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Question-

You are required to create a Employee Management Rest Api based Web application, where you will be developing CRUD(Create,Read,Update and Delete) functionality along with Sorting and some concepts of security.

Your Rest Api should be secure.And should have different endpoints for different operations-

Endpoint	Roles required
/roles/create	No Roles are required
/users/register	No Roles are required
/api/employees/save	Admin
/api/employees/getAllEmployees	Admin,user
/api/employees/getEmployeeById/**	Admin,user
/api/employees/search/**	Admin,user
/api/employees/sort/**	Admin,user
/api/employees/update	Admin
/api/employees/delete/**	Admin

1.Your application should be able to add roles in the database dynamically in the db.

Request URL: localhost:8080/roles/create

Ex payload-

```
{  
  "name":"USER"  
}
```

```
{  
  "name":"ADMIN"  
}
```

POST localhost:8080/roles/create Send

Params Authorization Headers (9) **Body** Pre-request Script Tests Settings Cookies

☐ none ☐ form-data ☐ x-www-form-urlencoded ☒ raw ☐ binary ☐ GraphQL **JSON** Beautify

```
1 {
2   "name": "ADMIN"
3 }
4
```

Body Cookies (1) Headers (11) Test Results Status: 201 Created Time: 320 ms Size: 379 B Save Response

Pretty Raw Preview Visualize **JSON** Copy Search

```
1 {
2   "id": 1,
3   "name": "ROLE_ADMIN"
4 }
```

POST Create POST Regis POST saveE GET getEmj GET getAIE PUT update DEL deletet GET localhc GET localhc + ... No Environment

Employee_assignment / CreateRole Save Copy Comment

POST localhost:8080/roles/create Send

Params Authorization Headers (9) **Body** Pre-request Script Tests Settings Cookies

☐ none ☐ form-data ☐ x-www-form-urlencoded ☒ raw ☐ binary ☐ GraphQL **JSON** Beautify

```
1 {
2   "name": "USER"
3 }
4
```

Body Cookies (1) Headers (11) Test Results Status: 201 Created Time: 13 ms Size: 378 B Save Response

Pretty Raw Preview Visualize **JSON** Copy Search

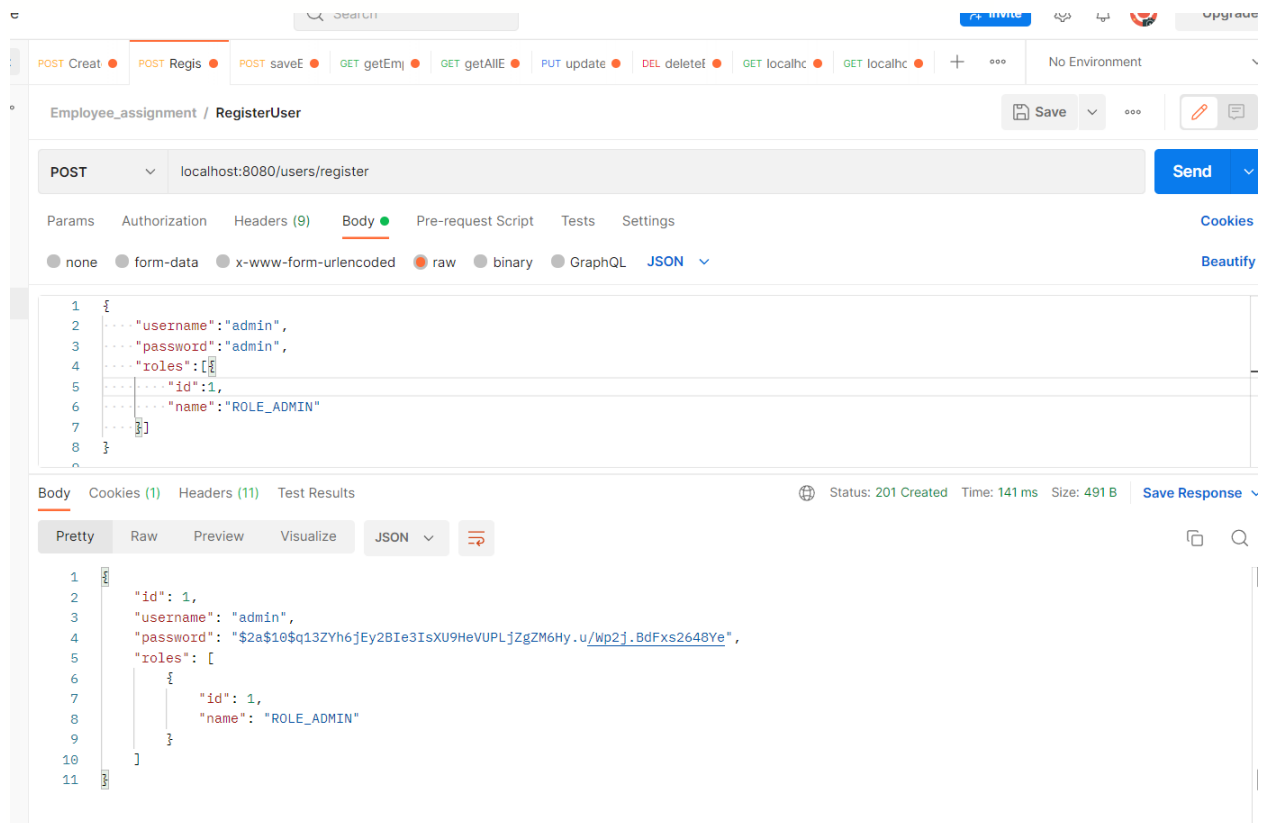
```
1 {
2   "id": 2,
3   "name": "ROLE_USER"
4 }
```

2. Your application should be able to add Users in the db which can be used for authentication purposes.

Creating user with Admin Role:

localhost:8080/users/register

```
{
  "username": "admin",
  "password": "admin",
  "roles": [{
    "id": 1,
    "name": "ROLE_ADMIN"
  }]
}
```



Employee_assignment / RegisterUser

POST localhost:8080/users/register

Params Authorization Headers (9) Body Pre-request Script Tests Settings

none form-data x-www-form-urlencoded raw binary GraphQL JSON

```
1 {
2   "username": "admin",
3   "password": "admin",
4   "roles": [
5     {
6       "id": 1,
7       "name": "ROLE_ADMIN"
8     }
9   ]
10 }
11
```

Body Cookies (1) Headers (11) Test Results

Status: 201 Created Time: 141 ms Size: 491 B Save Response

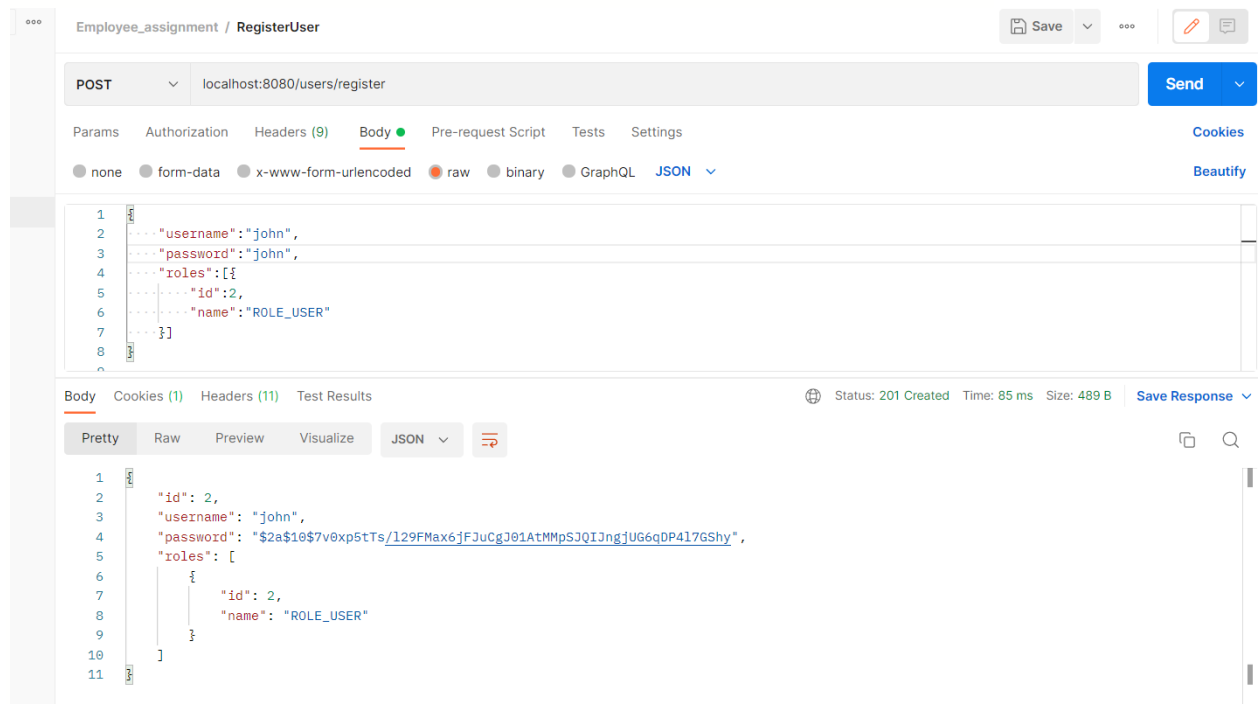
Pretty Raw Preview Visualize JSON

```
1 {
2   "id": 1,
3   "username": "admin",
4   "password": "$2a$10$q13ZYh6jEy28Ie3IsXU9HeVUPLjZgZM6Hy.u/Wp2j.BdFxs2648Ye",
5   "roles": [
6     {
7       "id": 1,
8       "name": "ROLE_ADMIN"
9     }
10 ]
11 }
```

Creating user with user role:

localhost:8080/users/register

```
{
  "username": "john",
  "password": "john",
  "roles": [{
    "id": 2,
    "name": "ROLE_USER"
  }]
}
```



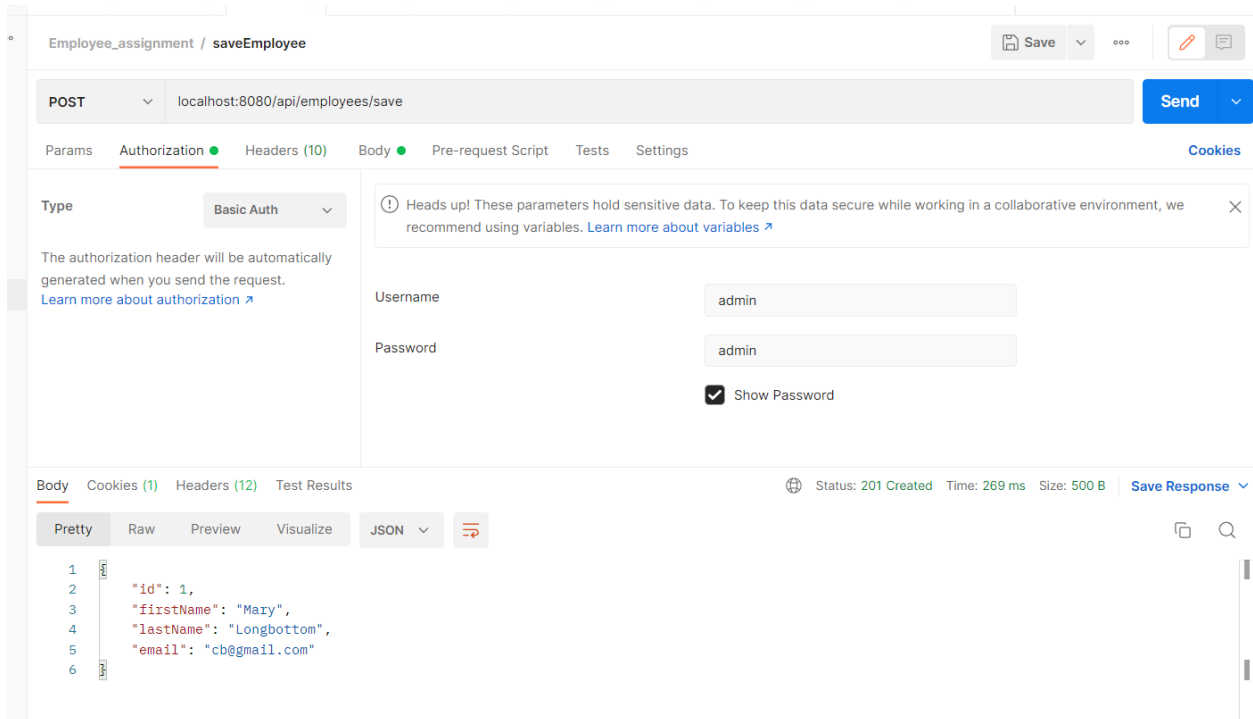
3. Now Your application should be able to add employees data in the db if and only if the authenticated user is **ADMIN**-

Ex-

```
{
  "firstName": "Mary",
```

```
"lastName": "Longbottom",  
"email": "cb@gmail.com"  
}
```

Saving an employee with the Admin Role



The screenshot shows the Postman interface for a REST client. The request is a POST to `localhost:8080/api/employees/save`. The Authorization tab is selected, showing Basic Auth with Username `admin` and Password `admin`. The Show Password checkbox is checked. The Body tab shows the JSON response:

```
1 {  
2   "id": 1,  
3   "firstName": "Mary",  
4   "lastName": "Longbottom",  
5   "email": "cb@gmail.com"  
6 }
```

The status bar at the bottom indicates: Status: 201 Created, Time: 269 ms, Size: 500 B. The Save Response button is visible.

Saving an employee with the User Role gives the 403 forbidden message

Employee_assignment / saveEmployee

POST localhost:8080/api/employees/save

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

Type Basic Auth

The authorization header will be automatically generated when you send the request. [Learn more about authorization](#)

Username john

Password john

☒ Show Password

Heads up! These parameters hold sensitive data. To keep this data secure while working in a collaborative environment, we recommend using variables. [Learn more about variables](#)

Body Cookies (1) Headers (11) Test Results

Status: 403 Forbidden Time: 104 ms Size: 482 B Save Response

Pretty Raw Preview Visualize JSON

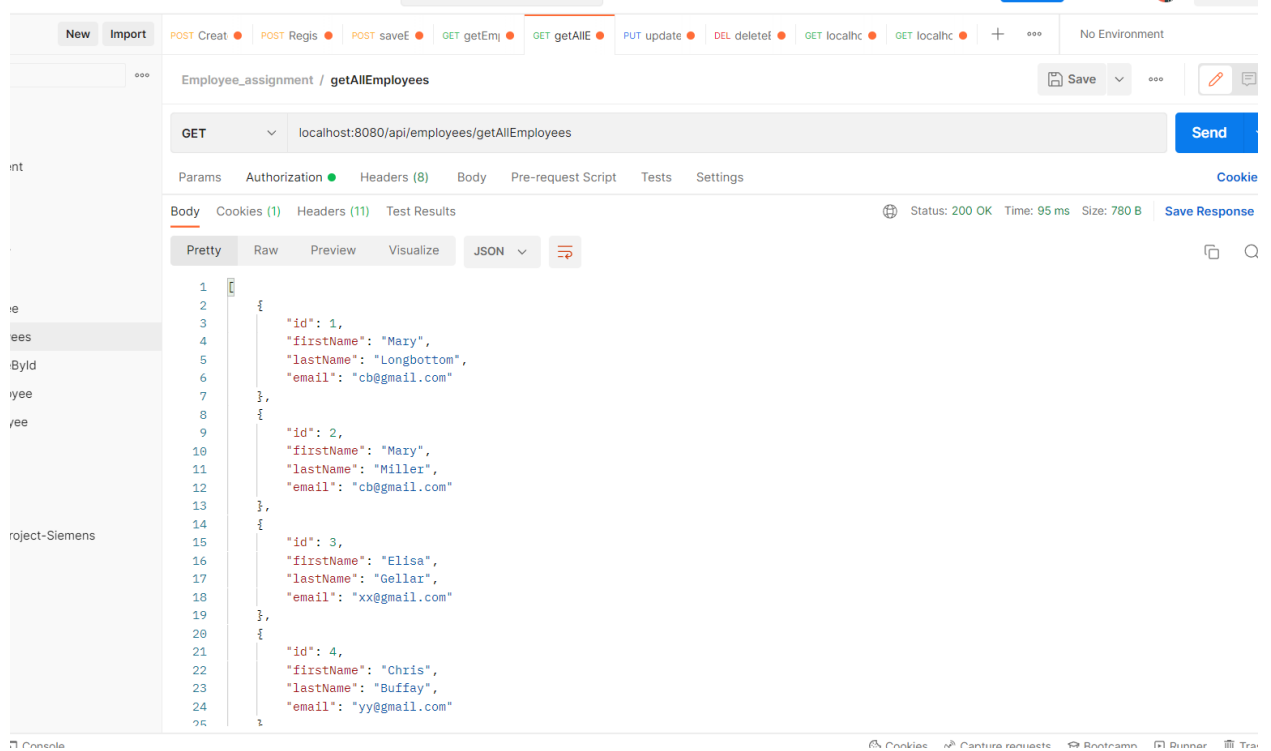
```

1  {
2    "timestamp": "2022-07-19T04:38:08.994+00:00",
3    "status": 403,
4    "error": "Forbidden",
5    "message": "Forbidden",
6    "path": "/api/employees/save"
7  }
```

4. Your application should provide an endpoint to list all the employees stored in the database.

Ex-

localhost:8080/api/employees/getAllEmployees



The screenshot shows a REST client interface with a GET request to `localhost:8080/api/employees/getAllEmployees`. The response status is 200 OK, with a time of 95 ms and a size of 780 B. The response body is a JSON array of 4 employee objects, displayed in a pretty-printed format.

```

1  {
2    "id": 1,
3    "firstName": "Mary",
4    "lastName": "Longbottom",
5    "email": "cb@gmail.com"
6  },
7  {
8    "id": 2,
9    "firstName": "Mary",
10   "lastName": "Miller",
11   "email": "cb@gmail.com"
12 },
13 {
14   "id": 3,
15   "firstName": "Elisa",
16   "lastName": "Gellar",
17   "email": "xx@gmail.com"
18 },
19 {
20   "id": 4,
21   "firstName": "Chris",
22   "lastName": "Buffay",
23   "email": "yy@gmail.com"
24 }
25 ]

```

5. Your application should provide endpoint to fetch or get an employee record specifically based on the id of that employee-

Ex- Url- `localhost:8080/api/employees/getEmployeeById/1`

Employee_assignment / **getEmployeeById** Save

GET localhost:8080/api/employees/getEmployeeById/1

Params **Authorization** Headers (8) Body Pre-request Script Tests Settings

Type **Basic Auth**

The authorization header will be automatically generated when you send the request.
[Learn more about authorization](#)

Username john

Password john

☒ Show Password

! Heads up! These parameters hold sensitive data. To keep this data secure while working in a collaborative recommend using variables. [Learn more about variables](#)

Body Cookies (1) Headers (11) Test Results

Pretty Raw Preview Visualize JSON

```

1  {
2    "id": 1,
3    "firstName": "Mary",
4    "lastName": "Longbottom",
5    "email": "cb@gmail.com"
6  }

```

Status: 200 OK Time: 18 ms Size: 4

6. Your application should provide an endpoint to update an existing employee record with the given updated json object.

Ex-

localhost:8080/api/employees/update

Request Body after updation-

```

{
  "id": 1,
  "firstName": "Smith",
  "lastName": "Hannigan",
  "email": "Smith@gmail.com"
}

```

Admin user can update employee's detail successfully.

Employee_assignment / updateEmployee

PUT localhost:8080/api/employees/update Send

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

Type Basic Auth

The authorization header will be automatically generated when you send the request.
[Learn more about authorization](#)

Username admin

Password admin

☒ Show Password

Heads up! These parameters hold sensitive data. To keep this data secure while working in a collaborative environment, we recommend using variables. [Learn more about variables](#)

Body Cookies (1) Headers (11) Test Results

Status: 202 Accepted Time: 116 ms Size: 430 B Save Response

Pretty Raw Preview Visualize JSON

```

1  {
2    "id": 1,
3    "firstName": "Adam",
4    "lastName": "GELLER",
5    "email": "Adamgeller@gmail.com"
6  }
```

Updating employee details with user role results in 403 forbidden error.

Employee_assignment / updateEmployee

PUT localhost:8080/api/employees/update Send

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

Type Basic Auth

The authorization header will be automatically generated when you send the request.
[Learn more about authorization](#)

Username john

Password john

☒ Show Password

Heads up! These parameters hold sensitive data. To keep this data secure while working in a collaborative environment, we recommend using variables. [Learn more about variables](#)

Body Cookies (1) Headers (11) Test Results

Status: 403 Forbidden Time: 126 ms Size: 484 B Save Response

Pretty Raw Preview Visualize JSON

```

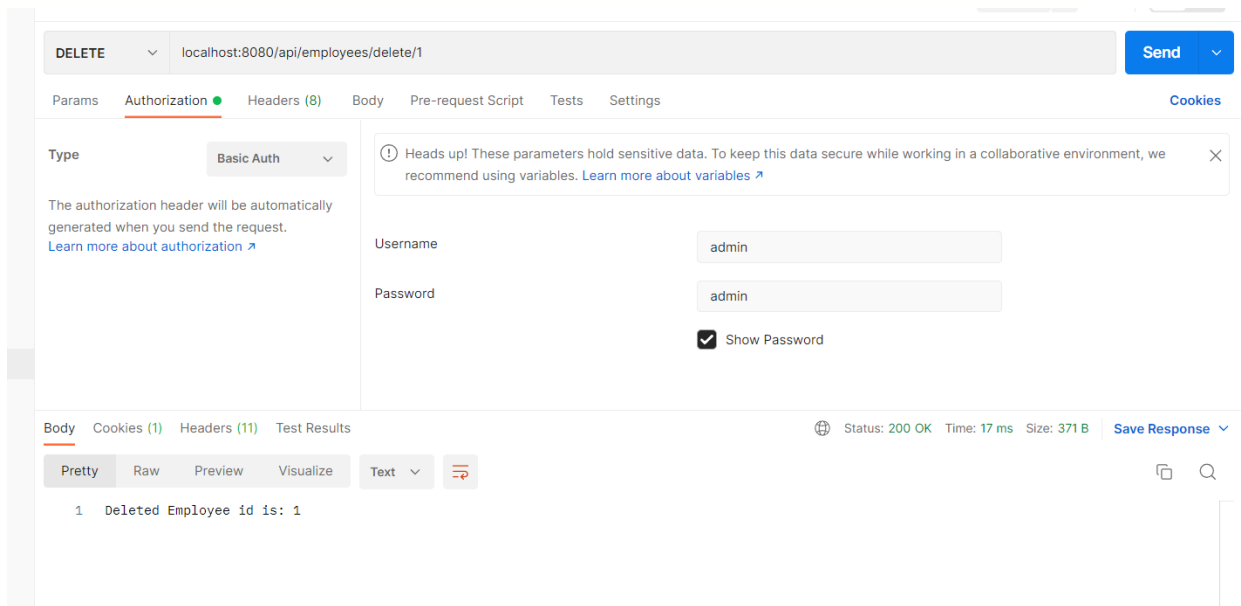
1  {
2    "timestamp": "2022-07-24T13:28:25.061+00:00",
3    "status": 403,
4    "error": "Forbidden",
5    "message": "Forbidden",
6    "path": "/api/employees/update"
7  }
```

7. Your application should also provide an endpoint to delete an existing employee record based on the id of the employee-

Ex-

Url- localhost:8080/api/employees/delete/1

Admin user can delete an employee's detail successfully.



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

- Method:** DELETE
- URL:** localhost:8080/api/employees/delete/1
- Authorization:** Basic Auth (selected)
- Username:** admin
- Password:** admin
- Show Password:** ☒
- Status:** 200 OK
- Time:** 17 ms
- Size:** 371 B
- Response Body:** 1 Deleted Employee id is: 1

Deleting an employee with user role results in 403 forbidden error.

Employee_assignment / deleteEmployee

DELETE localhost:8080/api/employees/delete/1 Send

Params **Authorization** Headers (8) Body Pre-request Script Tests Settings Cookies

Type Basic Auth

The authorization header will be automatically generated when you send the request.
[Learn more about authorization](#)

Username john

Password john

☒ Show Password

Heads up! These parameters hold sensitive data. To keep this data secure while working in a collaborative environment, we recommend using variables. [Learn more about variables](#)

Body Cookies (1) Headers (11) Test Results

Status: 403 Forbidden Time: 109 ms Size: 486 B [Save Response](#)

Pretty Raw Preview Visualize JSON

```

1  {
2    "timestamp": "2022-07-24T13:31:17.540+00:00",
3    "status": 403,
4    "error": "Forbidden",
5    "message": "Forbidden",
6    "path": "/api/employees/delete/1"
7  }

```

8. Your application should provide an endpoint to fetch an employee by his/her first name and if found more than one record then list them all-

Ex-

localhost:8080/api/employees/search/mary

Two employees with the same first name(Mary) retrieved successfully.

Explore

Import POST Creat POST Regis POST saveE GET getEm GET getAlIE PUT update DEL delete GET Search GET localhc + ... No Environment

Employee_assignment / SearchByFirstName Save ...

GET localhost:8080/api/employees/search/mary Send

Params Authorization Headers (8) Body Pre-request Script Tests Settings Cookies

Query Params

KEY	VALUE	DESCRIPTION	...	Bulk Edit

Body Cookies (1) Headers (11) Test Results Status: 200 OK Time: 11 ms Size: 490 B Save Response

Pretty Raw Preview Visualize JSON

```

1  {
2    "id": 2,
3    "firstName": "Mary",
4    "lastName": "Miller",
5    "email": "cb@gmail.com"
6  },
7  {
8    "id": 7,
9    "firstName": "Mary",
10   "lastName": "Goldman",
11   "email": "aa@gmail.com"
12  }
13 }
14

```

9. Your application should be able to list all employee records sorted on their first name in either ascending order or descending order .

Ex-

Url- localhost:8080/api/employees/sort?firstName=desc

OR

Url- localhost:8080/api/employees/sort?firstName=asc

Employees are sorted based on their 'first name' in ascending order.

Employee_assignment / sorting

GET localhost:8080/api/employees/sort?firstName=desc

Params Authorization Headers (8) Body Pre-request Script Tests Settings

Body Cookies (1) Headers (11) Test Results Status: 200 OK Time: 18 ms Size: 777 B Save Res

Pretty Raw Preview Visualize JSON

```
8  {
9    "id": 7,
10   "firstName": "Mary",
11   "lastName": "Goldman",
12   "email": "aa@gmail.com"
13 },
14 {
15   "id": 6,
16   "firstName": "Jack",
17   "lastName": "Hannigan",
18   "email": "aa@gmail.com"
19 },
20 {
21   "id": 3,
22   "firstName": "Elisa",
23   "lastName": "Gellar",
24   "email": "xx@gmail.com"
25 },
26 {
27   "id": 4,
28   "firstName": "Chris",
29   "lastName": "Buffay",
30   "email": "yy@gmail.com"
31 },
32 }
```

Employees are sorted based on their 'first name' in descending order.

Employee_assignment / sorting

GET localhost:8080/api/employees/sort?order=desc

Params Authorization Headers (8) Body Pre-request Script Tests Settings

Query Params

	KEY	VALUE	DESCRIPTION
<input checked="" type="checkbox"/>	order	desc	

Body Cookies (1) Headers (11) Test Results

Status: 200 OK Time: 36 ms Size: 570 B

Pretty Raw Preview Visualize JSON

```

1  {
2    {
3      "id": 2,
4      "firstName": "Ross",
5      "lastName": "GELLER",
6      "email": "rs@gmail.com"
7    },
8    {
9      "id": 3,
10     "firstName": "Monica",
11     "lastName": "GELLER",
12     "email": "rs@gmail.com"
13   },
14   {
15     "id": 1,
16     "firstName": "Adam",
17     "lastName": "GELLER",
18     "email": "Adamgeller@gmail.com"
19   }
20 }

```

Important instructions

- i) You should use the H2 In Memory database for the whole project along with Spring JPA and Spring Security.
- ii) Provide Screenshots of the operations(PostMan/Browser) along with code submission. (note → Screenshots will one of the criterias while grading)
- iii) You can also record your screen while demonstrating CRUD operation, upload on the drive and share the drive link along with code.
- iv) Spring Boot Application must follow the standard project structure .

v) Code should follow naming conventions along with proper indentations. vi) You are free to choose any Rest client to interact with api while implementation.(Prefer PostMan)