

Graded coding assignment 6

Employee Management Rest API Assignment

Create a Employee Management Rest Api based Web application, with CRUD(Create,Read,Update and Delete) functionality along with Sorting , searching and some concepts of security.

The screenshot shows the Eclipse IDE with the Spring Boot application running. The console displays the following logs:

```
2022-04-09 18:51:30.269 INFO 10892 --- [ restartedMain ] c.g.f.EmployeeManagementApplication : Starting EmployeeManagementApplication using Java 17.0.1 on LAPTOP-S54L84D3 with PID 10892 (C:\Users\HP\...\EmployeeManagementApplication [Spring Boot App])
2022-04-09 18:51:30.272 INFO 10892 --- [ restartedMain ] c.g.f.EmployeeManagementApplication : No active profile set, falling back to 1 default profile: "default"
2022-04-09 18:51:30.357 INFO 10892 --- [ restartedMain ] .e.DevToolsPropertyDefaultsPostProcessor : Devtools property defaults active! Set 'spring.devtools.add-properties' to 'false' to disable
2022-04-09 18:51:31.543 INFO 10892 --- [ restartedMain ] .s.d.r.c.RepositoryConfigurationDelegate : Bootstrapping Spring Data JPA repositories in DEFAULT mode.
2022-04-09 18:51:31.624 INFO 10892 --- [ restartedMain ] .s.d.r.c.RepositoryConfigurationDelegate : Finished Spring Data repository scanning in 67 ms. Found 3 JPA repository interfaces.
2022-04-09 18:51:32.553 INFO 10892 --- [ restartedMain ] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat initialized with port(s): 8089 (http)
2022-04-09 18:51:32.563 INFO 10892 --- [ restartedMain ] o.apache.catalina.core.StandardService : Starting service [Tomcat]
2022-04-09 18:51:32.563 INFO 10892 --- [ restartedMain ] org.apache.catalina.core.StandardEngine : Starting Servlet engine: [Apache Tomcat/9.0.60]
2022-04-09 18:51:32.803 INFO 10892 --- [ restartedMain ] org.apache.jasper.servlet.TldScanner : At least one JAR was scanned for TLDs yet contained no TLDs. Enable debug logging for this logger for a
2022-04-09 18:51:32.815 INFO 10892 --- [ restartedMain ] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring embedded WebApplicationContext
2022-04-09 18:51:32.815 INFO 10892 --- [ restartedMain ] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext: initialization completed in 2457 ms
2022-04-09 18:51:32.855 INFO 10892 --- [ restartedMain ] com.zaxxer.hikari.HikariDataSource : HikariPool-1 - Starting...
2022-04-09 18:51:33.186 INFO 10892 --- [ restartedMain ] com.zaxxer.hikari.HikariDataSource : HikariPool-1 - Start completed.
2022-04-09 18:51:33.195 INFO 10892 --- [ restartedMain ] o.s.b.a.h2.H2ConsoleAutoConfiguration : H2 console available at '/h2-console'. Database available at 'jdbc:h2:mem:testdb'
2022-04-09 18:51:33.250 WARN 10892 --- [ restartedMain ] o.a.c.c.C.[Tomcat].[localhost].[/] : Cannot deserialize session attribute [SPRING_SECURITY_CONTEXT] for session [7f6834445735f846c9227b170172c
2022-04-09 18:51:33.421 INFO 10892 --- [ restartedMain ] o.hibernate.jpa.internal.util.LogHelper : HHH000204: Processing PersistenceUnitInfo [name: default]
2022-04-09 18:51:33.526 INFO 10892 --- [ restartedMain ] org.hibernate.Version : HHH000412: Hibernate ORM core version 5.6.7.Final
2022-04-09 18:51:33.761 INFO 10892 --- [ restartedMain ] o.hibernate.annotations.common.Version : HCA0000001: Hibernate Commons Annotations (5.1.2.Final)
2022-04-09 18:51:33.901 INFO 10892 --- [ restartedMain ] org.hibernate.dialect.Dialect : HHH000400: Using dialect: org.hibernate.dialect.H2Dialect
```

The web browser window shows the URL: <http://localhost:8089/h2-console/login.jsp?sessionId=b4e7ed88b5768ef70d3fae3188d19c23>

English Preferences Tools Help

Login

Saved Settings: Generic H2 (Embedded) ▼

Setting Name: Generic H2 (Embedded) Save Remove

Driver Class: org.h2.Driver

JDBC URL: jdbc:h2:mem:testdb

User Name: sa

Password:

Connect Test Connection

Console Problems Debug Shell Internal Web Browser ×

http://localhost:8089/h2-console/login.do?jsessionId=b4e7ed88b5768ef70d3fae3188d19c23

Auto commit Max rows: 1000 Auto complete Off

jdbc:h2:mem:testdb

- EMPLOYEE
- ROLES
- USERS
- USERS_ROLES
- INFORMATION_SCHEMA
- Sequences
- Users
- H2 1.4.200 (2019-10-14)

Run Run Selected Auto complete Clear SQL statement:

SELECT * FROM EMPLOYEE

SELECT * FROM EMPLOYEE;

ID	EMAIL	FIRST_NAME	LAST_NAME
1	manju@gl.com	Manju	S
2	anu@gl.com	Anu	A

(2 rows, 5 ms)

Edit

Console Problems Debug Shell Internal Web Browser ×

http://localhost:8089/h2-console/login.do?jsessionId=b4e7ed88b5768ef70d3fae3188d19c23

Auto commit Max rows: 1000 Auto complete Off

jdbc:h2:mem:testdb

- EMPLOYEE
- ROLES
- USERS
- USERS_ROLES
- INFORMATION_SCHEMA
- Sequences
- Users
- H2 1.4.200 (2019-10-14)

Run Run Selected Auto complete Clear SQL statement:

SELECT * FROM ROLES |

SELECT * FROM ROLES;

ROLE_ID	NAME
1	ADMIN
2	USER

(2 rows, 2 ms)

Edit

The first screenshot shows the H2 database console with the query `SELECT * FROM USERS;` executed. The results are displayed in a table with three columns: `USER_ID`, `PASSWORD`, and `USERNAME`. There are two rows of data.

USER_ID	PASSWORD	USERNAME
1	\$2a\$12\$Kb0NWl4lb/kAKv/ZeVGf5uW/u1EJ676OSGmkoC2FBRP2B7.octATq	admin
2	\$2a\$12\$Fr0G37I9tN09swgU29qxy.eK.wIEANsYmwmoNWOUdBzMiFm7xztO	user

The second screenshot shows the H2 database console with the query `SELECT * FROM USERS_ROLES;` executed. The results are displayed in a table with two columns: `USER_ID` and `ROLE_ID`. There are two rows of data.

USER_ID	ROLE_ID
1	1
2	2

Rest Api is secure, and has different endpoints for different operations as below:

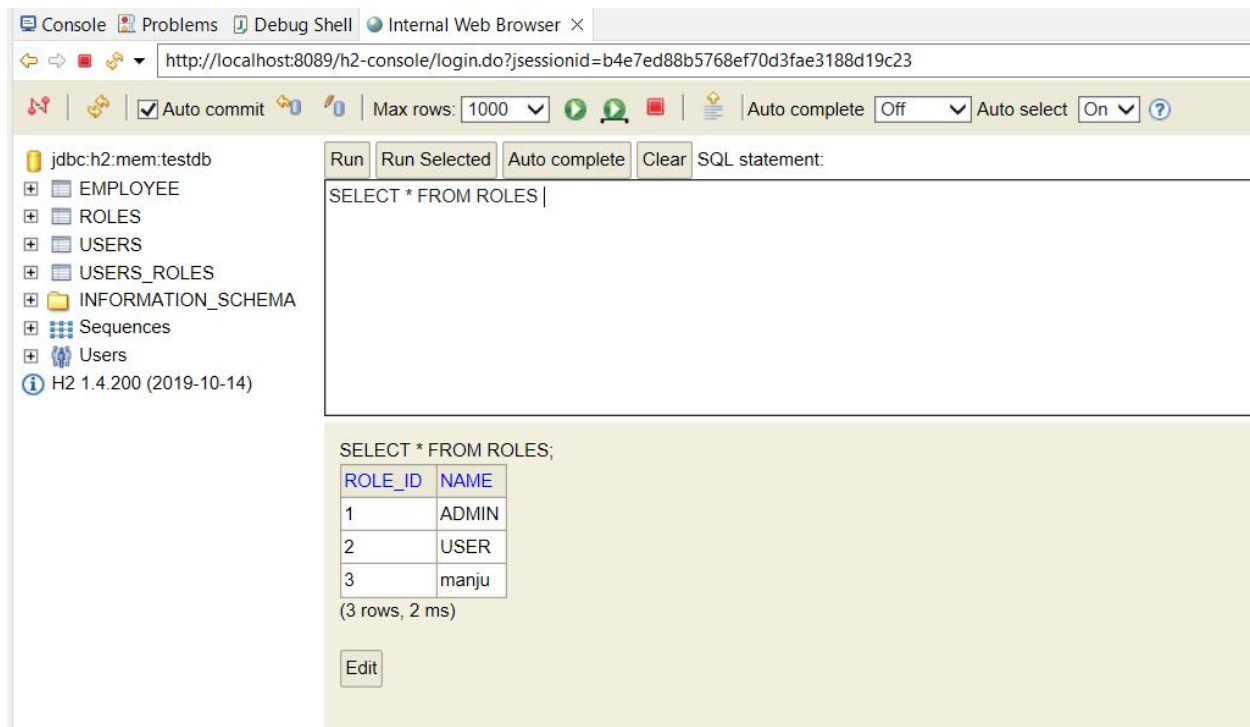
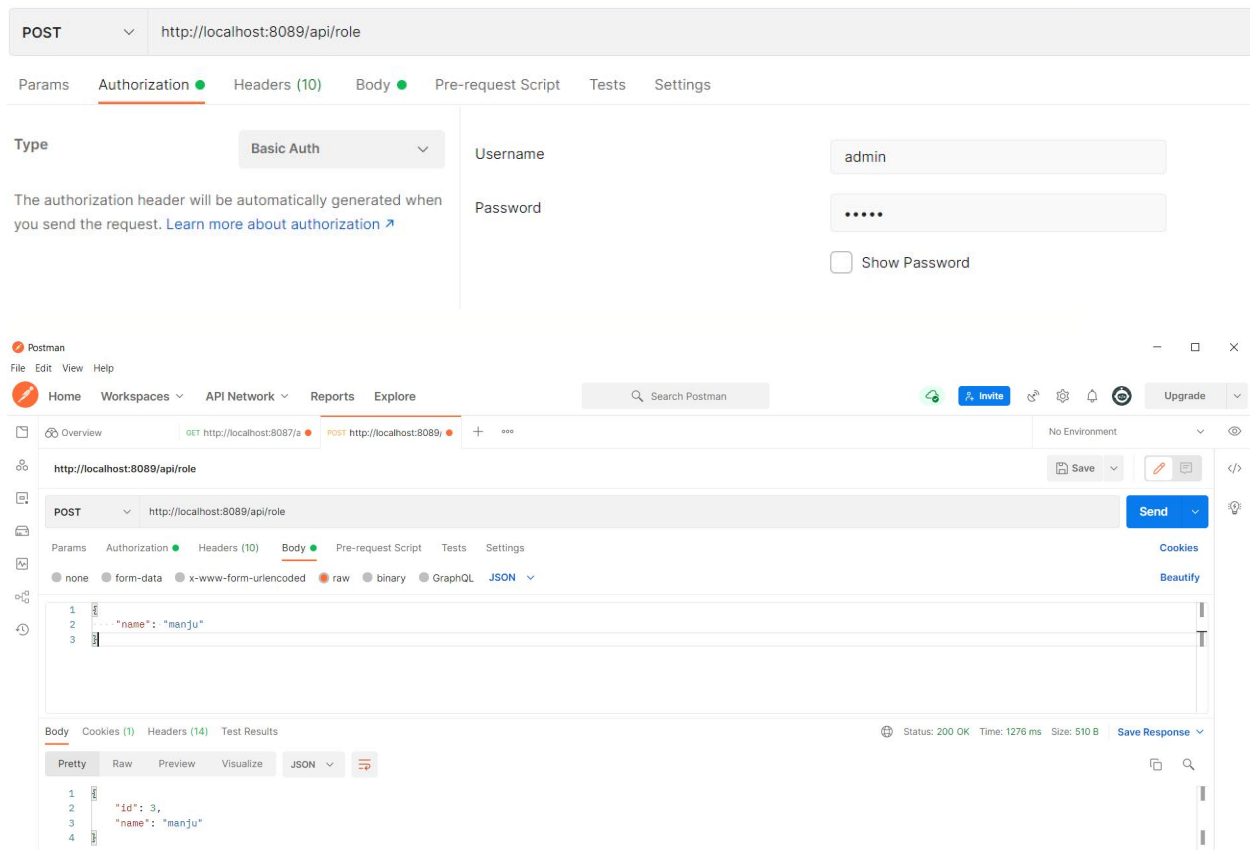
1.Add roles in the database dynamically in the db.

Ex-

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

Where name specifies a role which can be assigned to a user that will be

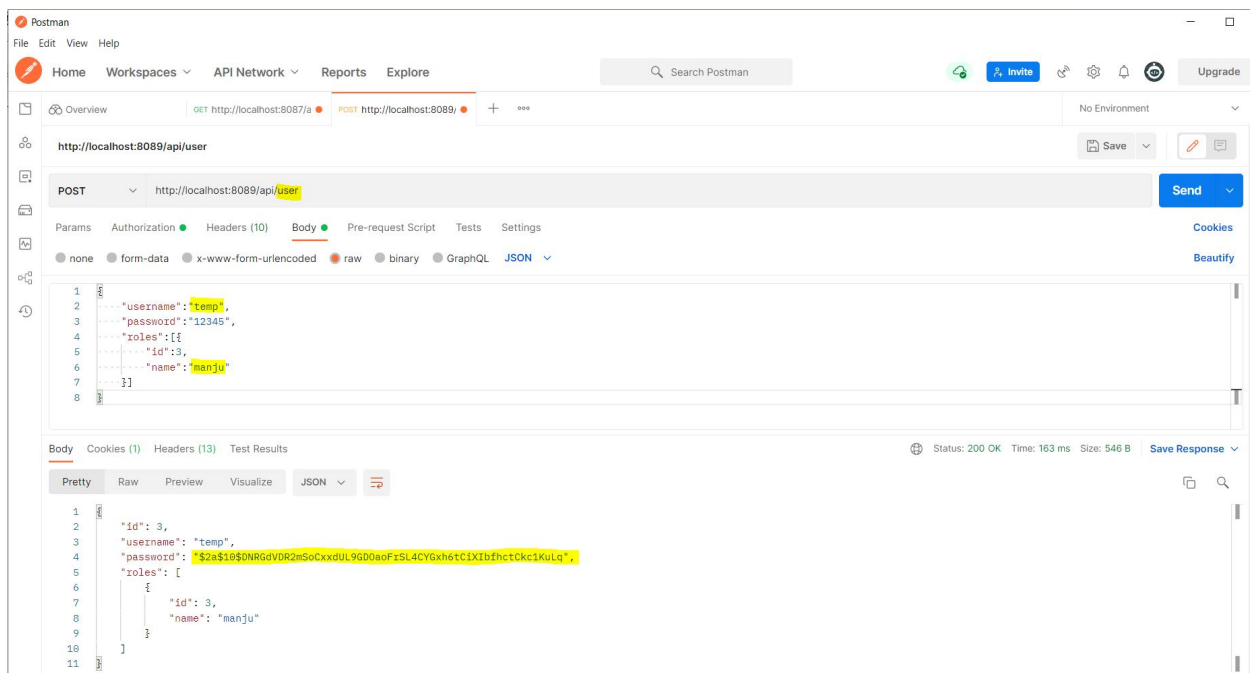
used for authentication purposes while interacting with the api.



2. Add Users in the db which can be used for authentication purposes.

Ex-

```
{  
  "username": "temp",  
  "password": "12345",  
  "roles": [{  
    "id": 2,  
    "name": "USER"  
  }]  
}
```



Console Problems Debug Shell Internal Web Browser x

http://localhost:8089/h2-console/login.do?jsessionid=b4e7ed88b5768ef70d3fae3188d19c23

Auto commit Max rows: 1000 Auto complete Off Auto select On

jdbc:h2:mem:testdb

- EMPLOYEE
- ROLES
- USERS
- USERS_ROLES
- INFORMATION_SCHEMA
- Sequences
- Users
- H2 1.4.200 (2019-10-14)

Run Run Selected Auto complete Clear SQL statement:

SELECT * FROM USERS;

USER_ID	PASSWORD	USERNAME
1	\$2a\$12\$Kb0NWI4Ib/kAKv/ZeVGf5uW/u1EJ676OSGmkoC2FBRP2B7.octATq	admin
2	\$2a\$12\$Fr0G37I9tN09swgU29qxy.eK.wlEANsYmwmoNWOUTDBzMiFm7xztO	user
3	\$2a\$10\$DNRGdVDR2mSoCxxdUL9GDOaoFrSL4CYGxh6tCiXlbfhctCkc1KuLq	temp

(3 rows, 3 ms)

Edit

3. Add employees data in the db if and only if the authenticated user is ADMIN.

Ex-

```
{  
  "firstName": "gl",  
  "lastName": "postman",  
  "email": "postman@gamil.com"  
}
```


Console Problems Debug Shell Internal Web Browser ×

http://localhost:8089/h2-console/login.do?jsessionId=b4e7ed88b5768ef70d3fae3188d19c23

Auto commit Max rows: 1000 Auto complete Off Auto select On

jdbc:h2:mem:testdb

- EMPLOYEE
- ROLES
- USERS
- USERS_ROLES
- INFORMATION_SCHEMA
- Sequences
- Users

H2 1.4.200 (2019-10-14)

Run Run Selected Auto complete Clear SQL statement:

SELECT * FROM USERS |

SELECT * FROM USERS;

USER_ID	PASSWORD	USERNAME
1	\$2a\$12\$Kb0NW4lb/kAKv/ZeVGf5uW/u1EJ676OSGmkoC2FBRP2B7.octATq	admin
2	\$2a\$12\$Fr0G37I9tN09swgU29qxy.eK.wIEANsYmwmoNWOtDBzMiFm7xztO	user
3	\$2a\$10\$DNRGdVDR2mSoCxxdUL9GDOaoFrSL4CYGxh6tCiXlbfhctCkc1KuLq	temp

(3 rows, 3 ms)

Edit

Console Problems Debug Shell Internal Web Browser ×

http://localhost:8089/h2-console/login.do?jsessionId=b4e7ed88b5768ef70d3fae3188d19c23

Auto commit Max rows: 1000 Auto complete Off Auto select

jdbc:h2:mem:testdb

- EMPLOYEE
- ROLES
- USERS
- USERS_ROLES
- INFORMATION_SCHEMA
- Sequences
- Users

H2 1.4.200 (2019-10-14)

Run Run Selected Auto complete Clear SQL statement:

SELECT * FROM ROLES |

SELECT * FROM ROLES;

ROLE_ID	NAME
1	ADMIN
2	USER
3	manju

(3 rows, 2 ms)

Edit

Console Problems Debug Shell Internal web Browser x

http://localhost:8089/h2-console/login.do?sessionId=b4e7ed88b5768ef70d3fae3188d19c23

Auto commit Max rows: 1000 Auto complete Off Auto select On

jdbc:h2:mem:testdb

- EMPLOYEE
- ROLES
- USERS
- USERS_ROLES
- INFORMATION_SCHEMA
- Sequences
- Users
- H2 1.4.200 (2019-10-14)

Run Run Selected Auto complete Clear SQL statement:

SELECT * FROM USERS_ROLES |

SELECT * FROM USERS_ROLES;

USER_ID	ROLE_ID
1	1
2	2
3	3

(3 rows, 2 ms)

http://localhost:8089/api/employees

POST http://localhost:8089/api/employees

Params Authorization Headers (10) 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 manju

Password

☐ Show Password

Postman

File Edit View Help

Home Workspaces API Network Reports Explore

Search Postman

Overview GET http://localhost:8087/a POST http://localhost:8089

No Environment

Save

POST http://localhost:8089/api/employees Send

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

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

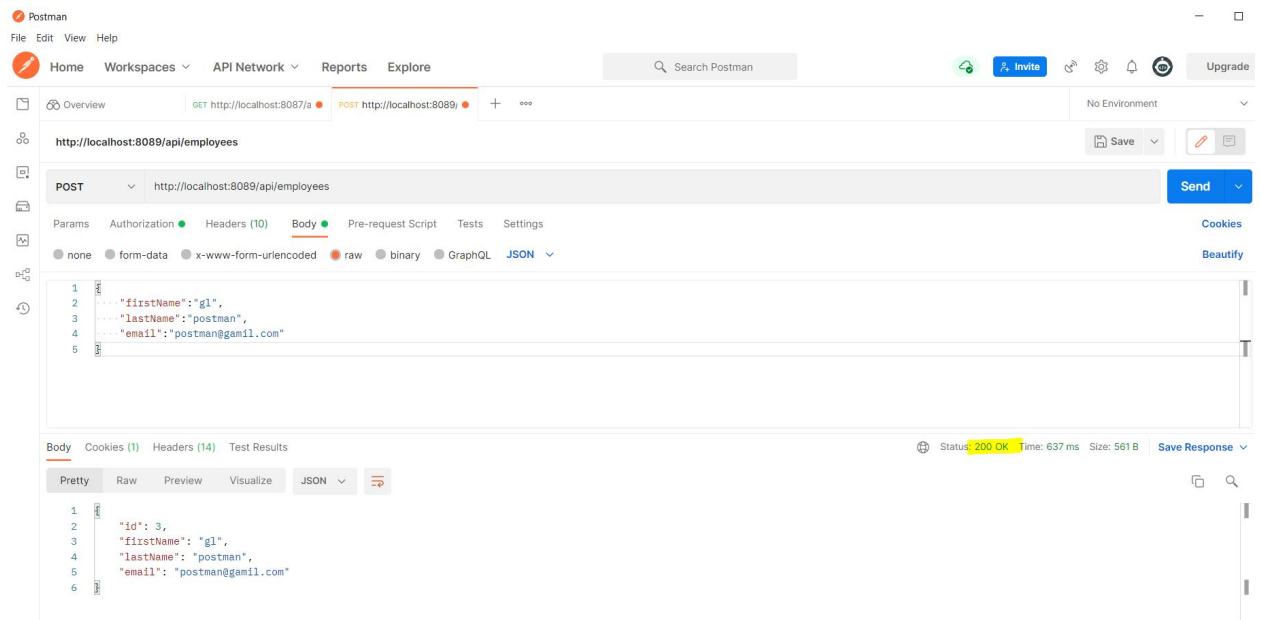
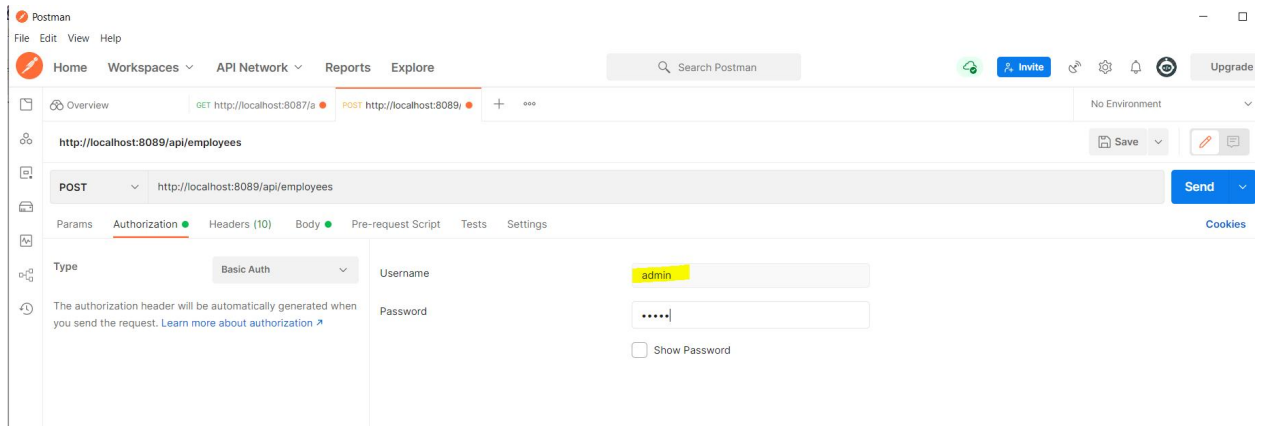
```
1 {
2   "firstName": "gl",
3   "lastName": "postman",
4   "email": "postman@gamil.com"
5 }
```

Body Cookies (1) Headers (14) Test Results

Status: 401 Unauthorized Time: 194 ms Size: 459 B Save Response

Pretty Raw Preview Visualize Text

1



The screenshot shows a web-based database console interface. The URL bar displays `http://localhost:8089/h2-console/login.do?jsessionid=b4e7ed88b5768ef70d3fae3188d19c23`. The interface includes a sidebar with a tree view of the database schema, showing tables like `EMPLOYEE`, `ROLES`, `USERS`, and `USERS_ROLES`. The main area contains a SQL statement input field with `SELECT * FROM EMPLOYEE` and buttons for `Run`, `Run Selected`, `Auto complete`, and `Clear`. Below the input field, the results of the query are displayed as a table with 3 rows and 4 columns: `ID`, `EMAIL`, `FIRST_NAME`, and `LAST_NAME`. The results are:
1 | manju@gl.com | Manju | S
2 | anu@gl.com | Anu | A
3 | postman@gamil.com | gl | postman
The status below the table indicates `(3 rows, 2 ms)`. An `Edit` button is located at the bottom left of the results area.

ID	EMAIL	FIRST_NAME	LAST_NAME
1	manju@gl.com	Manju	S
2	anu@gl.com	Anu	A
3	postman@gamil.com	gl	postman

4. List all the employees stored in the database.

Ex-

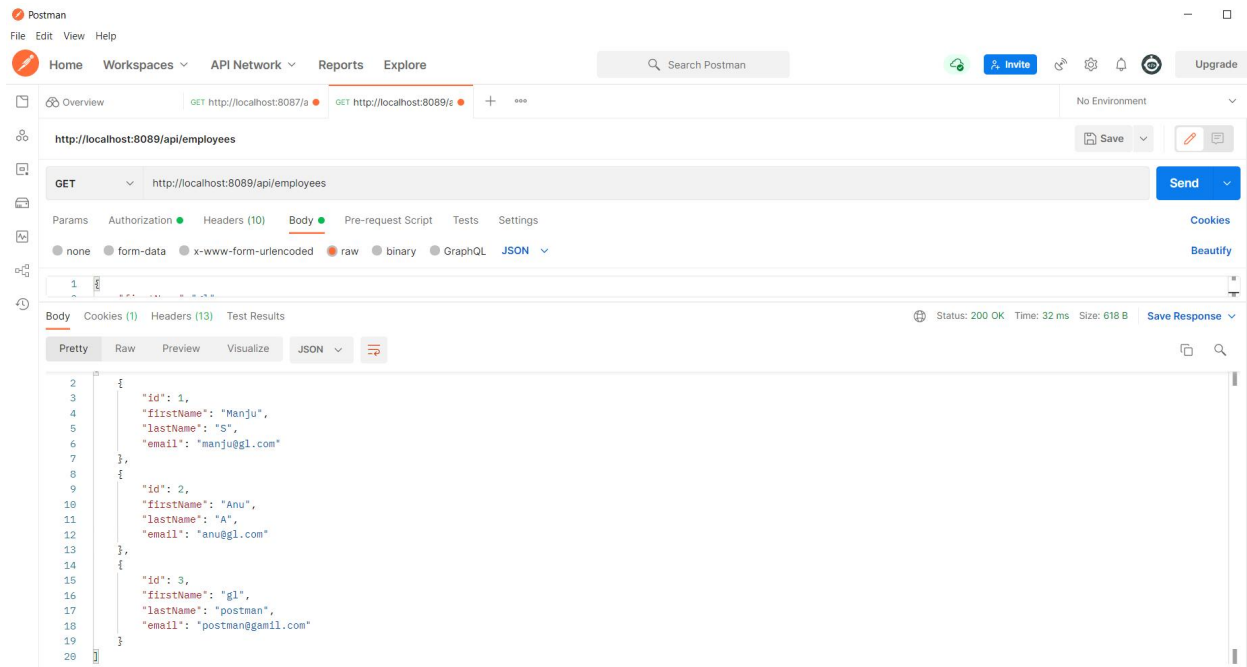
Response Body-

```
[  
  {  
    "id": 1,  
    "firstName": "Ujjawal",  
    "lastName": "Sharma",  
    "email": "fdfdgd@gmail.com"  
  },  
  {  
    "id": 2,  
    "firstName": "temp",  
    "lastName": "kaushik",  
    "email": "jfdkfdjj@gmail.com"  
  },  
]
```

```

{
  "id": 3,
  "firstName": "postman",
  "lastName": "postman",
  "email": "postman@gamil.com"
}
]

```



5. Fetch or get an employee record specifically based on the id of that employee.

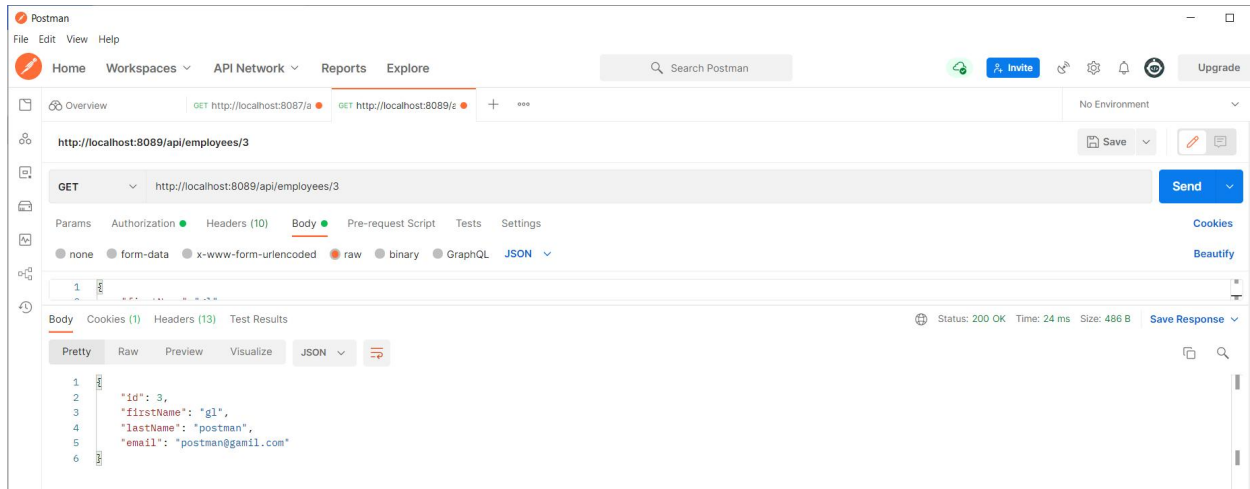
Ex- Url- <http://localhost:8080/api/employees/3>

Response Body-

```

{
  "id": 3,
  "firstName": "postman",
  "lastName": "postman",
  "email": "postman@gamil.com"
}

```



6. Update an existing employee record with the given updated json object.

Ex-

Object to be updated(raw->Json)-

```
{  
  "id": 1,  
  "firstName": "postman",  
  "lastName": "postman",  
  "email": "postman@gamil.com"  
}
```

Response Body after updation-

```
{  
  "id": 1,  
  "firstName": "postman",  
  "lastName": "postman",  
  "email": "postman@gamil.com"  
}
```

Console Problems Debug Shell Internal Web Browser ×

http://localhost:8089/h2-console/login.do?jsessionid=b4e7ed88b5768ef70d3fae3188d19c23

Auto commit Max rows: 1000 Auto complete Off Auto select On

jdbc:h2:mem:testdb

- EMPLOYEE
- ROLES
- USERS
- USERS_ROLES
- INFORMATION_SCHEMA
- Sequences
- Users
- H2 1.4.200 (2019-10-14)

Run Run Selected Auto complete Clear SQL statement:

SELECT * FROM EMPLOYEE |

SELECT * FROM EMPLOYEE;

ID	EMAIL	FIRST_NAME	LAST_NAME
1	manju@gl.com	Manju	S
2	anu@gl.com	Anu	A
3	postman@gamil.com	gl	postman

(3 rows, 2 ms)

Edit

Postman

File Edit View Help

Home Workspaces API Network Reports Explore

Search Postman

Invite

Upgrade

Overview x GET http://localhost:8087/a PUT http://localhost:8089/z

No Environment

http://localhost:8089/api/employees/

Save

PUT http://localhost:8089/api/employees/ Send

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

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

1 2 3 4 5 6

```
1 {
2   "id": 1,
3   "firstName": "postman",
4   "lastName": "postman",
5   "email": "postman@gamil.com"
6 }
```

Body Cookies (1) Headers (13) Test Results

Pretty Raw Preview Visualize JSON

1 2 3 4 5 6

```
1 {
2   "id": 1,
3   "firstName": "postman",
4   "lastName": "postman",
5   "email": "postman@gamil.com"
6 }
```

Status: 200 OK Time: 33 ms Size: 491 B Save Response

The screenshot shows the H2 console interface. On the left, a tree view displays the database schema: jdbc:h2:mem:testdb, EMPLOYEE, ROLES, USERS, USERS_ROLES, INFORMATION_SCHEMA, Sequences, Users, and H2 1.4.200 (2019-10-14). The main area shows the SQL statement 'SELECT * FROM EMPLOYEE;' and its results. The results are displayed in a table with 4 columns: ID, EMAIL, FIRST_NAME, and LAST_NAME. The first row is highlighted in yellow.

ID	EMAIL	FIRST_NAME	LAST_NAME
1	postman@gamil.com	postman	postman
2	anu@gl.com	Anu	A
3	postman@gamil.com	gl	postman

(3 rows, 1 ms)

Buttons: Run, Run Selected, Auto complete, Clear, SQL statement: SELECT * FROM EMPLOYEE; Edit

7. Delete an existing employee record based on the id of the employee.

Ex-

Url- <http://localhost:8080/api/employees/4>

Response Body-

"Deleted employee id - 4"

Console Problems Debug Shell Internal Web Browser ×

http://localhost:8089/h2-console/login.do?jsessionid=b4e7ed88b5768ef70d3fae3188d19c23

Auto commit Max rows: 1000 Auto complete Off Auto select On

jdbc:h2:mem:testdb

- EMPLOYEE
- ROLES
- USERS
- USERS_ROLES
- INFORMATION_SCHEMA
- Sequences
- Users
- H2 1.4.200 (2019-10-14)

Run Run Selected Auto complete Clear SQL statement:

SELECT * FROM EMPLOYEE |

SELECT * FROM EMPLOYEE;

ID	EMAIL	FIRST_NAME	LAST_NAME
1	postman@gamil.com	postman	postman
2	anu@gl.com	Anu	A
3	postman@gamil.com	gl	postman
4	Ekta@gl.com	Ekta	E

(4 rows, 1 ms)

Edit

Postman

File Edit View Help

Home Workspaces API Network Reports Explore

Overview x GET http://localhost:8087/a DEL http://localhost:8089/a + ...

http://localhost:8089/api/employees/4

DELETE http://localhost:8089/api/employees/4

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

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

```
1 {
2   ... "firstName": "Ekta",
3   ... "lastName": "E",
4   ... "email": "Ekta@gl.com"
5 }
```

Body Cookies (1) Headers (13) Test Results

Pretty Raw Preview Visualize Text

1 Deleted employee id - 4

The screenshot shows the H2 console web interface. The top bar includes tabs for Console, Problems, Debug Shell, and Internal Web Browser. The address bar shows the URL: <http://localhost:8089/h2-console/login.do?jsessionid=b4e7ed88b5768ef70d3fae3188d19c23>. Below the address bar is a toolbar with icons for various actions and settings like Auto commit, Max rows (1000), Auto complete, and Auto select. The left sidebar displays a database tree for 'jdbc:h2:mem:testdb' containing tables like EMPLOYEE, ROLES, USERS, and INFORMATION_SCHEMA. The main area shows the SQL statement 'SELECT * FROM EMPLOYEE;' and its results in a table with 3 rows. Below the table, it indicates '(3 rows, 1 ms)' and an 'Edit' button.

ID	EMAIL	FIRST_NAME	LAST_NAME
1	postman@gamil.com	postman	postman
2	anu@gl.com	Anu	A
3	postman@gamil.com	gl	postman

8. Fetch an employee by his/her first name and if found more than one record then list them all-

Ex-

Url- <http://localhost:8080/api/employees/search/gl>

Response Body-

```
[
  {
    "id": 11,
    "firstName": "gl",
    "lastName": "postman",
    "email": "postman@gamil.com"
  }
]
```

Postman

File Edit View Help

Home Workspaces API Network Reports Explore

Overview GET http://localhost:8087/a GET http://localhost:8089/z + ...

http://localhost:8089/api/employees/

GET http://localhost:8089/api/employees/

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

Body Cookies (1) Headers (13) Test Results

Pretty Raw Preview Visualize JSON

```
2  {
3    "id": 1,
4    "firstName": "postman",
5    "lastName": "postman",
6    "email": "postman@gamil.com"
7  },
8  {
9    "id": 2,
10   "firstName": "Anu",
11   "lastName": "A",
12   "email": "anu@gl.com"
13 },
14 {
15   "id": 3,
16   "firstName": "gl",
17   "lastName": "postman",
18   "email": "postman@gamil.com"
19 },
20 {
21   "id": 5,
22   "firstName": "Anu",
23   "lastName": "Balu",
24   "email": "anubalu@gmail.com"
25 }
```

Postman

File Edit View Help

Home Workspaces API Network Reports Explore

Overview x GET http://localhost:8087/a GET http://localhost:8089/ε + ...

http://localhost:8089/api/employees/search/anu

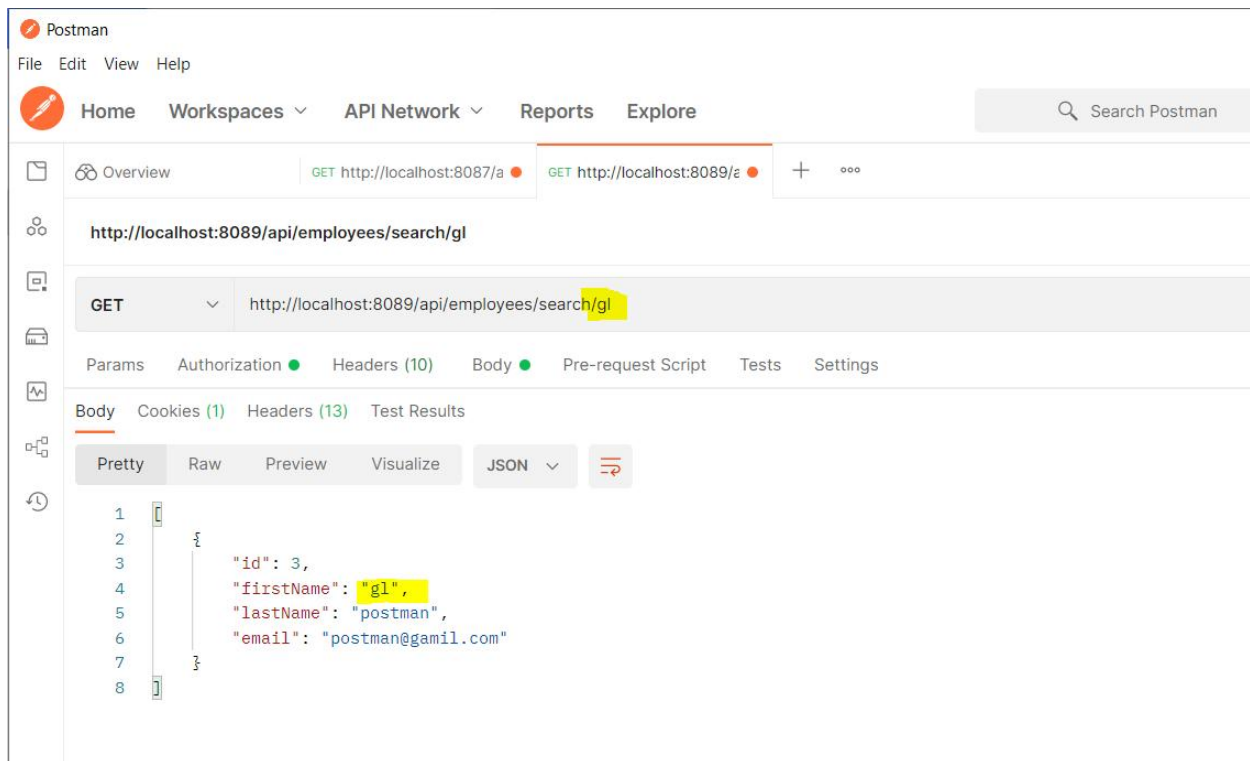
GET http://localhost:8089/api/employees/search/anu

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

Body Cookies (1) Headers (13) Test Results

Pretty Raw Preview Visualize JSON

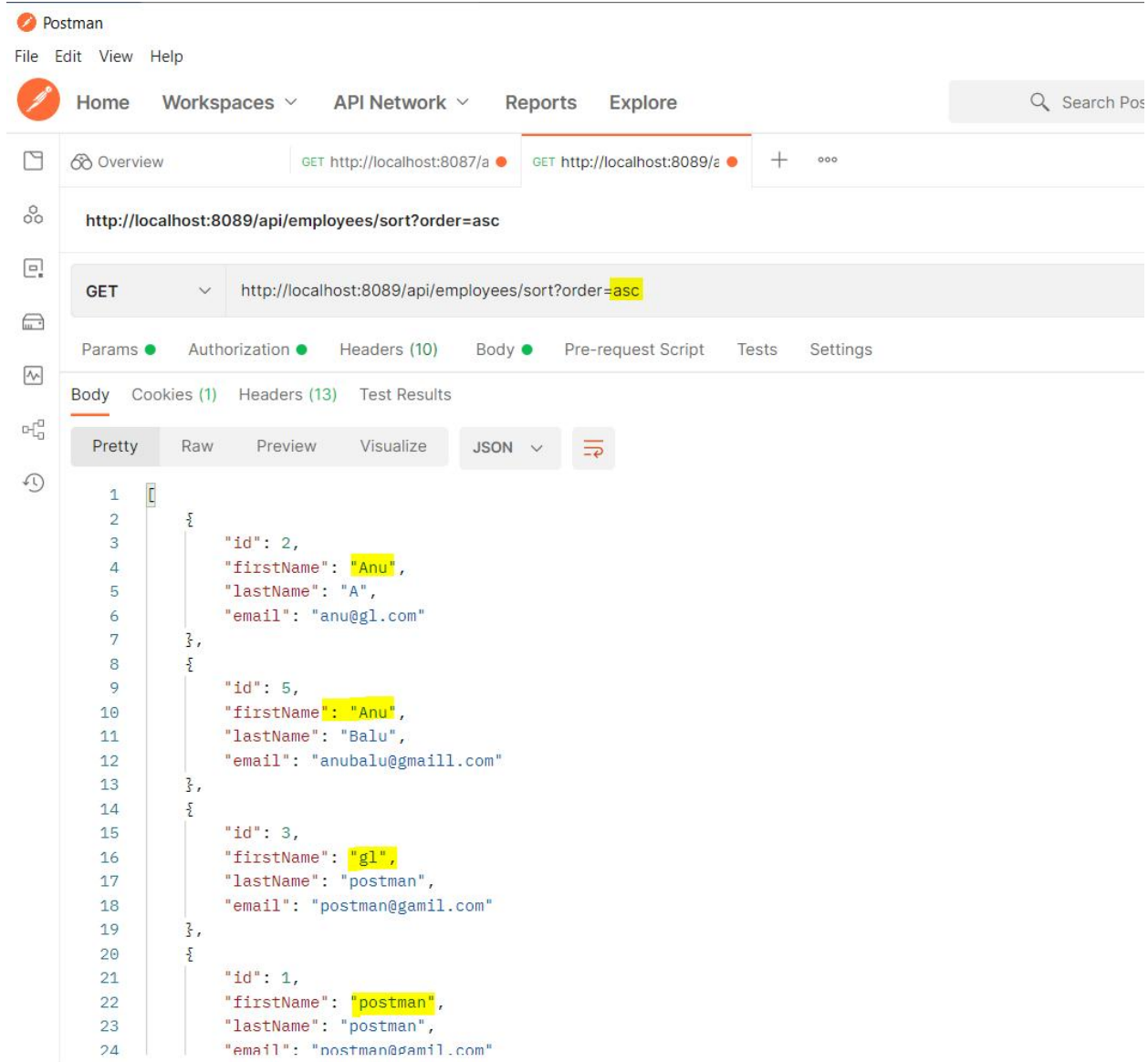
```
1 {
2   {
3     "id": 2,
4     "firstName": "Anu",
5     "lastName": "A",
6     "email": "anu@gl.com"
7   },
8   {
9     "id": 5,
10    "firstName": "Anu",
11    "lastName": "Balu",
12    "email": "anubalu@gmaill.com"
13  }
14 }
```

9. List all employee records sorted on their first name in either ascending order or descending order .

Ex-

Url- [http://localhost:8080/api/employees/sort?order="asc"](http://localhost:8080/api/employees/sort?order=)



Url- `http://localhost:8080/api/employees/sort?order="desc"`

Postman

File Edit View Help

Home Workspaces API Network Reports Explore

Overview GET http://localhost:8087/a GET http://localhost:8089/ε + ...

http://localhost:8089/api/employees/sort?order=desc

GET http://localhost:8089/api/employees/sort?order=desc

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

Body Cookies (1) Headers (13) Test Results

Pretty Raw Preview Visualize JSON

```
2 {
3   "id": 1,
4   "firstName": "postman",
5   "lastName": "postman",
6   "email": "postman@gamil.com"
7 },
8 {
9   "id": 3,
10  "firstName": "gl",
11  "lastName": "postman",
12  "email": "postman@gamil.com"
13 },
14 {
15   "id": 2,
16   "firstName": "Anu",
17   "lastName": "A",
18   "email": "anu@gl.com"
19 },
20 {
21   "id": 5,
22   "firstName": "Anu",
23   "lastName": "Balu",
24   "email": "anubalu@gmaill.com"
25 }
```