Title

Lab7: Implementing RESTful Web APIThis assignment has attachments

Due

Oct 13, 2025, 9:00 AM

Number of resubmissions allowed

Unlimited

Accept Resubmission Until

Oct 13, 2025, 9:00 AM

Status

Honor Pledge Accepted

Grade Scale

Points (max 40.00)

Modified by instructor

Oct 10, 2025, 12:45 PM

Instructions

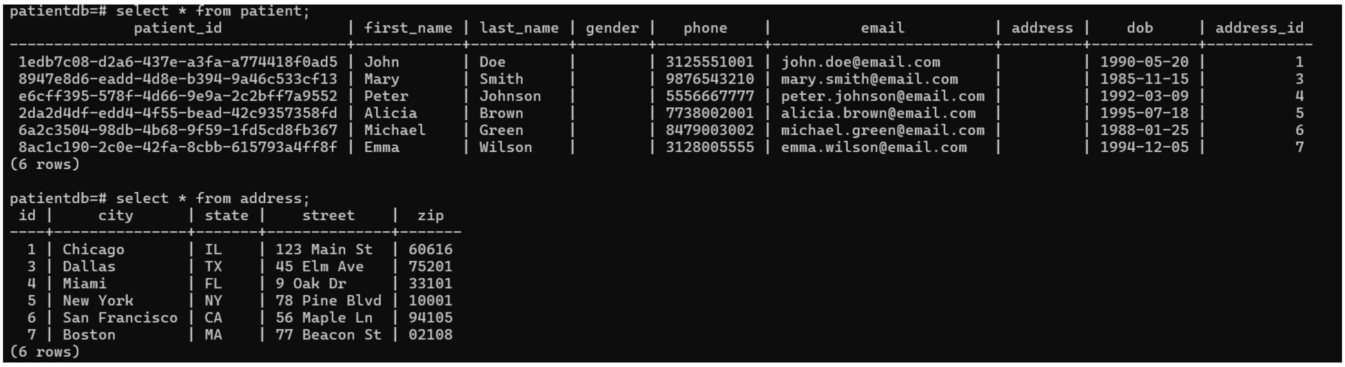
For this Lab Assignment 7, you are required to create a Spring Boot, Spring Web MVC-based Web application project and implement a RESTful Web API solution, for the ADS Dental Surgeries Appointments management system. Note that you can copy-over and use the backend, data access layer, domain model and service layer code from Lab 6.

In your solution, you are required to implement the following RESTful Web API endpoint URIs:

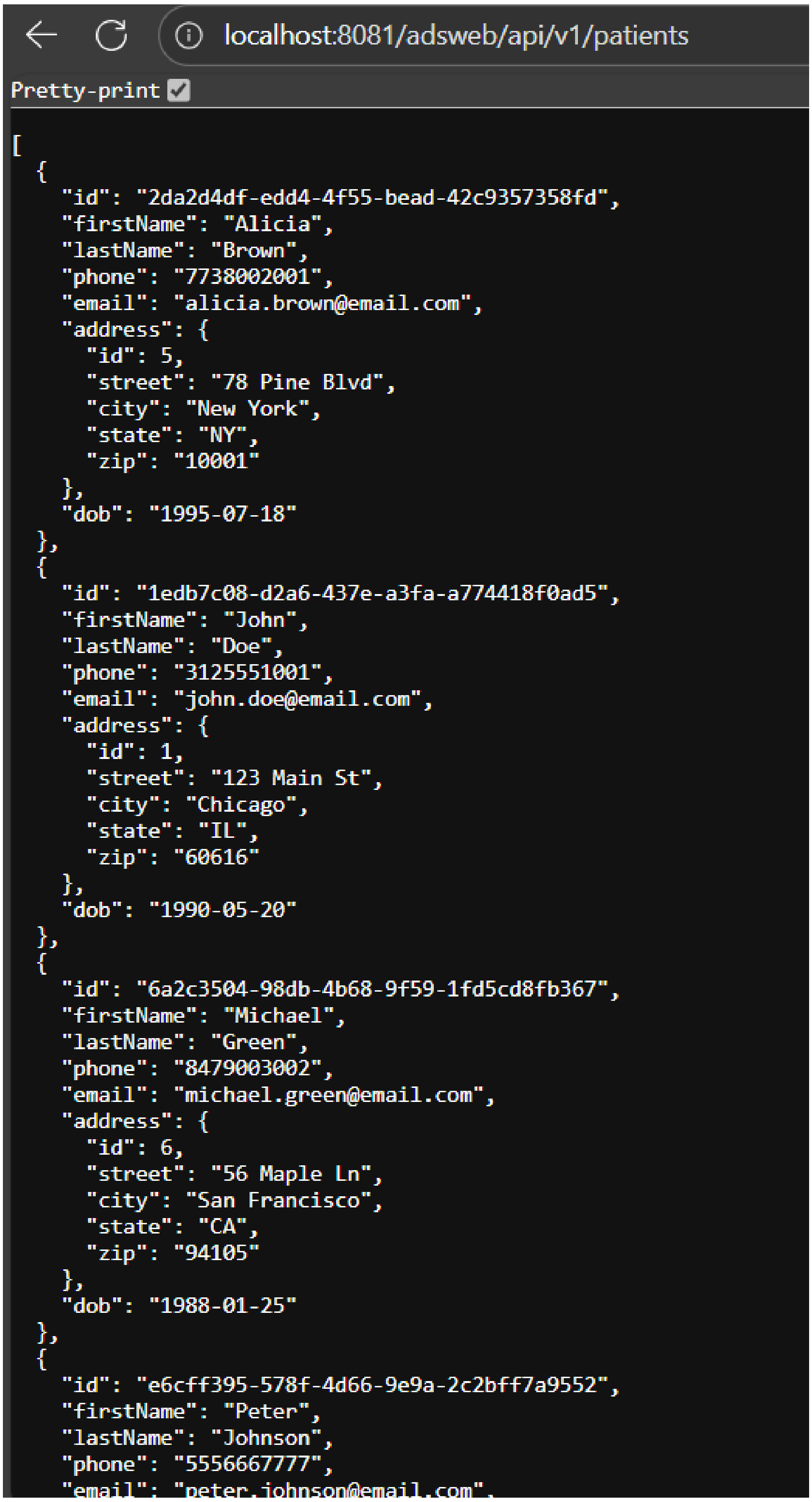
1. HTTP GET request: http://localhost:808/adsweb/api/v1/patients - Displays the list of all Patients, including their primaryAddresses, sorted in ascending order by their lastName, in JSON format.

Ans:

Tables



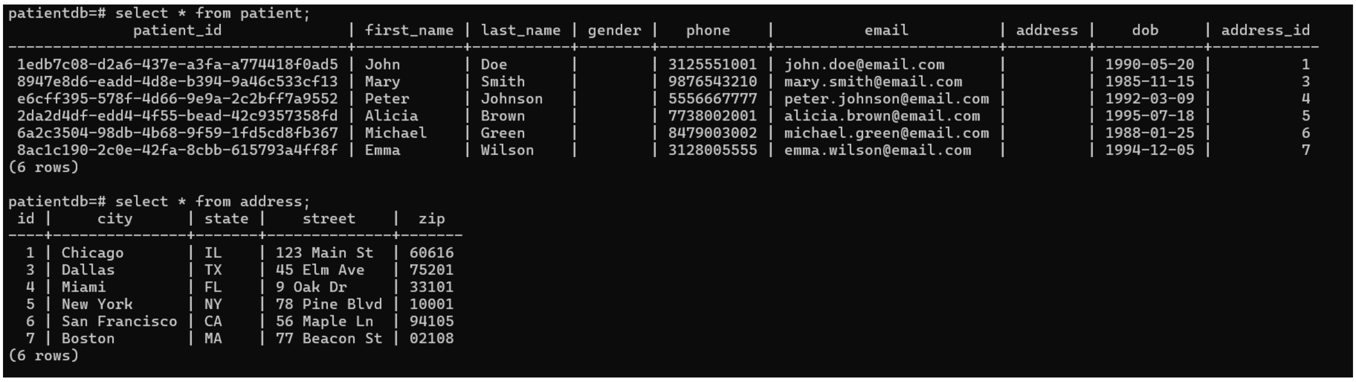
```
patientdb=# select * from patient;
              patient_id              | first_name | last_name | gender |   phone    |          email          | address |    dob     | address_id
--------------------------------------+------------+-----------+--------+------------+-------------------------+---------+------------+------------
 1edb7c08-d2a6-437e-a3fa-a774418f0ad5 | John       | Doe       |        | 3125551001 | john.doe@email.com      |         | 1990-05-20 |          1
 8947e8d6-eadd-4d8e-b394-9a46c533cf13 | Mary       | Smith     |        | 9876543210 | mary.smith@email.com    |         | 1985-11-15 |          3
 e6cff395-578f-4d66-9e9a-2c2bff7a9552 | Peter      | Johnson   |        | 5556667777 | peter.johnson@email.com |         | 1992-03-09 |          4
 2da2d4df-edd4-4f55-bead-42c9357358fd | Alicia     | Brown     |        | 7738002001 | alicia.brown@email.com  |         | 1995-07-18 |          5
 6a2c3504-98db-4b68-9f59-1fd5cd8fb367 | Michael    | Green     |        | 8479003002 | michael.green@email.com |         | 1988-01-25 |          6
 8ac1c190-2c0e-42fa-8cbb-615793a4ff8f | Emma       | Wilson    |        | 3128005555 | emma.wilson@email.com   |         | 1994-12-05 |          7
(6 rows)

patientdb=# select * from address;
 id |     city      | state |    street    |  zip
----+---------------+-------+--------------+-------
  1 | Chicago       | IL    | 123 Main St  | 60616
  3 | Dallas        | TX    | 45 Elm Ave   | 75201
  4 | Miami         | FL    | 9 Oak Dr     | 33101
  5 | New York      | NY    | 78 Pine Blvd | 10001
  6 | San Francisco | CA    | 56 Maple Ln  | 94105
  7 | Boston        | MA    | 77 Beacon St | 02108
(6 rows)
```



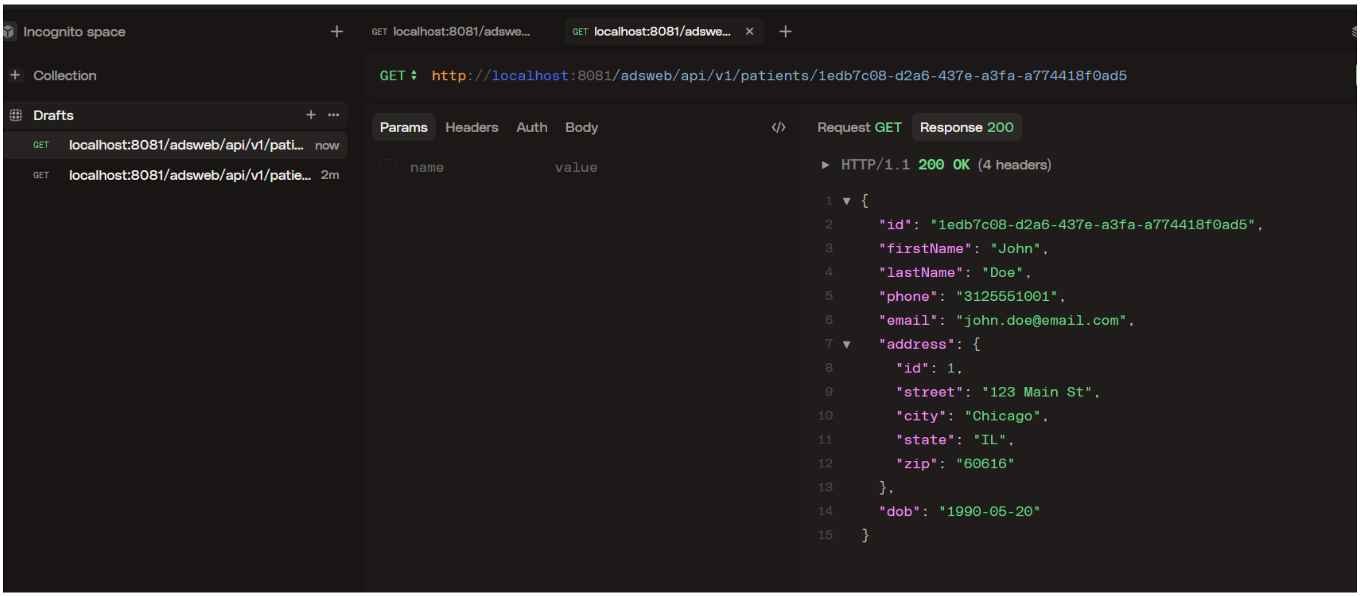
Pretty-print ☑

```
[
  {
    "id": "2da2d4df-edd4-4f55-bead-42c9357358fd",
    "firstName": "Alicia",
    "lastName": "Brown",
    "phone": "7738002001",
    "email": "alicia.brown@email.com",
    "address": {
      "id": 5,
      "street": "78 Pine Blvd",
      "city": "New York",
      "state": "NY",
      "zip": "10001"
    },
    "dob": "1995-07-18"
  },
  {
    "id": "1edb7c08-d2a6-437e-a3fa-a774418f0ad5",
    "firstName": "John",
    "lastName": "Doe",
    "phone": "3125551001",
    "email": "john.doe@email.com",
    "address": {
      "id": 1,
      "street": "123 Main St",
      "city": "Chicago",
      "state": "IL",
      "zip": "60616"
    },
    "dob": "1990-05-20"
  },
  {
    "id": "6a2c3504-98db-4b68-9f59-1fd5cd8fb367",
    "firstName": "Michael",
    "lastName": "Green",
    "phone": "8479003002",
    "email": "michael.green@email.com",
    "address": {
      "id": 6,
      "street": "56 Maple Ln",
      "city": "San Francisco",
      "state": "CA",
      "zip": "94105"
    },
    "dob": "1988-01-25"
  },
  {
    "id": "e6cff395-578f-4d66-9e9a-2c2bff7a9552",
    "firstName": "Peter",
    "lastName": "Johnson",
    "phone": "5556667777",
    "email": "peter.johnson@email.com",
```

2. HTTP GET request: http://localhost:8080/adsweb/api/v1/patients/1 - Displays the data for Patient whose PatientId is 1 including the primaryAddress, in JSON format. Also, make sure to implement appropriate exception handling, for where patientId is invalid and not found.



```
patientdb=# select * from patient;
              patient_id              | first_name | last_name | gender |   phone    |           email           | address |    dob     | address_id
--------------------------------------+------------+-----------+--------+------------+---------------------------+---------+------------+------------
 1edb7c08-d2a6-437e-a3fa-a774418f0ad5 | John       | Doe       |        | 3125551001 | john.doe@email.com        |         | 1990-05-20 |          1
 8947e8d6-eadd-4d8e-b394-9a46c533cf13 | Mary       | Smith     |        | 9876543210 | mary.smith@email.com      |         | 1985-11-15 |          3
 e6cff395-578f-4d66-9e9a-2c2bff7a9552 | Peter      | Johnson   |        | 5556667777 | peter.johnson@email.com   |         | 1992-03-09 |          4
 2da2d4df-edd4-4f55-bead-42c9357358fd | Alicia     | Brown     |        | 7738002001 | alicia.brown@email.com    |         | 1995-07-18 |          5
 6a2c3504-98db-4b68-9f59-1fd5cd8fb367 | Michael    | Green     |        | 8479003002 | michael.green@email.com   |         | 1988-01-25 |          6
 8ac1c190-2c0e-42fa-8cbb-615793a4ff8f | Emma       | Wilson    |        | 3128005555 | emma.wilson@email.com     |         | 1994-12-05 |          7
(6 rows)

patientdb=# select * from address;
 id |     city      | state |    street     |  zip
----+---------------+-------+---------------+-------
  1 | Chicago       | IL    | 123 Main St   | 60616
  3 | Dallas        | TX    | 45 Elm Ave    | 75201
  4 | Miami         | FL    | 9 Oak Dr      | 33101
  5 | New York      | NY    | 78 Pine Blvd  | 10001
  6 | San Francisco | CA    | 56 Maple Ln   | 94105
  7 | Boston        | MA    | 77 Beacon St  | 02108
(6 rows)
```

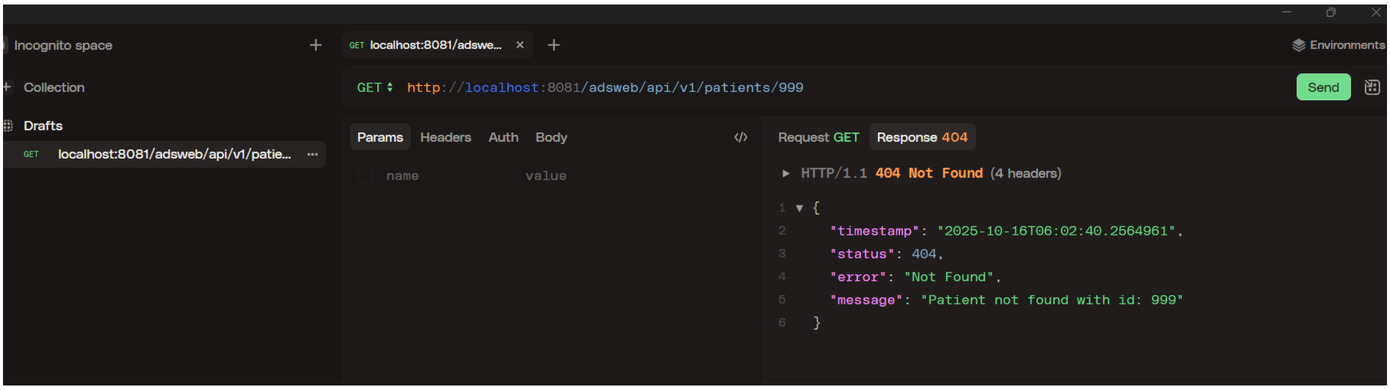

Incognito space
Collection
Drafts
GET localhost:8081/adsweb/api/v1/pati... now
GET localhost:8081/adsweb/api/v1/patie... 2m
GET localhost:8081/adswe...
GET localhost:8081/adswe...
Params
Headers
Auth
Body
name
value
Request GET
Response 200

GET http://localhost:8081/adsweb/api/v1/patients/1edb7c08-d2a6-437e-a3fa-a774418f0ad5

HTTP/1.1 200 OK (4 headers)

```
{
  "id": "1edb7c08-d2a6-437e-a3fa-a774418f0ad5",
  "firstName": "John",
  "lastName": "Doe",
  "phone": "3125551001",
  "email": "john.doe@email.com",
  "address": {
    "id": 1,
    "street": "123 Main St",
    "city": "Chicago",
    "state": "IL",
    "zip": "60616"
  },
  "dob": "1990-05-20"
}
```

Exception part.

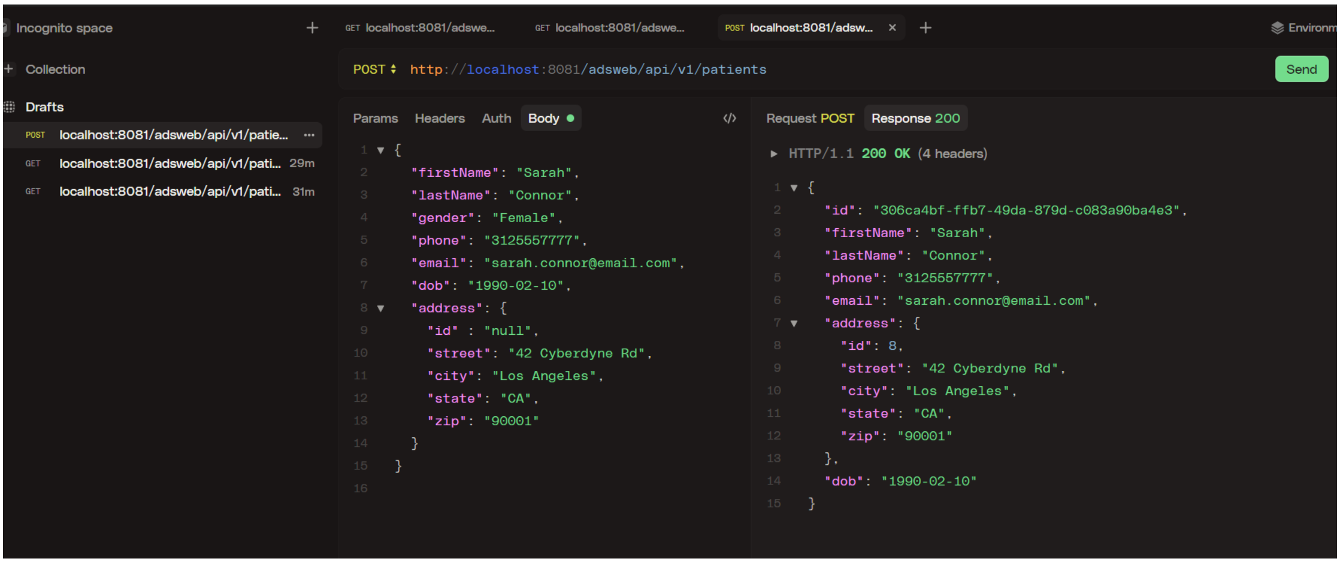


GET http://localhost:8081/adsweb/api/v1/patients/999

HTTP/1.1 404 Not Found (4 headers)

```
{
  "timestamp": "2025-10-16T06:02:40.2564961",
  "status": 404,
  "error": "Not Found",
  "message": "Patient not found with id: 999"
}
```

3. HTTP POST request: http://localhost:8080/adsweb/api/v1/patients - Register a new Patient into the system. Note: You supply the correct/appropriate Patient data in JSON format



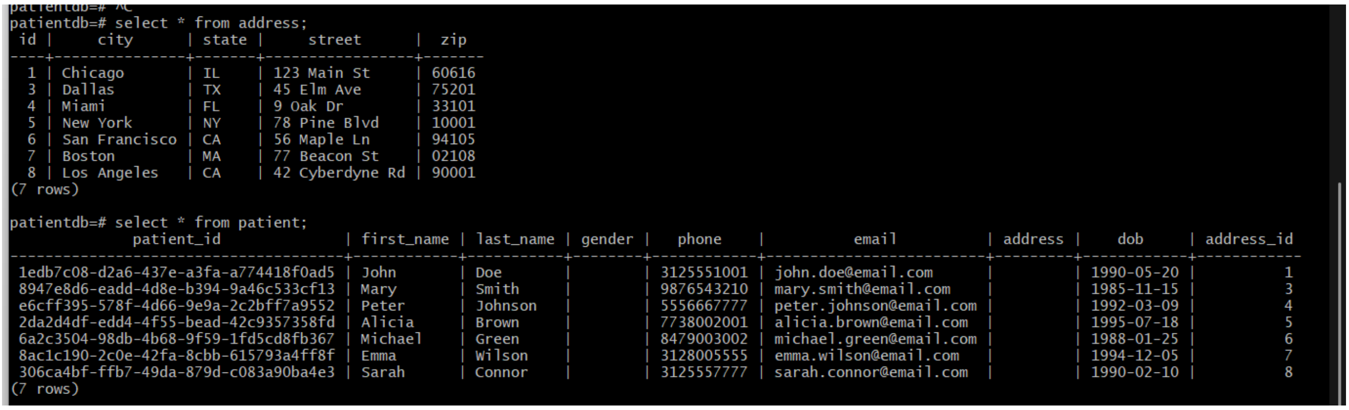
Incognito space
Collection
Drafts
POST localhost:8081/adsweb/api/v1/patie...
GET localhost:8081/adsweb/api/v1/pati... 29m
GET localhost:8081/adsweb/api/v1/pati... 31m
GET localhost:8081/adswe...
GET localhost:8081/adswe...
POST localhost:8081/adsw...
Environm
Send
Params
Headers
Auth
Body
Request POST
Response 200

POST http://localhost:8081/adsweb/api/v1/patients

```
{
  "firstName": "Sarah",
  "lastName": "Connor",
  "gender": "Female",
  "phone": "3125557777",
  "email": "sarah.connor@email.com",
  "dob": "1990-02-10",
  "address": {
    "id" : "null",
    "street": "42 Cyberdyne Rd",
    "city": "Los Angeles",
    "state": "CA",
    "zip": "90001"
  }
}
```

```
HTTP/1.1 200 OK (4 headers)
{
  "id": "306ca4bf-ffb7-49da-879d-c083a90ba4e3",
  "firstName": "Sarah",
  "lastName": "Connor",
  "phone": "3125557777",
  "email": "sarah.connor@email.com",
  "address": {
    "id": 8,
    "street": "42 Cyberdyne Rd",
    "city": "Los Angeles",
    "state": "CA",
    "zip": "90001"
  },
  "dob": "1990-02-10"
}
```

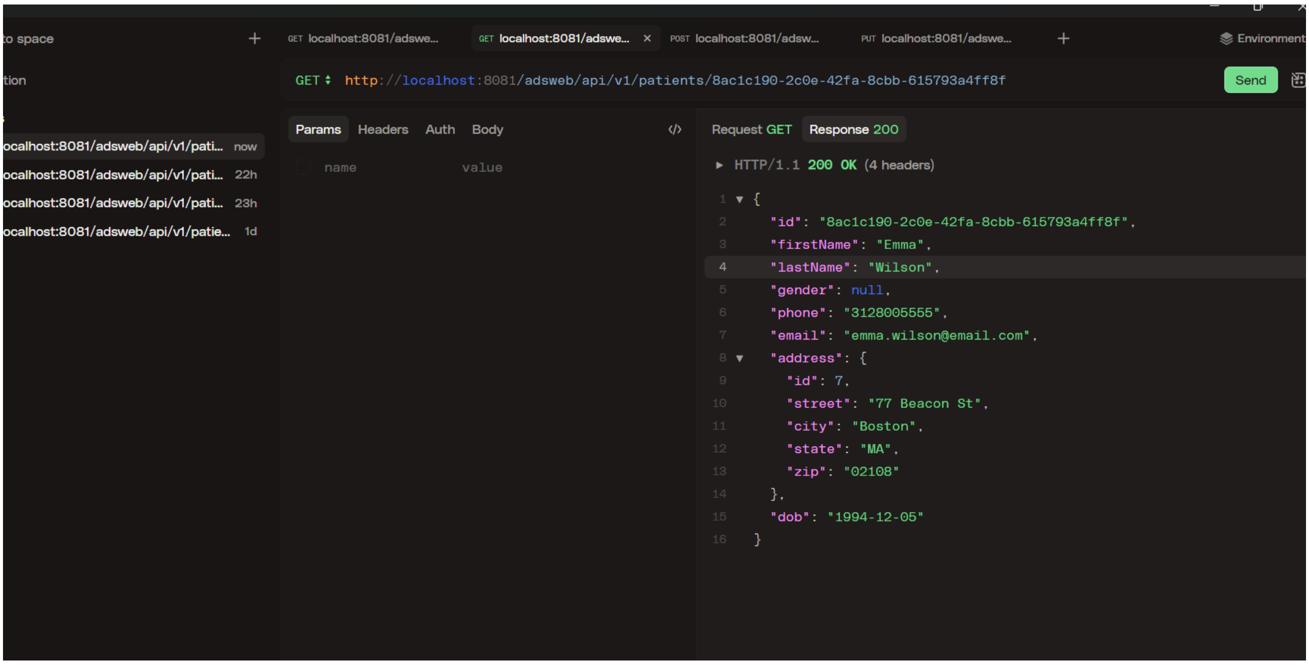
New Patient Added Sarah Connor



```
patientdb=# ^C
patientdb=# select * from address;
 id |     city      | state |     street      |  zip
----+---------------+-------+-----------------+-------
  1 | Chicago       | IL    | 123 Main St     | 60616
  3 | Dallas        | TX    | 45 Elm Ave      | 75201
  4 | Miami         | FL    | 9 Oak Dr        | 33101
  5 | New York      | NY    | 78 Pine Blvd    | 10001
  6 | San Francisco | CA    | 56 Maple Ln     | 94105
  7 | Boston        | MA    | 77 Beacon St    | 02108
  8 | Los Angeles   | CA    | 42 Cyberdyne Rd | 90001
(7 rows)

patientdb=# select * from patient;
              patient_id              | first_name | last_name | gender |   phone    |          email           | address |    dob     | address_id
--------------------------------------+------------+-----------+--------+------------+--------------------------+---------+------------+------------
 1edb7c08-d2a6-437e-a3fa-a774418f0ad5 | John       | Doe       |        | 3125551001 | john.doe@email.com       |         | 1990-05-20 |          1
 8947e8d6-eadd-4d8e-b394-9a46c533cf13 | Mary       | Smith     |        | 9876543210 | mary.smith@email.com     |         | 1985-11-15 |          3
 e6cff395-578f-4d66-9e9a-2c2bff7a9552 | Peter      | Johnson   |        | 5556667777 | peter.johnson@email.com  |         | 1992-03-09 |          4
 2da2d4df-edd4-4f55-bead-42c9357358fd | Alicia     | Brown     |        | 7738002001 | alicia.brown@email.com   |         | 1995-07-18 |          5
 6a2c3504-98db-4b68-9f59-1fd5cd8fb367 | Michael    | Green     |        | 8479003002 | michael.green@email.com  |         | 1988-01-25 |          6
 8ac1c190-2c0e-42fa-8cbb-615793a4ff8f | Emma       | Wilson    |        | 3128005555 | emma.wilson@email.com    |         | 1994-12-05 |          7
 306ca4bf-ffb7-49da-879d-c083a90ba4e3 | Sarah      | Connor    |        | 3125557777 | sarah.connor@email.com   |         | 1990-02-10 |          8
(7 rows)
```

4. HTTP PUT request: http://localhost:8080/adsweb/api/v1/patient/1 - Retrieves and updates Patient data for the patient whose patientId is 1 (or any other valid patientId). Also, make sure to implement appropriate exception handling, for where patientId is invalid and not found.

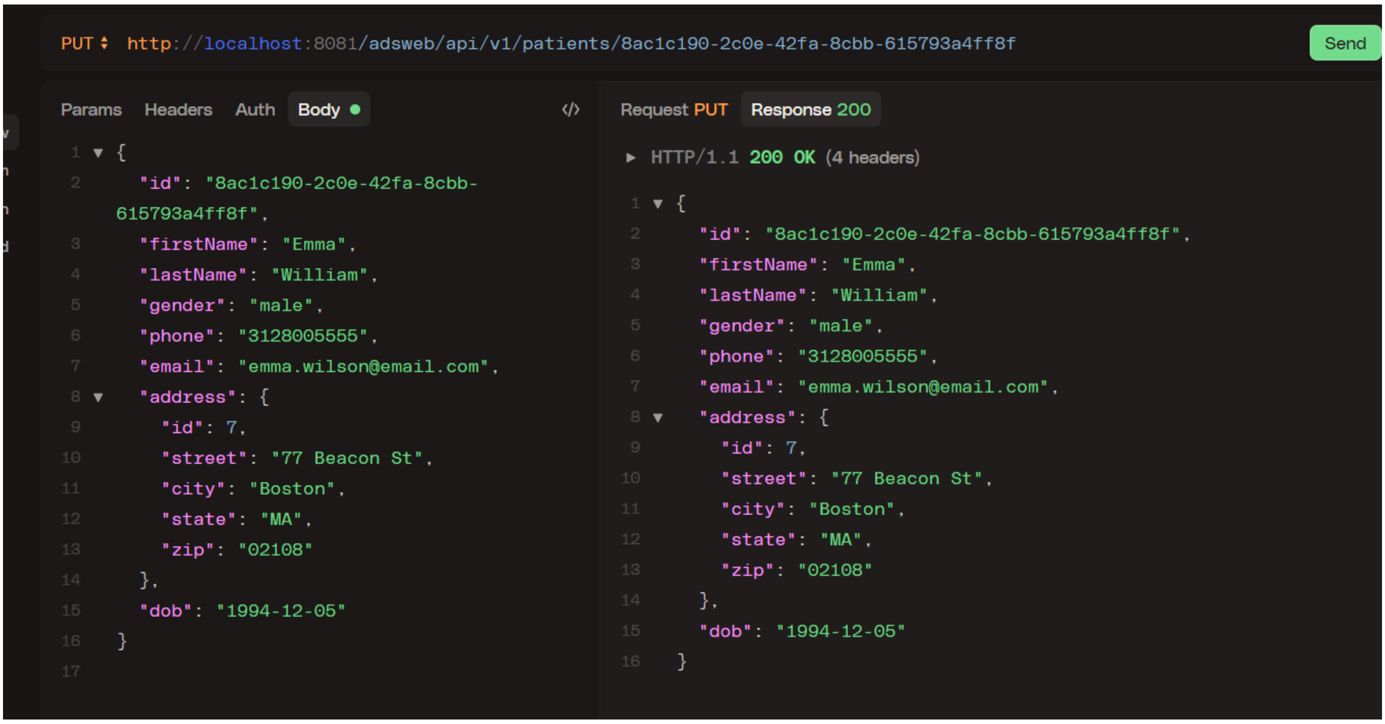
   Before change ID: 8ac1c190-2c0e-42fa-8cbb-615793a4ff8f


to space
tion
ocalhost:8081/adsweb/api/v1/pati... now
ocalhost:8081/adsweb/api/v1/pati... 22h
ocalhost:8081/adsweb/api/v1/pati... 23h
ocalhost:8081/adsweb/api/v1/patie... 1d
GET localhost:8081/adswe...
GET localhost:8081/adswe...
POST localhost:8081/adsw...
PUT localhost:8081/adswe...
Environment
Send
Params
Headers
Auth
Body
name
value
Request GET
Response 200

```
GET http://localhost:8081/adsweb/api/v1/patients/8ac1c190-2c0e-42fa-8cbb-615793a4ff8f
```

```
HTTP/1.1 200 OK (4 headers)
{
  "id": "8ac1c190-2c0e-42fa-8cbb-615793a4ff8f",
  "firstName": "Emma",
  "lastName": "Wilson",
  "gender": null,
  "phone": "3128005555",
  "email": "emma.wilson@email.com",
  "address": {
    "id": 7,
    "street": "77 Beacon St",
    "city": "Boston",
    "state": "MA",
    "zip": "02108"
  },
  "dob": "1994-12-05"
}
```

Update will be change the LastName: William and add gender: Male.



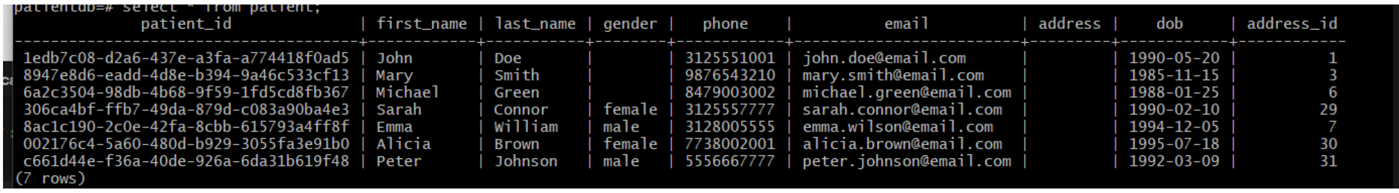
```
PUT http://localhost:8081/adsweb/api/v1/patients/8ac1c190-2c0e-42fa-8cbb-615793a4ff8f
```

```
{
  "id": "8ac1c190-2c0e-42fa-8cbb-
615793a4ff8f",
  "firstName": "Emma",
  "lastName": "William",
  "gender": "male",
  "phone": "3128005555",
  "email": "emma.wilson@email.com",
  "address": {
    "id": 7,
    "street": "77 Beacon St",
    "city": "Boston",
    "state": "MA",
    "zip": "02108"
  },
  "dob": "1994-12-05"
}
```

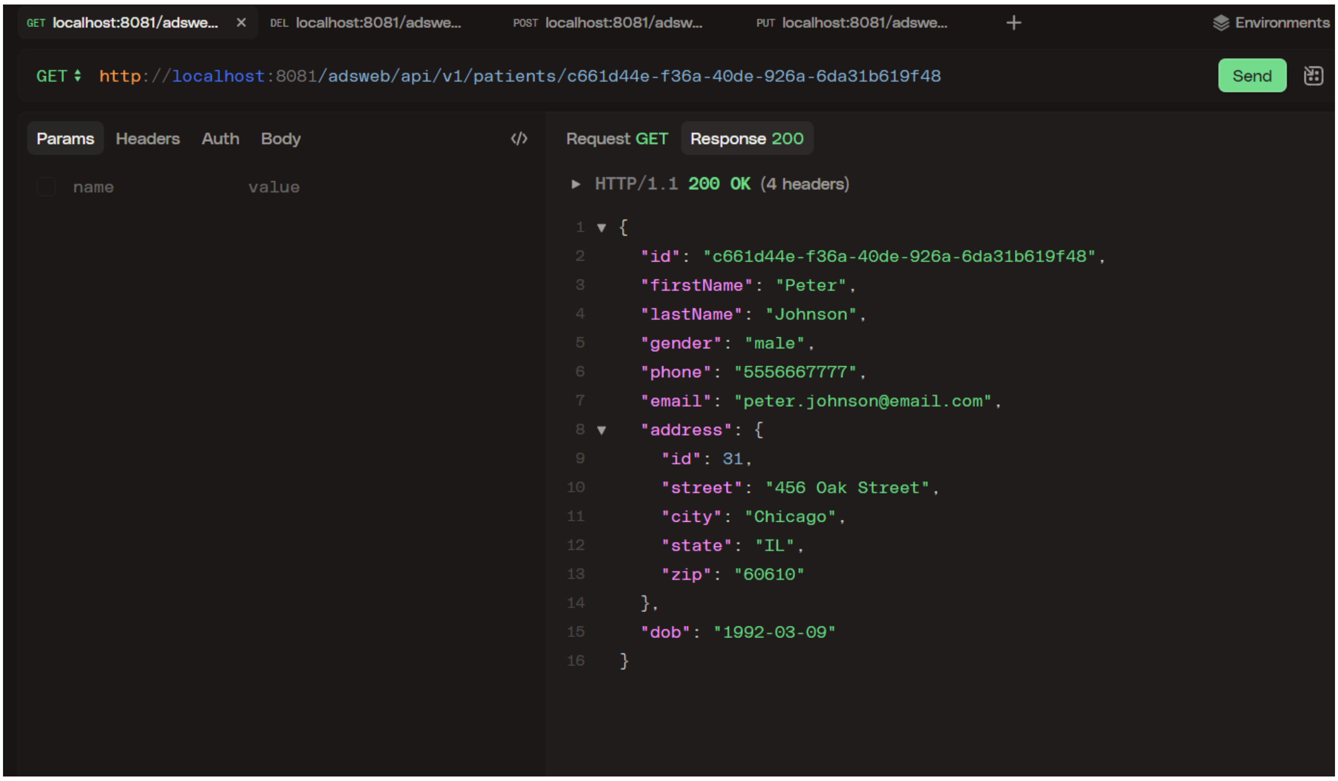
```
HTTP/1.1 200 OK (4 headers)
{
  "id": "8ac1c190-2c0e-42fa-8cbb-615793a4ff8f",
  "firstName": "Emma",
  "lastName": "William",
  "gender": "male",
  "phone": "3128005555",
  "email": "emma.wilson@email.com",
  "address": {
    "id": 7,
    "street": "77 Beacon St",
    "city": "Boston",
    "state": "MA",
    "zip": "02108"
  },
  "dob": "1994-12-05"
}
```

5. HTTP DELETE request: http://localhost:8080/adsweb/api/v1/patient/1 - Deletes the Patient data for the patient whose patientId is 1 (or any other valid patientId).

Delete PatientID: `c661d44e-f36a-40de-926a-6da31b619f48`
`Before:`



```
patientdb=# select * from patient;
              patient_id              | first_name | last_name | gender |   phone    |          email          | address |    dob     | address_id
--------------------------------------+------------+-----------+--------+------------+-------------------------+---------+------------+------------
 1edb7c08-d2a6-437e-a3fa-a774418f0ad5 | John       | Doe       |        | 3125551001 | john.doe@email.com      |         | 1990-05-20 |          1
 8947e8d6-eadd-4d8e-b394-9a46c533cf13 | Mary       | Smith     |        | 9876543210 | mary.smith@email.com    |         | 1985-11-15 |          3
 6a2c3504-98db-4b68-9f59-1fd5cd8fb367 | Michael    | Green     |        | 8479003002 | michael.green@email.com |         | 1988-01-25 |          6
 306ca4bf-ffb7-49da-879d-c083a90ba4e3 | Sarah      | Connor    | female | 3125557777 | sarah.connor@email.com  |         | 1990-02-10 |         29
 8ac1c190-2c0e-42fa-8cbb-615793a4ff8f | Emma       | William   | male   | 3128005555 | emma.wilson@email.com   |         | 1994-12-05 |          7
 002176c4-5a60-480d-b929-3055fa3e91b0 | Alicia     | Brown     | female | 7738002001 | alicia.brown@email.com  |         | 1995-07-18 |         30
 c661d44e-f36a-40de-926a-6da31b619f48 | Peter      | Johnson   | male   | 5556667777 | peter.johnson@email.com |         | 1992-03-09 |         31
(7 rows)
```



GET localhost:8081/adswe... ×
DEL localhost:8081/adswe...
POST localhost:8081/adsw...
PUT localhost:8081/adswe...
+
Environments

GET http://localhost:8081/adsweb/api/v1/patients/c661d44e-f36a-40de-926a-6da31b619f48

Send
Params
Headers
Auth
Body
name
value
Request GET
Response 200

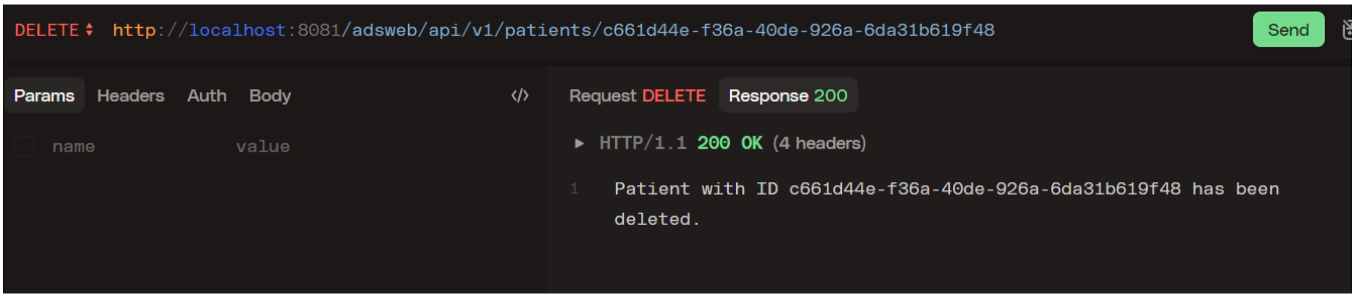
HTTP/1.1 200 OK (4 headers)

```
{
  "id": "c661d44e-f36a-40de-926a-6da31b619f48",
  "firstName": "Peter",
  "lastName": "Johnson",
  "gender": "male",
  "phone": "5556667777",
  "email": "peter.johnson@email.com",
  "address": {
    "id": 31,
    "street": "456 Oak Street",
    "city": "Chicago",
    "state": "IL",
    "zip": "60610"
  },
  "dob": "1992-03-09"
}
```

After:

Delete c661d44e-f36a-40de-926a-6da31b619f48

After:

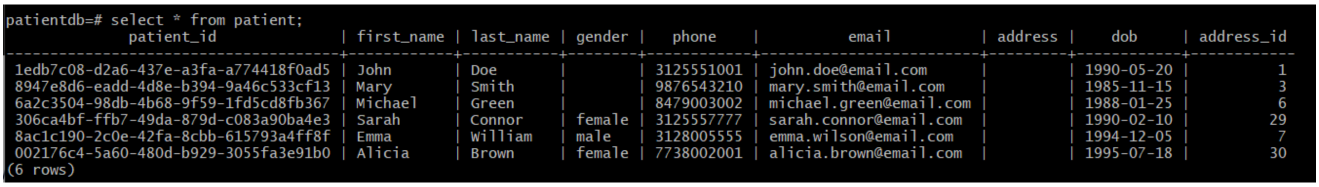


DELETE http://localhost:8081/adsweb/api/v1/patients/c661d44e-f36a-40de-926a-6da31b619f48

HTTP/1.1 200 OK (4 headers)

```
Patient with ID c661d44e-f36a-40de-926a-6da31b619f48 has been deleted.
```

DB after

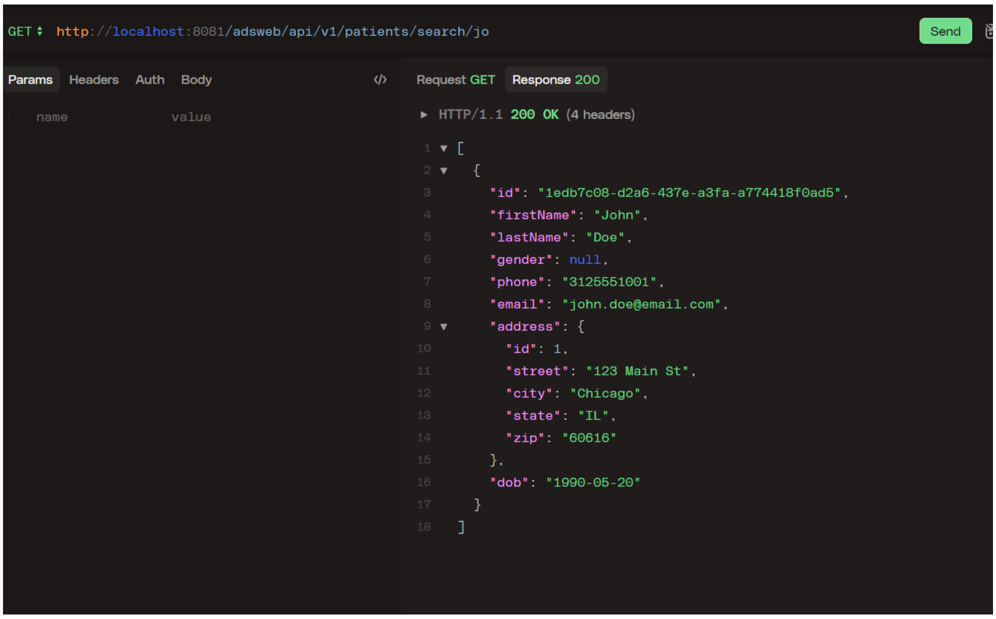


```
patientdb=# select * from patient;
              patient_id              | first_name | last_name | gender |   phone    |          email          | address |    dob     | address_id
--------------------------------------+------------+-----------+--------+------------+-------------------------+---------+------------+------------
 1edb7c08-d2a6-437e-a3fa-a774418f0ad5 | John       | Doe       |        | 3125551001 | john.doe@email.com      |         | 1990-05-20 |          1
 8947e8d6-eadd-4d8e-b394-9a46c533cf13 | Mary       | Smith     |        | 9876543210 | mary.smith@email.com    |         | 1985-11-15 |          3
 6a2c3504-98db-4b68-9f59-1fd5cd8fb367 | Michael    | Green     |        | 8479003002 | michael.green@email.com |         | 1988-01-25 |          6
 306ca4bf-ffb7-49da-879d-c083a90ba4e3 | Sarah      | Connor    | female | 3125557777 | sarah.connor@email.com  |         | 1990-02-10 |         29
 8ac1c190-2c0e-42fa-8cbb-615793a4ff8f | Emma       | William   | male   | 3128005555 | emma.wilson@email.com   |         | 1994-12-05 |          7
 002176c4-5a60-480d-b929-3055fa3e91b0 | Alicia     | Brown     | female | 7738002001 | alicia.brown@email.com  |         | 1995-07-18 |         30
(6 rows)
```

6. http://localhost:8080/adsweb/api/v1/patient/search/{searchString} - Queries all the Patient data for the patient(s) whose data matches the input searchString.

Serch string: jo

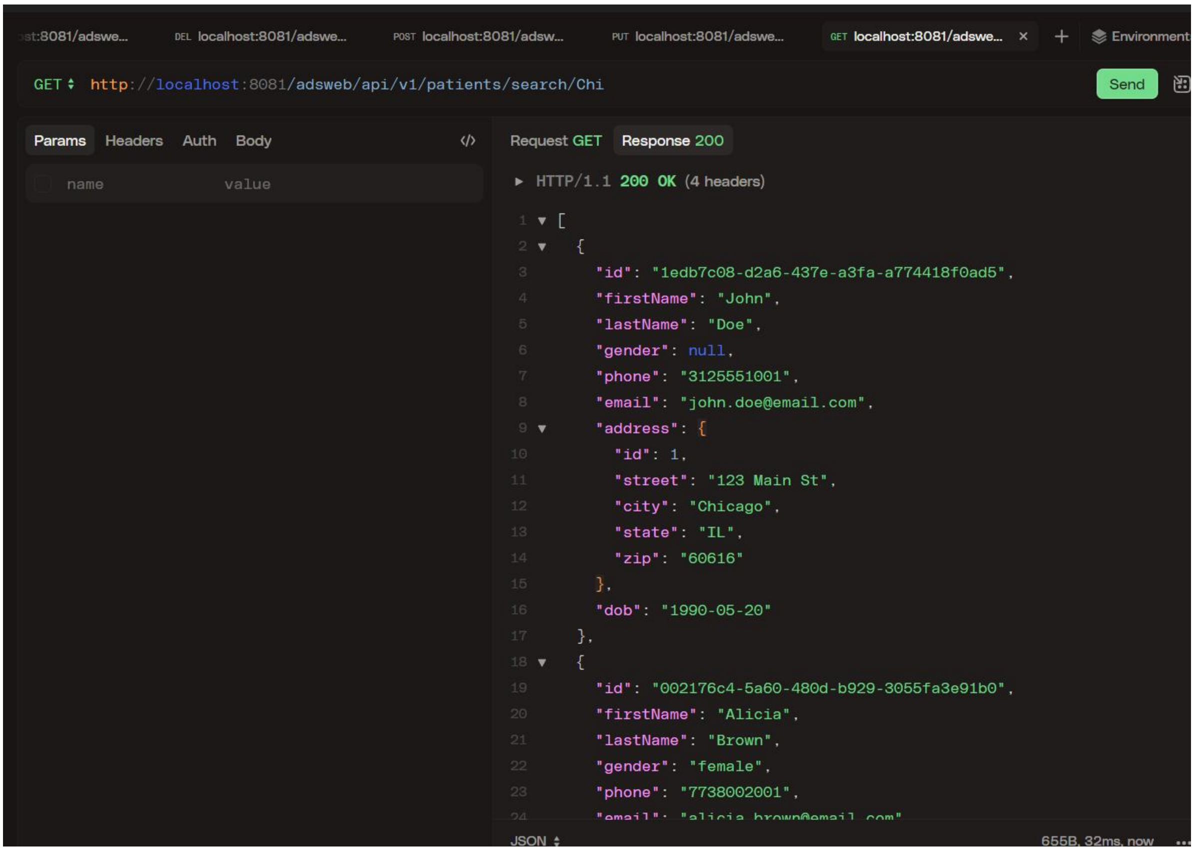
Returns below



```
GET http://localhost:8081/adsweb/api/v1/patients/search/jo
```

```
HTTP/1.1 200 OK (4 headers)
```

```
[
  {
    "id": "1edb7c08-d2a6-437e-a3fa-a774418f0ad5",
    "firstName": "John",
    "lastName": "Doe",
    "gender": null,
    "phone": "3125551001",
    "email": "john.doe@email.com",
    "address": {
      "id": 1,
      "street": "123 Main St",
      "city": "Chicago",
      "state": "IL",
      "zip": "60616"
    },
    "dob": "1990-05-20"
  }
]
```



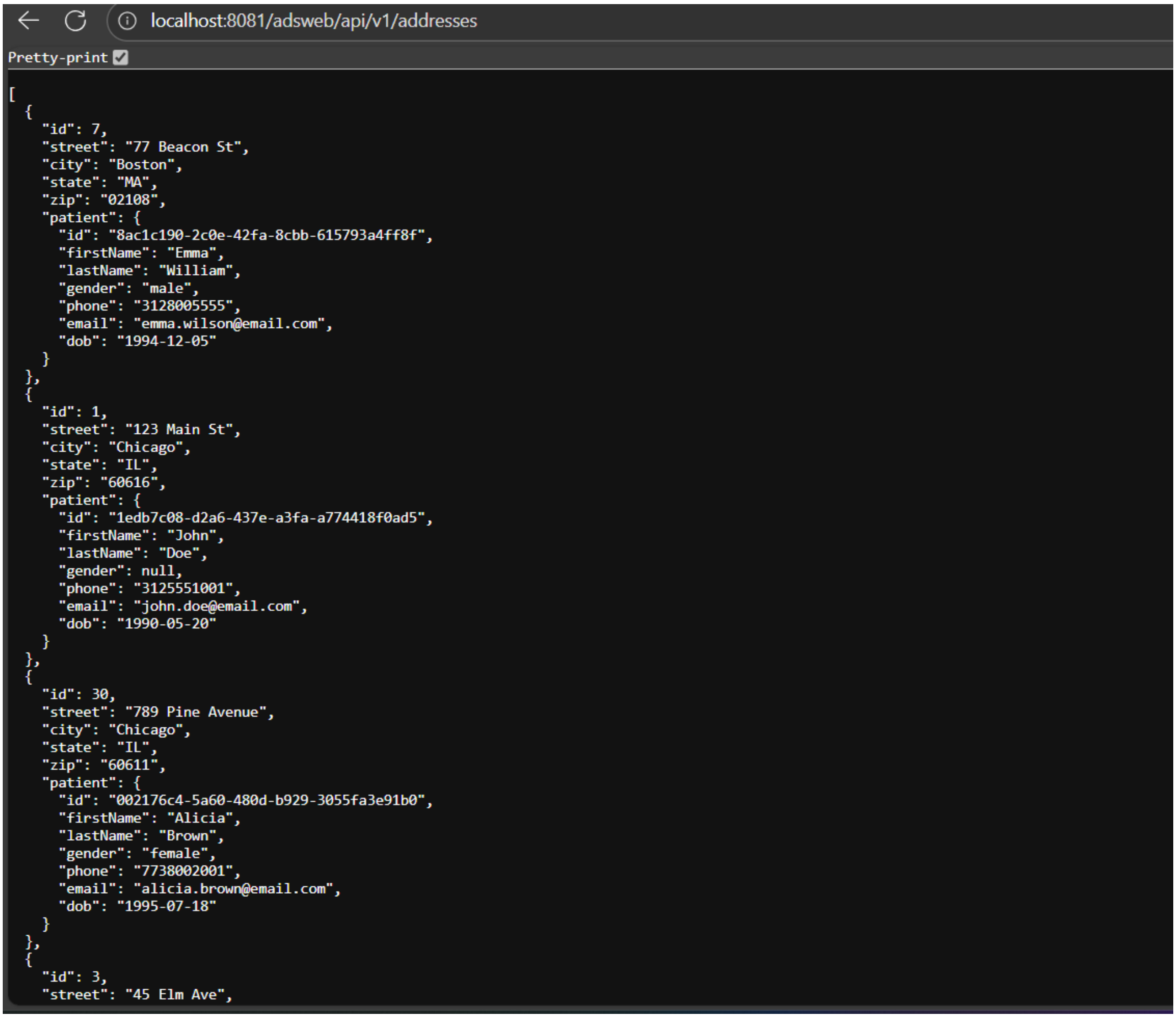
st:8081/adswe...
DEL localhost:8081/adswe...
POST localhost:8081/adsw...
PUT localhost:8081/adswe...
GET localhost:8081/adswe...
Environment
GET
Send
Params
Headers
Auth
Body
name
value
Request GET
Response 200
JSON
655B, 32ms, now

```
GET http://localhost:8081/adsweb/api/v1/patients/search/Chi
```

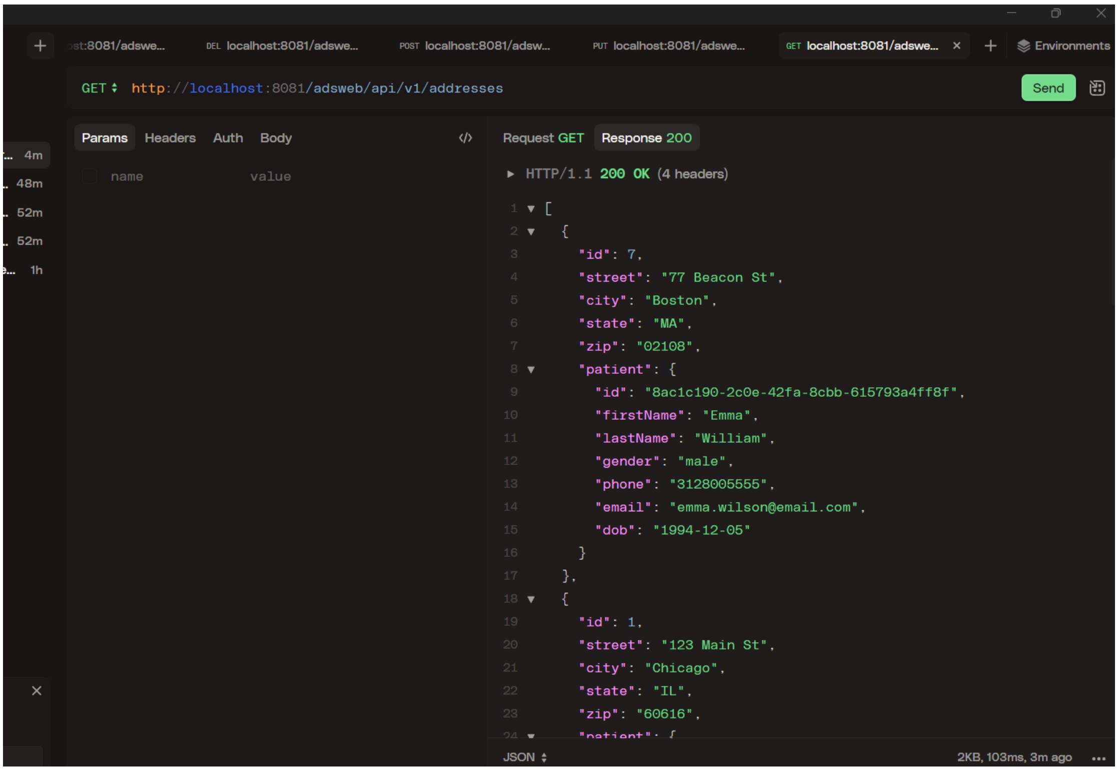
```
HTTP/1.1 200 OK (4 headers)
```

```
[
  {
    "id": "1edb7c08-d2a6-437e-a3fa-a774418f0ad5",
    "firstName": "John",
    "lastName": "Doe",
    "gender": null,
    "phone": "3125551001",
    "email": "john.doe@email.com",
    "address": {
      "id": 1,
      "street": "123 Main St",
      "city": "Chicago",
      "state": "IL",
      "zip": "60616"
    },
    "dob": "1990-05-20"
  },
  {
    "id": "002176c4-5a60-480d-b929-3055fa3e91b0",
    "firstName": "Alicia",
    "lastName": "Brown",
    "gender": "female",
    "phone": "7738002001",
    "email": "alicia.brown@email.com"
```

7. HTTP GET request: http://localhost:8080/adsweb/api/v1/addresses - Displays the list of all Addresses, including the Patient data, sorted in ascending order by their city, in JSON format.



```
[
  {
    "id": 7,
    "street": "77 Beacon St",
    "city": "Boston",
    "state": "MA",
    "zip": "02108",
    "patient": {
      "id": "8ac1c190-2c0e-42fa-8cbb-615793a4ff8f",
      "firstName": "Emma",
      "lastName": "William",
      "gender": "male",
      "phone": "3128005555",
      "email": "emma.wilson@email.com",
      "dob": "1994-12-05"
    }
  },
  {
    "id": 1,
    "street": "123 Main St",
    "city": "Chicago",
    "state": "IL",
    "zip": "60616",
    "patient": {
      "id": "1edb7c08-d2a6-437e-a3fa-a774418f0ad5",
      "firstName": "John",
      "lastName": "Doe",
      "gender": null,
      "phone": "3125551001",
      "email": "john.doe@email.com",
      "dob": "1990-05-20"
    }
  },
  {
    "id": 30,
    "street": "789 Pine Avenue",
    "city": "Chicago",
    "state": "IL",
    "zip": "60611",
    "patient": {
      "id": "002176c4-5a60-480d-b929-3055fa3e91b0",
      "firstName": "Alicia",
      "lastName": "Brown",
      "gender": "female",
      "phone": "7738002001",
      "email": "alicia.brown@email.com",
      "dob": "1995-07-18"
    }
  },
  {
    "id": 3,
    "street": "45 Elm Ave",
```


st:8081/adswe...
DEL localhost:8081/adswe...
POST localhost:8081/adsw...
PUT localhost:8081/adswe...
GET localhost:8081/adswe...
Environments
Send
Params
Headers
Auth
Body
name
value
Request GET
Response 200
4m
48m
52m
52m
1h
JSON

GET http://localhost:8081/adsweb/api/v1/addresses

HTTP/1.1 200 OK (4 headers)

```
[
  {
    "id": 7,
    "street": "77 Beacon St",
    "city": "Boston",
    "state": "MA",
    "zip": "02108",
    "patient": {
      "id": "8ac1c190-2c0e-42fa-8cbb-615793a4ff8f",
      "firstName": "Emma",
      "lastName": "William",
      "gender": "male",
      "phone": "3128005555",
      "email": "emma.wilson@email.com",
      "dob": "1994-12-05"
    }
  },
  {
    "id": 1,
    "street": "123 Main St",
    "city": "Chicago",
    "state": "IL",
    "zip": "60616",
    "patient": {
```

2KB, 103ms, 3m ago

Use my example from the CityLibraryWebAPI project from lesson7-rest-webapi.zip, which is attached for you here in zip file), as a guide.

When complete: Take screenshots of your Web API output screens using the Postman tool (or some other webclient tool) and add them to a subfolder inside your project named screenshots.

For submission, simply commit and push your solution to your github and submit the url here to this Lab Assignment item on Sakai.

ALTERNATIVELY: You work on implementing the Web API endpoints for your chosen Course Project.

Enjoy!!!

Additional resources for assignment