



“Capstone Project”

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LMS Id :

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Employee Management System

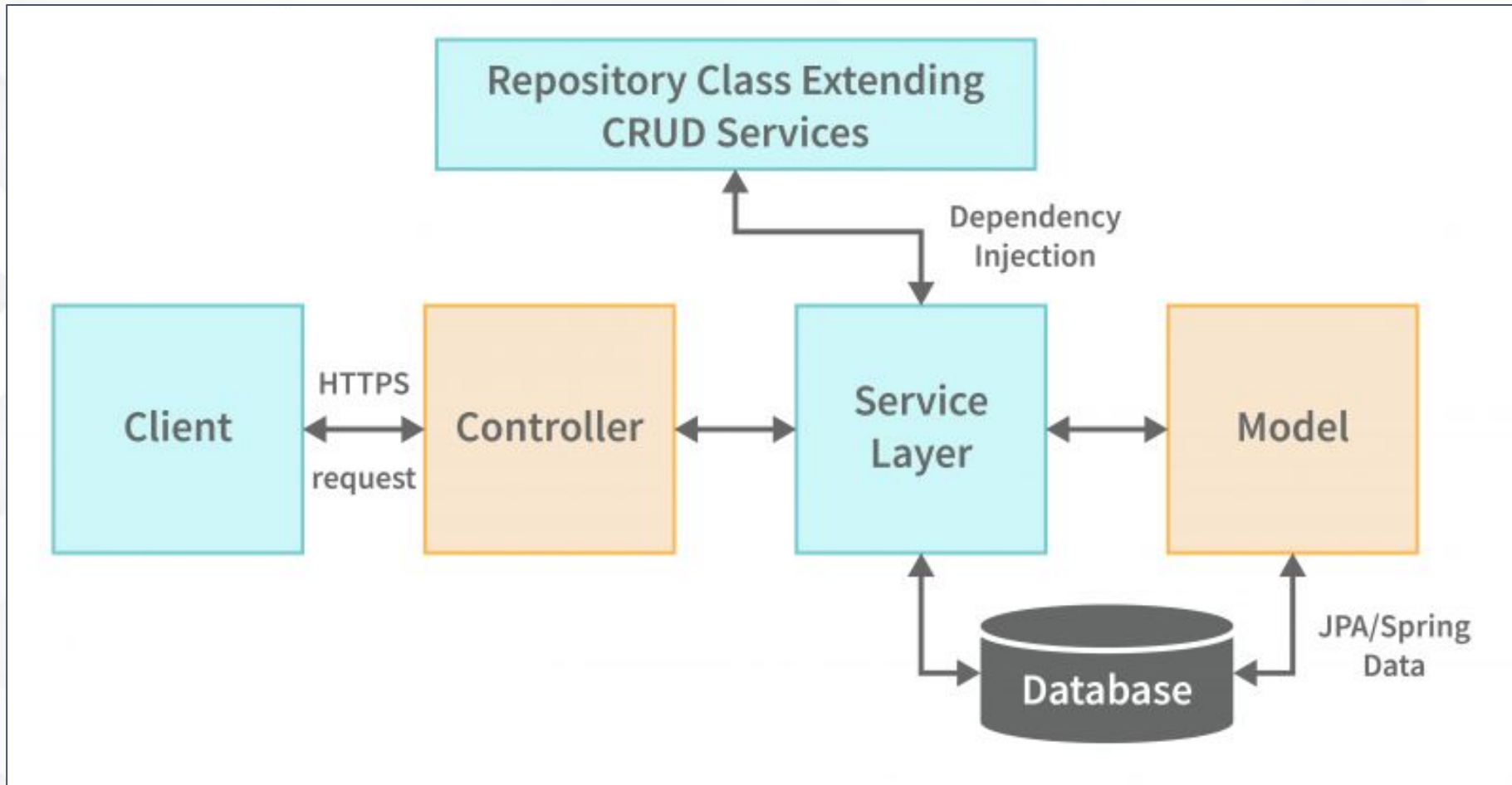
- ❑ It is a distributed application, developed to maintain the details of employees working in any organization.
- ❑ This project aims to simplify the task of maintaining records of the employees.
- ❑ We implemented the get Employee By ID features in this project.



- ❑ This Employee System is an open source project built using Java, Spring boot, SQL and JPA.
- ❑ The primary goal is to query a single record based on EmployeeID.
- ❑ Project is checked into a GIT repository.
- ❑ Jenkins is used to build and deploy modifications to the application server's code..
- ❑ Project is then exposed as a HTTP web service.
- ❑ The project also provides a log file and the CURL commands for accessing web services.
- ❑ DateOfBirth is AES-256 encrypted and decrypted so that only the intended receiver may read it with key.
- ❑ Deployed the containerized web application as a Docker image to a Kubernetes using Jenkins.

Tools and technologies used:

- ☐ Java 8+
- ☐ Spring Boot
- ☐ Spring Data JPA (Hibernate)
- ☐ MySQL
- ☐ Gradle
- ☐ Tomcat
- ☐ Jenkins
- ☐ Docker

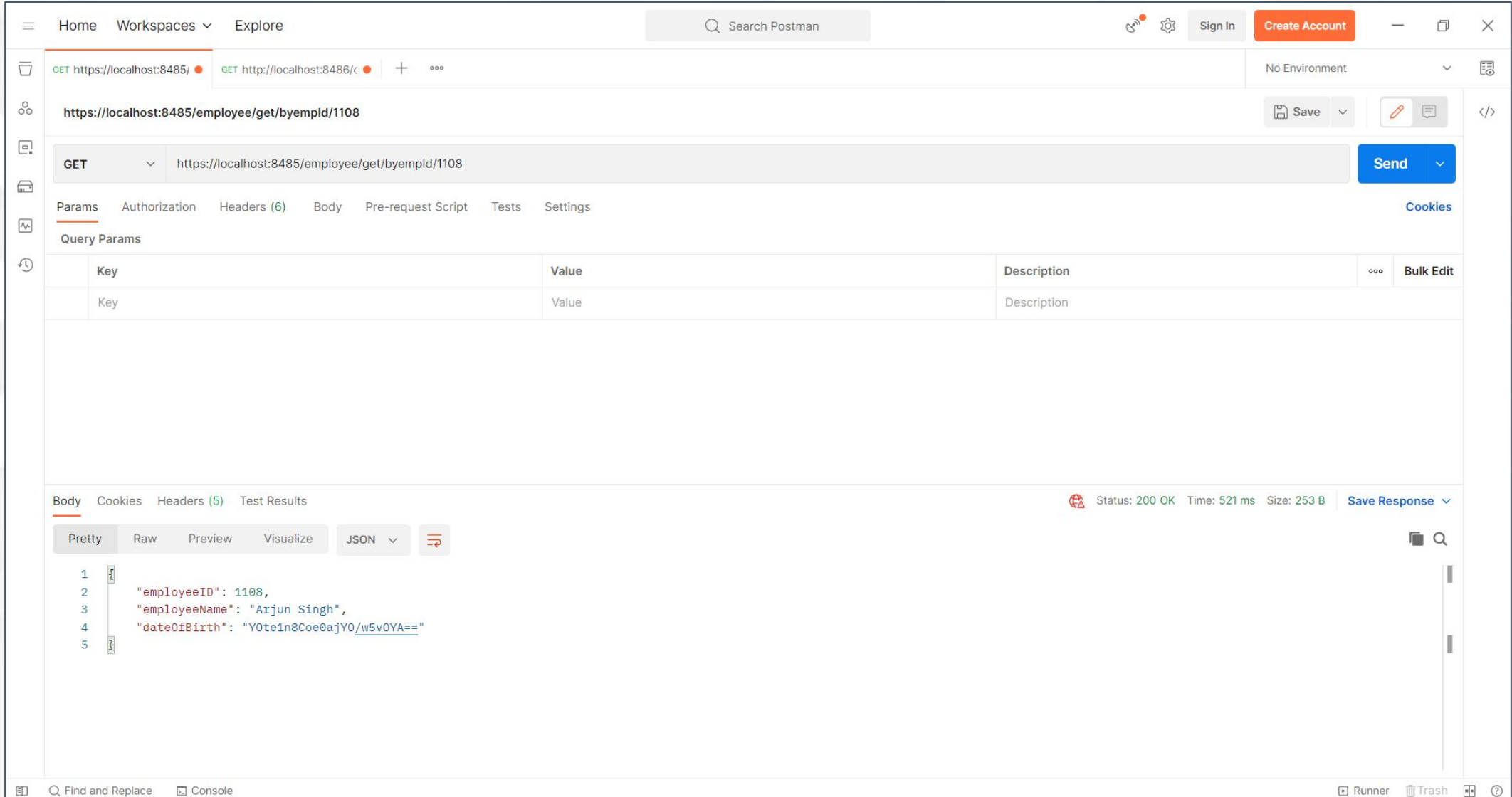


- The Employee Get Data Project's back-end development includes three main tasks: creating the database, setting up the RESTful endpoint, and ensuring the application's security.
- To begin, the database should be designed and implemented with the "EmployeeID" column as the primary key. Next, a RESTful endpoint must be created to accept an EmployeeID parameter and retrieve the corresponding employee data from the database.
- Ensuring the application's security is crucial, so HTTPS support must be implemented using a self-signed certificate. This step guarantees that sensitive employee data is not transmitted in plain text over the internet. Additionally, the "DateOfBirth" field must be encrypted using AES-256 to protect it from unauthorized access. Only authorized users with the decryption key will be able to access this data.
- To track and record all requests made to the server, a logging framework such as Log4j should be configured. This step ensures that all interactions with the server are recorded and can be reviewed later.

Unit Testing

- ❑ Unit tests help to detect early in development process.
- ❑ Unit Testing is a one of the testing done by the developers to make sure individual unit or component functionalities are working fine.
- ❑ Unit tests help prevent regression issues by providing a suite of tests that can be run after changes are made to code.

Employee Management



The screenshot shows the Postman interface with a GET request to `https://localhost:8485/employee/get/byempld/1108`. The response is a JSON object with the following data:

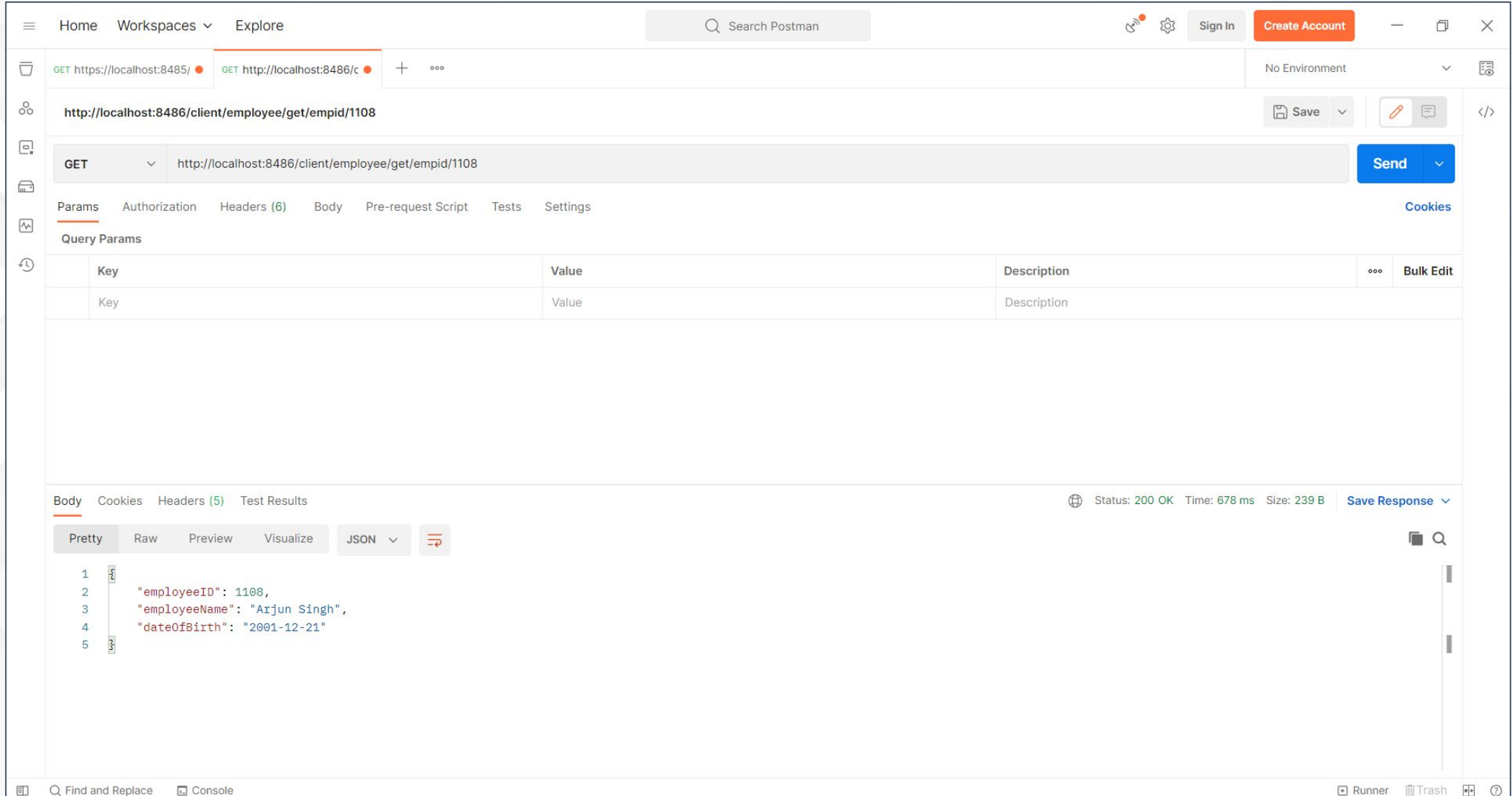
Key	Value	Description
Key	Value	Description

The response body is displayed in JSON format:

```
1 {
2   "employeeID": 1108,
3   "employeeName": "Arjun Singh",
4   "dateOfBirth": "Y0te1n8Coe0ajY0/w5v0YA=="
5 }
```

The status bar at the bottom indicates: Status: 200 OK, Time: 521 ms, Size: 253 B.

Client



The screenshot shows the Postman application interface. The top navigation bar includes "Home", "Workspaces", and "Explore". A search bar labeled "Search Postman" is present. On the right, there are "Sign In" and "Create Account" buttons. The main workspace displays a GET request to `http://localhost:8486/client/employee/get/empid/1108`. The request is saved in the "No Environment" collection. The "Params" tab is active, showing "Query Params" with a table:

Key	Value	Description	Bulk Edit
Key	Value	Description	

The "Body" tab is active, showing the response in "Pretty" JSON format:

```
1 {
2   "employeeID": 1108,
3   "employeeName": "Arjun Singh",
4   "dateOfBirth": "2001-12-21"
5 }
```

The response status is "200 OK", time is "678 ms", and size is "239 B". The bottom status bar includes "Find and Replace", "Console", "Runner", "Trash", and a help icon.

The capstone project was successful in achieving its goal of developing a restful web service that can retrieve all the information about an employee from a single record in a database. Additionally, we used https with a self-signed certificate and aes-256 encryption to assure security. Jenkins was used for both the containerized web services deployment on Kubernetes as well as continuous integration and deployment.

- ❑ Adding additional features to the program, like the ability to retrieve all employee data, update and delete it, and search for employees based on particular criteria.
- ❑ Creating a user interface to provide better accessibility and usability for end users.
- ❑ Role based Access Control (RBAC) implementation will give the application precise access control, allowing different roles to access only the functionalities they need.
- ❑ The application can also be enhanced by integrating payroll management.

1. <https://www.codejava.net/frameworks/spring-boot/logback-rolling-files-example>
2. <https://www.codejava.net/frameworks/spring-boot/configure-https-with-self-signed-certificate>
3. <https://www.javatpoint.com/aes-256-encryption-in-java>
4. <https://www.javaguides.net/2021/07/spring-boot-tutorial-build-employee-management-project.html>

Field	Type	Null	Key	Default	Extra
employee_id	int	NO	PRI	NULL	
employee_name	varchar(100)	YES		NULL	
date_of_birth	date	NO		NULL	

employee_id	employee_name	date_of_birth
1101	Pratiksha Patil	1997-11-21
1102	Pranay Singh	2000-11-28
1103	John Joe	2002-05-12
1104	Snehal Palve	1998-05-20
1105	Vaibhavi Patil	1997-08-30
1106	Ankita Mane	1997-08-25
1107	Mahan Nayak	1998-05-03
1108	Arjun Singh	2001-12-21
1109	Parth Kapoor	1995-12-12
1110	Kavya Chopra	2005-03-09


```
Command Prompt
Microsoft Windows [Version 10.0.22000.1696]
(c) Microsoft Corporation. All rights reserved.

C:\Users\HP>curl --version
curl 7.83.1 (Windows) libcurl/7.83.1 Schannel
Release-Date: 2022-05-13
Protocols: dict file ftp ftps http https imap imaps pop3 pop3s smtp smtps telnet tftp
Features: AsynchDNS HSTS IPv6 Kerberos Largefile NTLM SPNEGO SSL SSPI UnixSockets

C:\Users\HP>curl --insecure https://localhost:8485/employee/get/byempId/1103
{"employeeID":1103,"employeeName":"John Joe","dateOfBirth":"2002-05-12"}
C:\Users\HP>curl --insecure https://localhost:8485/employee/get/byempId/1108
{"employeeID":1108,"employeeName":"Arjun Singh","dateOfBirth":"2001-12-21"}
C:\Users\HP>curl --insecure https://localhost:8485/employee/get/byempId/1109
{"employeeID":1109,"employeeName":"Parth Kapoor","dateOfBirth":"1995-12-12"}
C:\Users\HP>curl --insecure https://localhost:8485/employee/get/byempId/1115
Invalid EmployeeID
C:\Users\HP>curl --insecure https://localhost:8485/employee/get/byempId/1110
{"employeeID":1110,"employeeName":"Kavya Chopra","dateOfBirth":"2005-03-09"}
C:\Users\HP>curl --insecure https://localhost:8485/employee/get/byempId/1101
{"employeeID":1101,"employeeName":"Pratiksha Patil","dateOfBirth":"1997-11-21"}
C:\Users\HP>
```

THANK YOU.