Rahul Gupta

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# Create CRUD APIs in NodeJS, Express and MySQL

Rahul Gupta Nov 19, 2019 · 8 min read

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In previous story we learnt how to create restful crud(create, read, update, delete) api in nodejs, express and mongodb but now in this we'll learn to create crud api in `nodejs` , `express` and `mysql` .

**Prerequisites and required applications**

**Node.js** is an open source, cross-platform runtime environment for developing server-side and networking applications. You should have basic understanding of nodejs.

**ExpressJS** is one of the most trending web frameworks for node.js. It is built on top of node.js http module, and adds support for routing, middleware, view system etc. It is very simple and minimal, unlike other frameworks.

**MySQL** is an open-source relational database management system. Its name is a combination of "My", the name of co-founder Michael Widenius's daughter, and "SQL", the abbreviation for Structured Query Language.

**EcmaScript (ES)** is a standardised scripting language for JavaScript (JS). The current ES version supported in modern browsers is ES5. However, ES6 tackles a lot of the limitations of the core language, making it easier for devs to code

**Postman** is an API(application programming interface) development tool which helps to build, test and modify APIs.It has the ability to make various types of HTTP requests(GET, POST, PUT, PATCH etc.).

**IDE** (**integrated development environment)** is a software application that provides comprehensive facilities to computer programmers for software development. An IDE normally consists of at least a source code editor, build automation tools, and a debugger. In case of mine, I prefer to use **visual studio code**.

**Create a Project**

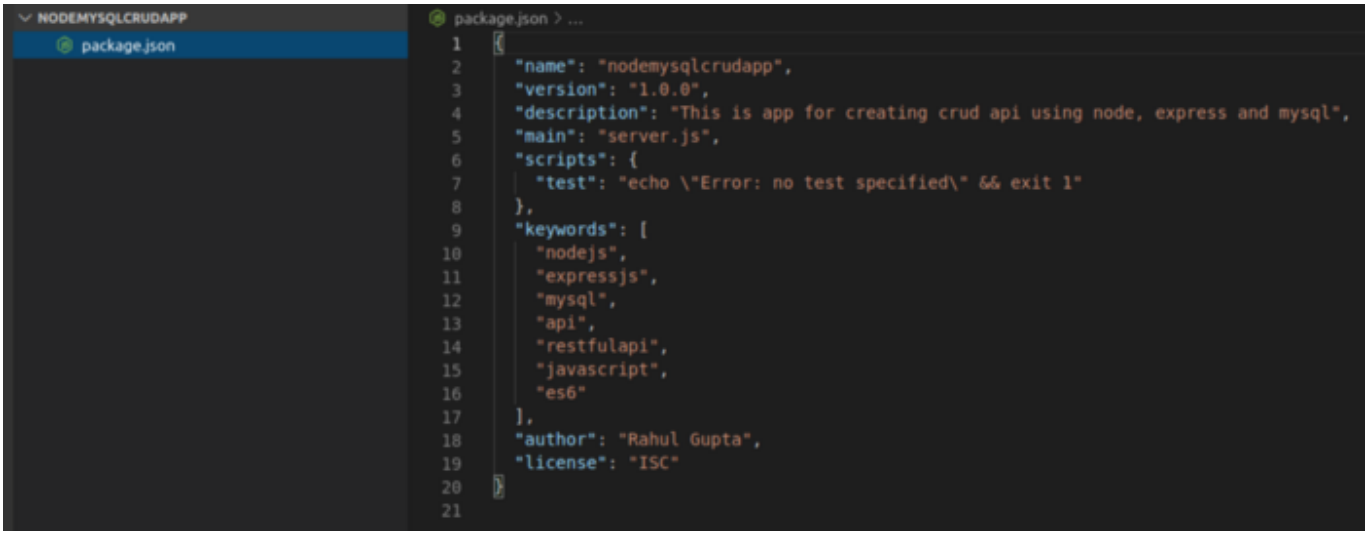
Now it's time to create our project. Create a directory name `NodeMysqlCrudApp` . Then navigate to `NodeMysqlCrudApp` directory. Command are as below

```
// Create directory
mkdir NodeMysqlCrudApp
```

```
// then Navigate to NodeMysqlCrudApp
cd NodeMysqlCrudApp
```

### Initialise and Configure Our Project

To initialise run the command in project folder `npm init` that will ask a few questions to avoid that you can run `npm init -y` . Finally `package.json` looks like below




package.json

### Install express and other dependencies

- **Express** is top framework of nodejs. Install using below command :

```
npm install express --save
```

- **Body Parser** is Node.js body parsing middleware. Parse incoming request bodies in a middleware before your handlers, available under the `req.body` property.

```
npm install body-parser --save
```

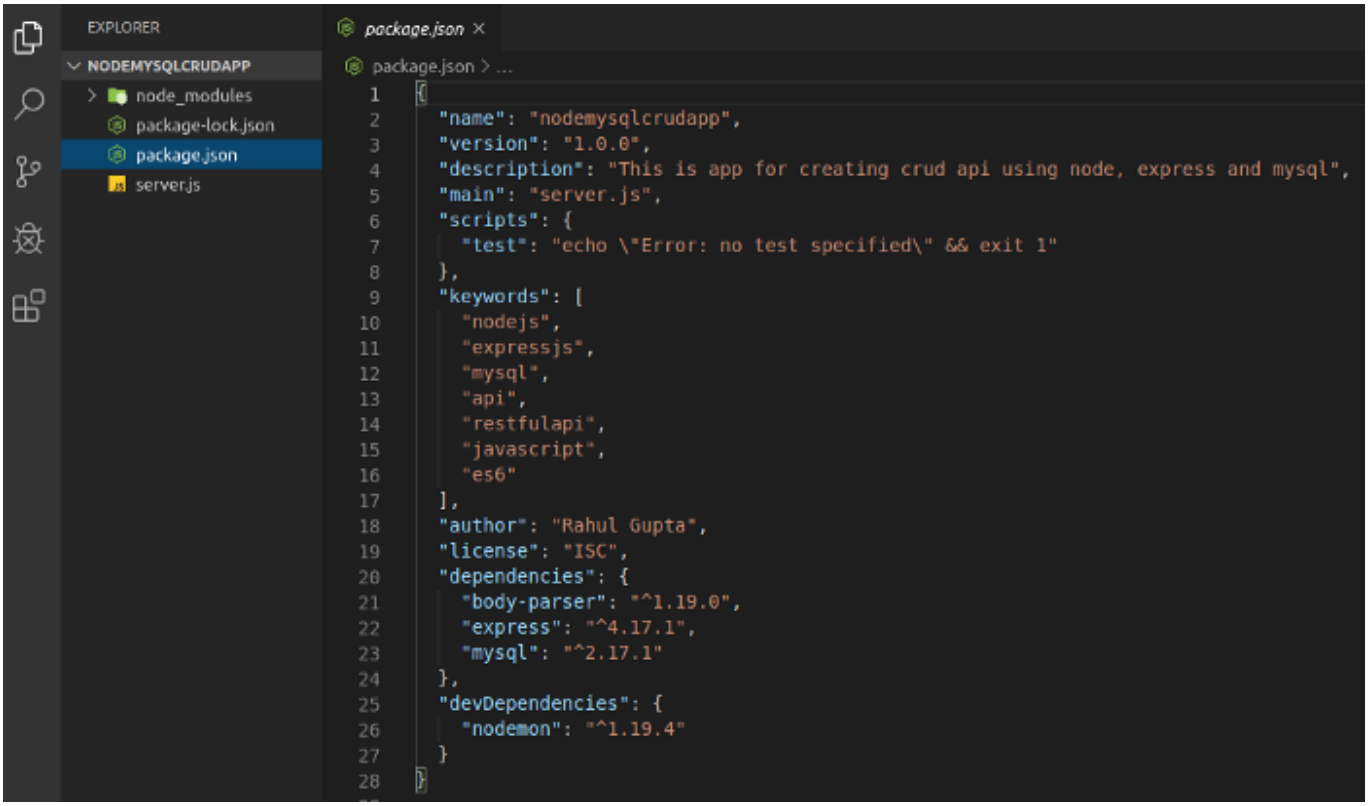
- **MySQL** is open source database use to interacting with database and manipulating the records.

```
npm install mysql --save
```

- **Nodemon** is a tool that helps develop node.js based applications by automatically restarting the node application when file changes in the directory are detected. Use `-dev` flag to save in devDependencies and `--save` will save the dependencies in package.json file.

```
npm install --save-dev nodemon
```

Now `package.json` looks like as below




package.json

## Start the web server

As we earlier we have created enter point of application is `server.js` , we will create server.js file at the root of project folder.

```
touch server.js
```

Add some code in `server.js` file

```
const express = require('express');
const bodyParser = require('body-parser');

// create express app
const app = express();

// Setup server port
const port = process.env.PORT || 5000;

// parse requests of content-type - application/x-www-form-
urlencoded
app.use(bodyParser.urlencoded({ extended: true }))

// parse requests of content-type - application/json
app.use(bodyParser.json())

// define a root route
app.get('/', (req, res) => {
  res.send("Hello World");
});

// listen for requests
app.listen(port, () => {
  console.log(`Server is listening on port ${port}`);
});
```

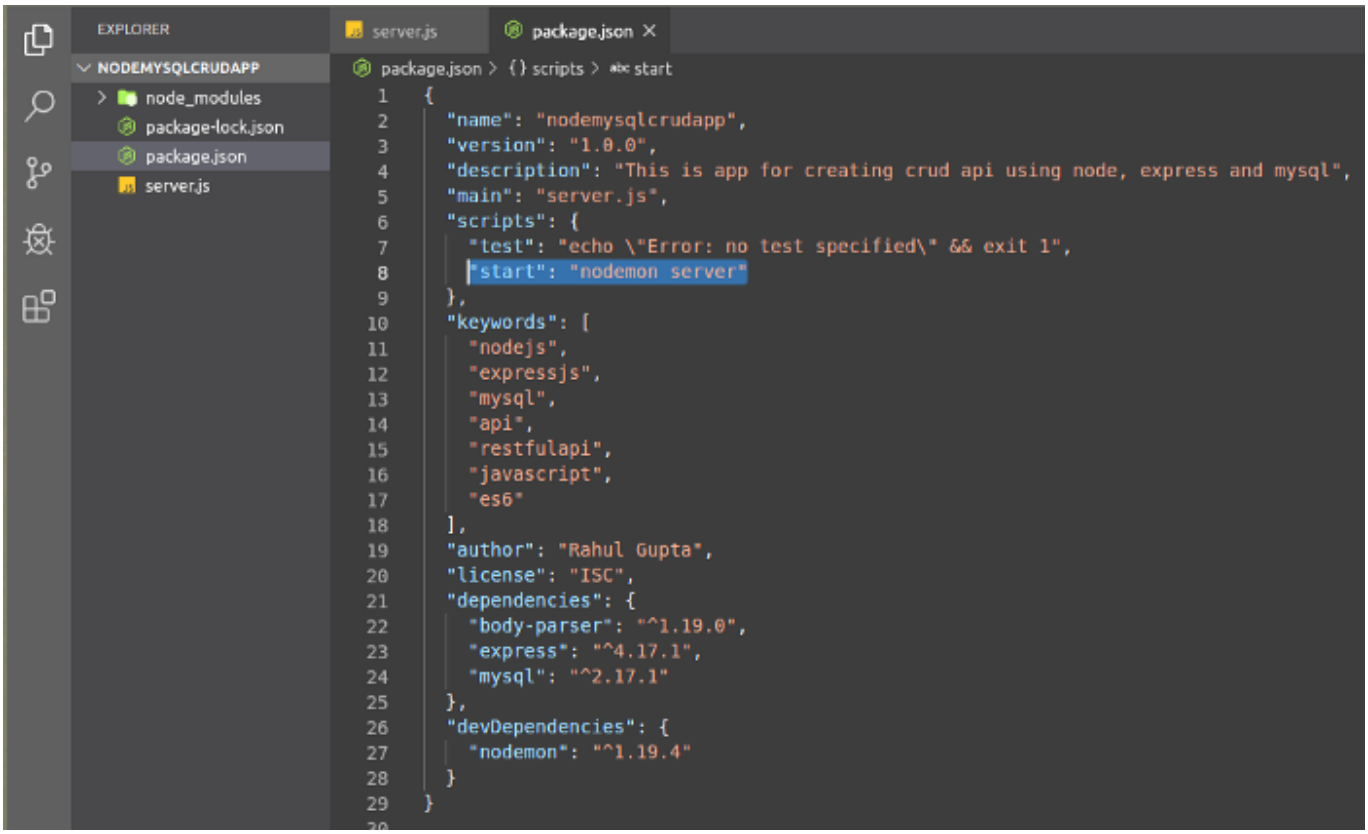
Now run the web server using `node server.js` or `node server` command :

```
node server.js

OR

node server
```

Now open your favourite browser and navigate to `http://localhost:5000` . Browser will show `Hello World` . That's great now our server is running.

In previous step we had installed `nodemon` . If we want run the server using nodemon then we have to use the `nodemon server.js` or `nodemon server` command. Let's do some change in `package.json` file , add a line of code in `scripts` object of package.json file.

```
"start": "nodemon server"
```




package.json

Now simply run `npm start` to run the server that will auto restart the serve when detect any change in files.

```
npm start
```

### Create database

```
CREATE DATABASE node_mysql_crud_db;
```

```
CREATE  TABLE IF NOT EXISTS `employees` (
  `id` BIGINT UNSIGNED AUTO_INCREMENT,
  `first_name` VARCHAR(255) NOT NULL,
  `last_name` VARCHAR(255) NOT NULL,
  `email` VARCHAR(255) NOT NULL,
  `phone` VARCHAR(50) NOT NULL,
  `organization` VARCHAR(255) NOT NULL,
  `designation` VARCHAR(100) NOT NULL,
  `salary` DECIMAL(11,2) UNSIGNED DEFAULT 0.00,
  `status` TINYINT UNSIGNED DEFAULT 0,
  `is_deleted` TINYINT UNSIGNED DEFAULT 0,
  `created_at` DATETIME NOT NULL,
  `updated_at` DATETIME DEFAULT CURRENT_TIMESTAMP ON UPDATE
CURRENT_TIMESTAMP,
  PRIMARY KEY (`id`))
ENGINE = InnoDB;

INSERT INTO `node_mysql_crud_db`.`employees` (`first_name`,
`last_name`, `email`, `phone`, `organization`, `designation`,
`salary`, `status`, `is_deleted`, `created_at`) VALUES ('John',
'Doe', 'johndoe@gmail.com', '1234567890', 'BR Softech Pvt Ltd',
'Full Stack Developer', '500.00', '1', '0', '2019-11-19 03:30:30');
INSERT INTO `node_mysql_crud_db`.`employees` (`first_name`,
`last_name`, `email`, `phone`, `organization`, `designation`,
`salary`, `status`, `is_deleted`, `created_at`) VALUES ('Jane',
'Doe', 'janedoe@gmail.com', '9876543210', 'RG Infotech Jaipur', 'PHP
Developer', '450.00', '1', '0', '2019-11-19 03:35:30');
```

### Make database connection

To make connectivity with database in our project we'll make seperate file. So create a `config` folder at root and make a `db.config.js` file inside `config` folder.

```
mkdir config
cd config
touch db.config.js
```

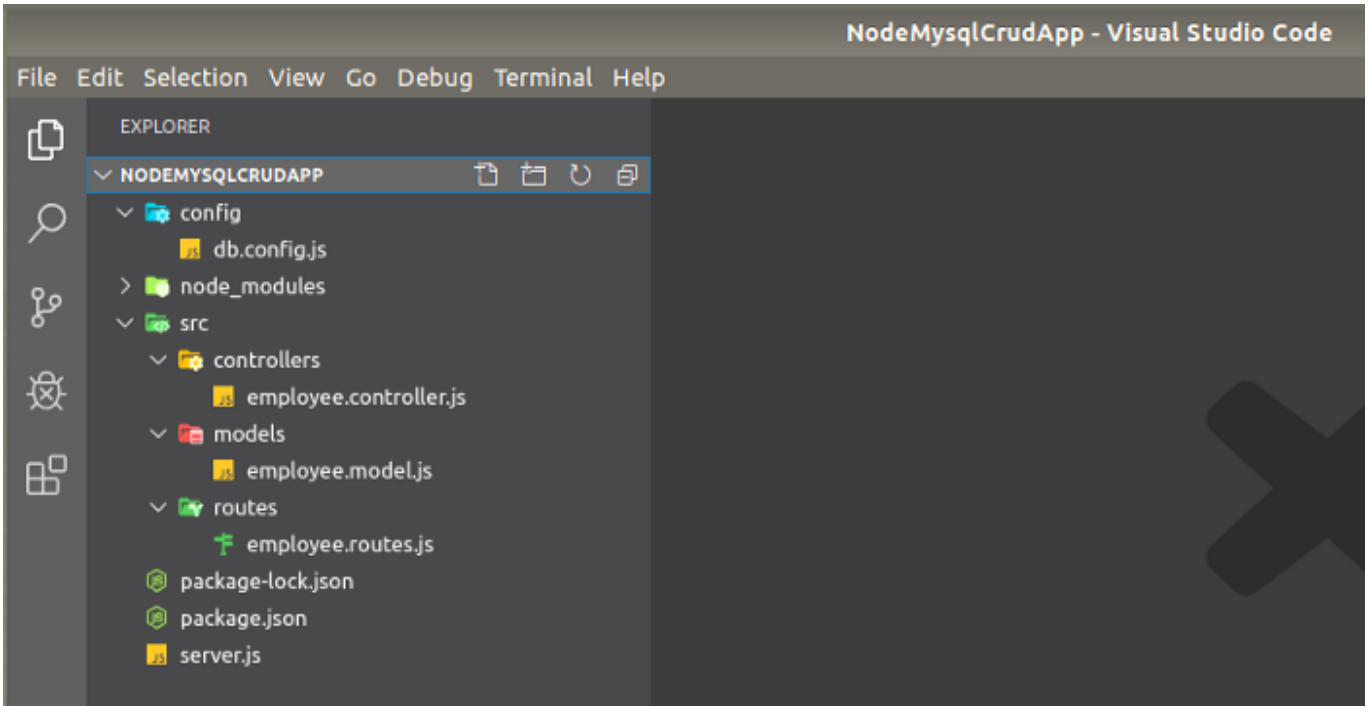
Now open `db.config.js` and add code below for creating mysql connection.

```
'use strict';

const mysql = require('mysql');

//local mysql db connection
```

```
const dbConn = mysql.createConnection({
  host     : 'localhost',
  user     : 'root',
  password : '',
  database : 'node_mysql_crud_db'
});
dbConn.connect(function(err) {
  if (err) throw err;
  console.log("Database Connected!");
});
module.exports = dbConn;
```

### Project Folder Structure

Now folder structure of project like as below




project directory structure

Complete `employee.model.js` file is here -

```
'use strict';

var dbConn = require('./../../config/db.config');

//Employee object create

var Employee = function(employee){

  this.first_name     = employee.first_name;

  this.last_name      = employee.last_name;

  this.email          = employee.email;

  this.phone          = employee.phone;

  this.organization   = employee.organization;

  this.designation    = employee.designation;

  this.salary         = employee.salary;

  this.status         = employee.status ? employee.status : 1;

  this.created_at     = new Date();

  this.updated_at     = new Date();

};

Employee.create = function (newEmp, result) {

dbConn.query("INSERT INTO employees set ?", newEmp, function (err,
res) {

if(err) {

  console.log("error: ", err);

  result(err, null);

}

else{

  console.log(res.insertId);
```

```
    result(null, res.insertId);

}

});

};

Employee.findById = function (id, result) {

dbConn.query("Select * from employees where id = ? ", id, function
(err, res) {

if(err) {

  console.log("error: ", err);

  result(err, null);

}

else{

  result(null, res);

}

});

};

Employee.findAll = function (result) {

dbConn.query("Select * from employees", function (err, res) {

if(err) {

  console.log("error: ", err);

  result(null, err);

}

else{

  console.log('employees : ', res);

  result(null, res);

}
```

```
});

};

Employee.update = function(id, employee, result){

dbConn.query("UPDATE employees SET
first_name=?,last_name=?,email=?,phone=?,organization=?,designation=
?,salary=? WHERE id = ?",
[employee.first_name,employee.last_name,employee.email,employee.phon
e,employee.organization,employee.designation,employee.salary, id],
function (err, res) {

if(err) {

  console.log("error: ", err);

  result(null, err);

}else{

  result(null, res);

}

});

};

Employee.delete = function(id, result){

dbConn.query("DELETE FROM employees WHERE id = ?", [id], function
(err, res) {

if(err) {

  console.log("error: ", err);

  result(null, err);

}

else{

  result(null, res);

}

});
```

```
};

module.exports= Employee;
```

Here is complete `employee.controller.js` file -

```
'use strict';

const Employee = require('../models/employee.model');

exports.findAll = function(req, res) {

Employee.findAll(function(err, employee) {

  console.log('controller')

  if (err)

  res.send(err);

  console.log('res', employee);

  res.send(employee);

});

};

exports.create = function(req, res) {

const new_employee = new Employee(req.body);

//handles null error

if(req.body.constructor === Object && Object.keys(req.body).length
=== 0){

  res.status(400).send({ error:true, message: 'Please provide all
required field' });

}else{

Employee.create(new_employee, function(err, employee) {

  if (err)

  res.send(err);
```

```
  res.json({error:false,message:"Employee added
successfully!",data:employee});

});

}

};

exports.findById = function(req, res) {

Employee.findById(req.params.id, function(err, employee) {

  if (err)

  res.send(err);

  res.json(employee);

});

};

exports.update = function(req, res) {

  if(req.body.constructor === Object && Object.keys(req.body).length
=== 0){

    res.status(400).send({ error:true, message: 'Please provide all
required field' });

  }else{

    Employee.update(req.params.id, new Employee(req.body),
function(err, employee) {

   if (err)

   res.send(err);

   res.json({ error:false, message: 'Employee successfully updated'
});

});

}

};

exports.delete = function(req, res) {
```

```
Employee.delete( req.params.id, function(err, employee) {

  if (err)

  res.send(err);

  res.json({ error:false, message: 'Employee successfully deleted'
});

});

};
```

Here is complete `employee.routes.js` file -

```
const express = require('express')

const router = express.Router()

const employeeController =
require('../controllers/employee.controller');

// Retrieve all employees

router.get('/', employeeController.findAll);

// Create a new employee

router.post('/', employeeController.create);

// Retrieve a single employee with id

router.get('/:id', employeeController.findById);

// Update a employee with id

router.put('/:id', employeeController.update);

// Delete a employee with id

router.delete('/:id', employeeController.delete);

module.exports = router
```

Now finally complete `server.js` file here :

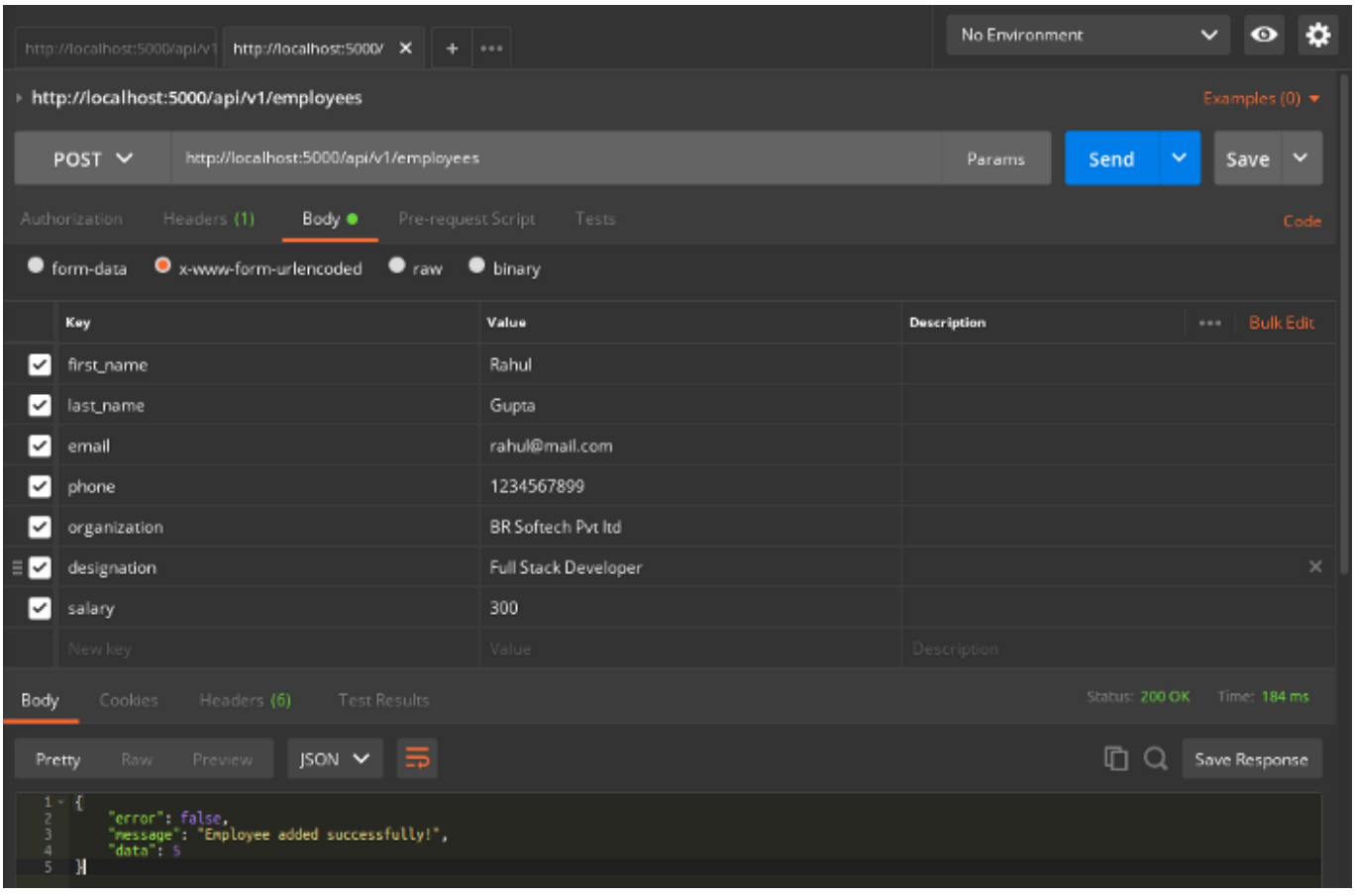
```
const express = require('express');

const bodyParser = require('body-parser');

// create express app

const app = express();

// Setup server port

const port = process.env.PORT || 5000;

// parse requests of content-type - application/x-www-form-
urlencoded

app.use(bodyParser.urlencoded({ extended: true }))

// parse requests of content-type - application/json

app.use(bodyParser.json())

// define a root route

app.get('/', (req, res) => {

  res.send("Hello World");

});

// Require employee routes

const employeeRoutes = require('./src/routes/employee.routes')

// using as middleware

app.use('/api/v1/employees', employeeRoutes)

// listen for requests

app.listen(port, () => {

  console.log(`Server is listening on port ${port}`);

});
```

## API End Points

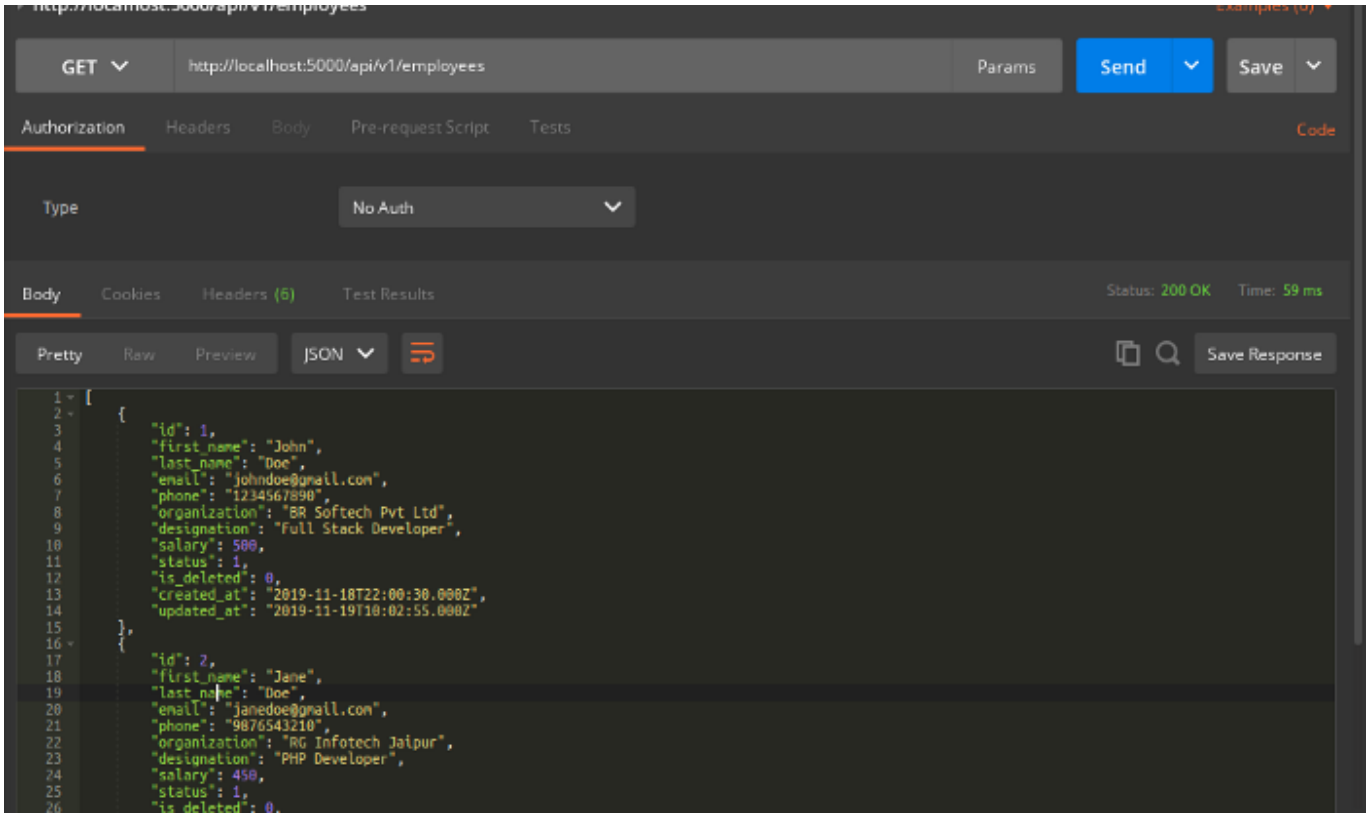
1. GET /api/v1/employees: will give all employees stored in database
2. GET /api/v1/employees/<employee_id>: will give a specific employee with employee_id.
3. POST /api/v1/employees : create a employee
4. PATCH /api/v1/employees/<employee_id>: update a employee partially
5. DELETE /api/v1/employees/<employee_id>: delete a employee
6. PUT /api/v1/employees/<employee_id>: update a employee completely

### APIs Test in Postman

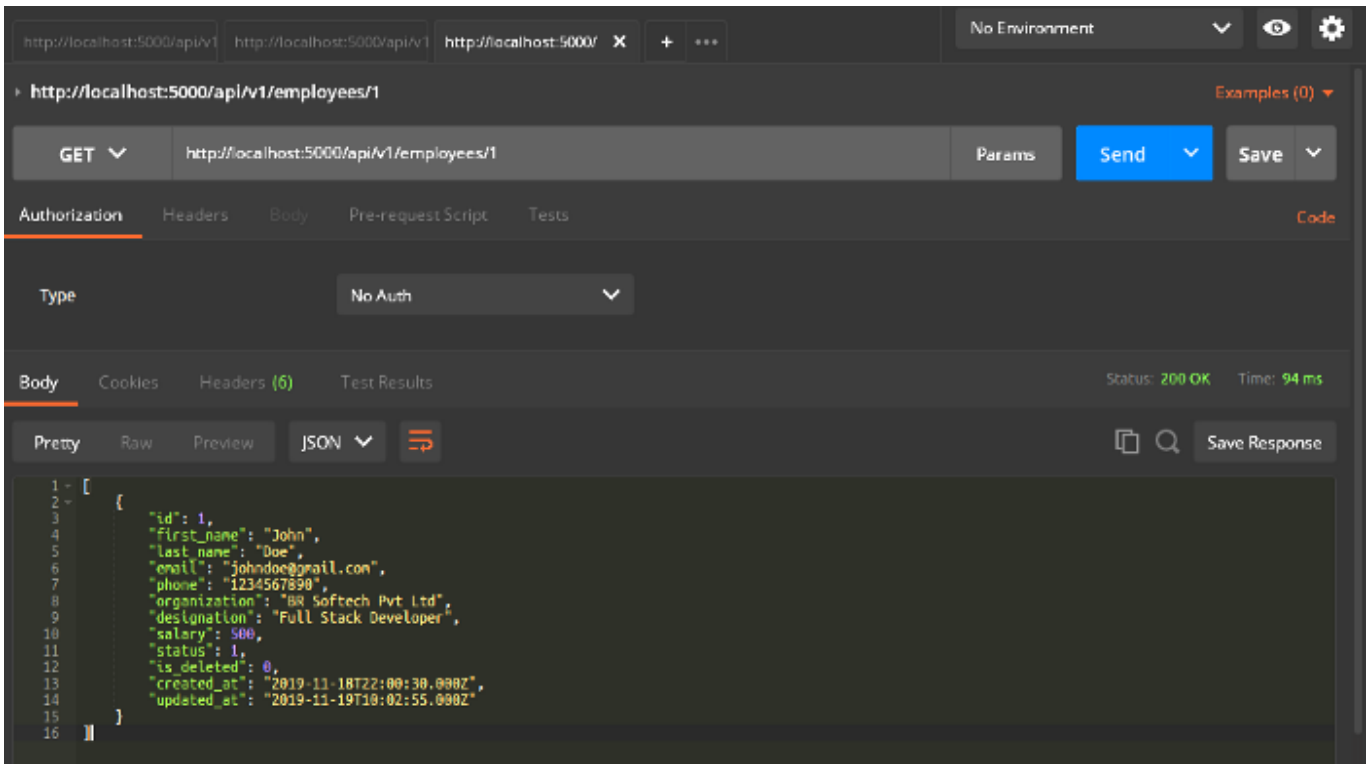
Creating a new employee `api/v1/employees` using `POST` method



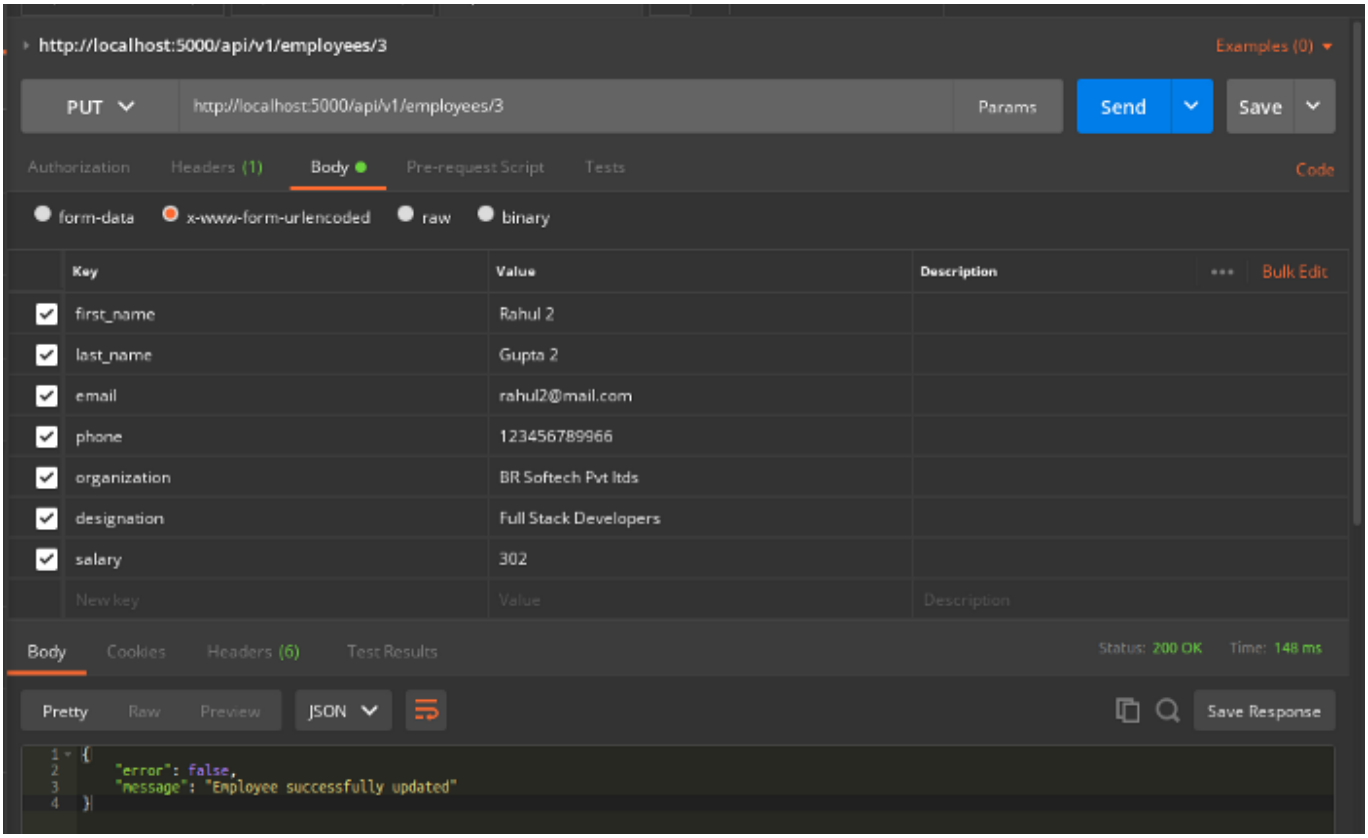

Get all employees list `api/v1/employees` using `GET` method



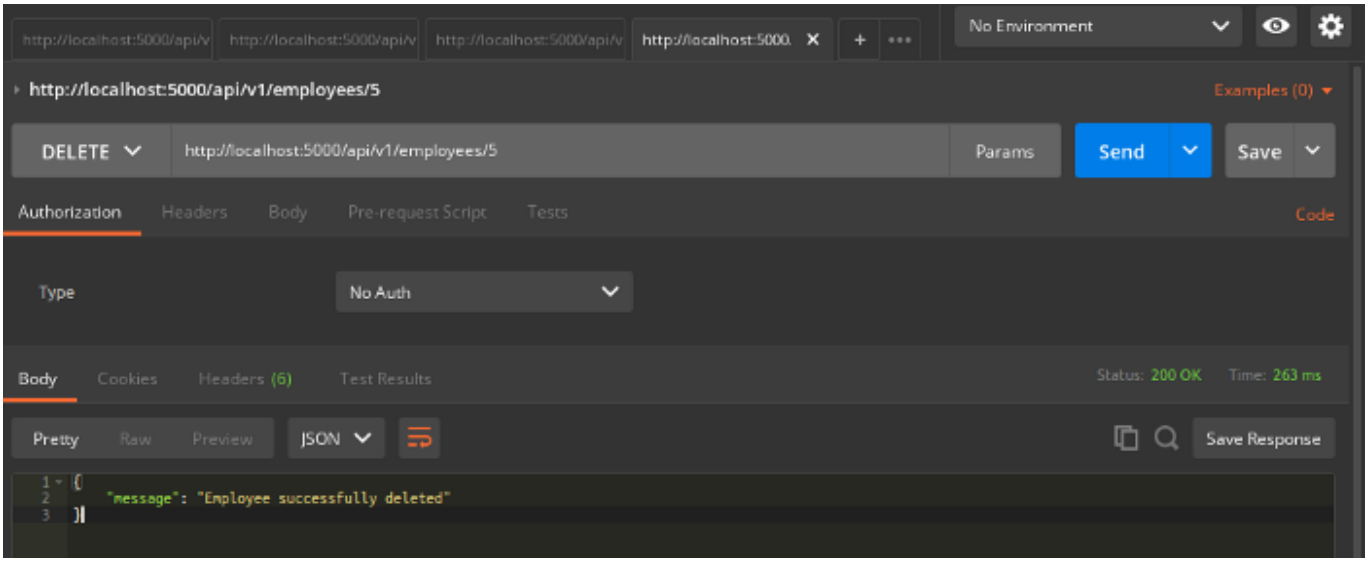

Get specific employee `api/v1/employees/id` using `GET` method




Update specific employee `api/v1/employees/id` using `PUT` method




Delete specific employee `api/v1/employees/id` using `DELETE` method




Watch the on YouTube:-

https://youtu.be/zgQq-gNvKH0

You can find it on git repository here.

https://github.com/rahulguptafullstack/node-mysql-crud-app

Thank for reading.

Nodejs Expressjs MySQL Restful Api API