**APIs**

**Authentication**

* **POST /auth/register**
  + **Register a new user or admin.**
  + **Input:**

**{**

**"username": "admin123",**

**"password": "securepassword",**

**"role": "admin" // or "student"**

**}**

* **Output:**

**{**

**"user\_id": 1,**

**"message": "User registered successfully."**

**}**

**Query:**

INSERT INTO users (username, password\_hash, role)

VALUES (

  'admin123', 'securepassword', 'admin'

);

SELECT user\_id FROM users WHERE username = 'admin123';

* **POST /auth/login**
  + **Authenticate student/admin and return a token.**
  + **Input:**

**{**

**"username": "admin123",**

**"password": "securepassword"**

**}**

* **Output:**

**{**

**"token": "jwt\_token",**

**"user\_id": 1,**

**"role": "admin"**

**}**

**Query:**

SELECT user\_id, role

FROM users

WHERE username = 'admin123' AND password\_hash = 'securepassword';

**Institution Management**

* **POST /institution/register**
  + **Creates an institution and links its admin.**
  + **Input:**

**{**

**"institution\_name": "Library Central",**

**"bio": "Main library of the city",**

**"address": "123 Library Street",**

**"opening\_hours": "9 AM - 8 PM",**

**"admin\_id”: 1**

**}**

* **Output:**

**{**

**"institution\_id": 1,**

**"message": "Institution registered successfully."**

**}**

INSERT INTO institutins (institution\_id, bio, address, opening\_hours, admin\_id)

VALUES (1, 'Library Central', 'Main library of the city', '9 AM - 8 PM', 1);

SELECT institution\_id FROM institutions WHERE name = 'Library Central';

* **GET /institutions**
  + **Retrieve a list of all institutions.**
  + **Output:**

**[**

**{**

**"institution\_id": 1,**

**"institution\_name": "Library Central",**

**"bio": "Main library of the city",**

**"address": "123 Library Street",**

**"opening\_hours": "9 AM - 8 PM"**

**},**

**{**

**"institution\_id": 2,**

**"institution\_name": "Co-working Space A",**

**"bio": "Modern space for startups",**

**"address": "456 Startup Lane",**

**"opening\_hours": "24/7"**

**}**

**]**

SELECT institution\_id, name, bio, address, opening\_hours FROM institutions;

* **GET /institutions/:id**
  + **Retrieve details of a specific institution.**
  + **Output:**

**{**

**"institution\_id": 1,**

**"institution\_name": "Library Central",**

**"bio": "Main library of the city",**

**"address": "123 Library Street",**

**"opening\_hours": "9 AM - 8 PM",**

**"admin\_username": "admin123"**

**}**

SELECT i.institution\_id, i.name, i.bio, i.address, i.opening\_hours AS admin\_username

FROM institutions i

JOIN institution\_admins ia ON i.institution\_id = ia.institution\_id

JOIN users u ON ia.admin\_id = u.user\_id

WHERE i.institution\_id = 1;

* **PATCH /institutions/:id**
  + **Update institution details.**
  + **Input:**

**{**

**"bio": "Updated bio for the institution",**

**"address": "New Address Street",**

**"opening\_hours": "8 AM - 6 PM"**

**}**

* **Output:**

**{**

**"message": "Institution details updated successfully."**

**}**

UPDATE institutions

SET bio = 'Updated bio for the institution',

    address = 'New Address Street',

    opening\_hours = '8 AM - 6 PM'

WHERE institution\_id = 2;

* **DELETE /institutions/:id**
  + **Delete the institution and its data.**
  + **Output:**

**{**

**"message": "Institution deleted successfully."**

**}**

DELETE FROM institutions WHERE institution\_id = 1;

**Space Management**

* **POST /institutions/:id/spaces**
  + **Create a space for a specific institution and upload a layout image.**
  + **Input:**

**{**

**"name": "Library Room A",**

**"layout\_image": "base64\_encoded\_image"**

**}**

* **Output:**

**{**

**"space\_id": 5,**

**"message": "Space created successfully."**

**}**

INSERT INTO spaces(name, layout)

VALUES (

    'Library Room A', 'base64\_encoded\_image'

);

SELECT space\_id FROM spaces WHERE name = 'Library Room A' AND institution\_id = 1;

* **GET /institutions/:id/spaces**
  + **Retrieve all spaces for a specific institution.**
  + **Output:**

**[**

**{**

**"space\_id": 5,**

**"name": "Library Room A",**

**"layout\_image": "https://example.com/uploads/room-a.png"**

**},**

**{**

**"space\_id": 6,**

**"name": "Library Room B",**

**"layout\_image": "https://example.com/uploads/room-b.png"**

**}**

**]**

SELECT space\_id, name, layout FROM spaces WHERE institution\_id = 1;

* **GET /institutions/:id/spaces/:spaceId**
  + **Retrieve details of a specific space, including the layout image.**
  + **Output:**

**{**

**"space\_id": 5,**

**"name": "Library Room A",**

**"layout\_image": "https://example.com/uploads/room-a.png"**

**}**

SELECT space\_id, name, layout FROM spaces WHERE institution\_id = 1 AND space\_id = 1;

* **PATCH /institutions/:id/spaces/:spaceId**
  + **Update space details and/or replace the layout image.**
  + **Input:**

**{**

**"name": "Updated Room Name",**

**"layout\_image": "base64\_encoded\_image"**

**}**

* **Output:**

**{**

**"message": "Space details updated successfully."**

**}**

UPDATE spaces

SET name = 'Updated Room Name',

    layout = 'updated.png'

WHERE institution\_id = 2 AND space\_id = 3;

* **DELETE /institutions/:id/spaces/:spaceId**
  + **Delete a specific space.**
  + **Output:**

**{**

**"message": "Space deleted successfully."**

**}**

DELETE FROM spaces WHERE institution\_id = 1 AND space\_id = 2;

**Seat Management**

* **POST /institutions/:id/spaces/:spaceId/seats**
  + **Add seats to a specific space within an institution.**
  + **Input:**

**{**

**"seat\_name": "A1",**

**"type": "Chair",**

**"facilities": ["Outlet", "Lamp"],**

**"status": "Available"**

**}**

* **Output:**

**{**

**"seat\_id": 101,**

**"message": "Seat added successfully."**

**}**

INSERT INTO seats (space\_id, name, type, facilities, status)

VALUES (2, 'C2', 'Chair', '["Outlet", "Lamp"]', 'Available');

SELECT seat\_id FROM seats WHERE name = 'C2' AND space\_id = 2;

* **PATCH /institutions/:id/spaces/:spaceId/seats/:seatId**
  + **Update details of a specific seat (e.g., facilities, status).**
  + **Input:**

**{**

**"type": "Table",**

**"facilities": ["Outlet"],**

**"status": "Unavailable"**

**}**

* **Output:**

**{**

**"message": "Seat details updated successfully."**

**}**

UPDATE seats

SET type = 'Table',

    facilities = '["Outlet"]',

    status = 'Unavailable'

WHERE space\_id = 3 AND seat\_id = 4;

* **DELETE /institutions/:id/spaces/:spaceId/seats/:seatId**
  + **Remove a specific seat.**
  + **Output:**

**{**

**"message": "Seat deleted successfully."**

**}**

DELETE FROM seats WHERE space\_id = 1 AND seat\_id = 1;

**Reservation Management**

* **POST /reservations**
  + **Create a reservation for a seat.**
  + **Input:**

**{**

**"seat\_id": 101,**

**"user\_id": 42,**

**"start\_time": "2024-12-22T09:00:00Z",**

**"end\_time": "2024-12-22T11:00:00Z"**

**}**

* **Output:**

**{**

**"reservation\_id": 201,**

**"message": "Reservation created successfully."**

**}**

INSERT INTO reservations (space\_id, seat\_id, user\_id, start\_time, end\_time, status)

VALUES (2, 2, 1, '2025-02-02 9:00', '2025-02-02 12:30', 'Active');

* **GET /reservations/:student\_id**
  + **Retrieve all reservations for a specific user.**
  + **Output:**

**[**

**{**

**"reservation\_id": 201,**

**"seat\_id": 101,**

**"seat\_name": "A1",**

**"start\_time": "2024-12-22T09:00:00Z",**

**"end\_time": "2024-12-22T11:00:00Z",**

**"status": "Active"**

**},**

**{**

**"reservation\_id": 202,**

**"seat\_id": 102,**

**"seat\_name": "B1",**

**"start\_time": "2024-12-23T14:00:00Z",**

**"end\_time": "2024-12-23T16:00:00Z",**

**"status": "Canceled"**

**}**

**]**

SELECT r.reservation\_id, r.seat\_id, r.start\_time, r.end\_time, r.status

FROM reservations r

JOIN seats s ON r.seat\_id = s.seat\_id

WHERE r.user\_id = 2;

* **PATCH /reservations/:id**
  + **Update the time or status of a reservation.**
  + **Input:**

**{**

**"start\_time": "2024-12-22T10:00:00Z",**

**"end\_time": "2024-12-22T12:00:00Z",**

**"status": "Active"**

**}**

* **Output:**

**{**

**"message": "Reservation updated successfully."**

**}**

UPDATE reservations

SET

    start\_time = COALESCE('2025-01-02 9:30', start\_time),

    end\_time = COALESCE('2025-01-02 12:30', end\_time),

    status = COALESCE('Cancelled', status)

WHERE reservation\_id = 3;

* **DELETE /reservations/:id**
  + **Cancel a reservation.**
  + **Output:**

**{**

**"message": "Reservation canceled successfully."**

**}**

UPDATE reservations

SET status = 'Cancelled'

WHERE reservation\_id = 4;