

Dental Management Platform

Naitik Rathod - Full Stack Developer Application

GitHub URL:

https://github.com/NaitikR/dental_management_system.git

Introduction

This project is a Dental Management Platform designed for managing clinics, doctors, and patients. It provides administrative users with tools to schedule appointments and track visits.

Features

User Authentication: Secure login system using Django's built-in authentication.

Clinics Management: Add, view, and edit clinics with doctor affiliations.

Doctors Management: Manage doctors with specialties and clinic affiliations.

Patient Management: Handles patient information, visits, and appointments.

REST API: Endpoints for integrating with external requests to add clinics, doctors, and patients and view clinic details.

Tech Stack and Architecture

Tech Stack

- Frontend: HTML, CSS, JavaScript, Bootstrap
 - Backend: Django, Django REST framework
 - Database: PostgreSQL
-

Architecture

Models:

Define the structure of the database tables for Clinics, Doctors, Patients, Visits, and Appointments.

Views:

Handles the logic for rendering templates and processing user input. Include class-based views (e.g., ListView, DetailView) and function-based views for specific tasks.

Templates:

HTML files that define the structure of the web pages. Use Django template language to display data dynamically.

URLs:

Route incoming requests to the appropriate view functions or classes. Separate URL configurations for app-specific routes and API endpoints.

API:

Provides endpoints for CRUD operations on Clinics, Doctors, Patients, Visits, and Appointments. Uses serializers to convert complex data types into JSON.

Admin Interface:

Utilizes Django's built-in admin panel to manage data directly.

Static Files:

This includes CSS and JavaScript files that Django serves during development.

Setup Instructions

1. Clone the Repository

```
git clone https://github.com/NaitikR/dental_management_system.git
cd dental_management_system
```

2. Set Up Virtual Environment:

```
python -m venv venv
# On MacOS use 'source venv/bin/activate'
# On Windows use 'venv\Scripts\activate'
```

3. Install Dependencies:

```
pip install -r requirements.txt
```

4. Configure PostgreSQL:

Enter Postgres and create a database and a user for the database and grant user access.

```
psql postgres
CREATE DATABASE dental_management_db;
CREATE USER 'username' WITH PASSWORD 'your_password';
GRANT ALL PRIVILEGES ON DATABASE dental_management_db TO 'username';
```

Exit postgres by:

```
\q
```

5. Update dental/settings.py with above database and user details:

```
DATABASES = {
    'default': {
        'ENGINE': 'django.db.backends.postgresql',
        'NAME': 'dental_management_db',
        'USER': 'your_username',
        'PASSWORD': 'your_password',
        'HOST': 'localhost',
        'PORT': '5432',
    }
}
```

6. Run Migrations:

```
python manage.py makemigrations
python manage.py migrate
```

7. Create Superuser:

```
python manage.py createsuperuser
#You will be prompted to enter a username, email address, and password. For example:
#Username: adminuser
#Email: adminuser@dentalproject.com
#Password: [Enter a secure password]
```

8. Run the Server:

```
python manage.py runserver
```

9. Access the Application:

Visit <http://127.0.0.1:8000/admin/> to log in as admin and add sample data.

10. Adding Sample Data

Log in to Admin Interface: Use the superuser credentials.
Add Data: Add clinics, doctors, and patients using the admin interface.

11. Check individual pages of clinics, patients and doctors by using the 'View Site' option on the top right.

You can see lists of the added data, view them, edit them, and add new data from here too.

12. For the REST APIs usage:

I used Postman to check for different API requests, examples of which are given below.

REST API Endpoints

1. Add Patient

Request Method: POST

URL: `http://127.0.0.1:8000/api/patients/`

Body (JSON):

```
{
  "name": "John Doe",
  "date_of_birth": "1990-01-01",
  "address": "123 Main St",
  "phone_number": "1234567890",
  "ssn_last_4": "1234",
  "gender": "M"
}
```

2. Add Doctor

Method: POST

URL: `http://127.0.0.1:8000/api/doctors/`

Body (JSON):

```
{
  "npi": "1234567890",
  "name": "Dr. Smith",
  "email": "dr.smith@example.com",
  "phone_number": "0987654321",
  "specialties": ["Cleaning", "Filling"]
}
```

3. Add Clinic

Method: POST

URL: `http://127.0.0.1:8000/api/clinics/`

Body (JSON):

```
{
  "name": "Downtown Clinic",
}
```

```
"phone_number": "1231231234",  
"email": "contact@downtownclinic.com",  
"address": "456 Elm St",  
"city": "Metropolis",  
"state": "NY"  
}
```

4. Get Clinic Information

Method: GET

URL: <http://127.0.0.1:8000/api/clinics/>

#this will give the list of all the clinics with their ids, then you can request individual clinics using id:

URL: <http://127.0.0.1:8000/api/clinics/<id>>

Assumptions Made

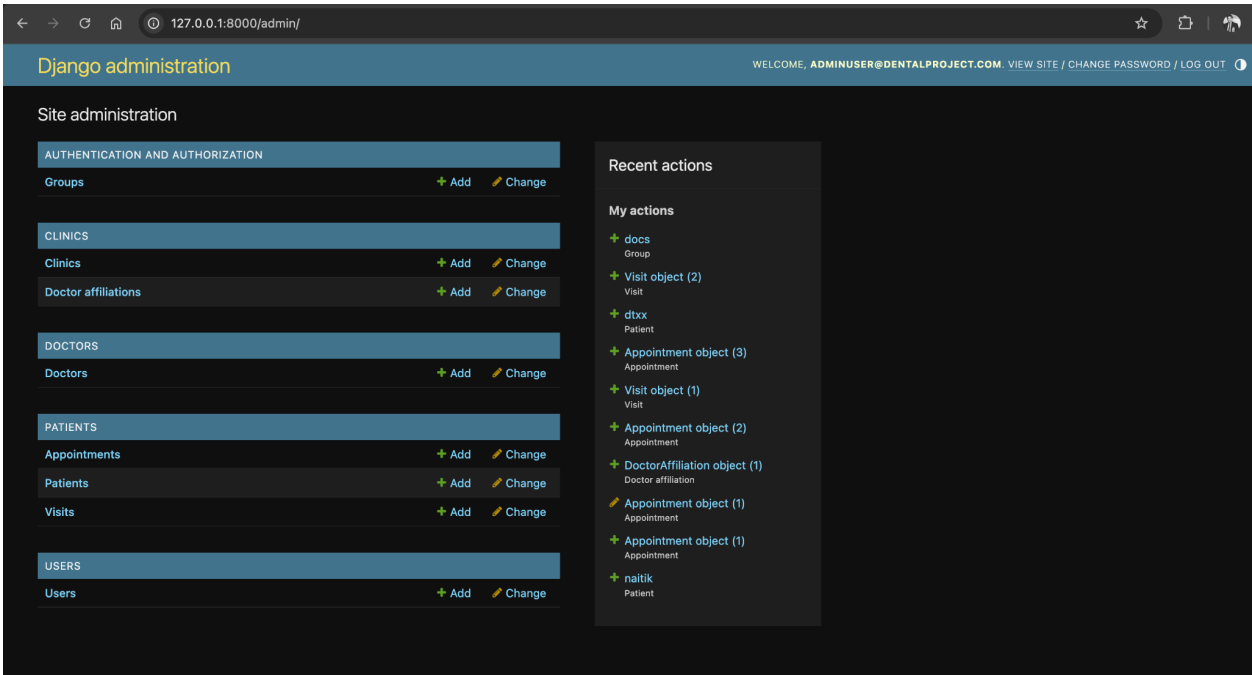
- The user interface is intuitive for administrative users.
- Clinics must have at least one doctor to offer procedures.
- Procedures are predefined and linked to doctor specialties.

Testing

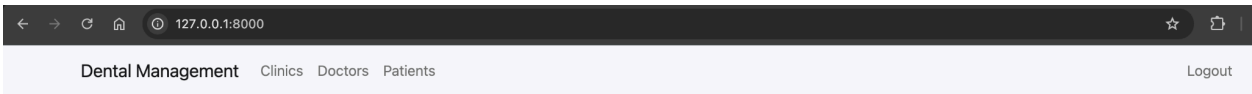
- Unit tests for critical functionalities can be added like:
- User authentication when multiple users are registered.
- CRUD operations for different clinics, patients, and doctors.
- Appointment scheduling for patients with different doctors, treatments and clinics.

Screenshots for the Application

Admin Page



Home Page



Clinics Page

127.0.0.1:8000/clinics/

Dental Management

Clinics

Doctors

Patients

Logout

Clinics

Name	Phone Number	City	State	Doctors	Patients	Actions
clinic1	1239892123	NYC	New York	1		<div>View</div> <div>Edit</div>
clinic2	394939921	Princeton	New Jersey	0		<div>View</div> <div>Edit</div>
Home Clinic	1342441534	QQueen	NY	0		<div>View</div> <div>Edit</div>
new Clinic	1342881534	Downtown Manhattan	NY	0		<div>View</div> <div>Edit</div>

Add New Clinic

Add Clinic

127.0.0.1:8000/clinics/create/

Add Clinic

Name*

Phone number*

Email*

Address*

City*

State*

Save

Cancel

Clinic details

127.0.0.1:8000/clinics/4/

☆

Dental ManagementClinicsDoctorsPatientsLogout

new Clinic

Phone: 1342881534

Email: newclinic@clinic.com

Address: 48 cyc, Downtown Manhattan, NY

Affiliated Doctors

NameOffice AddressWorking Schedule

Edit Clinic

Back to List

Edit Clinic Details

127.0.0.1:8000/clinics/4/update/

☆

Edit Clinic

Name*

new Clinic

Phone number*

1342881534

Email*

newclinic@clinic.com

Address*

48 cyc

City*

Downtown Manhattan

State*

NY

Save

Cancel

Doctors list page

127.0.0.1:8000/doctors/

Dental Management

Clinics

Doctors

Patients

Logout

Doctors

NPI	Name	Specialties	Affiliated Clinics	Affiliated Patients	Actions
anskj9783412	Dr one	Crown, Filling, Cleaning, Root Canal, Teeth Whitening	1		<div>View</div> <div>Edit</div>
9834742194	Dr. Dtx	Cleaning, Filling	0		<div>View</div> <div>Edit</div>

Add New Doctor

Add New Doctor

127.0.0.1:8000/doctors/create/

Dental Management

Clinics

Doctors

Patients

Logout

Add Doctor

Npi*

Name*

Email*

Phone number*

Specialties*

Please fill out this field.

null

Save

Cancel

Doctor details page

→ ↺ ↻ 127.0.0.1:8000/doctors/1/ ☆ ⌵

Dental Management Clinics Doctors Patients Logout

Dr one

NPI: anskjd9783412

Email: drone@doctor.com

Phone: 1239885393

Specialties

Crown

Filling

Cleaning

Root Canal

Teeth Whitening

Affiliated Clinics

clinic1

Patients

Edit Doctor

Back to List

Edit doctor details:

→ ↺ ↻ 127.0.0.1:8000/doctors/2/update/ ☆ ⌵

Dental Management Clinics Doctors Patients Logout

Edit Doctor

Npi*

9834742194

Name*

Dr. Dtx

Email*

drdtxplus@doctor.com

Phone number*

8764355354

Specialties*

["Cleaning", "Filling"]

Save

Cancel

Patients List Page

→ ↻ 🏠 ⓘ 127.0.0.1:8000/patients/ ☆ 📄 🌂

Dental Management Clinics Doctors Patients Logout

Patients

Name	Date of Birth	Last Visit	Next Appointment	Actions
naitik	Aug. 14, 2024	Sept. 4, 2024 with Dr. Dr one	Sept. 19, 2024 with Dr. Dr one	<button>View</button> <button>Edit</button>
dtxx	Aug. 10, 2024	No visits yet	No upcoming appointments	<button>View</button> <button>Edit</button>
newpatient2	Aug. 14, 2024	No visits yet	No upcoming appointments	<button>View</button> <button>Edit</button>
John Doe	Jan. 1, 1990	No visits yet	No upcoming appointments	<button>View</button> <button>Edit</button>
John Cena	Oct. 10, 1987	No visits yet	No upcoming appointments	<button>View</button> <button>Edit</button>

Add New Patient

Add new Patient

→ ↻ 🏠 ⓘ 127.0.0.1:8000/patients/create/ ☆ 📄 🌂

Please fill out this field.

Add Patient

Name*

Date of birth*

Address*

Phone number*

Ssn last 4*

Gender*

----- ▾

Save

Cancel

Patient details page

127.0.0.1:8000/patients/2/

Dental Management

Clinics

Doctors

Patients

Logout

dtxx

Date of Birth: Aug. 10, 2024

Phone: 123212312

Address: princeton, NJ

SSN Last 4: 9999

Gender: Male

Last Visit

No visits yet.

Next Appointment

No upcoming appointments.

Visits

Date & Time	Doctor	Clinic	Procedures	Notes
-------------	--------	--------	------------	-------

Add New Visit

Schedule Appointment

Edit Patient

Back to List

Add new visit for the patient

127.0.0.1:8000/patients/2/add_visit/

Dental Management

Clinics

Doctors

Patients

Logout

Add New Visit for dtxx

Doctor*

Clinic*

Date time*

Procedures*

null

Notes*

Schedule a new appointment for patient

Dental ManagementClinicsDoctorsPatientsLogout

Schedule Appointment for dtxx

Procedure

Filling

Clinic

clinic1

clinic2

Home Clinic

new Clinic

Date and Time

mm/dd/yyyy, --:-- --

Schedule Appointment

Dental ManagementClinicsDoctorsPatientsLogout

Schedule Appointment for dtxx

Procedure

Filling

Clinic

clinic1

Doctor

Dr one

Dr. Dtx

Date and Time

mm/dd/yyyy, --:-- --

Schedule Appointment

Schedule Appointment for dtxx

Procedure

Filling

Clinic

clinic1

Doctor

Dr one

Date and Time

mm/dd/yyyy, --:-- --

September 2024

↑

↓

07

06

PM

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8	9	10	11	12	13	14	10	08	
15	16	17	18	19	20	21	11	09	
22	23	24	25	26	27	28	12	10	
29	30	1	2	3	4	5	01	11	
6	7	8	9	10	11	12			

Clear

Today

Edit patient details

127.0.0.1:8000/patients/3/update/

Edit Patient

Name*

newpatient2

Date of birth*

2024-08-14

Address*

city-ny

Phone number*

0909012929

Ssn last 4*

1109

Gender*

Male

Save

Cancel

REST API Endpoints:

Patient POST request:


The screenshot displays a REST client interface with the following details:

- URL:** `http://127.0.0.1:8000/api/patients/`
- Method:** `POST`
- Body:** A JSON object representing a patient:

```
{  "name": "John Cena",  "date_of_birth": "1987-10-10",  "address": "13 Mall ST",  "phone_number": "93484384248",  "ssn_last_4": "9839",  "gender": "F"}
```
- Response:** The response is a JSON object indicating a successful creation:

```
{  "id": 5,  "name": "John Cena",  "date_of_birth": "1987-10-10",  "address": "13 Mall ST",  "phone_number": "93484384248",  "ssn_last_4": "9839",  "gender": "F"}
```
- Status:** `201 Created`
- Time:** `10 ms`
- Size:** `476 B`

Doctor POST request:

 http://127.0.0.1:8000/api/patients/

POST

http://127.0.0.1:8000/api/doctors/

Send

Params

Authorization

Headers (8)

Body

Pre-request Script

Tests

Settings

none

form-data

x-www-form-urlencoded

raw

binary

JSON

1

2

3

4

5

6

7

"npi": "9834742194",

"name": "Dr. Dtx",

"email": "drdtxplus@doctor.com",

"phone_number": "8764355354",

"specialties": ["Cleaning", "Filling"]

Body

Cookies

Headers (10)

Test Results

Status: 201 Created

Time: 14 ms

Size: 475 B

Save Response

Pretty

Raw

Preview

Visualize

JSON

1

2

3

4

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11

"id": 2,

"npi": "9834742194",

"name": "Dr. Dtx",

"email": "drdtxplus@doctor.com",

"phone_number": "8764355354",

"specialties": [


"Cleaning",

"Filling"

]

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Clinic POST Request

 http://127.0.0.1:8000/api/patients/

POST

http://127.0.0.1:8000/api/doctors/

Send

Params

Authorization

Headers (8)

Body

Pre-request Script

Tests

Settings

none

form-data

x-www-form-urlencoded

raw

binary

JSON

Beautify

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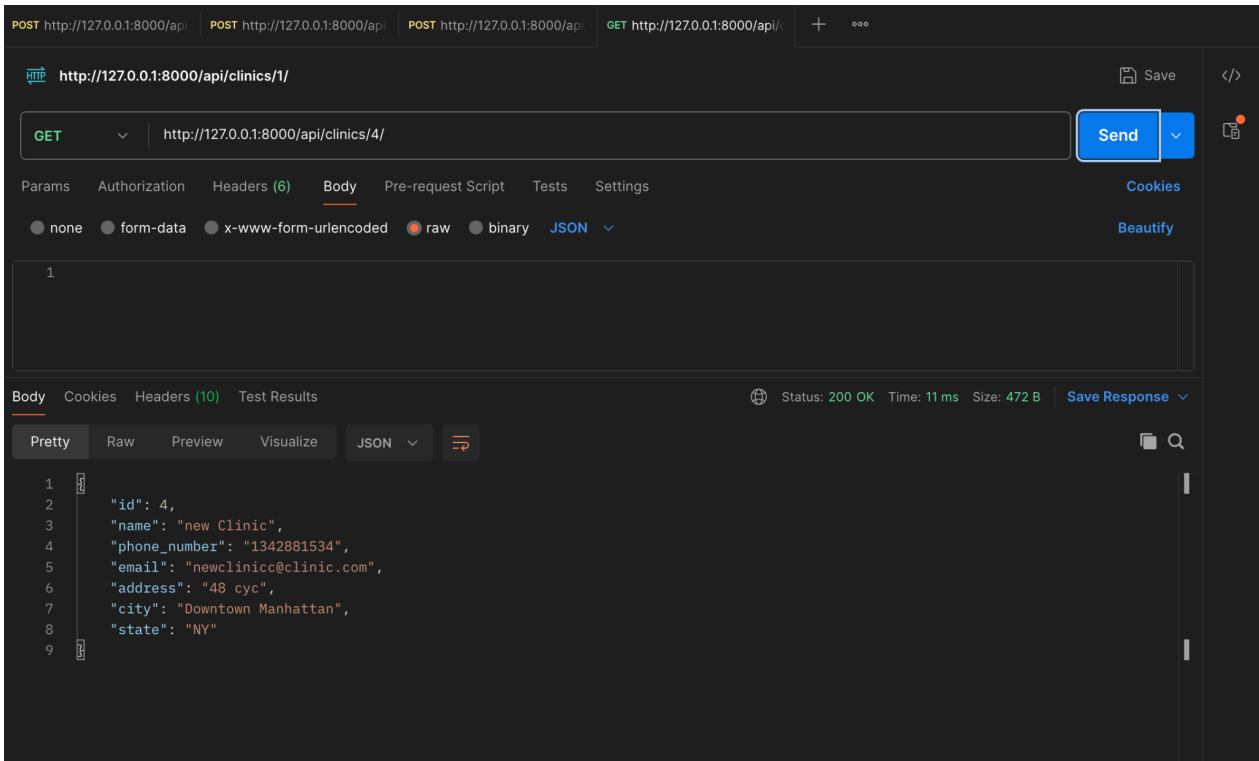
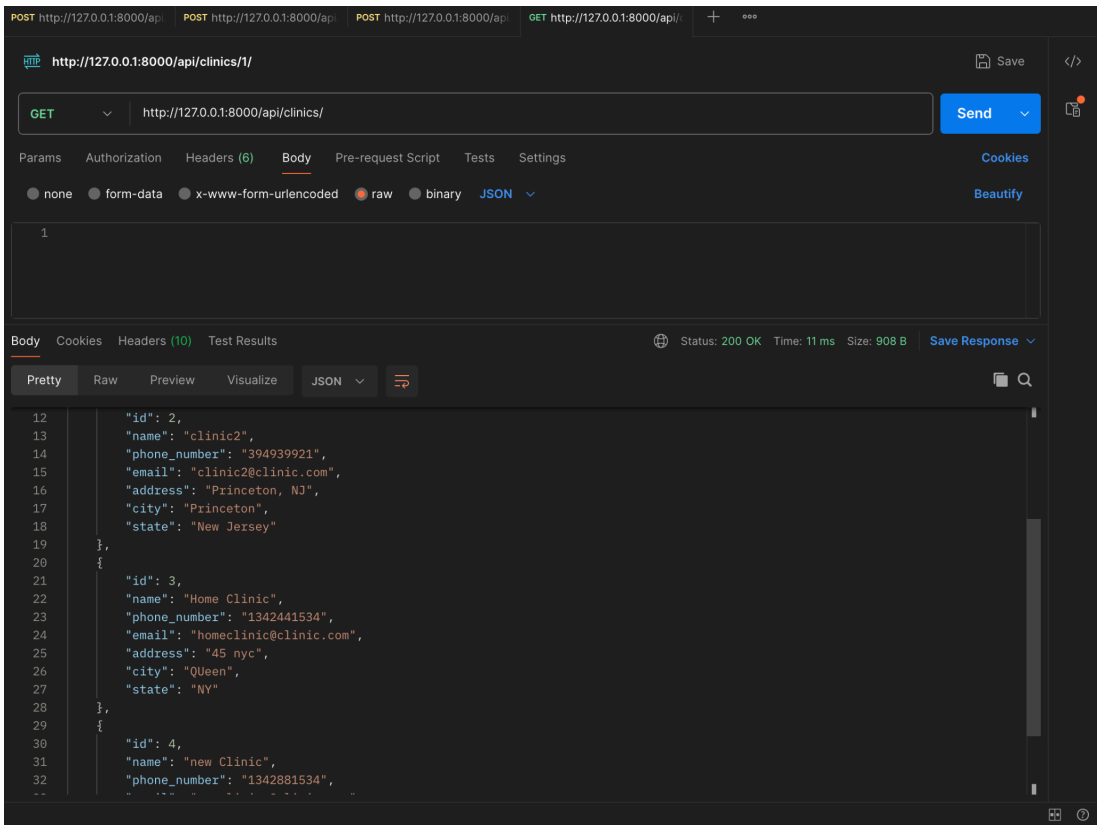
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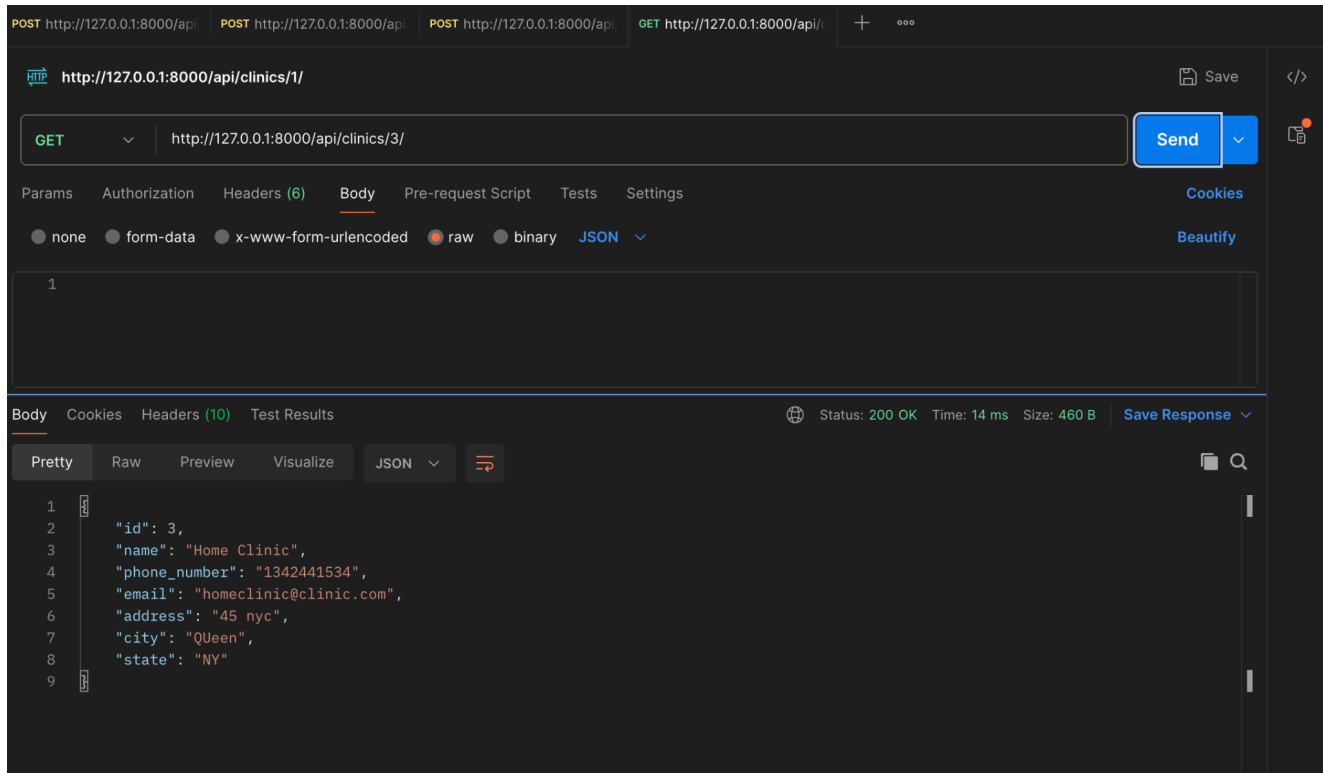
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Clinic GET request





Server log for the session:

```
[22/Sep/2024 17:50:17] "POST /api/patients/ HTTP/1.1" 201 140
[22/Sep/2024 17:50:22] "GET /patients/ HTTP/1.1" 200 4523
[22/Sep/2024 17:50:22] "GET /static/css/style.css HTTP/1.1" 404 1853
[22/Sep/2024 17:50:22] "GET /static/js/script.js HTTP/1.1" 404 1850
[22/Sep/2024 18:02:29] "POST /api/clinics/ HTTP/1.1" 201 136
[22/Sep/2024 18:03:16] "POST /api/doctors/ HTTP/1.1" 201 140
[22/Sep/2024 22:35:18] "GET / HTTP/1.1" 200 1830
[22/Sep/2024 22:35:18] "GET /static/css/style.css HTTP/1.1" 404 1853
[22/Sep/2024 22:35:18] "GET /static/js/script.js HTTP/1.1" 404 1850
[22/Sep/2024 22:35:18] "GET /admin/ HTTP/1.1" 200 14177
[22/Sep/2024 22:47:28] "POST /api/clinics/ HTTP/1.1" 201 148
[22/Sep/2024 22:48:22] "POST /api/patients/ HTTP/1.1" 201 141
[22/Sep/2024 22:48:41] "GET /api/clinics/ HTTP/1.1" 200 578
[22/Sep/2024 22:49:13] "GET /api/clinics/3/ HTTP/1.1" 200 136
[22/Sep/2024 22:49:24] "GET /api/clinics/4/ HTTP/1.1" 200 148
```

For any questions, feel free to reach me at:

<https://www.linkedin.com/in/naitikr/>