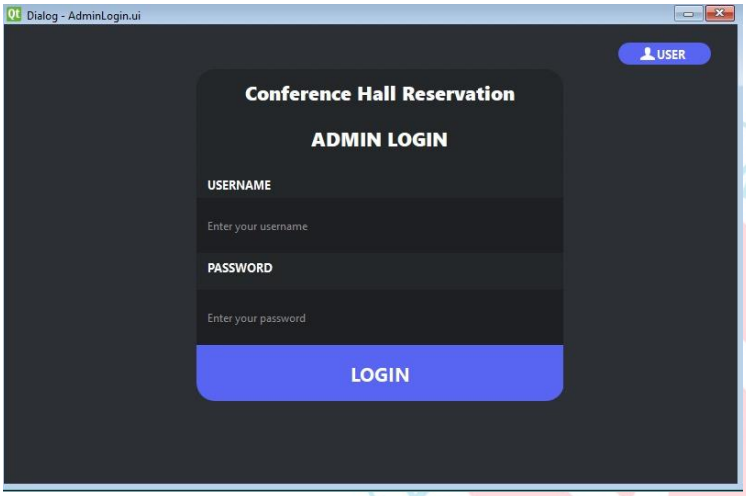
Important Functions and Classes

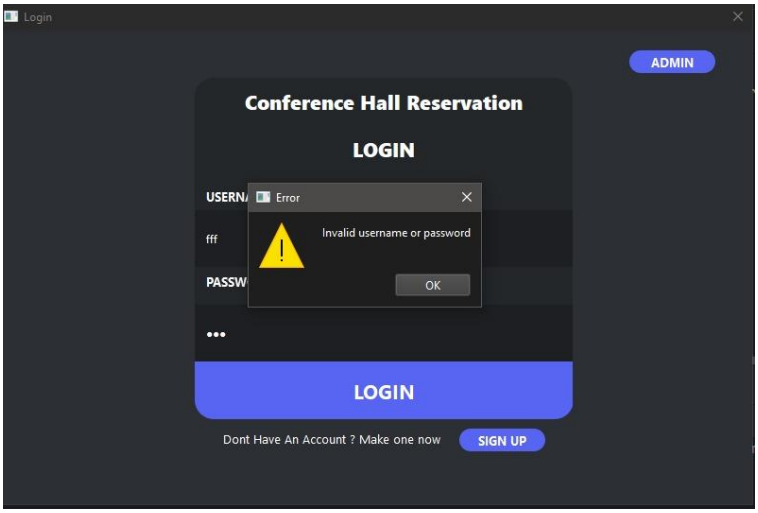
Function / Method	*Description*
handle_login()	*Verifies credentials, redirects user or admin.*
handle_signup()	*Validates inputs and registers new users in the database.*
handle_reservation()	*Saves reservation data to the database.*
handle_edit_reservation()	*Updates existing reservation details.*
handle_cancel_reservation()	*Removes reservation entry from the database.*
handle_add_hall()	*Admin-only: Inserts new hall into the hall list.*
handle_edit_hall()	*Admin-only: Updates selected hall info.*
handle_delete_hall()	*Admin-only: Deletes a hall entry.*
admin_view_reservations()	*Displays all reservations for review.*

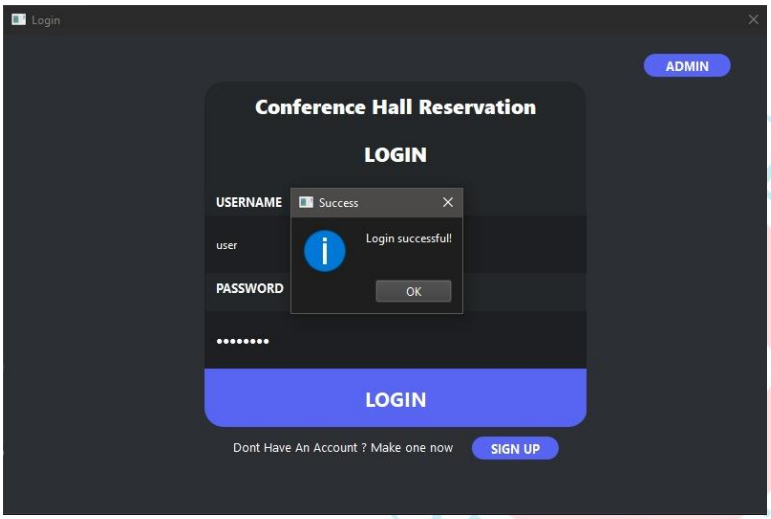
Screenshots

Login page

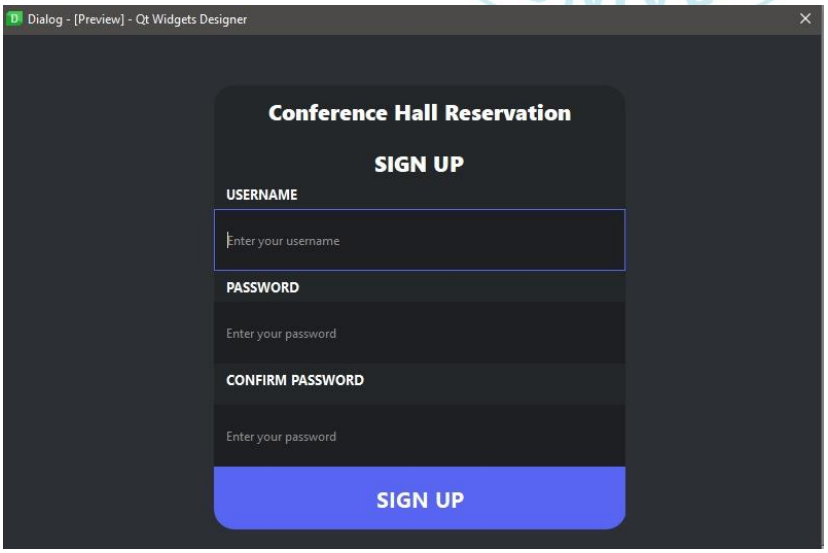

Login - [Preview] - Qt Widgets Designer
ADMIN
Conference Hall Reservation
LOGIN
USERNAME
Enter your username
PASSWORD
Enter your password
LOGIN
Dont Have An Account ? Make one now
SIGN UP


Dialog - AdminLogin.ui
USER
Conference Hall Reservation
ADMIN LOGIN
USERNAME
Enter your username
PASSWORD
Enter your password
LOGIN

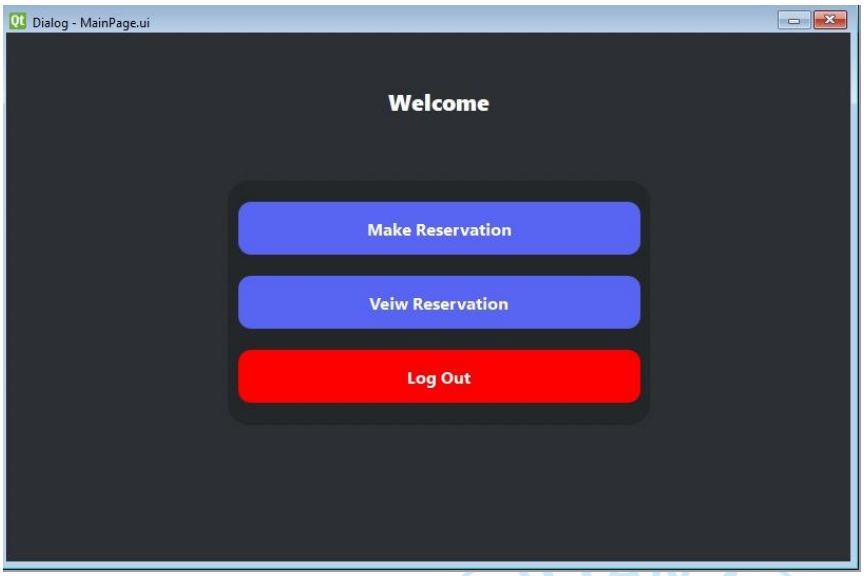

Login
ADMIN
Conference Hall Reservation
LOGIN
USERN
Error
fff
Invalid username or password
PASSW
OK
•••
LOGIN
Dont Have An Account ? Make one now
SIGN UP

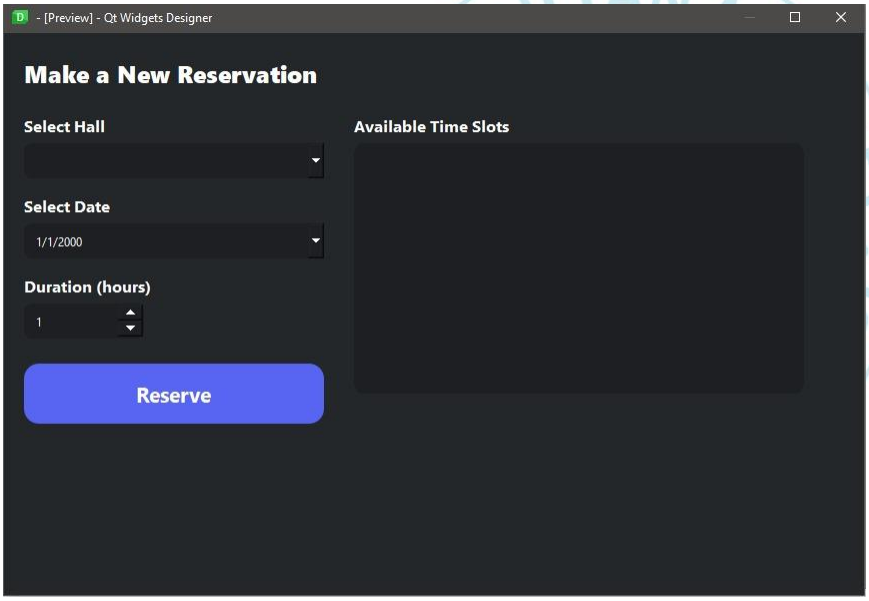

Login
ADMIN
Conference Hall Reservation
LOGIN
USERNAME
Success
user
Login successful!
PASSWORD
OK
••••••••
LOGIN
Dont Have An Account ? Make one now
SIGN UP

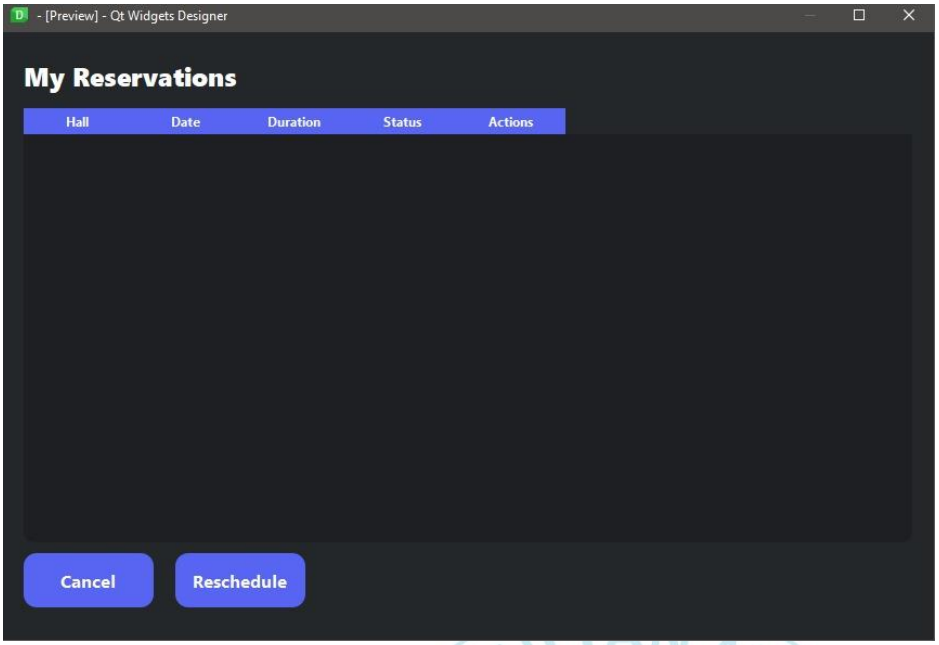
Signup Form

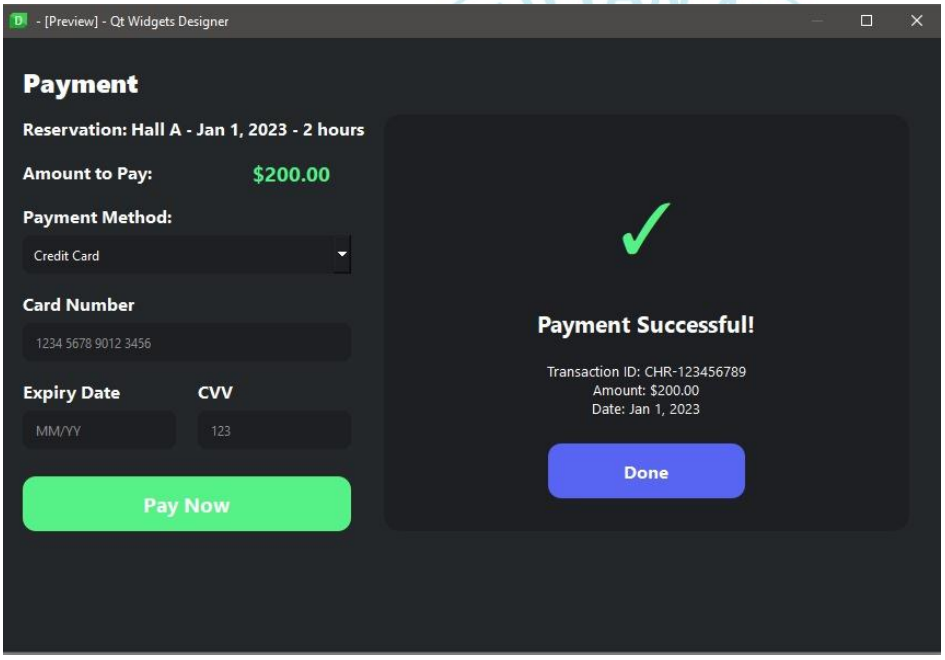

Dialog - [Preview] - Qt Widgets Designer
Conference Hall Reservation
SIGN UP
USERNAME
Enter your username
PASSWORD
Enter your password
CONFIRM PASSWORD
Enter your password
SIGN UP

Reservation System

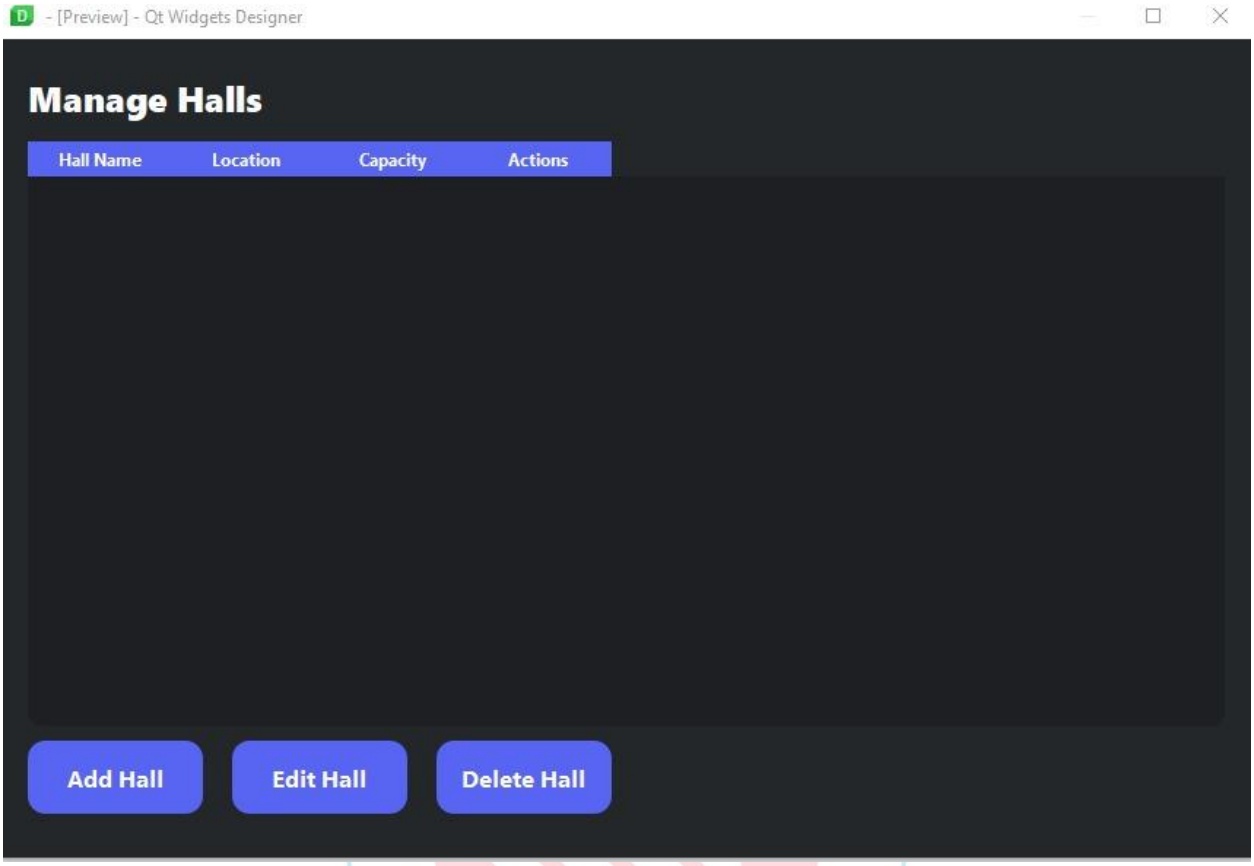


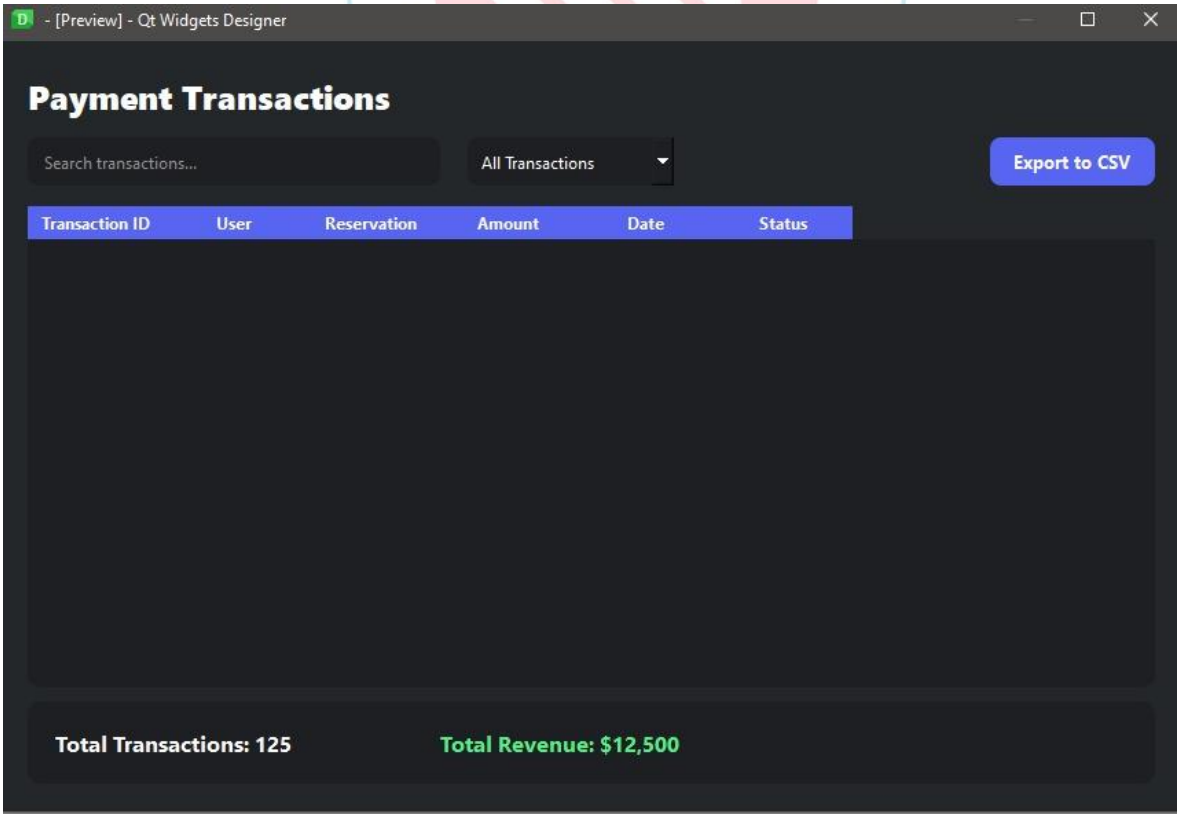


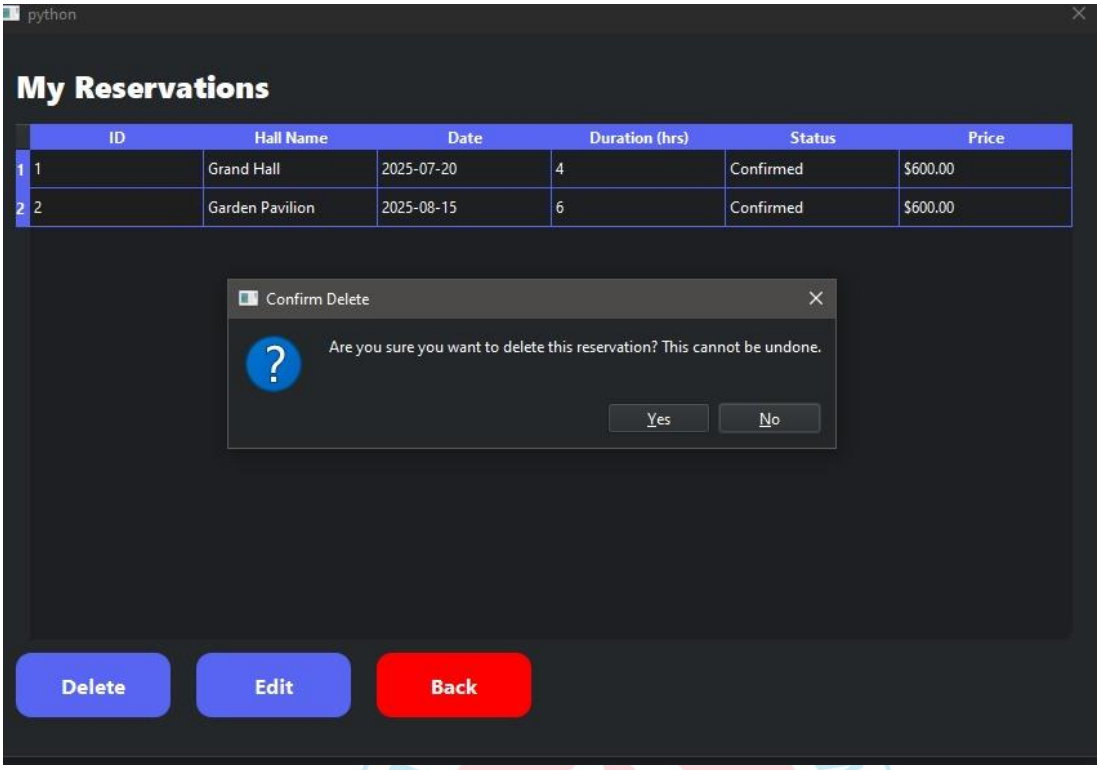

- [Preview] - Qt Widgets Designer
My Reservations
Hall
Date
Duration
Status
Actions
Cancel
Reschedule

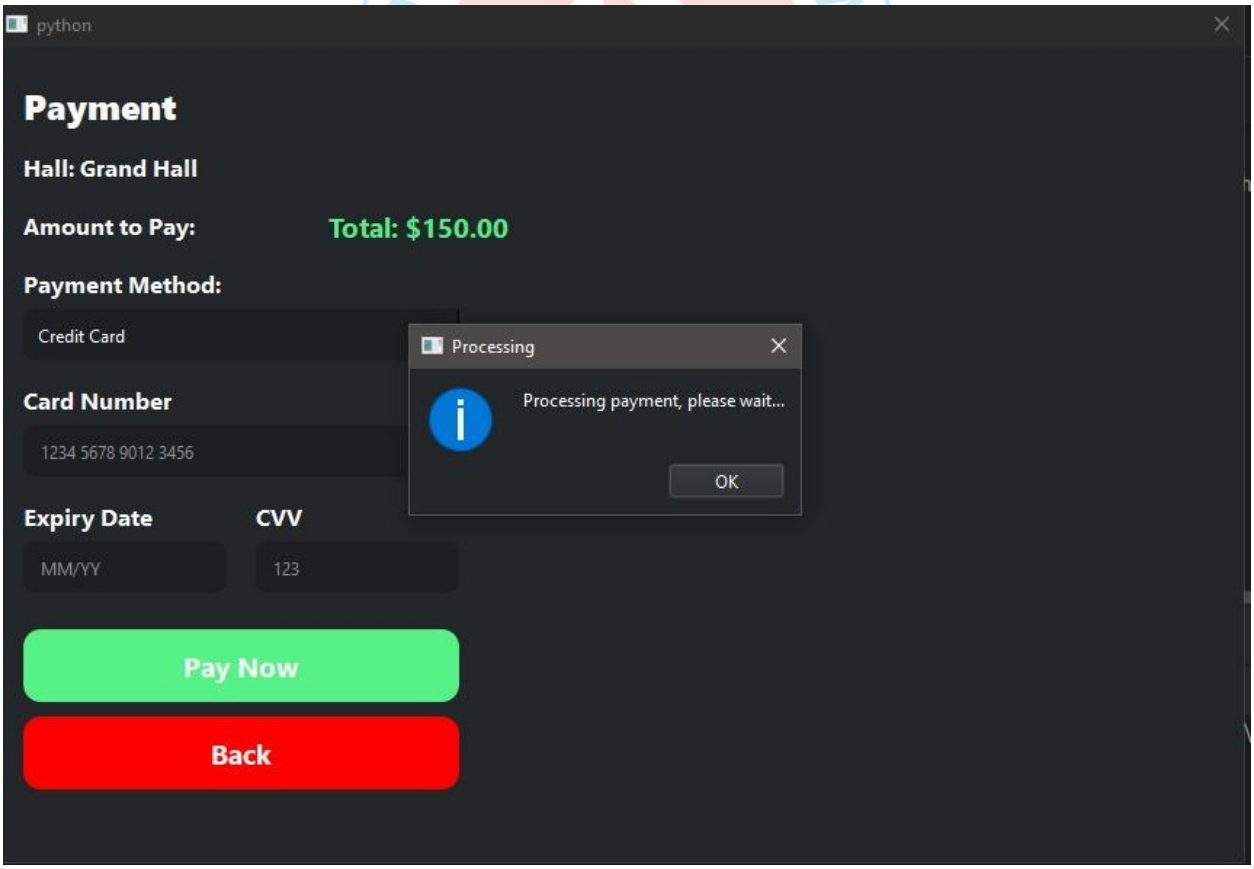

- [Preview] - Qt Widgets Designer
Payment
Reservation: Hall A - Jan 1, 2023 - 2 hours
Amount to Pay:
$200.00
Payment Method:
Credit Card
Card Number
1234 5678 9012 3456
Expiry Date
CVV
MM/YY
123
Pay Now
Payment Successful!
Transaction ID: CHR-123456789
Amount: $200.00
Date: Jan 1, 2023
Done

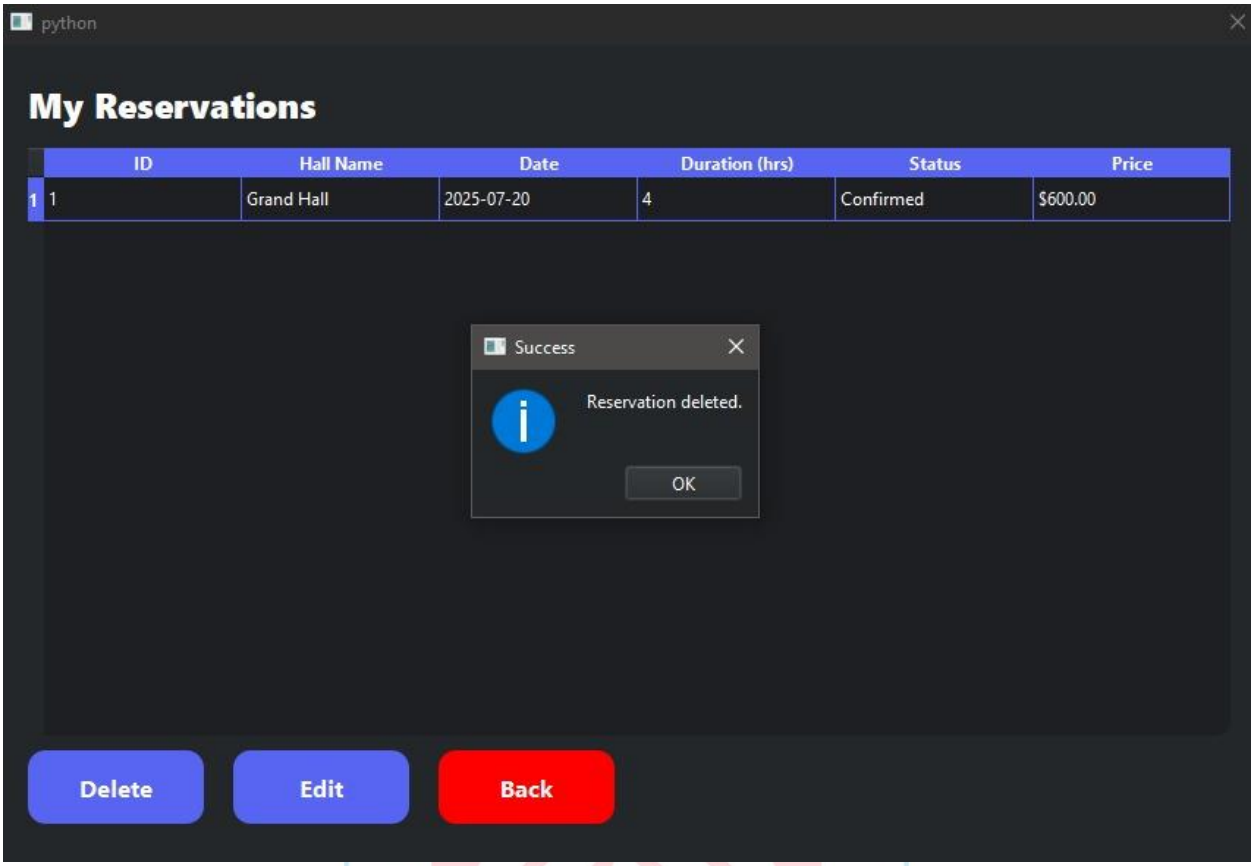
Admin System

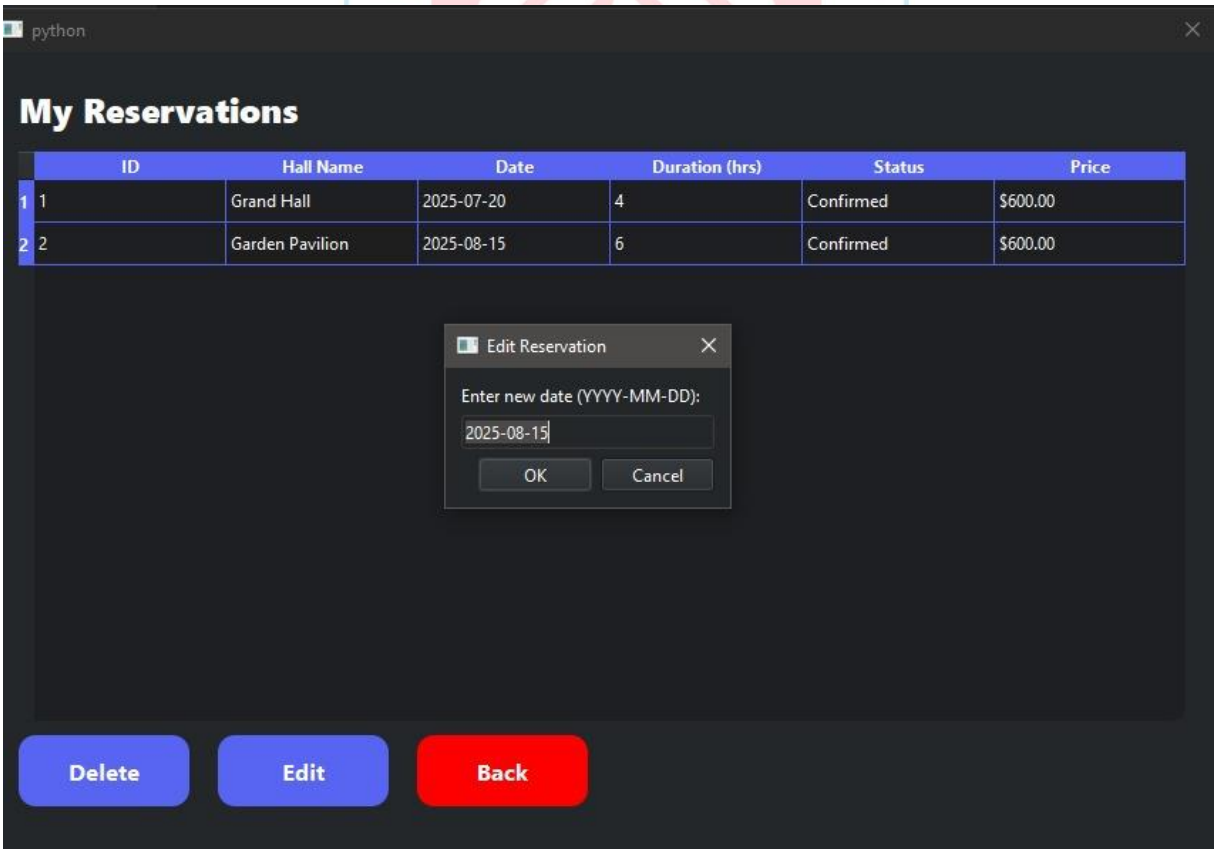





python
My Reservations
ID
Hall Name
Date
Duration (hrs)
Status
Price
1
1
Grand Hall
2025-07-20
4
Confirmed
$600.00
2
2
Garden Pavilion
2025-08-15
6
Confirmed
$600.00
Confirm Delete
Are you sure you want to delete this reservation? This cannot be undone.
Yes
No
Delete
Edit
Back


python
Payment
Hall: Grand Hall
Amount to Pay:
Total: $150.00
Payment Method:
Credit Card
Card Number
1234 5678 9012 3456
Expiry Date
CVV
MM/YY
123
Pay Now
Back
Processing
Processing payment, please wait...
OK


python
My Reservations
ID
Hall Name
Date
Duration (hrs)
Status
Price
1
1
Grand Hall
2025-07-20
4
Confirmed
$600.00
Success
Reservation deleted.
OK
Delete
Edit
Back


python
My Reservations
ID
Hall Name
Date
Duration (hrs)
Status
Price
1
1
Grand Hall
2025-07-20
4
Confirmed
$600.00
2
2
Garden Pavilion
2025-08-15
6
Confirmed
$600.00
Edit Reservation
Enter new date (YYYY-MM-DD):
2025-08-15
OK
Cancel
Delete
Edit
Back

Challenges Faced

Challenge	*Solution*
Convering .ui file to .py	*Switched to PySide*
SQLite connection errors	*Used try-except blocks and verified each SQL query with sample data.*
Navigating between windows	*Used .hide() and .show() strategically to simulate screen transitions.*
Keeping roles separate in code	*Organized the project with clearly labeled methods and modular functions.*

Future Improvements

- **Add email notifications for bookings.**
- **Include hall images or 3D model**
- **Integrate actual payment system like PayPal.**

Conclusion

Our Hall Reservation System successfully demonstrates the effective integration of drag and drop GUI design with back-end application logic and database management. By dividing the project into specific part and giving tasks to members separately, our team efficiently built a complete, functional reservation system that simulates a real-world booking system.

This project provided invaluable hands-on experience in GUI development with PySide6, database interaction using SQLite3, This project taught us valuable skills in GUI development and database management, we also learned how to translate user interface (.ui) into backend logic (functions in .py)