

Group 10 - 貝殼 BackSpace

A Dedicated Space & Resource Reservation System for NPC.

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📍 Explore Available Spaces

Select a location you're interested in to browse bookable resources



Main Library

A quiet study environment with power outlets and Wi-Fi.

[View Resources](#)

Programming Club Office

Equipped with 3 PCs and 7 Raspberry Pi units available for borrow.

[View Resources](#)

Room 313 (Lab)

Computer lab, reservations only accepted for club course hours.

[View Resources](#)

📅 Booking Schedule Overview

Click on an event in the calendar to view details



January 2026

Today

Sun	Mon	Tue	Wed	Thu	Fri	Sat
28	29	30	31	1	2	3



Confirm Booking

Programming Club Office • Workstation 01

⌚ Start Time

2026-01-06 09:00

⌚ End Time

2026-01-06 12:00

👥 Number of Attendees

1

 Once submitted, your request will be reviewed by an administrator. You will be notified when the status is updated.

Back

Submit Booking Request

⚠ Booking Approval Center

Manage and review space application statuses for all users

 Search users, resources, or spaces...

All Statuses

User	Resource / Space	Time Slot	Attendees	Status	Approval Actions
admin	Workstation 01 Programming Club Office	2026-01-06 - 2026-01-06 09:00 - 12:00	1 Person	Pending	  

📅 Booking Schedule Overview

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11	12	13	14	15	16	17

9a Workstation...

Motivation

The Problem:

- Current club space booking relies on paper forms or verbal agreements.
- Students cannot see real-time availability.
- Double-booking occurs frequently.

The Solution:

- A centralized Web Platform for real-time status checks and reservations.
- Digitalizes the workflow: Apply -> Review -> Approve

Features

Visual Discovery:

Browse spaces (Club rooms, Labs) via a card-based UI.

Real-time Availability:

"Calendar View" shows booked slots instantly to prevent conflicts.

Asset Management:

Reserve specific equipment (e.g., Computers, Recording gear) within a room.

Admin Dashboard:

A dedicated portal for managing requests (Approve/Reject) and editing space details.

Tech Stack

Frontend:

- HTML
- CSS
- JavaScript
- Bootstrap Icons
- FullCalendar

Deployment:

- Host: Ubuntu 24.04 LTS
- Containerization: Docker (Database)
- Web Server: Caddy
- DNS/Security: Cloudflare

Backend:

- Python Flask

Database:

- PostgreSQL (Docker)

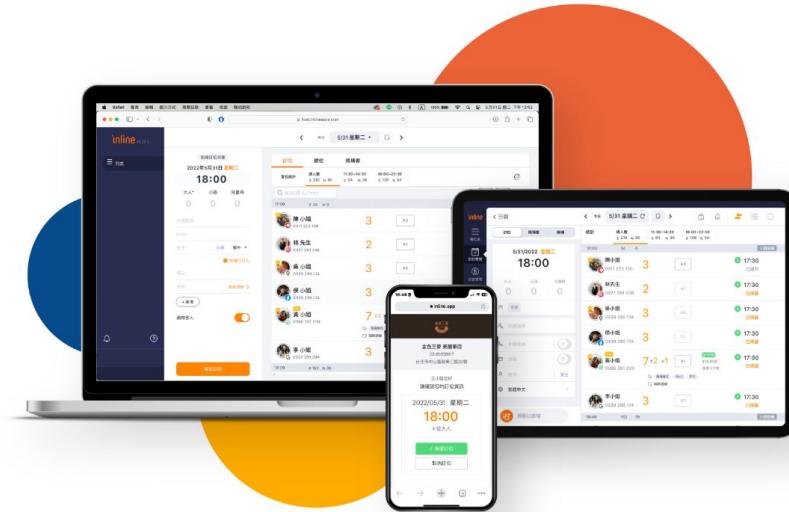
Live Demo

<https://final.ntut.uk>

Related Website Comparison - Inline

What we like about Inline:

- Excellent automation (SMS confirmations).
- Visual queue management.



Related Website Comparison - Inline

	Inline	BackSpace
Target Audience	Restaurant owners, general diners	Club members, students
Core Focus	Turnover, Payment, Queuing	Identity Verification, Conflict-free
Allocation Logic	Table-based configuration	Time-slot based, Strict anti-overlap
Feature	Ordering, Waitlist, Payment	Space/Asset Mgmt, Permission Control

Creative Feature: Permission System

The Math:

- Read (4): View schedules.
- Write (2): Make reservations.
- Admin (1): Approve requests/Manage users.

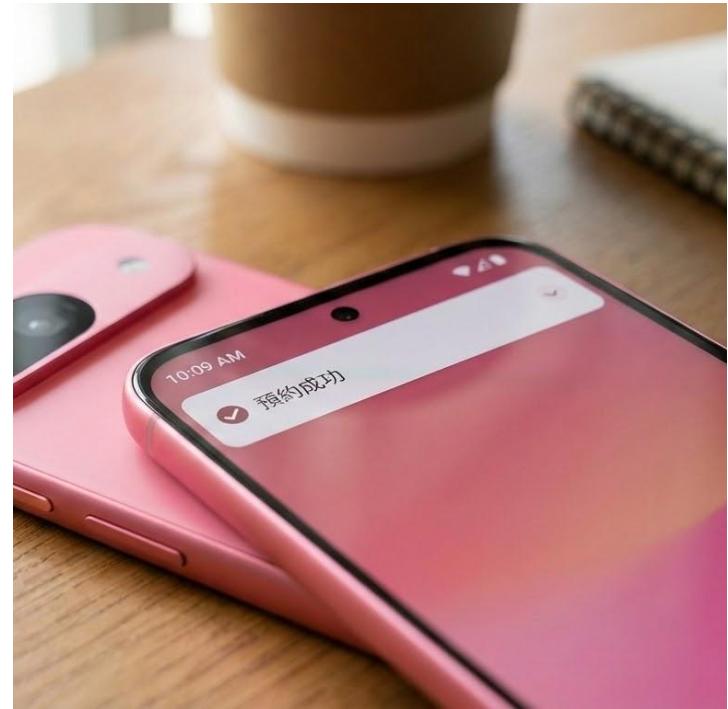
Implementation:

- Guest: Level 4 (Read-only)
- Club Member: Level 6 (4+2, Read + Write)
- Super User: Level 7 (4+2+1, Full Access)

Future Outlook

Notification System

(Discord Bot / Discord Webhook)



Limitations

Approval Bottleneck:

The system currently relies on manual admin approval. If admins are inactive, requests remain pending.



Source Code & Docs

<https://github.com/kevinlee-06/webfinal10>

Tour

<https://final.ntut.uk>

Landing Page

The entry point for all users, displaying a card-based list of available facilities like the Main Library, Club Office, and Computer Labs.

The screenshot shows a web browser window for 'Space Reservation' at 'final10.ntut.uk'. The page features a header with a logo, search bar, and navigation links. Below is a section titled 'Explore Available Spaces' with three cards:

- Main Library**: Shows an interior view of a study area with bookshelves. Description: A quiet study environment with power outlets and Wi-Fi. Button: View Resources.
- Programming Club Office**: Shows a stylized 'T' logo. Description: Equipped with 3 PCs and 7 Raspberry Pi units available for borrow. Button: View Resources.
- Room 313 (Lab)**: Shows an exterior view of a building with Chinese characters. Description: Computer lab, reservations only accepted for club course hours. Button: View Resources.

At the bottom, there's a section titled 'Booking Schedule Overview' with a calendar interface showing January 2026.

Resource & Equipment List

A detailed view that appears after clicking a space, allowing users to book specific seats or assets (e.g., Seat A1, Seat A2).

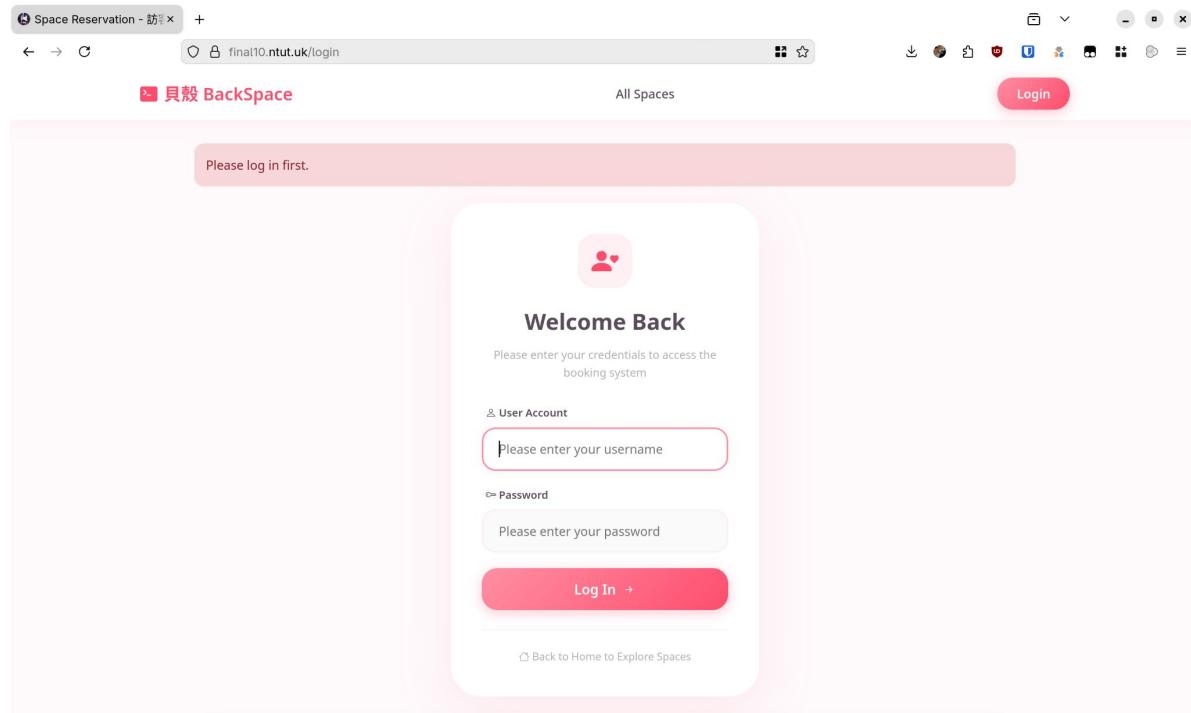
The screenshot shows a web browser window titled "Space Reservation - 訂位" with the URL "final10.ntut.uk/space/1". The page header includes the title "貝殼 BackSpace", a "Login" button, and a "All Spaces" link. The main content area is titled "Resource List" and displays six items, each representing a seat:

- Seat A1 Seat**: Description: "This resource has no detailed description yet." Action: "Book Now" button.
- Seat A2 Seat**: Description: "This resource has no detailed description yet." Action: "Book Now" button.
- Seat A3 Seat**: Description: "This resource has no detailed description yet." Actions: "Book Now" button and "Open" button.
- Seat B1 Seat**: Description: "This resource has no detailed description yet." Action: "Book Now" button.
- Seat B2 Seat**: Description: "This resource has no detailed description yet." Action: "Book Now" button.

To the right of the seat list, there is a "Space Introduction" section featuring a thumbnail image of a study room and the text: "A quiet study environment with power outlets and Wi-Fi."

Login Portal

The secure gateway that requires valid credentials, distinguishing between standard users (students) and administrators.



Booking Request Form

The interface where users define their "Time Slot" and attendee count. This is where the overlap-check logic happens.

The screenshot shows a web browser window with the title bar reading "Space Reservation - ad... final10.ntut.uk/book/1". The main content area displays a booking form titled "Confirm Booking" for "Main Library · Seat A1". The form includes fields for "Start Time" and "End Time" (both empty), and a dropdown for "Number of Attendees" set to "1". Below the form is a note: "Once submitted, your request will be reviewed by an administrator. You will be notified when the status is updated." At the bottom are "Back" and "Submit Booking Request" buttons.

Space Reservation - ad... final10.ntut.uk/book/1

貝殼 BackSpace

All Spaces My Bookings Admin Console

admin Logout

Confirm Booking
Main Library · Seat A1

Start Time

End Time

Number of Attendees

Once submitted, your request will be reviewed by an administrator. You will be notified when the status is updated.

Back Submit Booking Request

My Bookings

A personal dashboard for students to view their schedule and the status of their requests (Pending vs. Approved).

The screenshot shows a web browser window titled "Space Reservation - admin" with the URL "final10.ntut.uk/my-bookings". The page is titled "My Bookings" and includes a sub-header "Track your application status and manage your schedule".

My Bookings Table:

RESOURCE	TIME SLOT	STATUS	ACTIONS
Workstation 01 Programming Club Office	2026-01-06 - 2026-01-06 09:00 - 12:00	Pending	Cancel Application

Booking Schedule Overview:

Click on an event in the calendar to view details

January 2026

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A pink box highlights the date "5" on the calendar, with a yellow dot indicating "9a Workstation...".

Admin Console - Approval Center

The command center for club leaders to review incoming requests and take action (Approve/Reject).

The screenshot shows the 'Booking Approval Center' section of the admin console. At the top, there's a search bar with placeholder text 'Search users, resources, or spaces...' and a dropdown menu labeled 'All Statuses'. Below this is a table with columns: USER, RESOURCE / SPACE, TIME SLOT, ATTENDEES, STATUS, and APPROVAL ACTIONS. A single row is shown for 'admin' booking 'Workstation 01' from 'Programming Club Office' on '2026-01-06 - 2026-01-06 09:00 - 12:00' for '1 Person'. The status is 'Pending' with three action buttons: a green checkmark, a red X, and a blue circular arrow. Below this is a 'Booking Schedule Overview' section with a calendar for January 2026. The 5th of January is highlighted in pink, indicating a booking for '9a Workstation...'. Navigation arrows, a 'Today' button, and month/year labels are also present.

USER	RESOURCE / SPACE	TIME SLOT	ATTENDEES	STATUS	APPROVAL ACTIONS
admin	Workstation 01 Programming Club Office	2026-01-06 - 2026-01-06 09:00 - 12:00	1 Person	Pending	✓ ✗ ⟳

Booking Schedule Overview

Click on an event in the calendar to view details

< > January 2026 Today

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Global Calendar Overview

A high-level calendar view for admins to visualize usage across the entire month and spot busy periods.

Space Reservation - admin

final10.ntut.uk/admin/dashboard

貝殼 BackSpace

All Spaces My Bookings Admin Console

admin Logout

Booking Schedule Overview

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< > Today

January 2026

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	12p 313-02 (admin) 9a Workstatio...					
11	12	13	14	15	16	17
		12p Bed (admin)				
18	19	20	21	22	23	24
	12p Bed (admin)					
25	26	27	28	29	30	31
1	2	3	4	5	6	7

Spaces & Resources Management

The CRUD interface for admins to add new rooms or toggle the availability of existing seats without coding.

The screenshot shows a web-based administrative interface titled "Spaces & Resources List". The page header includes a logo, the title, a search bar, and navigation links for "All Spaces", "My Bookings", and "Admin Console". A user "admin" is logged in. The main content area displays a table of assets under the heading "Main Library". The table has columns: "Resource Name", "Type", "Toggle Visibility", and "Actions". The "Actions" column contains icons for edit, delete, and other management tasks. The assets listed are:

Resource Name	Type	Toggle Visibility	Actions
Seat A1	Seat	<input checked="" type="checkbox"/>	
Seat A2	Seat	<input checked="" type="checkbox"/>	
Seat A3	Seat	<input checked="" type="checkbox"/>	
Seat B1	Seat	<input checked="" type="checkbox"/>	
Seat B2	Seat	<input checked="" type="checkbox"/>	
Seat B3	Seat	<input checked="" type="checkbox"/>	
Discussion Room 1	Meeting Room	<input checked="" type="checkbox"/>	

Add User & Permissions

The interface for creating accounts and assigning permission masks (our Bitwise system).

