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Certified B Corporation

ASSESSMENT DOCUMENTATION

API Project

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Contents

1.0. INTRODUCTION

The assessment is a back-end-only Python application by Flask that runs on the web. The application interrogates a local MySQL database through API endpoints, which allow data fetching and all CRUD operations. To protect the endpoints from unauthorised access, a JSON Web Token system has been implemented. The session's timeout is 30 minutes.

However, the web token is refreshed at every request to guarantee the use of the application without interruptions. The application also handles error inputs that the User might run into, preventing the application from crashing. In case of human error, the User can remake a request by providing the right inputs.

Requests can be made through the website Postman. However, to perform some requests, the desktop version of the service has to be installed. Screenshots of examples will illustrate the application's functionalities and how human errors are handled.

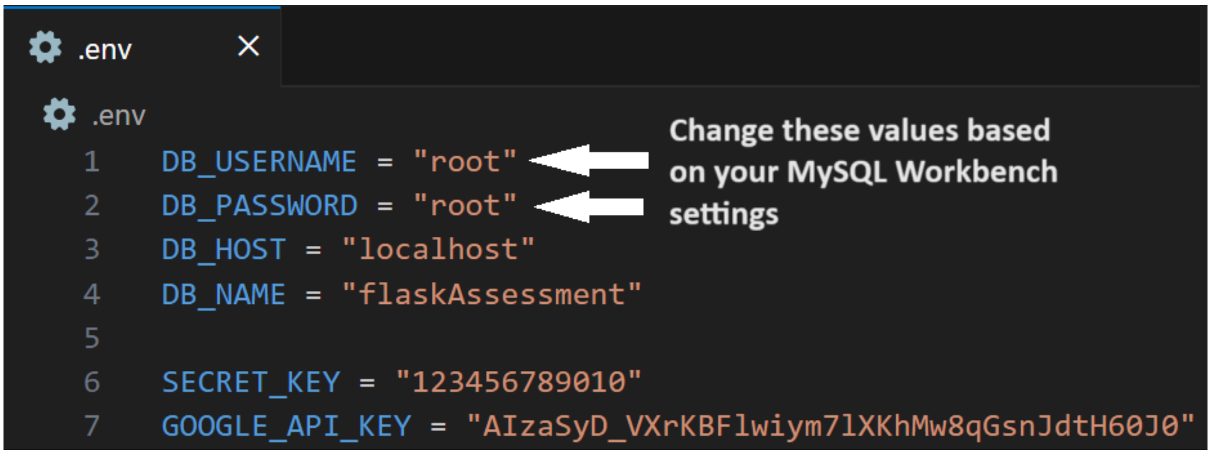
A database is created on the application startup, and some data are uploaded. This process is performed only once, meaning data will not be overwritten. The database has two tables joined by a One to One relationship. The table Student comes with a sample dataset whilst the Address table is empty. An additional table, User, hosts information about users in order to perform login operations. A default user is added with the following credentials:

email: guest@xandertalent.com

password: Welcome_to_this_assessment01

The project folder also comes with a .env file, which contains sensitive information. This file is the root of the project directory. Before launching the application, two pieces of data used to build the connection string to the database might need to be changed. Please refer to Figure 1 below as an example.

Figure 1



```
DB_USERNAME = "root"
DB_PASSWORD = "root"
DB_HOST = "localhost"
DB_NAME = "flaskAssessment"

SECRET_KEY = "123456789010"
GOOGLE_API_KEY = "AIzaSyD_VXrKBFlwiym7lXKhMw8qGsnJdtH60J0"
```

Finally, the application provides an additional endpoint to interact with Google's Geocoding API. By passing the ***StudentID***, the application can interrogate Google's API using latitude and longitude as parameters. This will return an address, which will be inserted into the address table. Google's API documentation can be viewed and studied at the following link.

You will need to install a virtual environment. All necessary packages are in the requirements.txt file.

2.0. API DOCUMENTATION

The application defines four routes:

- Student
- Address
- User
- Geocoding

Each allows you to perform a set of requests. Student and Address share a similar code base. To improve code reusability, those two classes inherit from a custom abstract class named **AbstractRoute**. User allows you to perform two POST requests, one for login operations and one for registering a new user. Finally, Geocoding allows a POST request only. Further information about these APIs is provided below.

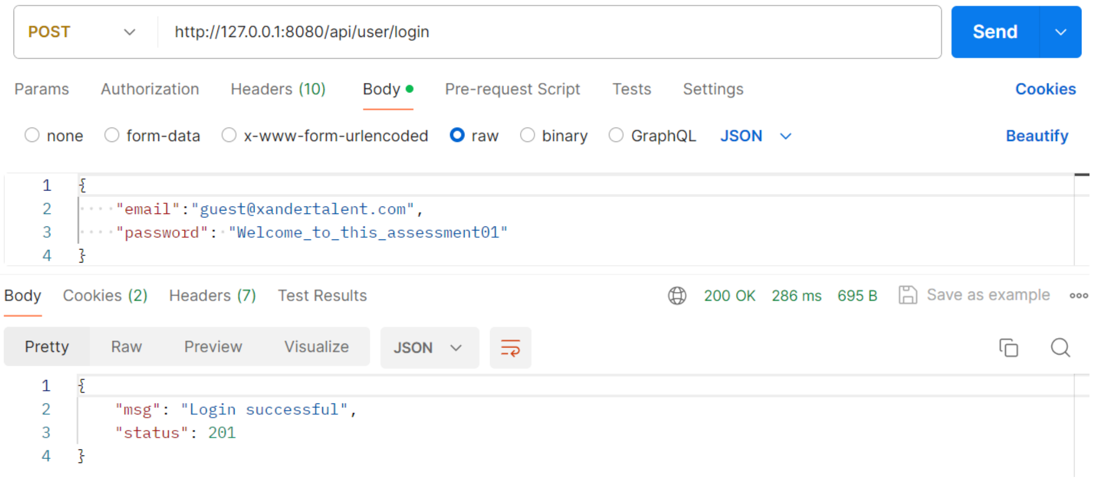
2.1. USER API:

This API can be used through the following link: http://127.0.0.1:8080/api/user/. Depending on your localhost settings, you might need to change http://127.0.0.1:8080/ to your localhost address. The API has two endpoints to perform two POST requests.

2.1.1. POST - LOGIN:

By providing an email and password, the User can perform a POST request through http://127.0.0.1:8080/api/user/login. The body to pass in the request should look as follows:

```
{
    "email": "guest@xandertalent.com",
    "password": "Welcome_to_this_assessment01"
}
```


POST http://127.0.0.1:8080/api/user/login

Body: raw, JSON

```
{
    "email":"guest@xandertalent.com",
    "password": "Welcome_to_this_assessment01"
}
```

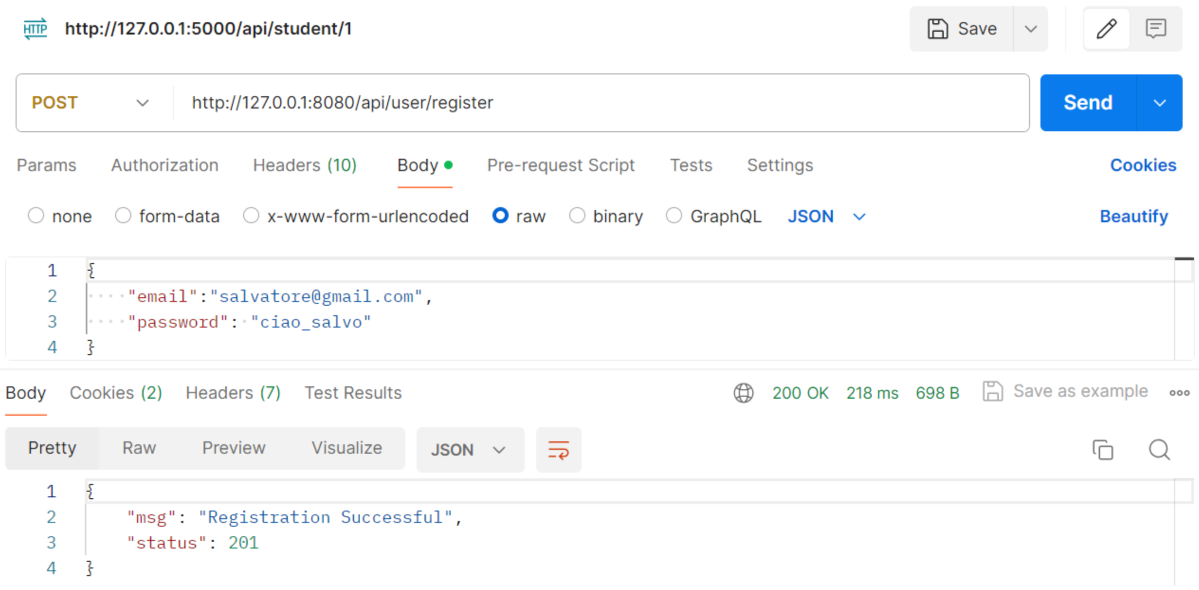
200 OK 286 ms 695 B

```
{
    "msg": "Login successful",
    "status": 201
}
```

2.1.2. POST - REGISTER:

If you want to add one more User, you can use the http://127.0.0.1:8080/api/user/register. The body to pass in the request should look as follows:

```
{
    "email":"salvatore@gmail.com",
    "password": "ciao_salvo"
}
```


http://127.0.0.1:5000/api/student/1

POST http://127.0.0.1:8080/api/user/register

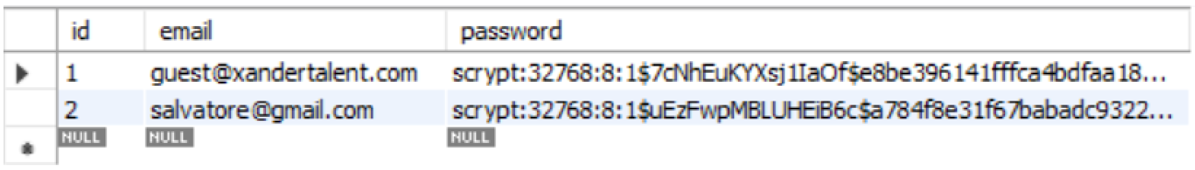
Body: raw, JSON

```
{
    "email":"salvatore@gmail.com",
    "password": "ciao_salvo"
}
```

200 OK 218 ms 698 B

```
{
    "msg": "Registration Successful",
    "status": 201
}
```

This request will add a new user to the database, as shown below:



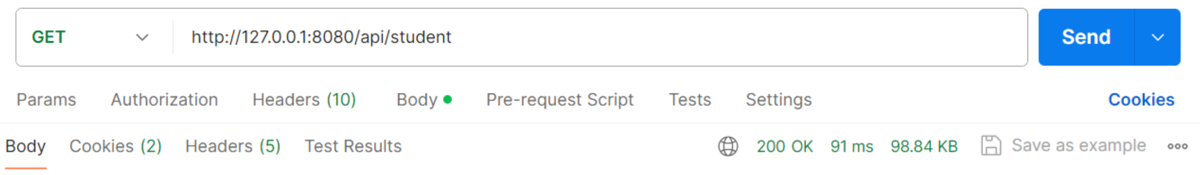
id	email	password
1	guest@xandertalent.com	scrypt:32768:8:1$7cNhEuKYXsj1IaOf$e8be396141fffca4bdfaa18...
2	salvatore@gmail.com	scrypt:32768:8:1$uEzFwpMBLUHEiB6c$a784f8e31f67babadc9322...
NULL	NULL	NULL

2.2. STUDENT API:

This API can be used through the following link: http://127.0.0.1:8080/api/student. Depending on your localhost settings, you might need to change http://127.0.0.1:8080/ to your localhost address.

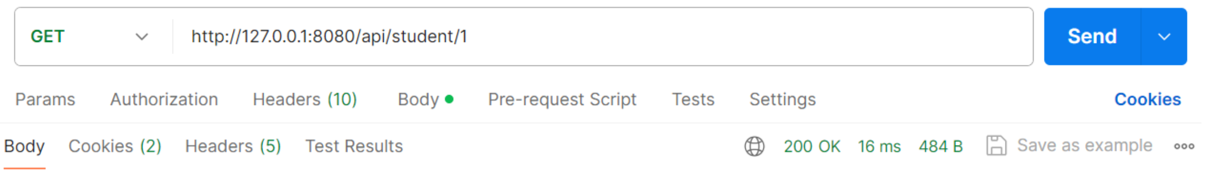
2.2.1. GET – ALL RECORDS:

The first request is a GET request where all students in the database can be retrieved.



2.2.2. GET – BY STUDENT ID:

Alternatively, you can retrieve student information based on the StudentID.

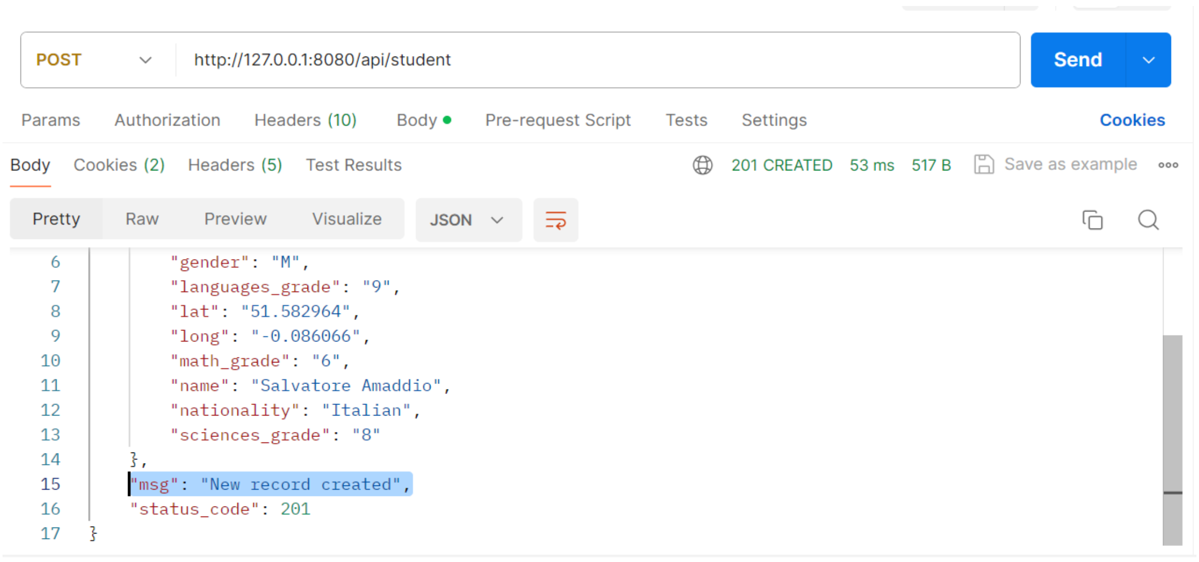


2.2.2. POST:

If you wish to add a new Student, you can perform a POST request at http://127.0.0.1:8080/api/student by providing the body request as follows:

```
{
        "name":"Salvatore Amaddio",
        "nationality": "Italian",
        "city": "London",
        "lat": "51.582964",
        "long":"-0.086066",
        "gender": "M",
        "age": "30",
        "english_grade": "9",
        "math_grade": "6",
        "sciences_grade": "8",
        "languages_grade": "9"
}
```

The output will be the new record inserted, for double-check purposes, and a message saying New record created. The picture below shows an example of a successful request.



POST http://127.0.0.1:8080/api/student Send

Params Authorization Headers (10) Body Pre-request Script Tests Settings Cookies

Body Cookies (2) Headers (5) Test Results 201 CREATED 53 ms 517 B Save as example

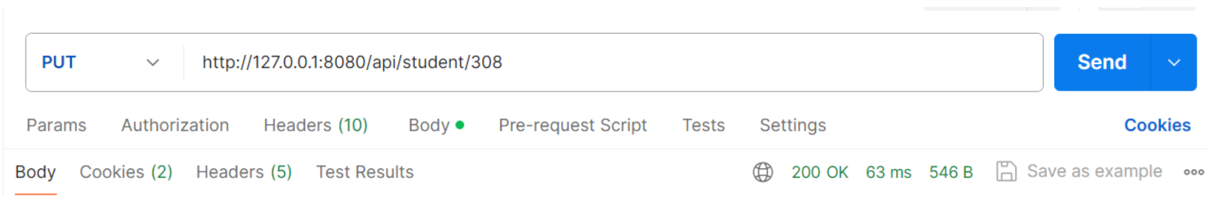
Pretty Raw Preview Visualize JSON

```
        "gender": "M",
        "languages_grade": "9",
        "lat": "51.582964",
        "long": "-0.086066",
        "math_grade": "6",
        "name": "Salvatore Amaddio",
        "nationality": "Italian",
        "sciences_grade": "8"
    },
    "msg": "New record created",
    "status_code": 201
}
```

2.2.3 PUT:

If you wish to amend a record, you can make a PUT request at http://127.0.0.1:8080/api/student by providing the ***StudentID***. You must provide all required fields for PUT requests as in the POST request. For Example:

```
{
        "name":"Salvatore Amaddio Rivolta",
        "nationality": "Italian",
        "city": "London",
        "lat": "51.582964",
        "long":"-0.086066",
        "gender": "M",
        "age": "30",
        "english_grade": "10",
        "math_grade": "7",
        "sciences_grade": "9",
        "languages_grade": "10"
}
```



PUT http://127.0.0.1:8080/api/student/308 Send

Params Authorization Headers (10) Body Pre-request Script Tests Settings Cookies

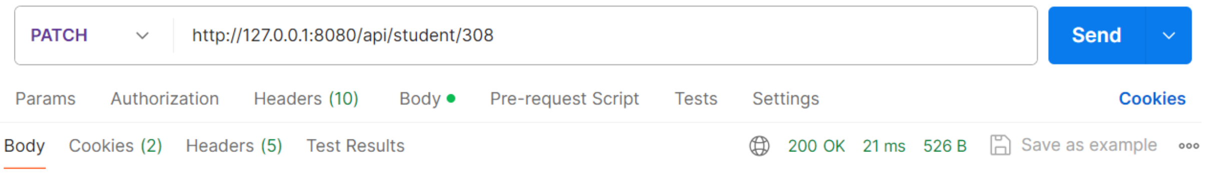
Body Cookies (2) Headers (5) Test Results 200 OK 63 ms 546 B Save as example

2.2.4 PATCH:

If you wish to amend some record attributes, you can make a PATCH request at http://127.0.0.1:8080/api/student by providing the student ID. Unlike a PUT Request, a Patch Request does not require all the required fields.

For Example:

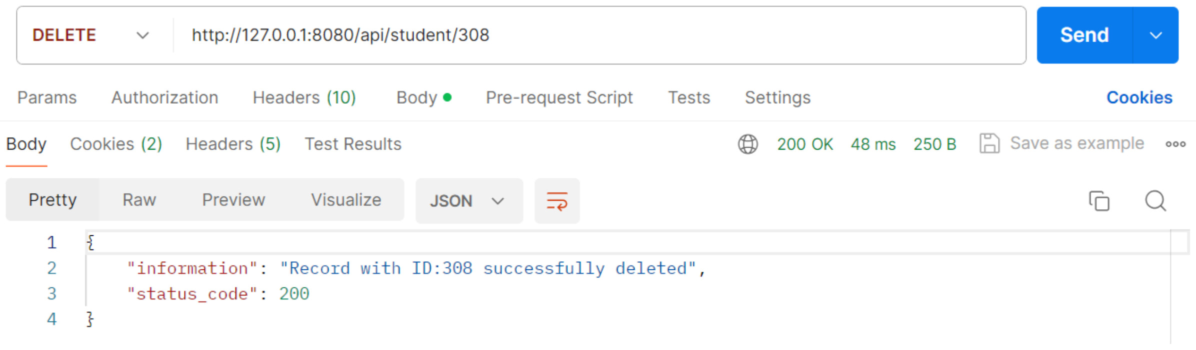
```
{
    "name": "Salvo"
}
```



Please note that the ***StudentID*** should not appear in the body. The ***StudentID*** is an autoincremented primary key and should not be altered by the User. Attempting to do so will return a 400 error inviting the User not to include the primary key.

2.2.5 DELETE:

If you wish to delete a record, you can make a DELETE request at http://127.0.0.1:8080/api/student by providing the ***StudentID***.



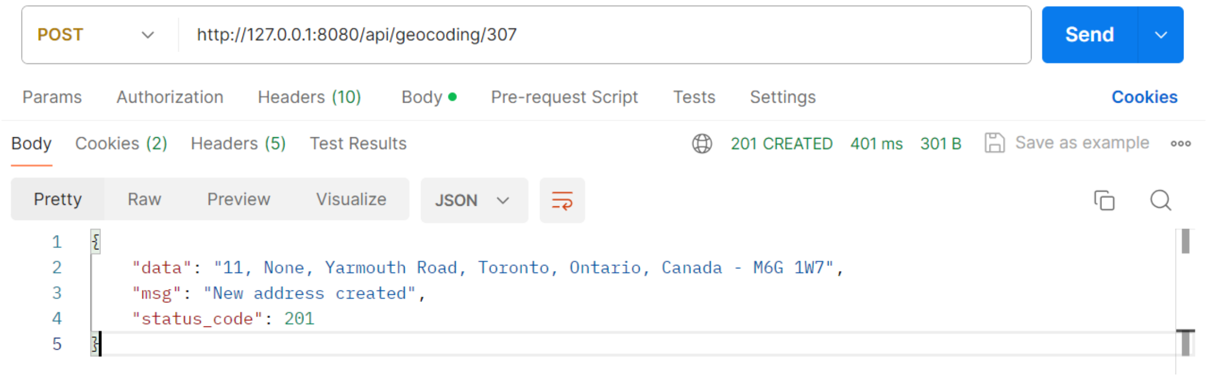
```
{
    "information": "Record with ID:308 successfully deleted",
    "status_code": 200
}
```

2.3. GOOGLE GEOCODING API:

This API can be used through the following link: http://127.0.0.1:8080/api/geocoding by passing the ***StudentID***. Depending on your localhost settings, you might need to change http://127.0.0.1:8080/ to your localhost address.

2.3.1. POST:

To find an address, you can perform a POST request by passing the ***StudentID***. For Example:

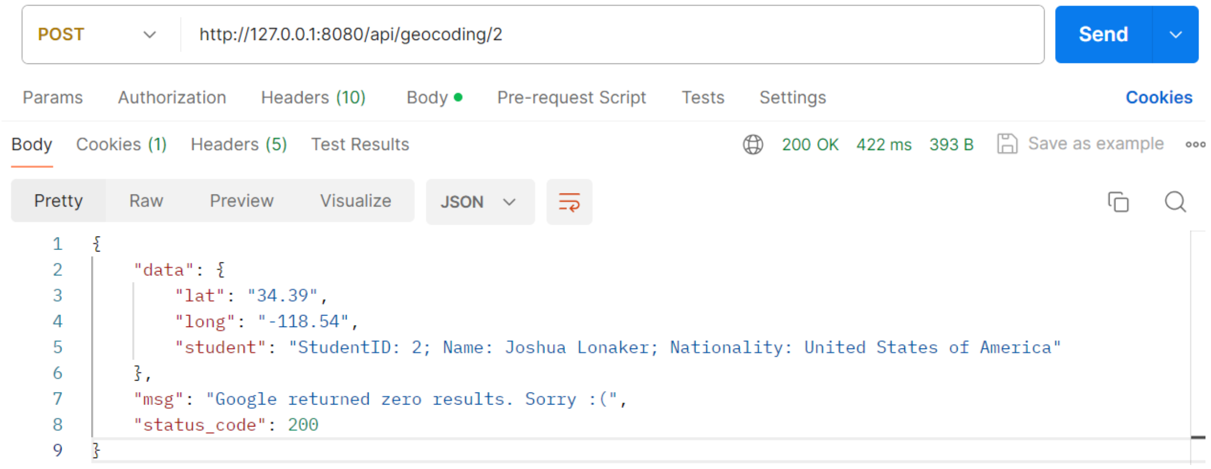


```
http://127.0.0.1:8080/api/geocoding/307
```

201 CREATED 401 ms 301 B

```
{
    "data": "11, None, Yarmouth Road, Toronto, Ontario, Canada - M6G 1W7",
    "msg": "New address created",
    "status_code": 201
}
```

In case the Google API fails to retrieve address information, the following message will be displayed instead:

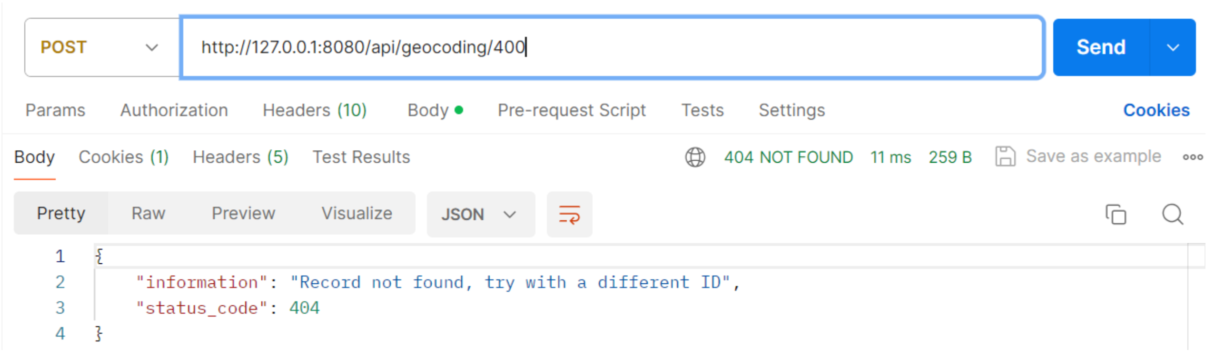


```
http://127.0.0.1:8080/api/geocoding/2
```

200 OK 422 ms 393 B

```
{
    "data": {
        "lat": "34.39",
        "long": "-118.54",
        "student": "StudentID: 2; Name: Joshua Lonaker; Nationality: United States of America"
    },
    "msg": "Google returned zero results. Sorry :(",
    "status_code": 200
}
```

IMPORTANT: If you attempt to use an ID that does not exist, the following message will be displayed:

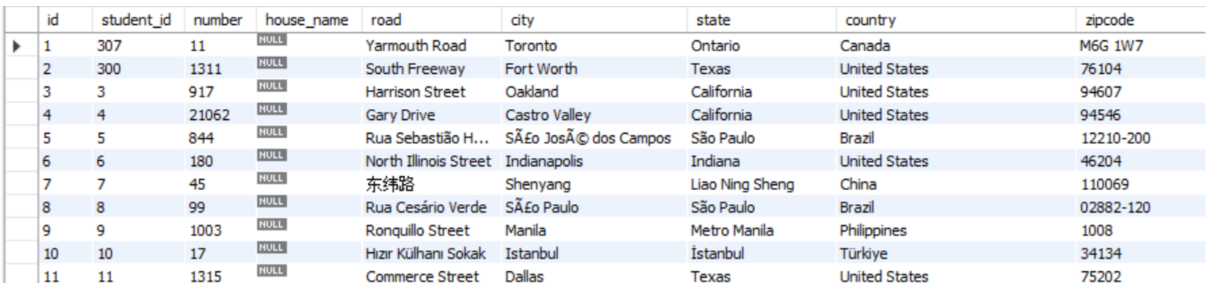


```
http://127.0.0.1:8080/api/geocoding/400
```

404 NOT FOUND 11 ms 259 B

```
{
    "information": "Record not found, try with a different ID",
    "status_code": 404
}
```

The address table is empty by default. However, this endpoint will insert data into the Address table:



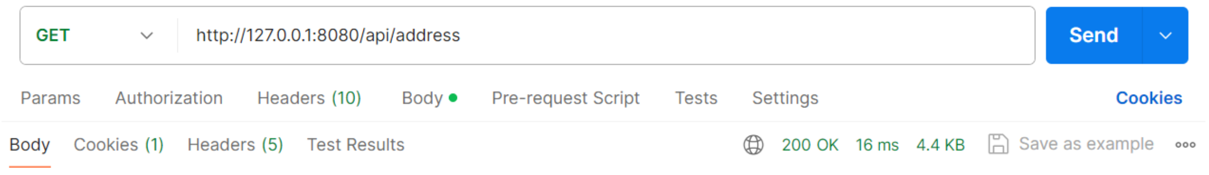
id	student_id	number	house_name	road	city	state	country	zipcode
1	307	11	NULL	Yarmouth Road	Toronto	Ontario	Canada	M6G 1W7
2	300	1311	NULL	South Freeway	Fort Worth	Texas	United States	76104
3	3	917	NULL	Harrison Street	Oakland	California	United States	94607
4	4	21062	NULL	Gary Drive	Castro Valley	California	United States	94546
5	5	844	NULL	Rua Sebastião H...	SÃ£o JosÃ© dos Campos	São Paulo	Brazil	12210-200
6	6	180	NULL	North Illinois Street	Indianapolis	Indiana	United States	46204
7	7	45	NULL	东纬路	Shenyang	Liao Ning Sheng	China	110069
8	8	99	NULL	Rua Cesário Verde	SÃ£o Paulo	São Paulo	Brazil	02882-120
9	9	1003	NULL	Ronquillo Street	Manila	Metro Manila	Philippines	1008
10	10	17	NULL	Hızır Külhanı Sokak	Istanbul	İstanbul	Türkiye	34134
11	11	1315	NULL	Commerce Street	Dallas	Texas	United States	75202

2.4. ADDRESS API:

This API can be used through the following link: http://127.0.0.1:8080/api/address. Depending on your localhost settings, you might need to change http://127.0.0.1:8080/ to your localhost address.

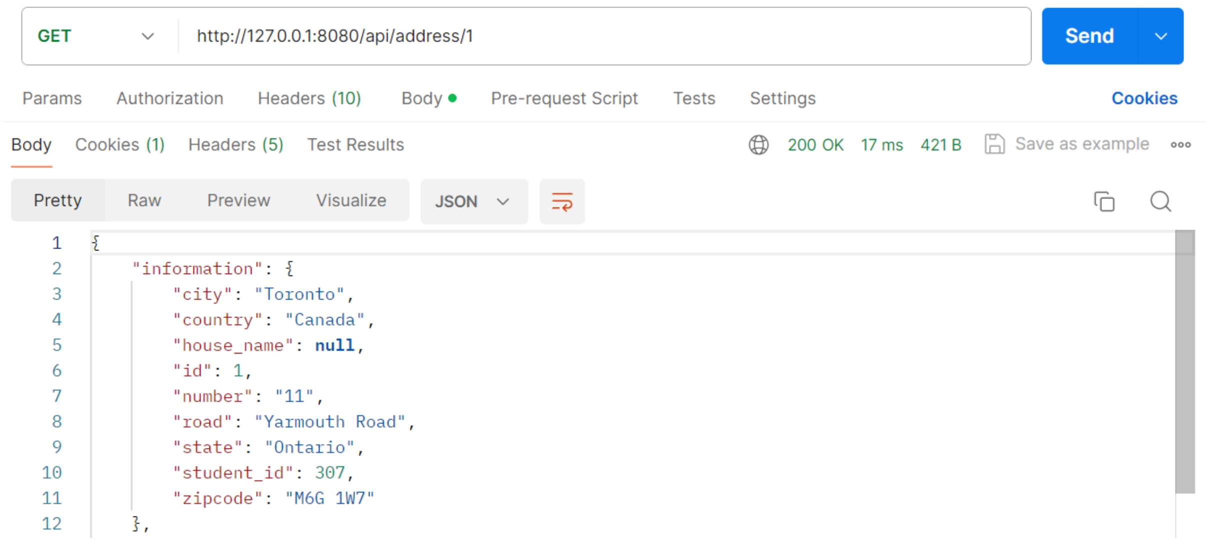
2.4.1. GET:

The first request is a GET request where all addresses in the database can be retrieved.



2.4.2. GET – BY ADDRESS ID:

Alternatively, you can retrieve address information based on the AddressID.



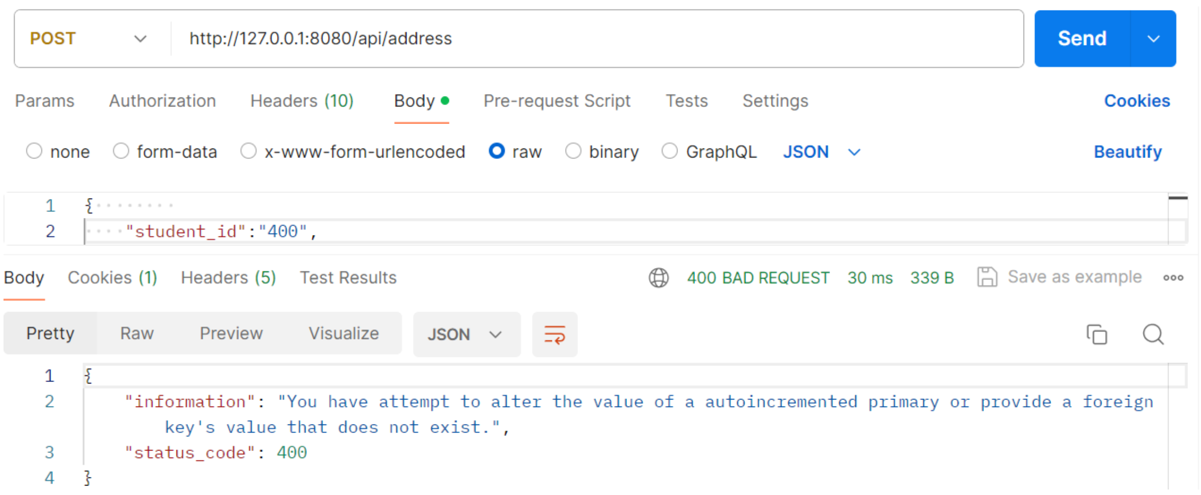
```
{
    "information": {
        "city": "Toronto",
        "country": "Canada",
        "house_name": null,
        "id": 1,
        "number": "11",
        "road": "Yarmouth Road",
        "state": "Ontario",
        "student_id": 307,
        "zipcode": "M6G 1W7"
    },
```

2.4.3. POST:

If you wish to add a new Address, you can perform a POST request at http://127.0.0.1:8080/api/address by providing the body request as follows:

```
{
    "student_id": "1",
    "number": "79",
    "house_name": "The Grove",
    "road": "North Grove",
    "city": "London",
    "state": "England",
    "country": "United Kingdom",
    "zipcode": "N15 5QS"
}
```

Please note that the Address table requires a Foreign Key, which is a valid ***StudentID***. If you provide a non-existing ***StudentID*** value, the following error message will be displayed:



POST http://127.0.0.1:8080/api/address

```
{
    "student_id":"400",
```

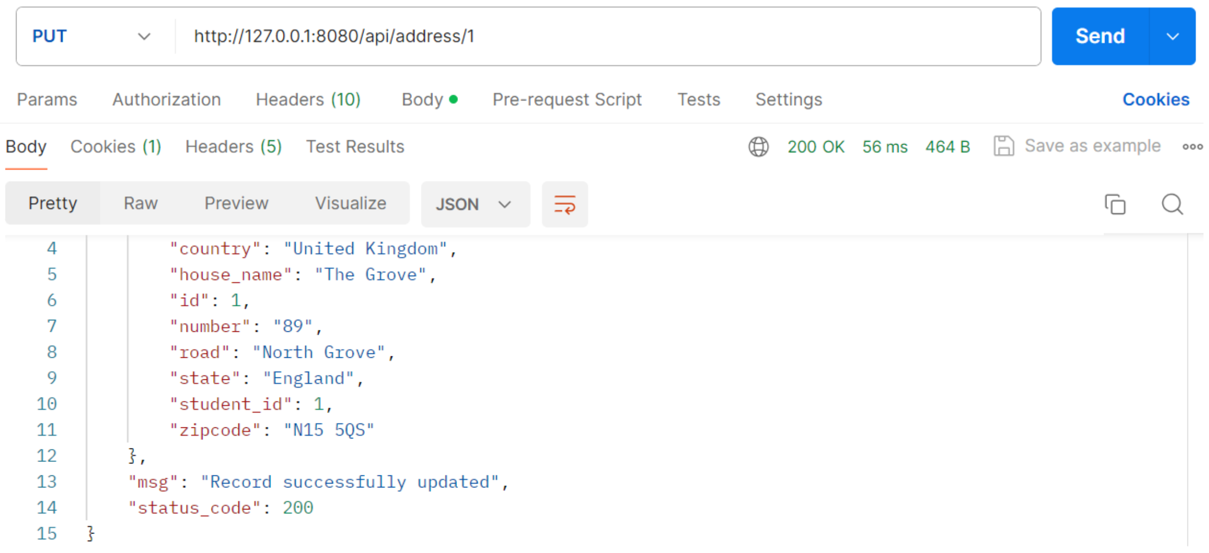
400 BAD REQUEST 30 ms 339 B

```
{
    "information": "You have attempt to alter the value of a autoincremented primary or provide a foreign
        key's value that does not exist.",
    "status_code": 400
}
```

2.4.3 PUT:

If you wish to amend a record, you can make a PUT request at http://127.0.0.1:8080/api/address by providing the ***AddressID***. You must provide all required fields for PUT requests as in the POST request. For Example:

```
{
    "student_id": "1",
    "number": "89",
    "house_name": "The Grove",
    "road": "North Grove",
    "city": "London",
    "state": "England",
    "country": "United Kingdom",
    "zipcode": "N15 5QS"
}
```



PUT http://127.0.0.1:8080/api/address/1

200 OK 56 ms 464 B

```
        "country": "United Kingdom",
        "house_name": "The Grove",
        "id": 1,
        "number": "89",
        "road": "North Grove",
        "state": "England",
        "student_id": 1,
        "zipcode": "N15 5QS"
    },
    "msg": "Record successfully updated",
    "status_code": 200
}
```

2.4.4 PATCH:

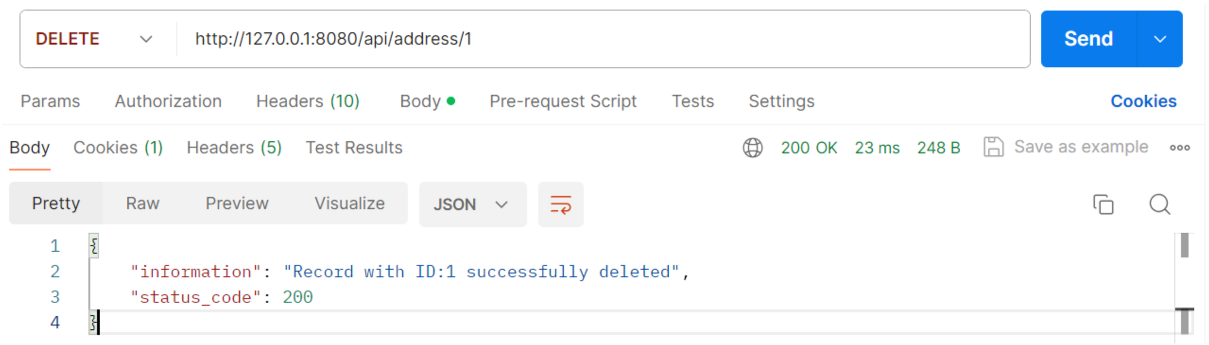
If you wish to amend some record attributes, you can make a PATCH request at http://127.0.0.1:8080/api/address by providing the ***AddressID***. Unlike a PUT Request, a Patch Request does not require all the required fields. For Example:

```
{
    "number": "9"
}
```

Please note that the ***AddressID*** should not appear in the body. The ***AddressID*** is an autoincremented primary key and should not be altered by the User. Attempting to do so will return a 400 error inviting the User not to include the primary key.

2.4.5 DELETE:

If you wish to delete a record, you can make a DELETE request at http://127.0.0.1:8080/api/address by providing the ***AddressID***.



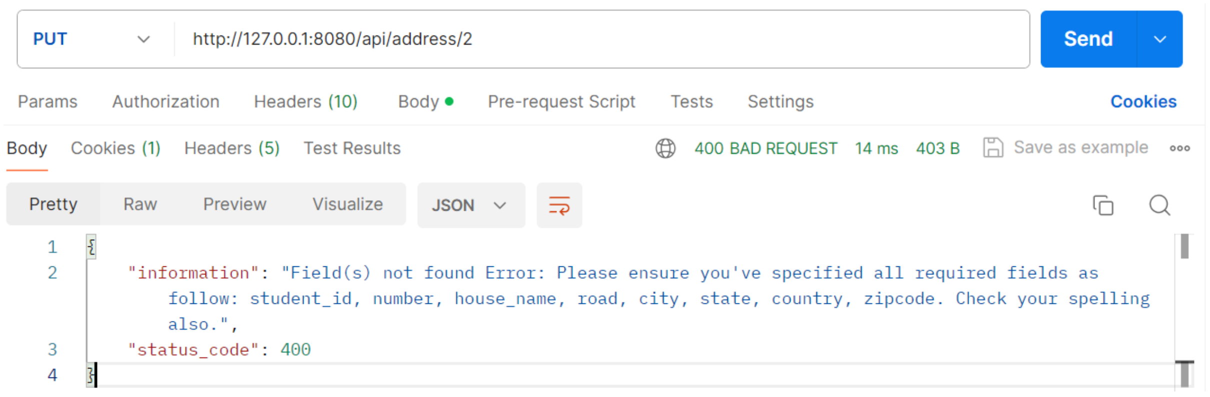
```
{
    "information": "Record with ID:1 successfully deleted",
    "status_code": 200
}
```

3.0. ERROR HANDLING:

The application handles a series of possible human error inputs, such as spelling errors or missing essential inputs.

3.1. Example:

The following message will be displayed if the User attempts to send a PUT request or any other request without satisfying the necessary requirements. It will also appear if the User misspells any of the required inputs.



```
{
    "information": "Field(s) not found Error: Please ensure you've specified all required fields as
        follow: student_id, number, house_name, road, city, state, country, zipcode. Check your spelling
        also.",
    "status_code": 400
}
```