



REST API

#Node JS Notes

What is API?

- A web service is a collection of open protocols and standards used for exchanging data between applications or systems.
- Software applications written in various programming languages and running on various platforms can use web services to exchange data over computer networks like the Internet in a manner similar to inter-process communication on a single computer.



What is API?

- API (Application Program Interface) is an agreed way to send and receive data between computers.
- For example, if you want to display Google Maps on your site, but the maps are on Google's servers, you need a way to ask Google to provide you with the maps.
- The way to ask Google to send you the requested maps is through an API provided by Google that tells you to which web addresses should you send the requests to get the data.
- In a more formal language, you need to send a request to the remote server to get a response.



What is Rest?

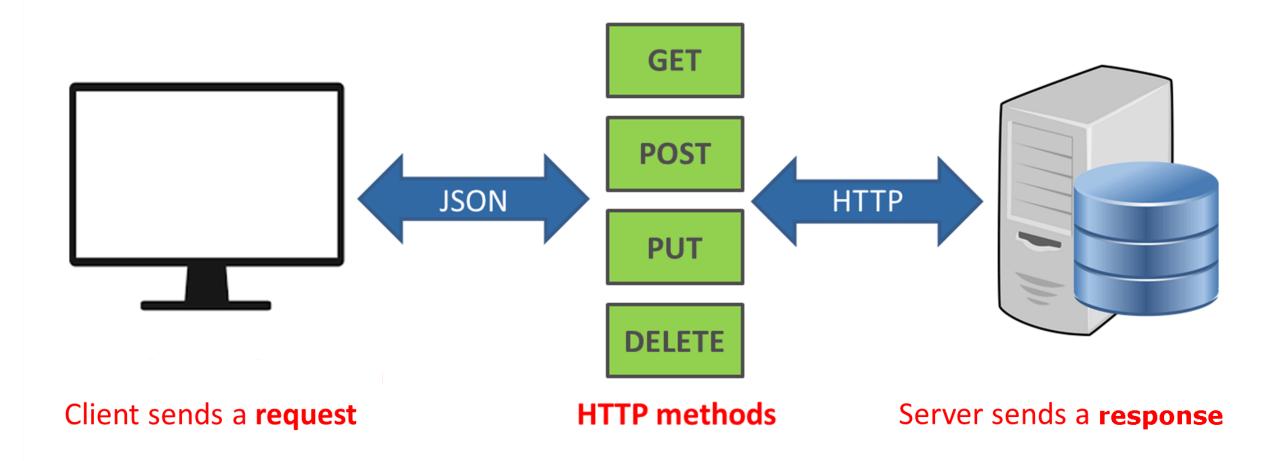
• **REST** (Representational State Transfer) is an API that defines a set of functions that programmers can use to send requests and receive responses using the HTTP protocol methods such as GET and POST.



What is REST API?

• **REST API** can be used by any site or application no matter what language it is written in because the requests are based on the universal HTTP protocol, and the information is usually returned in the JSON format that almost all of the programming languages can read.







HTTP methods

- Following four HTTP methods are commonly used in REST based architecture.
- **GET** Retrieves data from a remote server. It can be a single resource or a list of resources.
- **POST** Creates a new resource on the remote server.
- PUT Updates the data on the remote server.
- DELETE Deletes data from the remote server.



HTTP status codes

Code	Message	Description	
200	ОК	The data was received and the operation was performed.	
201	Created	The data was received and a new resource was created. The response needs to return the data in the payload.	
204	No content	The operation was successful but no data is returned in the response body. This is useful when deleting a resource.	
301	Moved permanently	This and all the future requests should be redirected to a new URL.	
302	Moved temporarily	The resource moved temporarily to another URL.	
400	Bad request	The server cannot accept the request because something is wrong with the client or the request that it sent.	
403	Forbidden	The client is not allowed to use the resource.	
404	Not found	The computer is not able to find the resource.	
405	Method not allowed	For example, when sending a DELETE request to a server that doesn't support the method.	
500	Internal server error	Service unavailable due to error on the server side.	

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- For example, to create a new article on our blog, we should send a request to a remote server using the POST HTTP method.
- To view a single article or a list of articles, we use the GET method. The PUT method can be used to edit an existing article, and the DELETE method to delete.

Method	Url	Action
GET	users	fetch all users
GET	user/1	fetch user with id =1
POST	user	add new user
PUT	user/1	update user by id = 1
DELETE	user/1	delete user by id = 1



- **GET** /photo Retrieve all photos
- GET /photo/:id Retrieve a photo by its ID
- POST /photo Create a new photo
- PUT /photo/:id Update properties of a photo by its ID
- **DELETE** /photo/:id Delete a photo by its ID



Software to Test API

- PostMan
 - https://www.postman.com/downloads/
- VS Code (Thunder Client)
 - https://marketplace.visualstudio.com/items?itemName=rangav.vscode-thunder-client
 - https://www.thunderclient.io/
- JSON Viewer Chrome Extenstion (Get Method)
 - https://chrome.google.com/webstore/detail/json-viewer/gbmdgpbipfallnflgajpaliibnhdgobh



JSON Validator

- https://jsonlint.com/
- https://jsonformatter.org/
- https://jsonformatter.curiousconcept.com/
- https://elmah.io/tools/json-formatter/
- https://codebeautify.org/jsonvalidator

```
### SONULIT-THE SON Validator

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```





Fake JSON Data

- https://jsonplaceholder.typicode.com/
- https://www.mockaroo.com/
- https://fakestoreapi.com/
- https://www.npmjs.com/package/json-server
- https://www.mockachino.com/
- https://dummy.restapiexample.com/
- https://gorest.co.in/



JSON DATA Pass

Simple Json Data Convert

```
res.send(JSON.stringify(rows));
```

Json Data with Status Code

```
res.status(200).send(JSON.stringify(rows));
```

Json Data with Status Code Error

```
res.status(500).send(JSON.stringify({"msg":"Error"}));
```



Json Data with Object and Array

```
res.send(JSON.stringify({"status": 200,"flag": 1, "message": "Data Fetch", "data": rows})); res.send(JSON.stringify({"status": 500,"flag": 0, "message": "Error", "data": err}));
```

Json Data with Status Code a Object and Array

```
res.status(500).send(JSON.stringify({"status": 500,"flag": 0, "message": "Error", "data": err})); res.status(200).send(JSON.stringify({"status": 200,"flag": 1, "message": "Data Deleted", "data": "}));
```



MongoDB

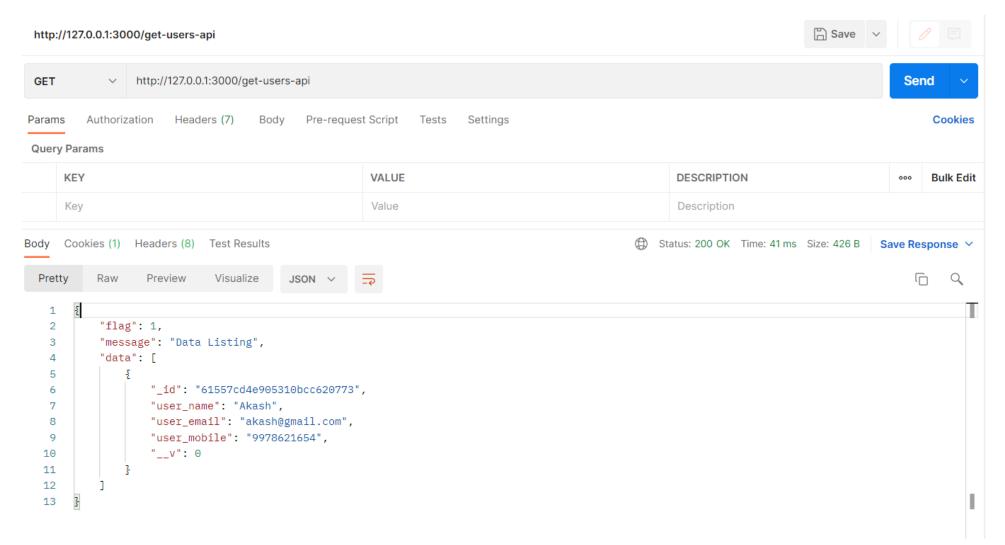


Display

```
//Get All Data API
router.get('/get-users-api', function(req, res, next) {
    UsersModel.find({}, function(err, mydata) {
        if (err) {
            res.send(JSON.stringify({'flag':0,'message':'Error in API','err' : err}));
        } else {
            res.send(JSON.stringify({'flag':1,'message':'Data Listing','data':mydata}));
        }
    });
});
```



Display



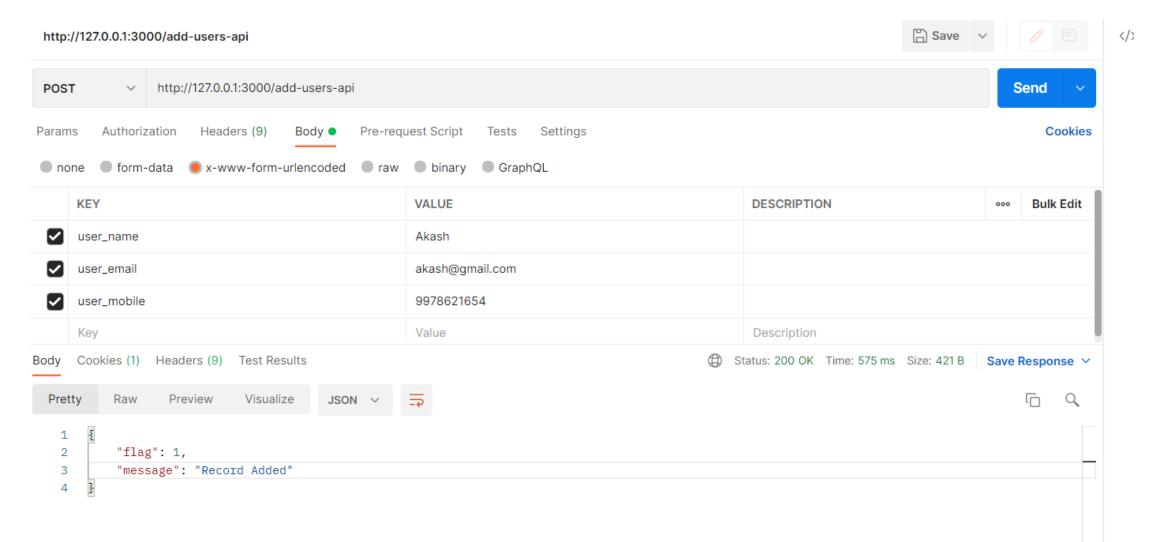


Add Record

```
//Add Data API
router.post('/add-users-api', function(req, res, next) {
    console.log(req.body);
    const mybodydata = {
        user_name: req.body.user_name,
        user_email: req.body.user_email,
        user_mobile: req.body.user_mobile
    var data = UsersModel(mybodydata);
    data.save(function(err) {
        if (err) {
            res.send(JSON.stringify({'flag':0,'message':'Error in API','err' : err}));
         else {
            res.send(JSON.stringify({'flag':1,'message':'Record Added'}));
```



Add Record





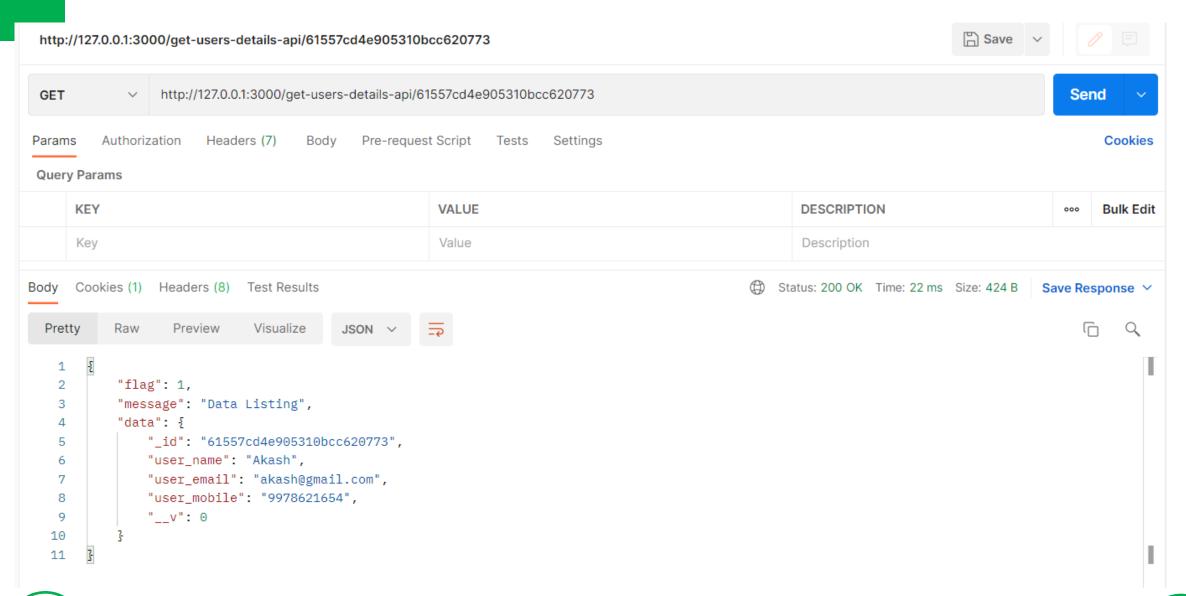
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Single Record

```
/* GET SINGLE Data BY ID */
router.get('/get-users-details-api/:id', function(req, res, next) {
  UsersModel.findById(req.params.id, function (err, mydata) {
   if(err){
       res.send(JSON.stringify({'flag':0,'message':'Error in API','err' : err}));
  }else{
    res.send(JSON.stringify({'flag':1,'message':'Data Listing','data':mydata}));
```



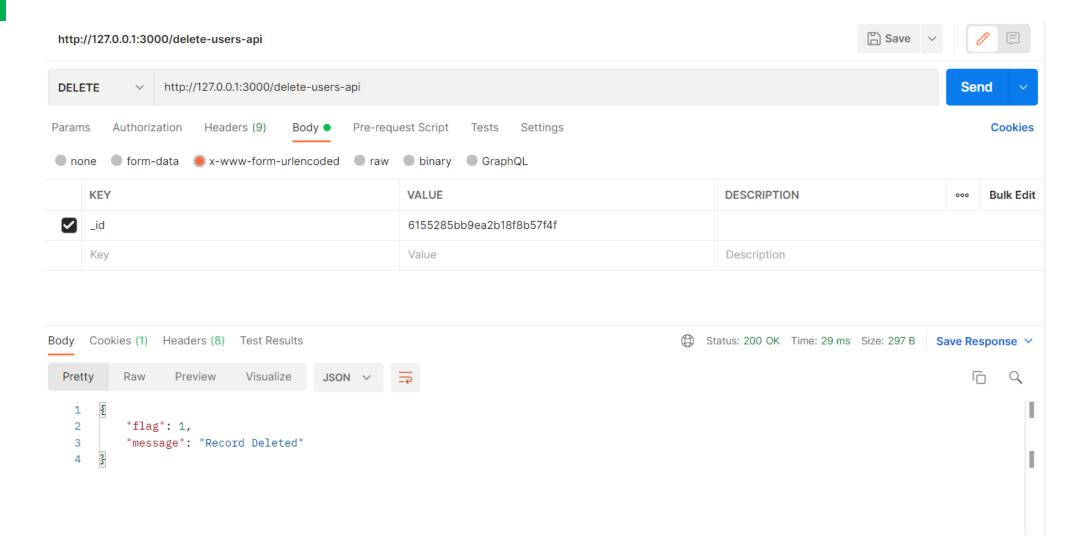




Delete

```
/* DELETE Data BY ID */
router.delete('/delete-users-api', function(req, res, next) {
  UsersModel.findByIdAndRemove(req.body._id, function (err, post) {
    if (err) {
        res.send(JSON.stringify({'flag':0,'message':'Error in API','err' : err}));
     else {
         res.send(JSON.stringify({'flag':1,'message':'Record Deleted'}));
 });
```



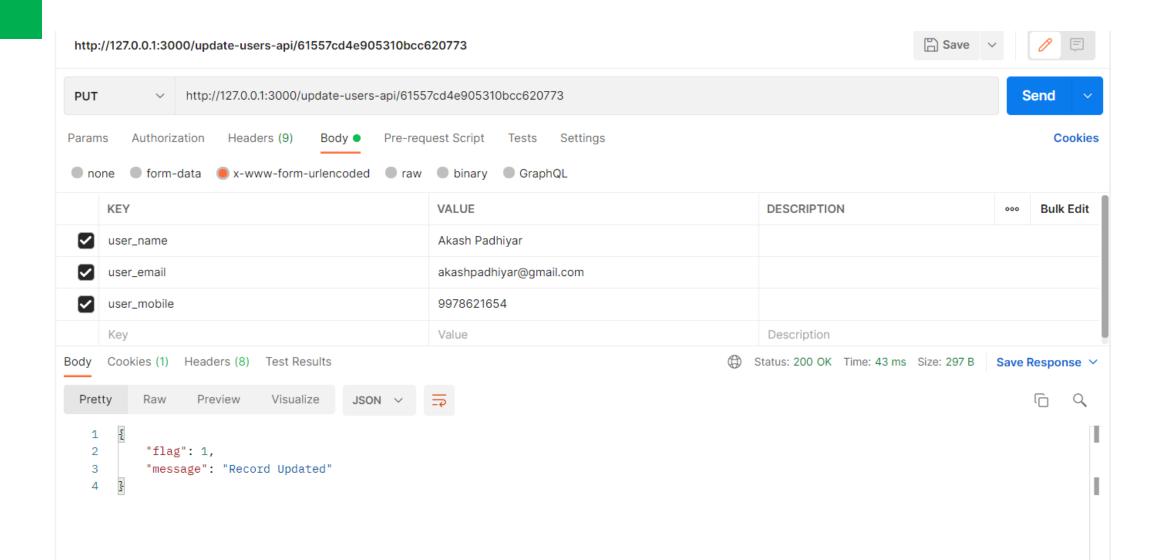




Update

```
/* UPDATE Data API */
router.put('/update-users-api/:id', function(req, res, next) {
  console.log(req.params.id);
  UsersModel.findByIdAndUpdate(req.params.id, req.body, function (err, post) {
  if (err) {
    res.send(JSON.stringify({'flag':0,'message':'Error in API','err' : err}));
  } else {
    res.send(JSON.stringify({'flag':1,'message':'Record Updated'}));
});
```





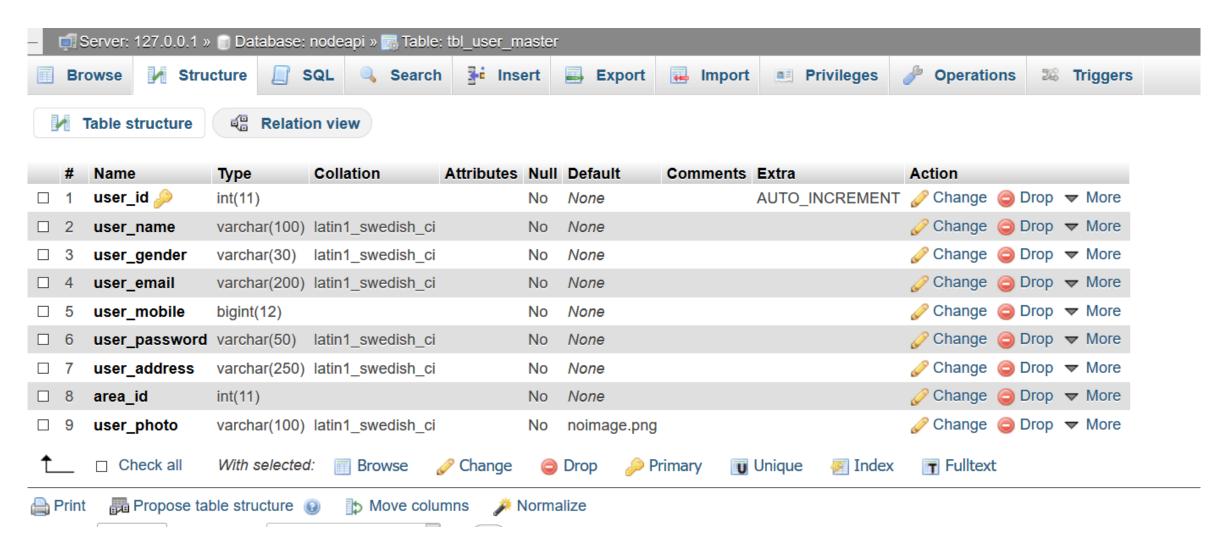


(JS)

API Create using Mysql

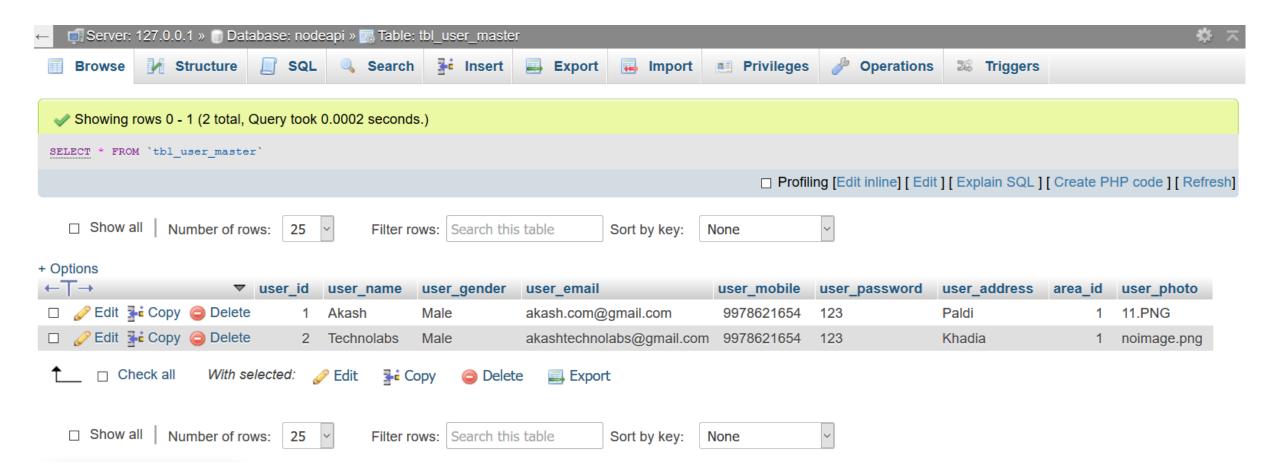


Table Structure





Record





Mysql Connection

```
File Edit Selection View Go Run Terminal Help
                                                                     index.js - api - Visual Studio Code
                           JS index.js X
      EXPLORER
    ∨ OPEN EDITORS
                           routes > JS index.js > ...
                                   var express = require('express');
      X JS index.js routes
                                   var mysql = require('mysql');

✓ API

                                   var router = express.Router();
      > 💼 bin
مړ
      //Db Connection Start
      > 📹 database
₽
                                   var connection = mysql.createConnection({
      > node modules
                                       host: 'localhost',
      > 🌃 public
                                       user: 'root',
      品
                                       password: '',
         JS index.js
                                       database: 'nodeapi'
         JS users.js
                             10
                                   });
        views
                             11
        JS app.js
                             12
                                   connection.connect(function (err) {
        package-lock.json
                             13
                                       if (!err) {
        package.json
                             14
                                            console.log("Database is connected ");
        ™ README.md
                             15
                             16
                                       } else {
                                            console.log("Error connecting database" + err);
                             17
                             18
                             19
                                   });
                             20
                                   //DB Connection End
                             21
```



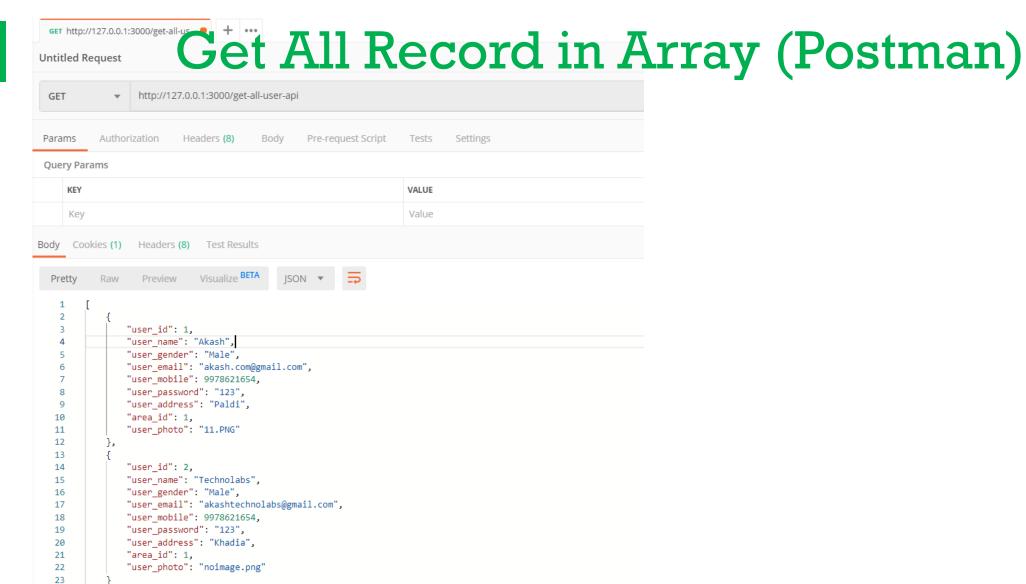


Get all User Data

```
File Edit Selection View Go Run Terminal Help
                                                                    index.js - api - Visual Studio Code
     JS index.js X
      routes > JS index.js > ...
        22
        23
        24 //Display Home Page (Index Page)
             router.get('/', function (req, res, next) {
                 res.render('index');
        26
             });
        28
            //Display all records API
品
             router.get('/get-all-user-api', function (req, res, next) {
        31
                 connection.query("select * from tbl user master", function (err, rows) {
        32
                     if (err) {
        33
                          res.send(JSON.stringify({"status": 500,"flag": 0, "message": "Error", "data": err}));
        34
        35
                       else {
                          console.log(rows);
        36
        37
                          res.send(JSON.stringify(rows));
        38
                 })
        39
             });
```



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24



```
    3 127.0.0.1;3000/get-all-user-api
    ★
    ★
    C
    ① 127.0.0.1;3000/get-all-user-api
```

Chrome Output

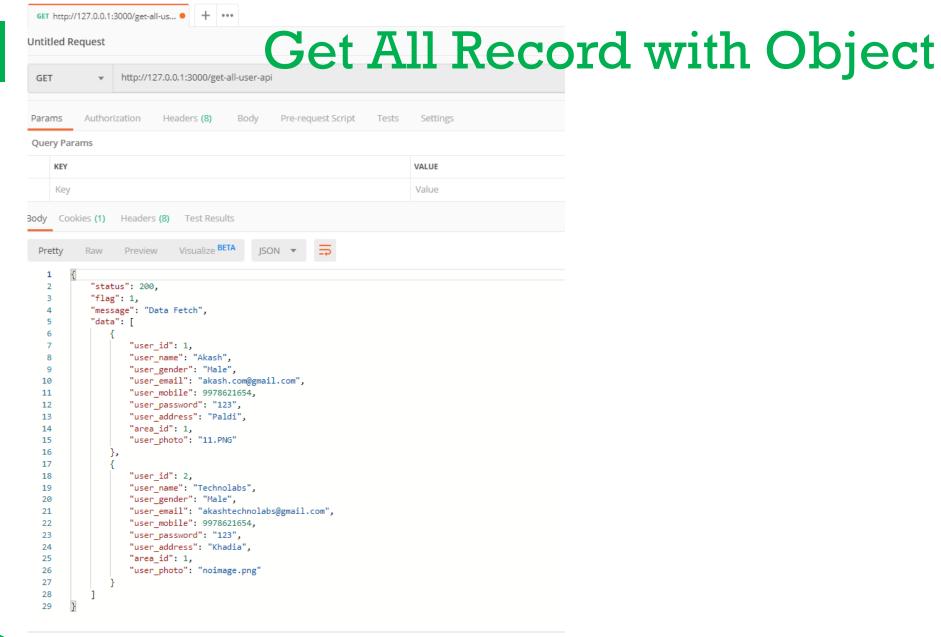
```
// 20200418202959
      // http://127.0.0.1:3000/get-all-user-api
3
4
5
6
          "user_id": 1,
          "user name": "Akash",
8
          "user gender": "Male",
          "user_email": "akash.com@gmail.com",
9
          "user mobile": 9978621654,
10
11
          "user password": "123",
12
          "user_address": "Paldi",
13
          "area_id": 1,
          "user_photo": "11.PNG"
14
15
        },
16 ▼
          "user_id": 2,
17
18
          "user_name": "Technolabs",
          "user_gender": "Male",
19
          "user_email": "akashtechnolabs@gmail.com",
20
          "user_mobile": 9978621654,
21
          "user_password": "123",
22
23
          "user_address": "Khadia",
          "area id": 1,
24
          "user photo": "noimage.png"
25
26
```



Get All Record with Object

```
JS index.js X
routes > Js index.js > \bigcirc router.get('/get-all-user-api') callback > \bigcirc connection.query("select * from tbl_user_master") callback
  22
  23
       //Display Home Page (Index Page)
  24
  25
       router.get('/', function (req, res, next) {
            res.render('index');
  26
  27
        });
  28
  29
       //Display all records API
  30
        router.get('/get-all-user-api', function (req, res, next) {
  31
            connection.query("select * from tbl user master", function (err, rows) {
  32
                if (err) {
  33
                     res.send(JSON.stringify({"status": 500,"flag": 0, "message": "Error", "data": err}));
  34
                  else {
  35
                     console.log(rows);
  36
  37
                     res.send(JSON.stringify({"status": 200,"flag": 1, "message": "Data Fetch", "data": rows}));
  38
  39
  40
        });
```







```
③ 127.0.0.1:3000/get-all-user-api × +
 ← → C ↑ ① 127.0.0.1:3000/get-all-user-api
      // 20200418202924
      // http://127.0.0.1:3000/get-all-user-api
 3
4 ▼ {
 5
        "status": 200,
        "flag": 1,
 6
 7
        "message": "Data Fetch",
        "data": [
 8 🔻
9 🔻
            "user_id": 1,
10
            "user_name": "Akash",
11
            "user_gender": "Male",
12
            "user_email": "akash.com@gmail.com",
13
            "user_mobile": 9978621654,
14
            "user_password": "123",
15
            "user_address": "Paldi",
16
17
            "area_id": 1,
            "user_photo": "11.PNG"
18
19
          },
20 🔻
            "user_id": 2,
21
            "user_name": "Technolabs",
22
            "user_gender": "Male",
23
24
            "user_email": "akashtechnolabs@gmail.com",
            "user_mobile": 9978621654,
25
            "user_password": "123",
26
            "user_address": "Khadia",
27
            "area_id": 1,
28
            "user_photo": "noimage.png"
29
30
31
32 }
```



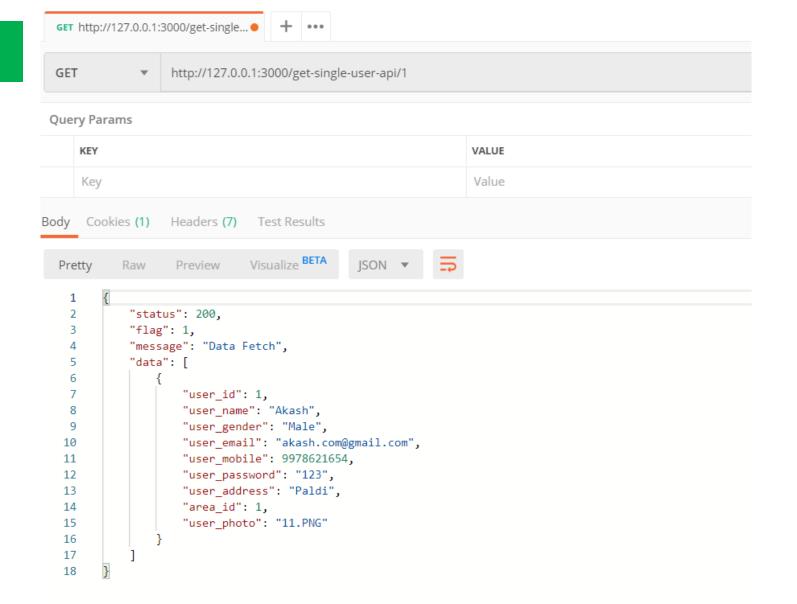
```
JS index.js
routes > JS index.js > 分 router.get('/get-single-user-api/:id') callback
  42
       //Get Single User Data API
       router.get('/get-single-user-api/:id', function (req, res, next) {
  43
  44
           var id = req.params.id;
  45
           console.log("Parameter Value" + id);
  46
           connection.query("select * from tbl_user_master where user_id = ?", [id], function (err, rows) {
  47
  48
                if (err) {
                    res.send(JSON.stringify({"status": 500,"flag": 0, "message": "Error", "data": err}));
  49
                } else {
  50
  51
                    console.log(rows);
  52
                    res.send(JSON.stringify({"status": 200,"flag": 1, "message": "Data Fetch", "data": rows}));
  53
  54
           })
  55
  56
```



Check Data Present or not and Print Counter

```
JS index.js
routes > Js index.js > \bigcirc router.get('/get-all-user-api') callback > \bigcirc connection.guery("select * from tbl_user_master") callback
  28
       //Display all records API
  29
       router.get('/get-all-user-api', function (req, res, next) {
  30
  31
  32
            connection.query("select * from tbl user master", function (err, rows) {
                if (err) {
  33
  34
                    res.send(JSON.stringify({"status": 500,"flag": 0, "message": "Error", "data": err}));
  35
                } else {
                    if(rows && rows.length>0)
  37
                         count = rows.length;
  38
                         console.log(rows);
  39
                         res.send(JSON.stringify({"status": 200,"flag": 1, "message": count + " Records Found", "data": rows}));
  40
  41
                     }else{
  42
                         res.send(JSON.stringify({"status": 200,"flag": 0, "message": "NO Records Found"}));
  43
  44
  46
```







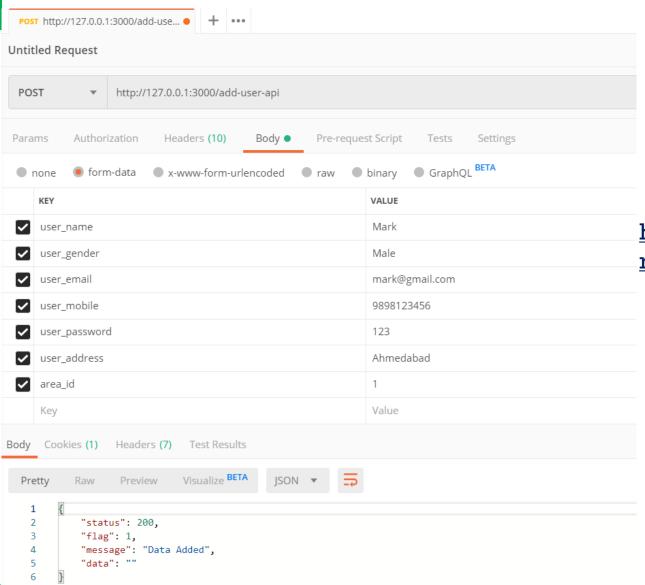
```
③ 127.0.0.1:3000/get-single-user-ap x +
← → C ↑ ① 127.0.0.1:3000/get-single-user-api/1
      // 20200418203120
1
      // http://127.0.0.1:3000/get-single-user-api/1
 3
4
         "status": 200,
 5
         "flag": 1,
        "message": "Data Fetch",
        "data": [
 8
9 🔻
             "user_id": 1,
10
             "user_name": "Akash",
11
12
             "user_gender": "Male",
             "user_email": "akash.com@gmail.com",
13
             "user_mobile": 9978621654,
14
             "user_password": "123",
15
             "user_address": "Paldi",
16
17
             "area_id": 1,
18
             "user_photo": "11.PNG"
19
20
21
```



Add Record

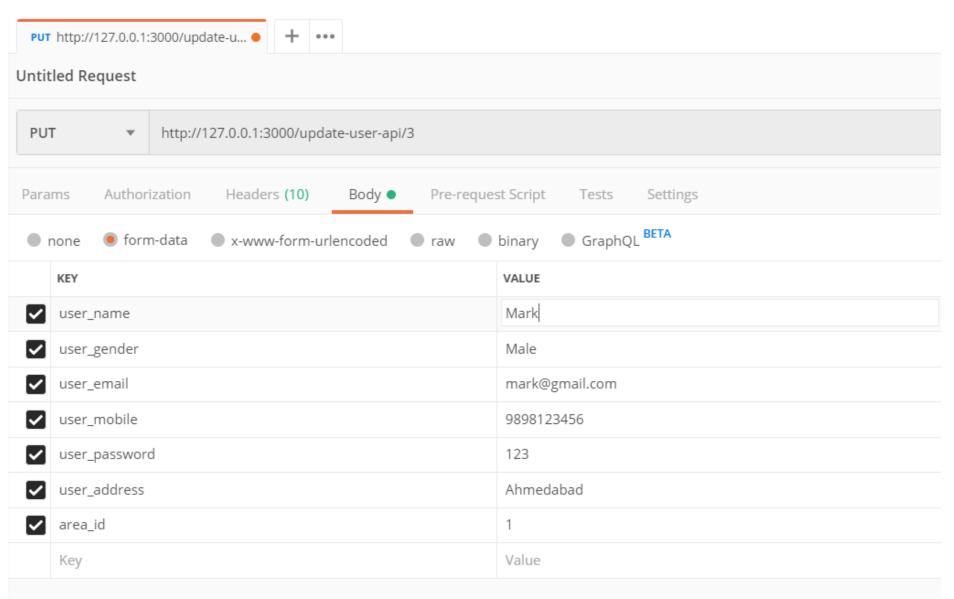
```
JS index.js X
routes > JS index.js > 分 router.post('/add-user-api') callback > ❷ mybodydata
       //Add User API Using Post Method
       router.post('/add-user-api', function (req, res, next) {
  60
           console.log("Body Data "+req.body);
  62
           const mybodydata = {
  63
               user_name: req.body.user_name,
  64
               user_gender: req.body.user_gender,
               user email: req.body.user email,
               user mobile: req.body.user mobile,
  67
               user password: req.body.user password,
               user_address: req.body.user_address,
               area id: req.body.area id
  69
  70
  71
           connection.query("insert into tbl user master set ?", mybodydata, function (err, result) {
  72
               if (err) {
  73
                   res.send(JSON.stringify({"status": 500,"flag": 0, "message": "Data Fetch", "data": err}));
  74
               } else {
  75
                   res.send(JSON.stringify({"status": 200,"flag": 1, "message": "Data Added", "data": ''}));
  76
  77
           });
  78
  79
       });
  80
```





https://learning.postman.com/docs/sendingrequests/requests/







What is the difference between form-data, x-www-form-urlencoded and raw

- These are different Form content types defined by W3C. If you want to send simple text/ ASCII data, then x-www-form-urlencoded will work. This is the default.
- But if you have to send non-ASCII text or large binary data, the form-data is for that.
- You can use Raw if you want to send plain text or JSON or any other kind of string. Like the name suggests, Postman sends your raw string data as it is without modifications. The type of data that you are sending can be set by using the content-type header from the drop down.
- Binary can be used when you want to attach non-textual data to the request,
 e.g. a video/audio file, images, or any other binary data file.



Update

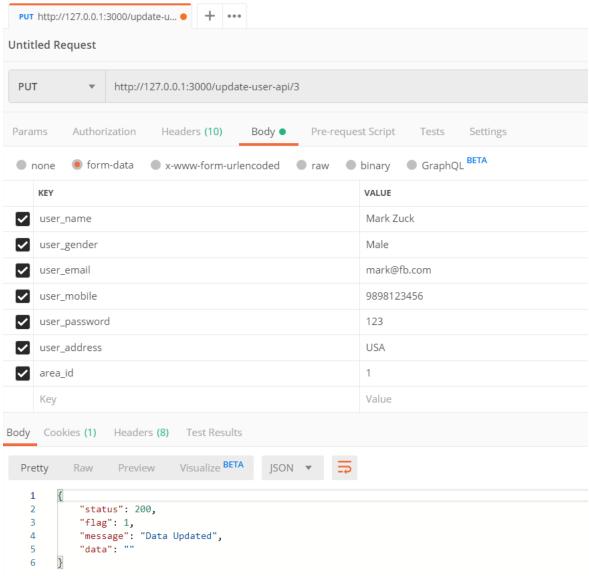
```
JS index.js X
routes > JS index.js > ♦ router.put('/update-user-api/:id') callback
  80
       //Update Record API Using Put method
  81
       router.put('/update-user-api/:id', function (req, res) {
  82
           console.log("Parameter ID"+ req.params.id);
  83
  84
           var user id = req.params.id;
           var user name = req.body.user name;
  87
           var user gender = req.body.user gender;
           var user_email = req.body.user_email;
  88
           var user mobile = req.body.user mobile;
  89
           var user_address = req.body.user_address;
  90
           var area_id = req.body.area_id;
  91
           // ` is used for multi line string
           connection.query(`update tbl user master set user name = ?,user gender = ?,user email = ?,user mobile = ?,
                            user address = ?, area id = ? where user id = ? `,
  94
                     [user name, user gender, user email, user address, area id, user mobile, user id], function (err, respond) {
                   if (err) {
                        res.send(JSON.stringify({"status": 500,"flag": 0, "message": "Error", "data": err}));
                   } else {
  99
                        res.send(JSON.stringify({"status": 200, "flag": 1, "message": "Data Updated", "data": ''}));
 100
 101
               });
       });
 102
 103
```



Put and Patch

- PUT is a method of modifying resource where the client sends data that updates the entire resource.
- PATCH is a method of modifying resources where the client sends partial data that is to be updated without modifying the entire data.







```
← → C ↑ ① 127.0.0.1:3000/get-all-user-api
            "user_email": "akashtechnolabs@gmail.com",
24
25
            "user_mobile": 9978621654,
            "user_password": "123",
26
            "user address": "Khadia",
27
            "area id": 1,
28
29
            "user_photo": "noimage.png"
30
          },
31 ▼
            "user id": 3,
32
33
            "user name": "Mark Zuck",
            "user_gender": "Male",
34
35
            "user_email": "mark@fb.com",
            "user_mobile": 0,
36
            "user_password": "123",
37
            "user_address": "1",
38
            "area_id": 2147483647,
39
            "user_photo": "noimage.png"
40
41
42
43
```



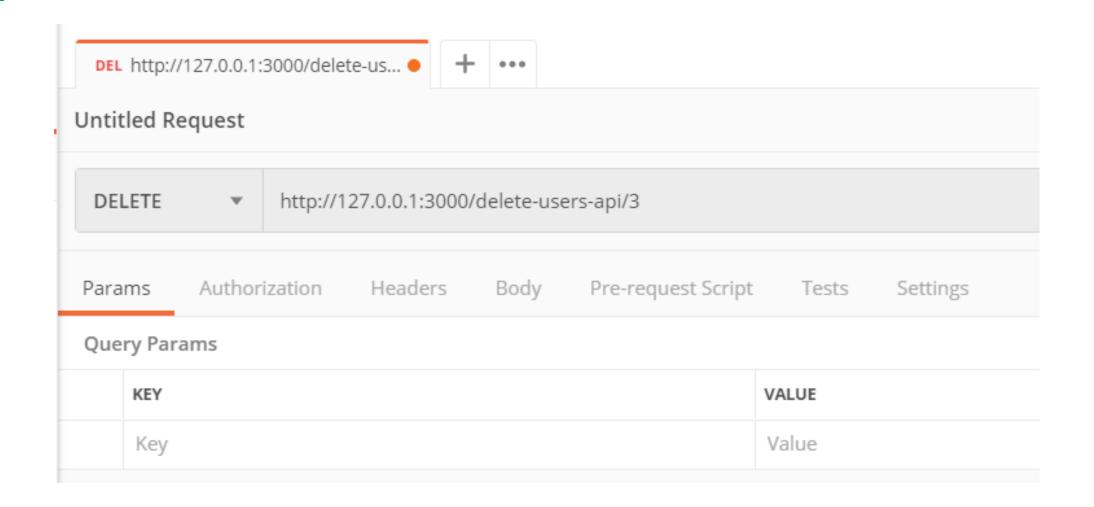
Delete Record

```
JS index.js X
routes > JS index.js > ...
 106
       router.delete('/delete-users-api/:id', function (req, res, next) {
 107
 108
 109
           var deleteid = req.params.id;
           console.log(`Parameter value is ${deleteid}`);
 110
 111
 112
           connection.query("delete from tbl_user_master where user_id = ? ", [deleteid], function (err, rows) {
 113
               if (err) {
 114
                   res.send(JSON.stringify({"status": 500,"flag": 0, "message": "Error", "data": err}));
 115
               } else {
 116
                    console.log(rows);
 117
                   res.send(JSON.stringify({"status": 200,"flag": 1, "message": "Data Deleted", "data": ''}));
 118
 119
           })
       });
 120
 121
       module.exports = router;
 122
 123
```

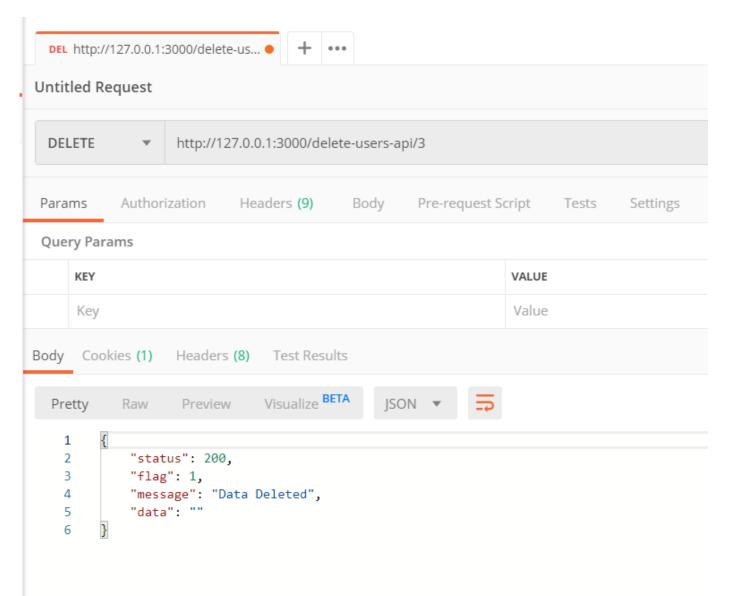


```
JS index.js X
routes > JS index.js > 😚 router.delete('/delete-users-api/:id') callback > 😚 connection.query("delete from tbl_user_master where user_id = ? ") callback
       router.delete('/delete-users-api/:id', function (req, res, next) {
114
115
116
           var deleteid = req.params.id;
           console.log(`Parameter value is ${deleteid}`);
117
118
           connection.query("delete from tbl_user_master where user_id = ? ", [deleteid], function (err, rows) {
 119
 120
               if (err) {
                    res.status(500).send(JSON.stringify({"status": 500,"flag": 0, "message": "Error", "data": err}));
121
 122
123
                } else {
                    if(rows && rows.affectedRows >0)
 124
125
 126
                        console.log(rows);
                        res.status(200).send(JSON.stringify({"status": 200, "flag": 1, "message": "Data Deleted",
 127
128
                          "data": rows.affectedRows}));
                    }else{
 129
                        res.status(200).send(JSON.stringify({"status": 200, "flag": 0, "message": "Data Not Found"}));
130
131
 132
133
           })
 134
 135
       });
```









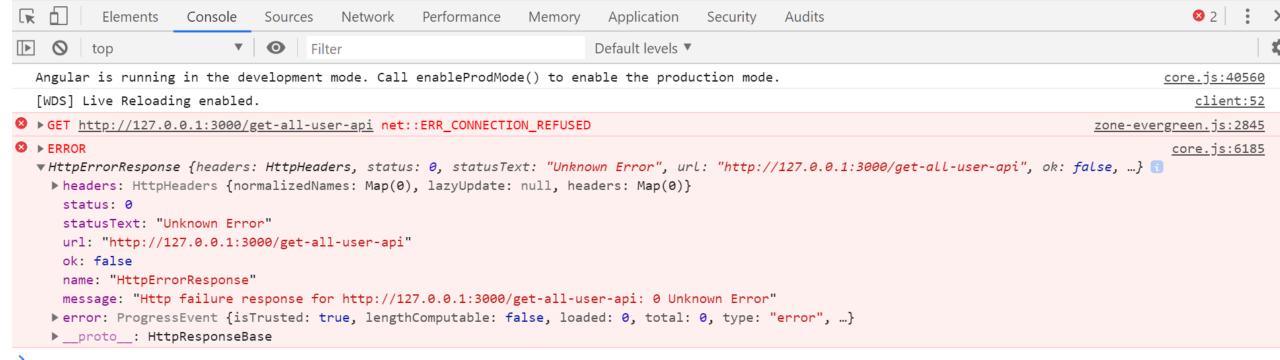


Cors

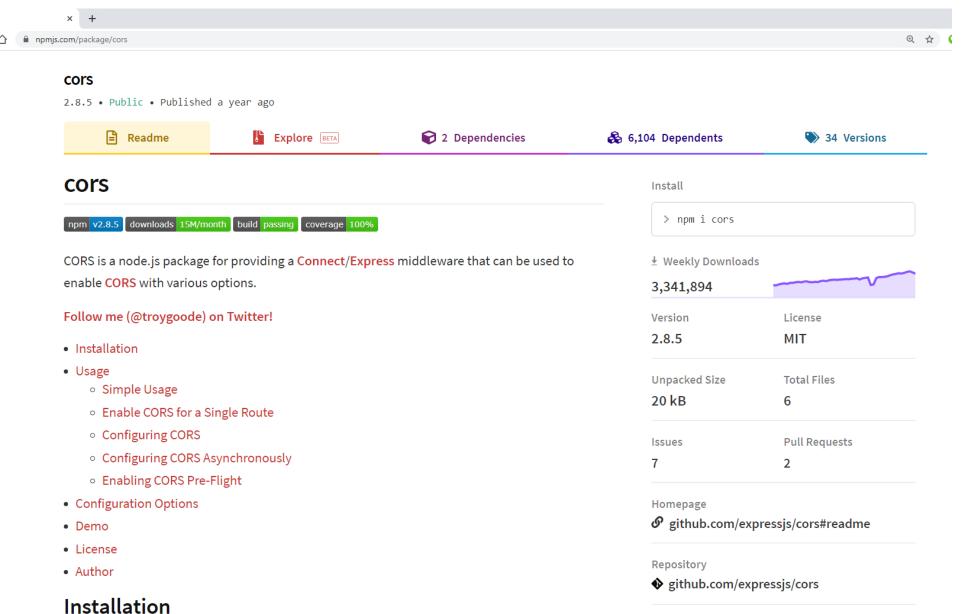


What is Cors?

 Cross-Origin Resource Sharing (CORS) is a mechanism that uses additional HTTPheaders to tell a browser to let a web application running at one origin (domain) have permission to access selected resources from a server at a different origin



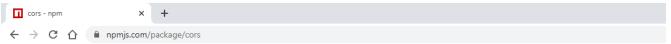






cors - npm





usage

Simple Usage (Enable All CORS Requests)

```
var express = require('express')
var cors = require('cors')
var app = express()

app.use(cors())

app.get('/products/:id', function (req, res, next) {
    res.json({msg: 'This is CORS-enabled for all origins!'})
})

app.listen(80, function () {
    console.log('CORS-enabled web server listening on port 80')
})
```

Enable CORS for a Single Route

```
var express = require('express')
var cors = require('cors')
var app = express()

app.get('/products/:id', cors(), function (req, res, next) {
    res.json({msg: 'This is CORS-enabled for a Single Route'})
})

app.listen(80, function () {
    console.log('CORS-enabled web server listening on port 80')
})
```



C:\Windows\system32\cmd.exe

D:\akash\api>npm i cors --save



```
C:\Windows\system32\cmd.exe
```

```
D:\akash\api>npm i cors --save3
+ cors@2.8.5
added 2 packages from 2 contributors and audited 189 packages in 1.137s
found 1 low severity vulnerability
run `npm audit fix` to fix them, or `npm audit` for details
D:\akash\api>
```



```
JS app.js X
   var createError = require('http-errors');
       var express = require('express');
       var path = require('path');
       var cookieParser = require('cookie-parser');
      var logger = require('morgan');
       const fileUpload = require('express-fileupload');
      var session = require('express-session');
       var flash = require('req-flash');
       var cors = require('cors')
       var mysql = require('mysql');
      var indexRouter = require('./routes/index');
      var usersRouter = require('./routes/users');
      var app = express();
       app.use(cors())
       app.set('views', path.join(__dirname, 'views'));
       app.set('view engine', 'ejs');
      app.use(logger('dev'));
       app.use(express.json());
       app.use(fileUpload());
  28 app.use(express.urlencoded({ extended: false }));
```



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