

Group 10 - 貝殼 BackSpace

A Dedicated Space & Resource Reservation System for NPC.

112810006 李圓凱

113590017 黃楷程

113590037 黃閔陽

113590042 陳佑軒

📍 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

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	<div> <div>✓</div> <div>✗</div> <div>↺</div> </div>

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
4	5 9a Workstatio...	6	7	8	9	10
11	12	13	14	15	16	17

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)

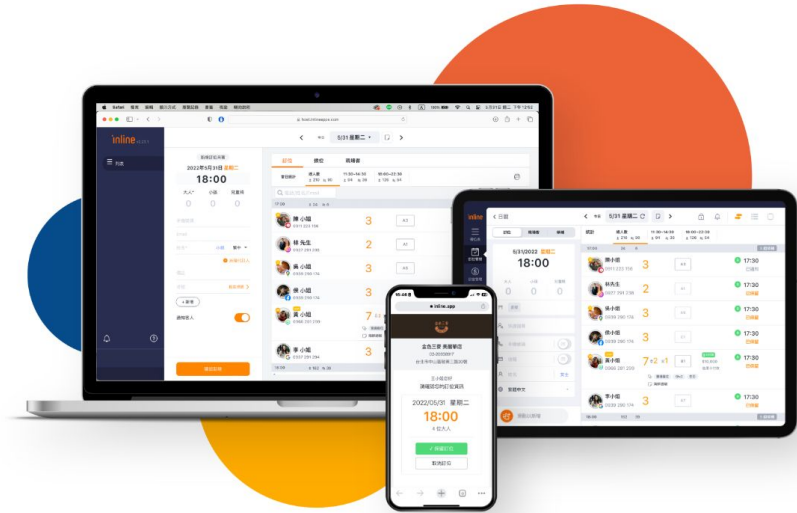
Live Demo

<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

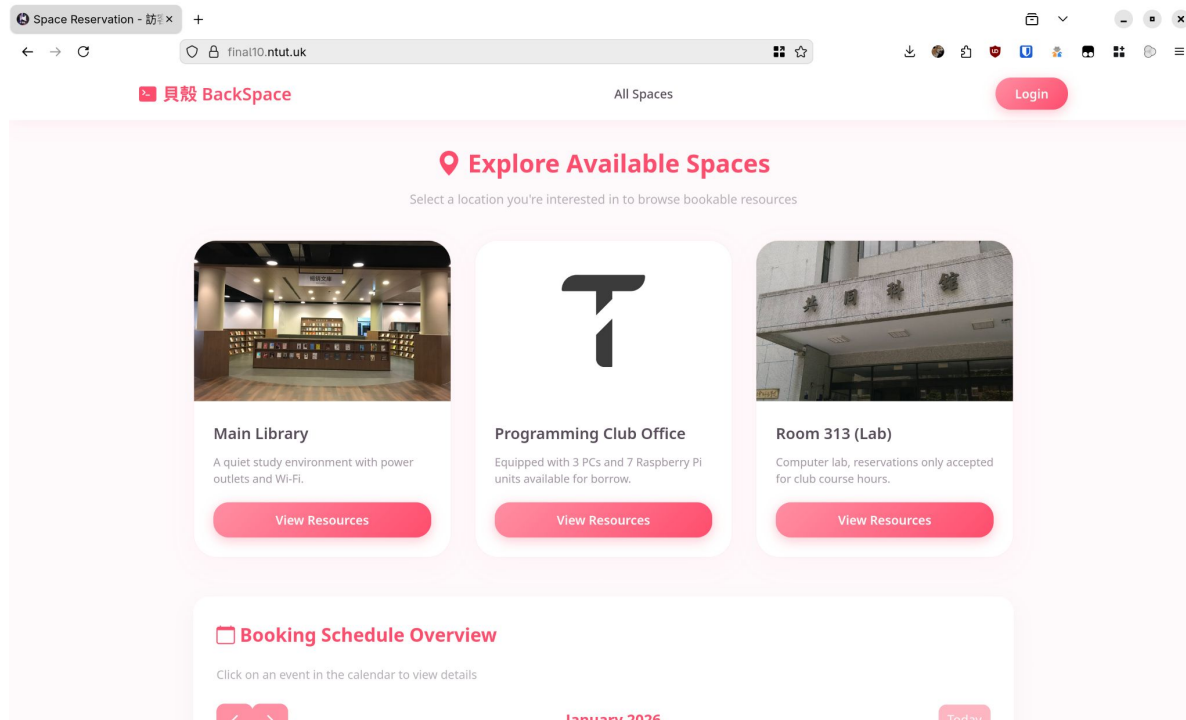
<https://github.com/kevinlee-06/webfinal10>

Tour

<https://final.ntut.uk>

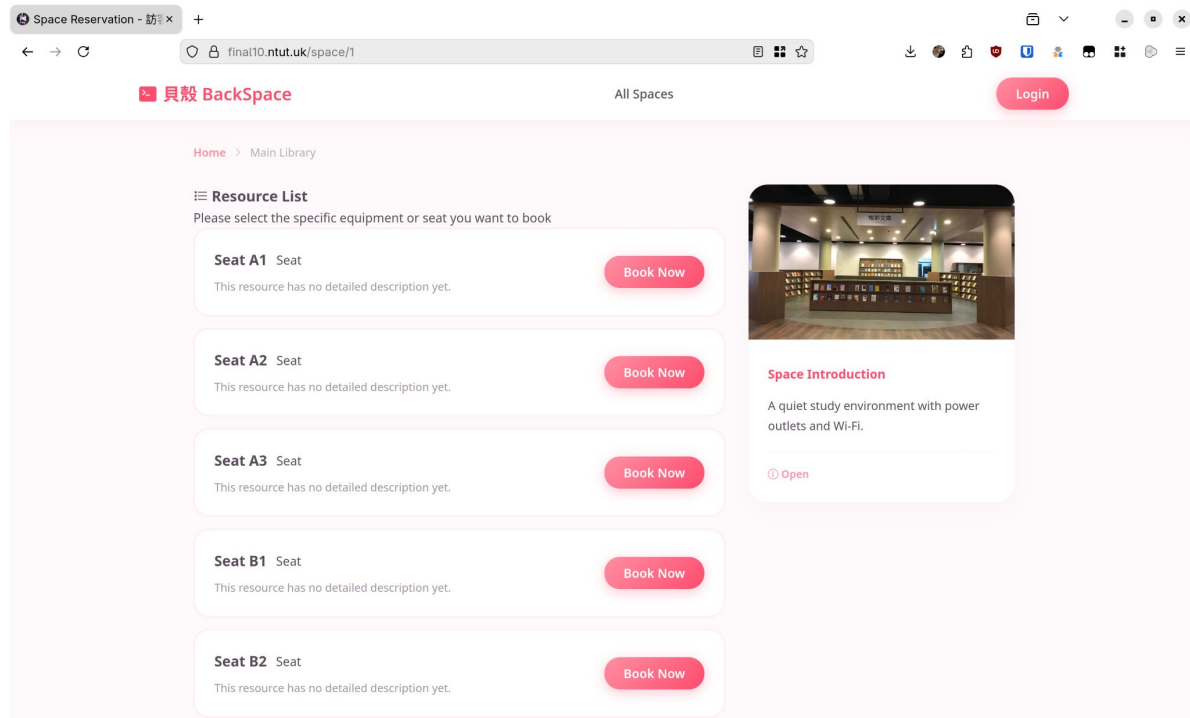
Landing Page

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



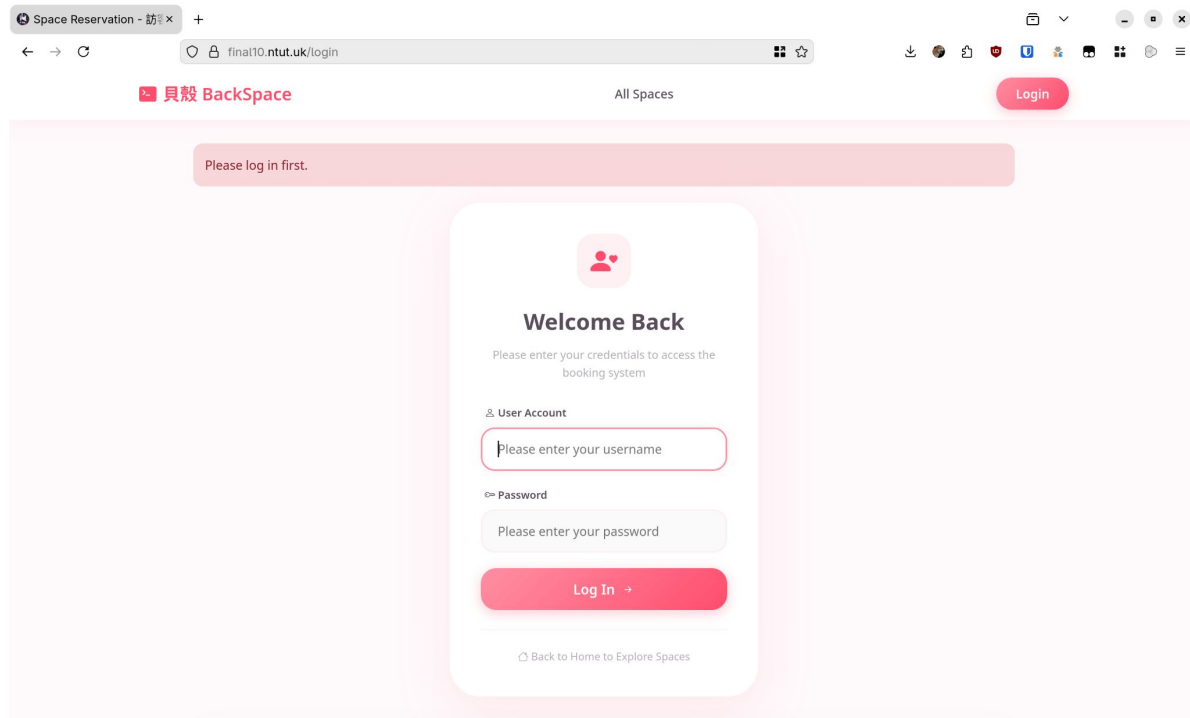
Resource & Equipment List

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



Login Portal

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



The screenshot displays a web browser window with the address bar showing 'final10.ntut.uk/login'. The page header includes the 'BackSpace' logo, a link to 'All Spaces', and a 'Login' button. A pink message bar at the top states 'Please log in first.' The main content area features a 'Welcome Back' section with a user icon, a prompt to enter credentials, and input fields for 'User Account' (username) and 'Password'. A 'Log In' button is positioned below these fields, and a link to 'Back to Home to Explore Spaces' is at the bottom.

Space Reservation - 訪客

final10.ntut.uk/login

貝殼 BackSpace

All Spaces

Login

Please log in first.

Welcome Back

Please enter your credentials to access the booking system

User Account

Please enter your username

Password

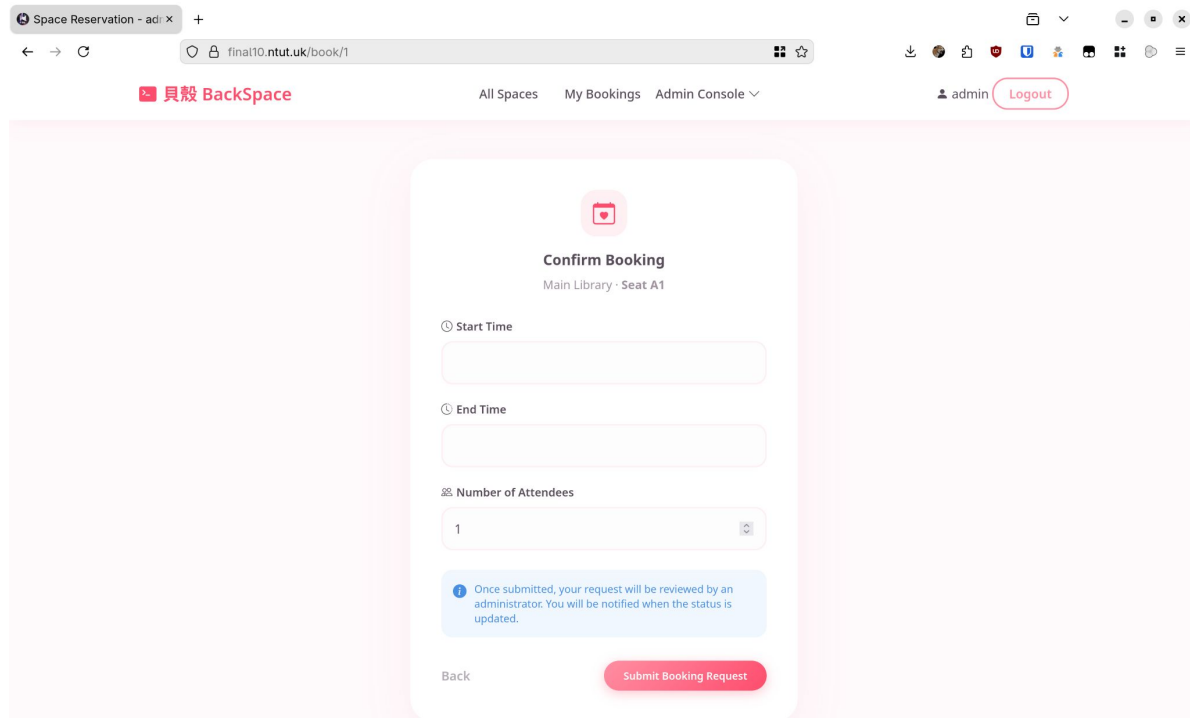
Please enter your password

Log In →

Back to Home to Explore Spaces

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 address bar displaying "final10.ntut.uk/book/1". The page title is "Space Reservation - admin". The navigation bar includes "貝殼 BackSpace", "All Spaces", "My Bookings", and "Admin Console". The user is logged in as "admin" with a "Logout" button.

The main content area is titled "Confirm Booking" with a subtitle "Main Library - Seat A1". It contains the following form fields:

- Start Time**: A text input field.
- End Time**: A text input field.
- Number of Attendees**: A numeric input field with a value of "1".

A blue information box states: "Once submitted, your request will be reviewed by an administrator. You will be notified when the status is updated."

At the bottom, there is a "Back" link and a "Submit Booking Request" button.

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 with the URL `final10.ntut.uk/my-bookings`. The page header includes the 'BackSpace' logo, navigation links for 'All Spaces', 'My Bookings', and 'Admin Console', and a user profile for 'admin' with a 'Logout' button.

The main content area is titled 'My Bookings' with the subtitle 'Track your application status and manage your schedule'. It features a table with the following data:

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

Below the table is a 'Booking Schedule Overview' section with a calendar for January 2026. The calendar shows a booking for January 5th (Monday) from 9a to 12p, labeled '9a Workstation...'. The day '5' is highlighted in red.

Admin Console - Approval Center

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

The screenshot shows a web browser window with the URL `final10.ntut.uk/admin/dashboard`. The page title is "Space Reservation - admin". The navigation bar includes "All Spaces", "My Bookings", and "Admin Console". The user is logged in as "admin" with a "Logout" button.

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

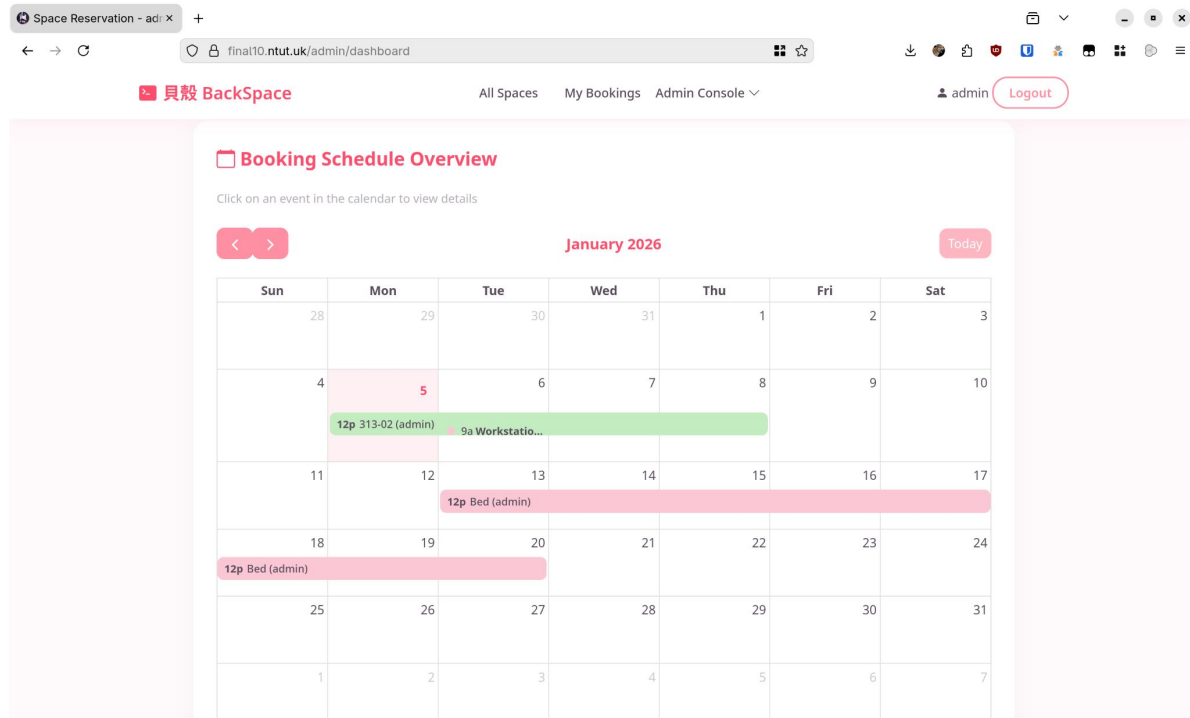
Click on an event in the calendar to view details

< > January 2026 Today

Sun	Mon	Tue	Wed	Thu	Fri	Sat
28	29	30	31	1	2	3
4	5 9a Workstatio...	6	7	8	9	10

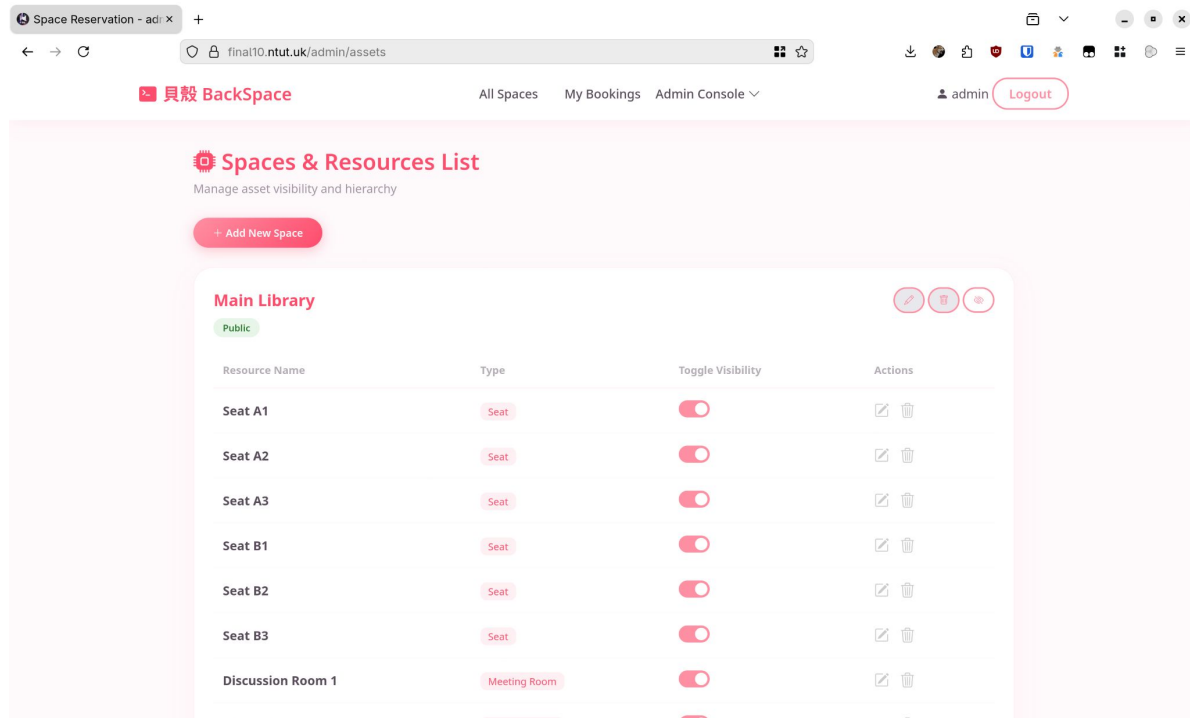
Global Calendar Overview

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



Spaces & Resources Management

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



Add User & Permissions

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

The screenshot shows a web browser window with the address bar displaying 'final10.ntut.uk/admin/add_user'. The page title is 'Space Reservation - admin'. The header includes the 'BackSpace' logo and navigation links for 'All Spaces', 'My Bookings', and 'Admin Console'. A user profile for 'admin' with a 'Logout' button is visible in the top right. The main content area is titled 'Add New User' and contains a form for creating a new member account. The form includes fields for 'Username' (with a hint to 'Enter student ID or name'), 'Password' (with a hint to 'Set a password (6+ characters)'), and 'Confirm Password' (with a hint to 'Re-enter password'). There is also a 'Default Permission Mask' dropdown menu currently set to 'Standard User (Read + Write = 6)'. A red 'Create Account' button is at the bottom of the form.

Space Reservation - admin

final10.ntut.uk/admin/add_user

貝殼 BackSpace

All Spaces My Bookings Admin Console

admin Logout

Add New User

Create a new member account and set system permissions

Username

Enter student ID or name

Password

Set a password (6+ characters)

Confirm Password

Re-enter password

Default Permission Mask

Standard User (Read + Write = 6)

Create Account