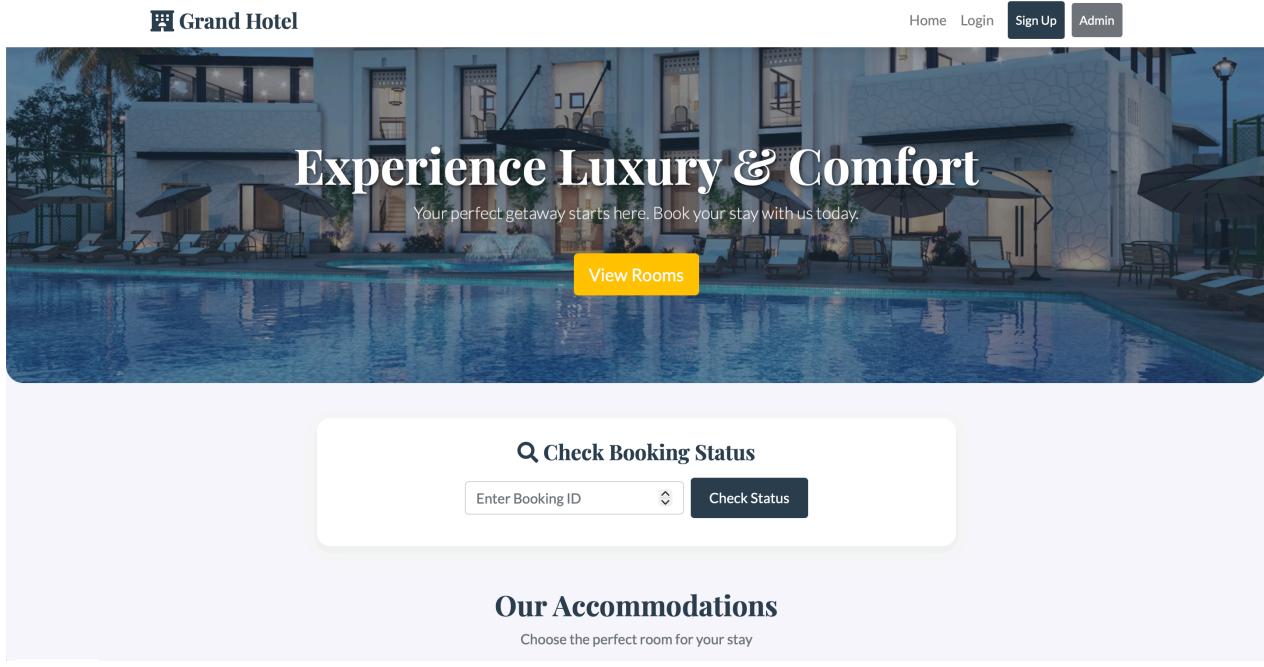


# Hotel Booking System Introduction

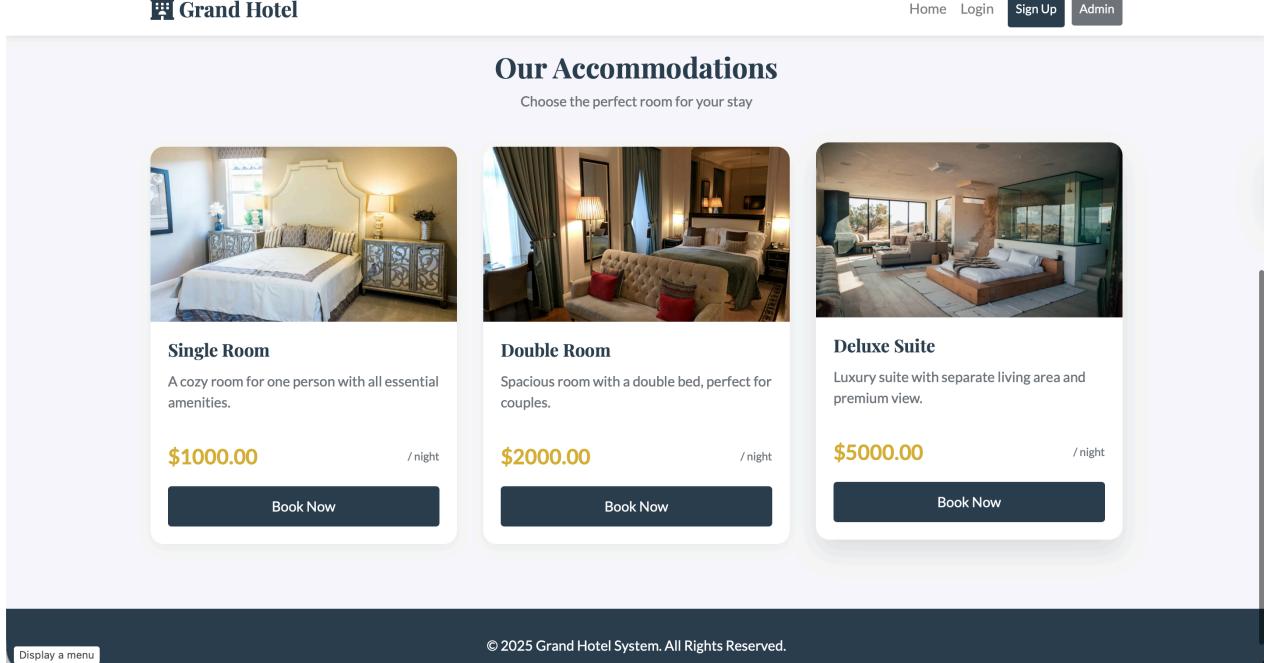
## 專案成果展示

### 使用者(user) / 顧客 視角

- 訂房網站首頁 (Home)



The screenshot shows the homepage of the "Grand Hotel" website. At the top, there is a navigation bar with links for "Home", "Login", "Sign Up", and "Admin". Below the navigation is a large banner featuring a night view of a modern hotel complex with a swimming pool and lounge chairs. The banner has the text "Experience Luxury & Comfort" and a subtext "Your perfect getaway starts here. Book your stay with us today." A yellow "View Rooms" button is prominently displayed in the center of the banner. Below the banner, there is a search bar with the placeholder "Check Booking Status" and a "Check Status" button. The main content area is titled "Our Accommodations" with the subtext "Choose the perfect room for your stay". It features three room options: "Single Room", "Double Room", and "Deluxe Suite", each with a small image, a description, a price of \$1000.00, \$2000.00, or \$5000.00 per night, and a "Book Now" button.



The screenshot shows a detailed view of the "Our Accommodations" section on the website. It displays three room types: "Single Room", "Double Room", and "Deluxe Suite". Each room type has a corresponding image, a brief description, a price per night, and a "Book Now" button. The "Single Room" is described as a cozy room for one person with essential amenities, priced at \$1000.00 per night. The "Double Room" is described as a spacious room with a double bed for couples, priced at \$2000.00 per night. The "Deluxe Suite" is described as a luxury suite with a separate living area and a premium view, priced at \$5000.00 per night. The bottom of the page includes a footer with a "Display a menu" link and a copyright notice: "© 2025 Grand Hotel System. All Rights Reserved."

- 會員註冊

### Create Account

Full Name

Email

Password

Phone Number

[Sign Up](#)

Already have an account? [Login here](#)

- 會員登入

### Login

Email

Password

[Login](#)

Don't have an account? [Register here](#)

[Back to Home](#)

- 會員登入後的主畫面，右上角功能列可查看訂房紀錄與登出。

Grand Hotel

Home Hi, test My Bookings Logout Admin

# Experience Luxury & Comfort

Your perfect getaway starts here. Book your stay with us today.

[View Rooms](#)

Check Booking Status

Enter Booking ID  Check Status

- 訂房頁面（會員登入後基本資料會自動填入）

Grand Hotel

Cancel

## Complete Your Reservation

**Deluxe Suite**  
Luxury suite with separate living area and premium view.

\$5000.00 / night

**Guest Information**

Full Name \*  Phone Number \*

Email Address

**Stay Details**

Check-in Date \*  Check-out Date \*

Display a menu

訂單選項可客製化選擇額外服務，或是填寫備註

Grand Hotel

Cancel

**Stay Details**

Check-in Date \*  Check-out Date \*

Adults  Children

**Add-on Services**

Daily Breakfast (+\$20/person)  
 Extra Bed (+\$50/night)  
 Airport Pickup Service (+\$80)

**Special Requests**

Any specific requirements? (e.g. Quiet room, Late check-in...)

Confirm Booking →

- 訂購成功頁面（可點擊 Print Receipt 列印訂單資訊）

Grand Hotel

Home

Success! Error: Check-out date must be after check-in date.

**Booking Details** ID: #2

**Confirmed**

Thank you for choosing Grand Hotel

**GUEST INFO**  
test  
📞 0900000000  
✉️ test@gmail.com

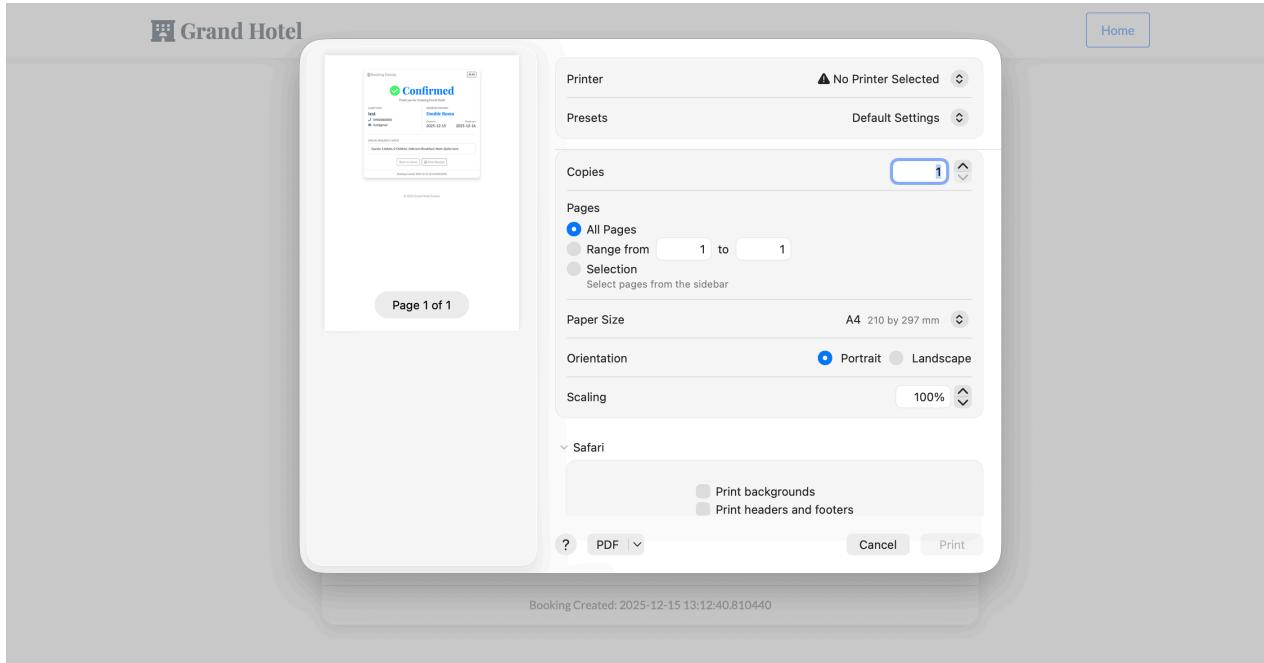
**RESERVATION INFO**  
**Double Room**  
Check-in 2025-12-15 Check-out 2025-12-16

**SPECIAL REQUESTS / NOTES**  
Guests: 2 Adults, 0 Children | Add-ons: Breakfast | Note: Quite room

Back to Home Print Receipt

Booking Created: 2025-12-15 13:12:40.810440

- 訂購成功頁面 可點擊 Print Receipt 列印訂單資訊



- 會員可查詢歷史訂單（主畫面右上角功能列）

The screenshot shows the 'My Booking History' section of the 'Grand Hotel' website. The title 'My Booking History' is at the top left, and a 'Total: 1' badge is at the top right. Below is a table with columns: Order ID, Room Type, Stay Dates, Status, and Action. One row is shown: Order ID '#2', Room Type 'Double Room', Stay Dates 'In: 2025-12-15' and 'Out: 2025-12-16', Status 'Confirmed', and Action 'View Details' (button). At the bottom of the page, a dark footer bar contains the text '© 2025 Grand Hotel System'.

- 主畫面可使用訂單編號查詢訂單資訊 (可點擊進去看詳細資訊)

The screenshot shows the main homepage of 'Grand Hotel'. At the top, there's a navigation bar with 'Home', 'Hi, test', 'My Bookings' (which is highlighted with a red box), 'Logout', and 'Admin'. Below the navigation is a large banner image of a swimming pool. In the center, a modal dialog box is open with the title 'Check Booking Status'. It has a dropdown menu set to '2' and a 'Check Status' button. The result section says 'Booking Found!' and provides details: 'Room: Double Room' and 'Date: 2025-12-15 to 2025-12-16'. There's a 'View Full Details' button. At the bottom of the page, there's a section titled 'Our Accommodations' with a sub-section 'Choose the perfect room for your stay' and three small thumbnail images of rooms.

## 管理者(Admin)視角

- 登入身份為管理者，可開啟Admin的管理後台視窗

The screenshot shows the 'Dashboard Overview' page of the Admin Panel. At the top, there is a search bar with fields for 'Search Keyword', 'From Date' (12/15/2025), and 'To Date' (12/15/2025). Below the search bar is a button for 'Filter' and another for 'Clear'. A total booking count of 'Total Bookings: 2' is displayed in the top right corner. The main section is titled 'Recent Bookings' and contains two rows of booking data:

ID	Room Type	Guest	Check-in / Out	Actions
#2	Double Room	test test@gmail.com	→ 2025-12-15 ← 2025-12-16	
#1	Double Room	3r1 d12@gine	→ 2025-12-14 ← 2025-12-15	

- 使用 Filter 透過訂單編號或顧客姓名查找訂單

The screenshot shows the 'Dashboard Overview' page of the Admin Panel. The search bar has 'test' entered in the 'Search Keyword' field. The results show one booking for guest 'test' (test@gmail.com) with room type 'Double Room'.

ID	Room Type	Guest	Check-in / Out	Actions
#2	Double Room	test test@gmail.com	→ 2025-12-15 ← 2025-12-16	

- 使用 Filter 透過日期區間查找訂單

Search Keyword: Guest Name or ID... From Date: 12/14/2025 To Date: 12/14/2025

**Recent Bookings**

ID	Room Type	Guest	Check-in / Out	Actions
#1	Double Room	3r1 d12@gine	→ 2025-12-14 ← 2025-12-15	

- 管理者點擊黃色修改按鈕 可在後台修改訂單的資訊

Search Keyword: Guest Name or ID... From Date: 12/15/2025 To Date: 12/15/2025

**Recent Bookings**

ID	Room Type	Guest	Check-in / Out	Actions
#2	Double Room	test test@gmail.com	→ 2025-12-15 ← 2025-12-16	 Edit
#1	Double Room	3r1 d12@gine	→ 2025-12-14 ← 2025-12-15	

**Edit Booking** ID: #2

**Guest Details**

Guest Name: test

Phone: 0900000000 Email: test@gmail.com

**Reservation Dates**

Check-in: 12/15/2025 Check-out: 12/16/2025

**Discard Changes** **Save Update**

- 點擊紅色按鈕可以刪除訂單

**Dashboard Overview**

Total Bookings: 2

ID	Room Type	Guest	Check-in / Out	Actions
#2	Double Room	test test@gmail	→ 2025-12-15 ← 2025-12-16	
#1	Double Room	3r1 d12@gine	→ 2025-12-14 ← 2025-12-15	 Cancel Booking

- 點擊藍色眼睛按鈕可以查看訂單詳細資訊

**Dashboard Overview**

Total Bookings: 2

ID	Room Type	Guest	Check-in / Out	Actions
#2	Double Room	test test@gmail	→ 2025-12-15 ← 2025-12-16	 View Details
#1	Double Room	3r1 d12@gine	→ 2025-12-14 ← 2025-12-15	

- 點擊訂單左側 ID 也可查看訂單詳細資訊

The screenshot shows a dashboard overview for a hotel booking system. At the top, there are search filters for 'Search Keyword', 'From Date' (12/15/2025), and 'To Date' (12/15/2025). Below the filters is a section titled 'Recent Bookings' with two entries:

ID	Room Type	Guest	Check-in / Out	Actions
#2	Double Room	test test@gmail.com	→ 2025-12-15 ← 2025-12-16	
#1	Double Room	3r1 d12@gine	→ 2025-12-14 ← 2025-12-15	

## Database development

- Services Table (展示房型)

The screenshot shows the pgAdmin 4 interface with the 'Object Explorer' on the left and the 'Query' tab on the right. The query window contains the following SQL code:

```
1 SELECT * FROM "Services"
```

The results are displayed in a table titled 'Data Output':

	service_id [PK] integer	service_name character varying (100)	description text	price numeric (10,2)	image_url text
1	1	Single Room	A cozy room for one person with all essential amenit...	1000.00	<a href="https://images.unsplash.com/photo-1505693314120-0d443867">https://images.unsplash.com/photo-1505693314120-0d443867</a>
2	2	Double Room	Spacious room with a double bed, perfect for couples.	2000.00	<a href="https://images.unsplash.com/photo-1590490360182-c33d5773">https://images.unsplash.com/photo-1590490360182-c33d5773</a>
3	3	Deluxe Suite	Luxury suite with separate living area and premium vi...	5000.00	<a href="https://images.unsplash.com/photo-1578683010236-d716f9a3f">https://images.unsplash.com/photo-1578683010236-d716f9a3f</a>

- 建立 Services Table (展示房型)

-- 1. 建立 Services 表格

```
CREATE TABLE "Services" (
    service_id SERIAL PRIMARY KEY,
    service_name VARCHAR(100) NOT NULL, -- 例如: Single Room
    description TEXT, -- 例如: A cozy room for one...
    price DECIMAL(10, 2) NOT NULL, -- 例如: 1000.00
```

```
    image_url VARCHAR(255)          -- (選填) 圖片連結
);

-- 2. 插入一些預設資料
INSERT INTO "Services" (service_name, description, price) VALUES
('Single Room', 'A cozy room perfect for solo travelers.', 1000),
('Double Room', 'Spacious room with a double bed, great for couples.', 2000),
('Deluxe Suite', 'Luxury suite with city view and premium amenities.', 5000);
```

- Users Table (會員資料庫)

會員 password 的部分使用雜湊加密，後端資料庫也無法看到使用者的密碼

The screenshot shows the pgAdmin 4 interface. The left pane is the Object Explorer, displaying the database structure. The right pane contains a query editor and a data output viewer.

```
SELECT * FROM "Users"
```

	<b>id</b>	<b>email</b>	<b>password_hash</b>
1	1	vincent941017@gmail.com	scrypt:32768:8:1\$2arTH9PaWIDKzmx&\$18a7fe73c21ce1dd1d66c5bc2df49e34c1ff82c052b3ecc4881868131208965a6369ae344b1cedb0
2	2	test@gmail	scrypt:32768:8:1\$VWq2IMImAf2ls5t\$3b015234696897933d4046a7fe352dd51a6d56c236e4c828a2414ddb70657cb4fb0431960e

The screenshot shows the pgAdmin 4 interface. The left pane is the Object Explorer, displaying the database structure. The right pane contains a query editor and a data output viewer.

```
SELECT * FROM "Users"
```

	<b>id</b>	<b>name</b>	<b>role</b>	<b>phone</b>
1	1	Vincent	admin	0900000000
2	2	test	user	0900000000

- 建立 Users Table (會員資料庫)

```
CREATE TABLE "Users" (
    id SERIAL PRIMARY KEY,
    email VARCHAR(100) UNIQUE NOT NULL,
    password_hash VARCHAR(200) NOT NULL,
    name VARCHAR(100)
);
```

- Users Table 中加入 role , 使只有管理員可以進入 admin 的後台管理介面

-- 1. 新增 role 欄位，預設值為 'user'

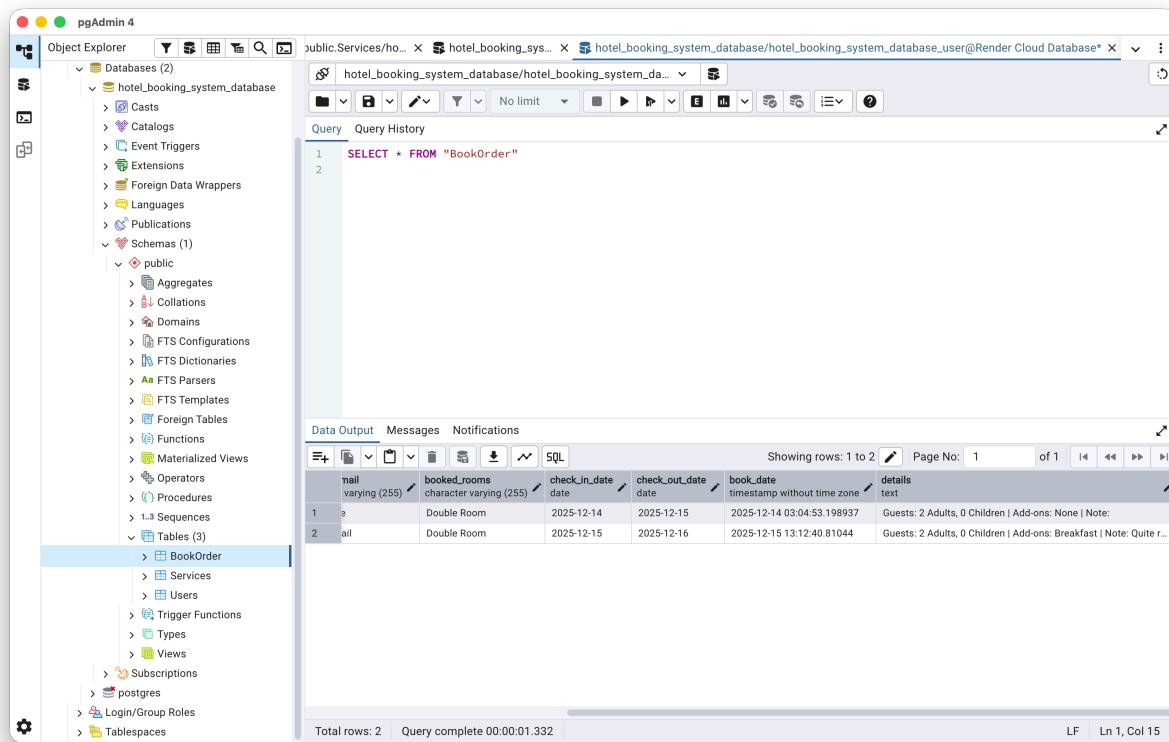
```
ALTER TABLE "Users" ADD COLUMN role VARCHAR(20) DEFAULT 'user';
```

-- 2. 把自己設定成管理員

```
UPDATE "Users" SET role = 'admin' WHERE email = 'your_email@example.com';
```

- BookOrder Table (存放訂單資訊)

	book_id	booker_name	booker_phone	booker_email	booked_rooms	check_in_date	check_out_date	book_date
1	1	3r1	1d3	d12@gine	Double Room	2025-12-14	2025-12-15	2025-12-14 03:04
2	2	test	0900000000	test@gmail	Double Room	2025-12-15	2025-12-16	2025-12-15 13:12



- 建立 BookOrder Table

```
-- 建立 BookOrder 資料表
CREATE TABLE "BookOrder" (
    book_id SERIAL PRIMARY KEY,
    booker_name VARCHAR(255) NOT NULL,
    booker_phone VARCHAR(50),
    booker_email VARCHAR(255),
    booked_rooms VARCHAR(255),
    service_name
    check_in_date DATE NOT NULL,
    check_out_date DATE NOT NULL,
    book_date TIMESTAMP DEFAULT CURRENT_TIMESTAMP, -- 訂單建立時間 (自動填入)
    details TEXT
);
```

-- 訂單 ID (自動編號)  
-- 訂房人姓名  
-- 電話  
-- Email  
-- 預約的房型名稱 (對應 Services 的 service\_name)  
-- 入住日期  
-- 退房日期  
-- 訂單建立時間 (自動填入)  
-- 備註/特殊需求 (選填)

## 網站部署

- 使用 **Render** 進行線上資料庫、網站部署

Overview

**Projects**

Final\_Project\_Hotel\_Booking\_System

All services are up and running

+ Create new project

**Ungrouped Services**

SERVICE NAME	STATUS	RUNTIME	REGION	UPDATED
Final_Project_Hotel_Booking_System	✓ Deployed	Python 3	Virginia	2d

- **requirements.txt (必要)**：告訴雲端伺服器要安裝什麼套件。

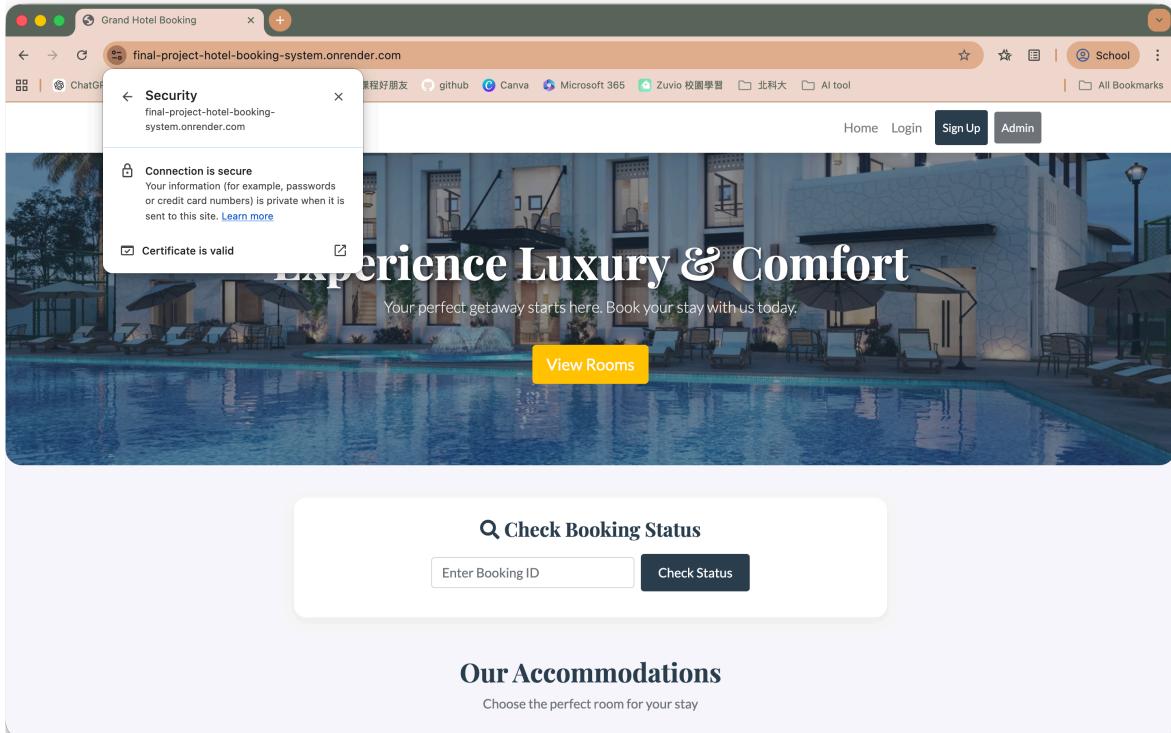
```
Flask
psycopg2-binary
Flask-Login
Werkzeug
gunicorn
```

- **Procfile (必要，檔名沒有副檔名)**：告訴雲端伺服器怎麼啟動您的程式。

```
web: gunicorn app:app
```

## Security (安全性)

- **SSL 加密 / HTTPS 安全連線**：使用 Render，預設自動提供免費的 SSL 憑證。打開訂房網站時，會看到網址列有個「鎖頭」，代表已經實作了 SSL 加密連線。



- Input Validation (輸入驗證)

在後端 ( app.py ) 檢查使用者輸入的資料是否合理。例如：退房日期不能早於入住日期。

## 成果展示

- GitHub 連結

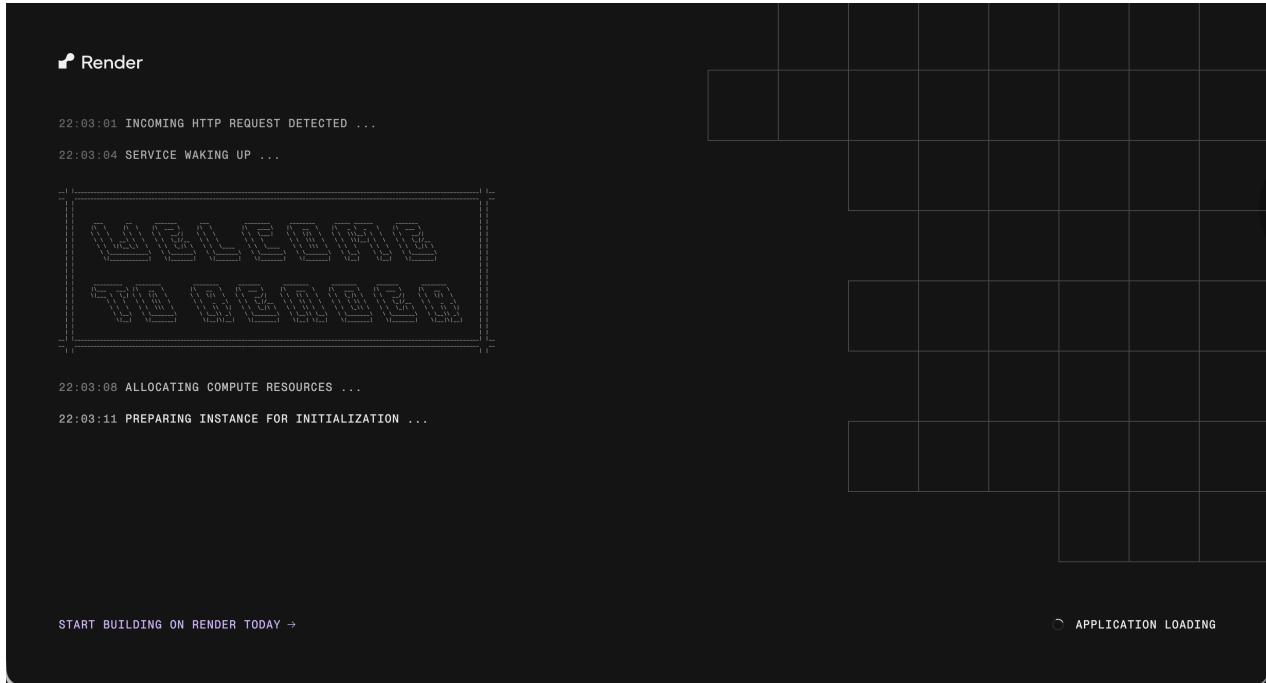
[https://github.com/PolarBear1017/Final\\_Project\\_Hotel\\_Booking\\_System](https://github.com/PolarBear1017/Final_Project_Hotel_Booking_System)

- 訂房網站展示連結

(一開始載入時需要耐心等待部署，會顯示Render部署載入進度的頁面，載入完成就能看到我做的訂房展示網頁)

<https://final-project-hotel-booking-system.onrender.com>

(Render部署載入進度頁面)



## 專案詳細介紹

### 1. 專案簡介 (Project Overview)

- 專案名稱：Hotel Booking System
- 專案目標：開發一個具備完整前後端功能的飯店預約網站，提供使用者瀏覽房型、註冊會員、線上預約，並提供管理員後台進行訂單管理。
- 開發語言與框架：Python (Flask Web Framework), PostgreSQL, HTML模板, CSS

### 2. 使用技術 (Tech Stack)

- 後端 (Back-end)：Python 3, Flask, Flask-Login (會員驗證), Werkzeug (密碼加密)。
- 資料庫 (Database)：PostgreSQL (本地開發 & 雲端 Render PostgreSQL)。
- 前端 (Front-end)：HTML5, CSS3, Bootstrap 4.5 (RWD 響應式設計), Jinja2 模板引擎。
- 部署 (Deployment)：Render Cloud (Web Service), Gunicorn (WSGI Server)。
- 安全性 (Security)：HTTPS/SSL, SQL Injection 防護 (參數化查詢)。

### 3. 系統功能架構 (System Features)

根據實作的功能，分為 前台 (使用者) 與 後台 (管理員) 兩部分：

#### A. 會員與使用者功能 (User Features)

##### 1. 瀏覽與搜尋：

- 首頁展示所有房型與價格 (Single, Double, Deluxe Suite)。
- 提供訂單編號查詢功能 (/search)，非會員也能查詢訂單狀態。

##### 2. 會員系統：

- 使用者註冊 (`/register`)：包含姓名、Email、密碼、電話。
- 使用者登入/登出 (`/login`, `/logout`)。
- 我的訂單 (`/my_bookings`)：會員可查看自己的歷史訂房紀錄。

### 3. 線上預約：

- 自動填入會員資料：登入後，預約表單會自動帶入姓名、電話、Email。
- 客製化選項：選擇入住人數、加購服務（早餐、加床、機場接送）、特殊備註。
- 防呆機制：輸入驗證（退房日期不可早於入住日期）。
- 預約成功收據：訂房完成顯示詳細訂單資訊。

## B. 管理員後台功能 (Admin Features)

### 1. 管理員後台 (`/admin`)：

- 權限控管：只有 `role='admin'` 的帳號可以進入。
- 總覽所有訂單列表。

### 2. 訂單管理：

- **搜尋與篩選**：可依照「關鍵字」或「日期範圍」篩選訂單，並支援清除篩選 (Clear Filter)。
- **檢視訂單**：可檢視訂單詳細資訊。
- **修改訂單**：可編輯訂單，修改訂單資訊。
- **取消訂單**：管理員可刪除特定訂單。

## 4. 資料庫設計 (Database Schema)

1. **Users**：儲存使用者帳號、雜湊密碼、角色 (admin/user)、電話。
2. **Services**：儲存房型名稱、描述、價格、圖片 URL。
3. **BookOrder**：儲存訂單詳情、入住退房日期。

## 5. 雲端部署與設定 (Deployment)

- 平台：使用 **Render** 進行雲端託管。
- 資料庫連線：
  - 使用環境變數 (`os.environ.get('DATABASE_URL')`) 自動切換本地與雲端資料庫。
  - 配置 `Procfile` 與 `requirements.txt` 進行自動化部署。
- **SSL 加密**：網站全面支援 HTTPS 安全連線。

## 6. 遇到的困難與解決方案 (Challenges & Solutions)

- **問題 1**：部署時找不到 `requirements.txt`。
  - **解決**：發現是因為檔案層級問題，透過設定 Render 的 **Root Directory** 解決。
- **問題 2**：雲端資料庫連線失敗 (`UndefinedTable`)。
  - **解決**：了解雲端資料庫是空的，使用 pgAdmin 遠端連線並執行 SQL 初始腳本。
- **問題 3**：登入時若輸入不存在的 Email，系統會崩潰顯示 500 錯誤。

- 解決：在程式碼中加入 `if user_data` 的判斷邏輯，並使用 Flash 訊息提示使用者。
- **問題 4**：本地開發與雲端部署的資料庫位址不同，導致程式碼無法同時兼容。
  - 解決：利用 `os` 模組讀取環境變數，自動判斷並切換使用 `localhost` 或 `Render` 的雲端資料庫連線。
- **問題 5**：使用 `pgAdmin` 連線雲端資料庫時失敗，顯示 `FATAL: SSL/TLS required`。
  - 解決：在連線設定中新增參數 `sslmode = require`，強制啟用加密連線以符合雲端安全性要求。
- **問題 6**：使用者可能輸入「退房日期早於入住日期」的不合理訂單。
  - 解決：在後端接收表單資料時加入邏輯比對，若日期順序錯誤則攔截請求並顯示警告訊息。