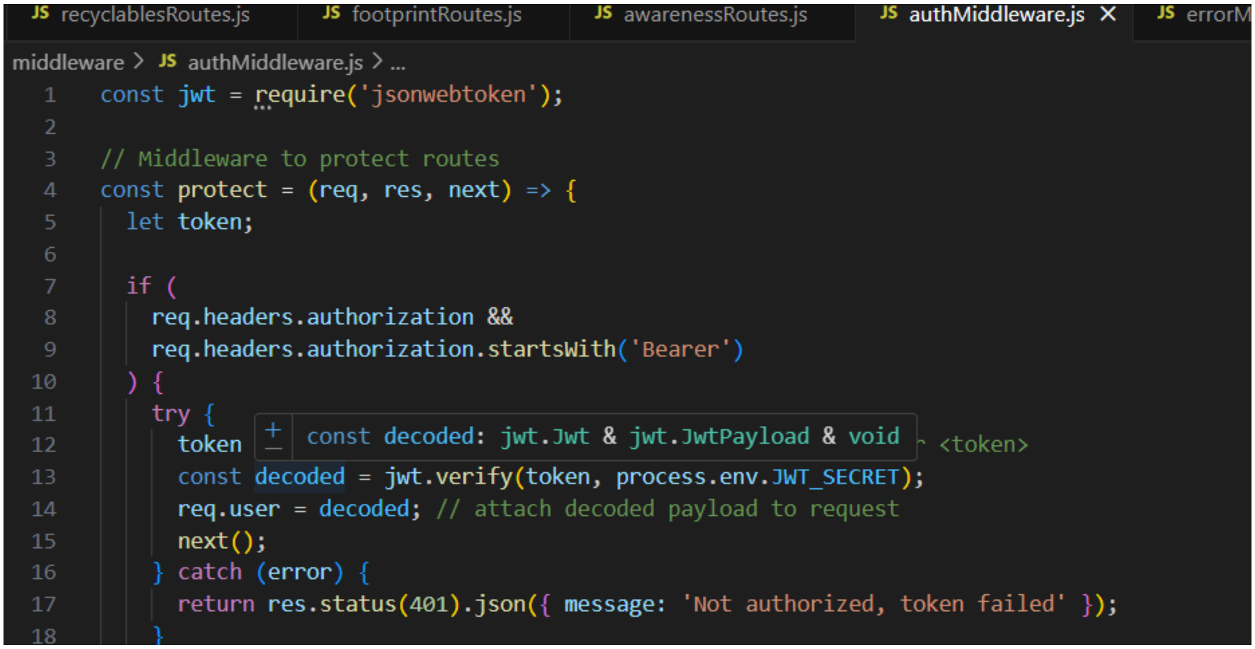
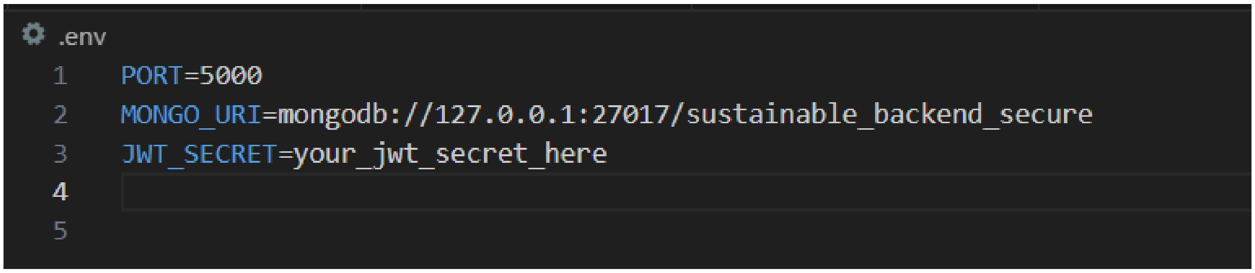
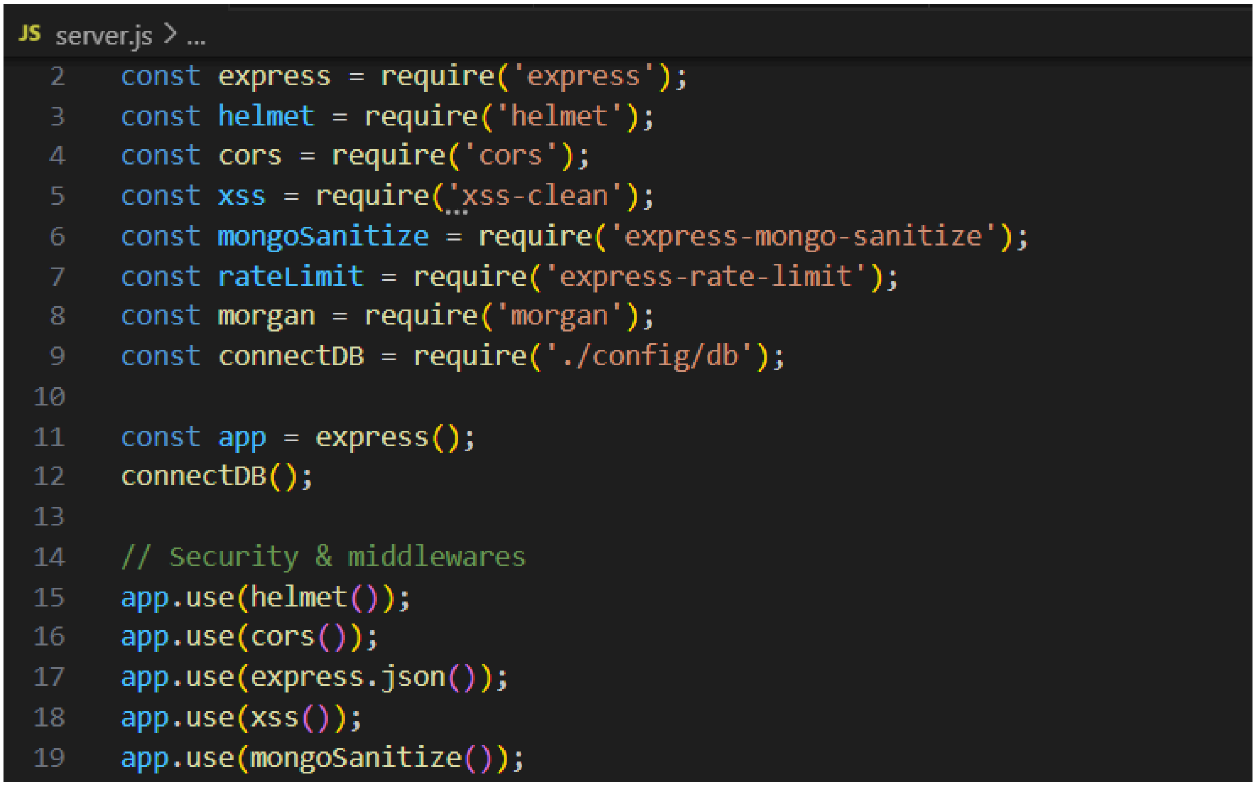
CODE:



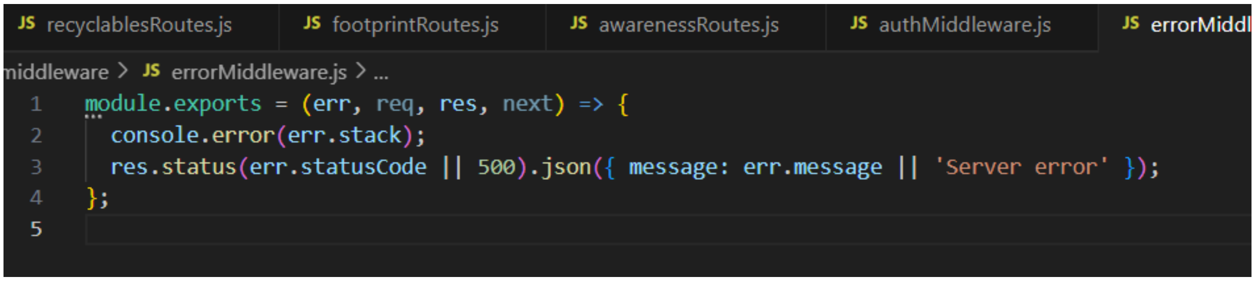
```
const jwt = require('jsonwebtoken');

// Middleware to protect routes
const protect = (req, res, next) => {
  let token;

  if (
    req.headers.authorization &&
    req.headers.authorization.startsWith('Bearer')
  ) {
    try {
      token   const decoded: jwt.Jwt & jwt.JwtPayload & void   <token>
      const decoded = jwt.verify(token, process.env.JWT_SECRET);
      req.user = decoded; // attach decoded payload to request
      next();
    } catch (error) {
      return res.status(401).json({ message: 'Not authorized, token failed' });
    }
```



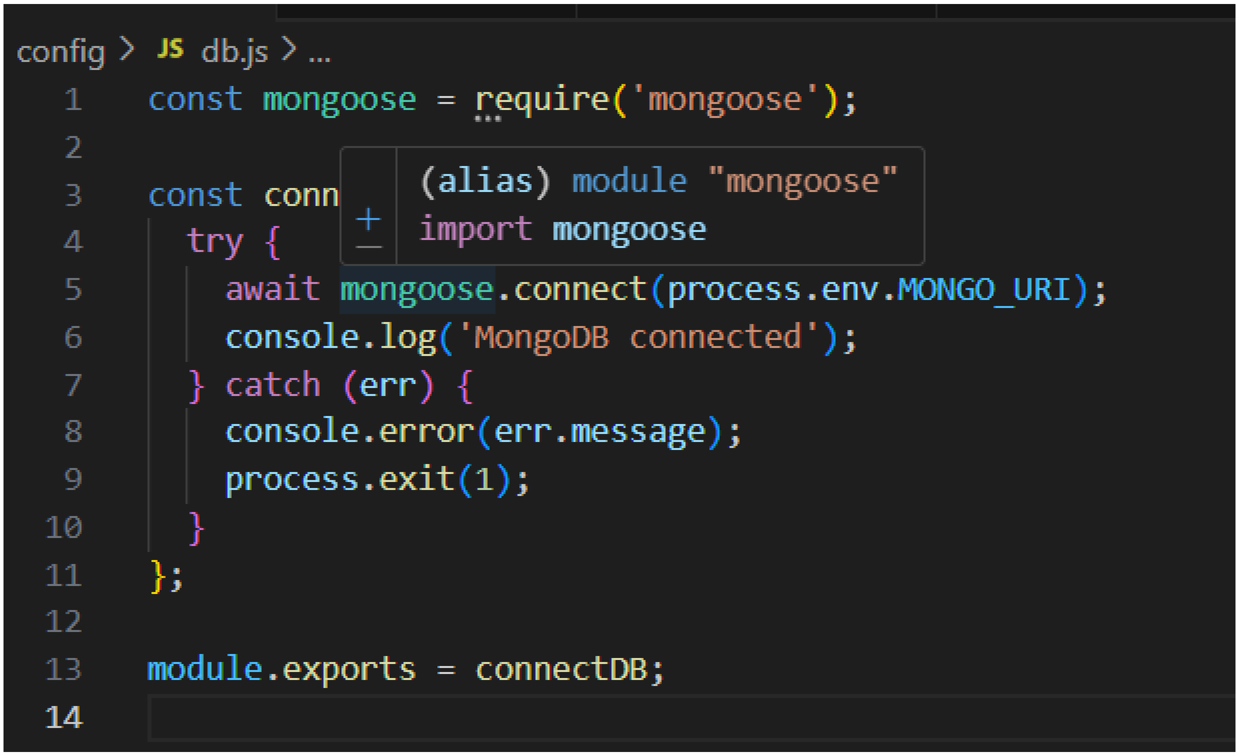
```
PORT=5000
MONGO_URI=mongodb://127.0.0.1:27017/sustainable_backend_secure
JWT_SECRET=your_jwt_secret_here
```



```javascript
const express = require('express');
const helmet = require('helmet');
const cors = require('cors');
const xss = require('xss-clean');
const mongoSanitize = require('express-mongo-sanitize');
const rateLimit = require('express-rate-limit');
const morgan = require('morgan');
const connectDB = require('./config/db');

const app = express();
connectDB();

// Security & middlewares
app.use(helmet());
app.use(cors());
app.use(express.json());
app.use(xss());
app.use(mongoSanitize());
```

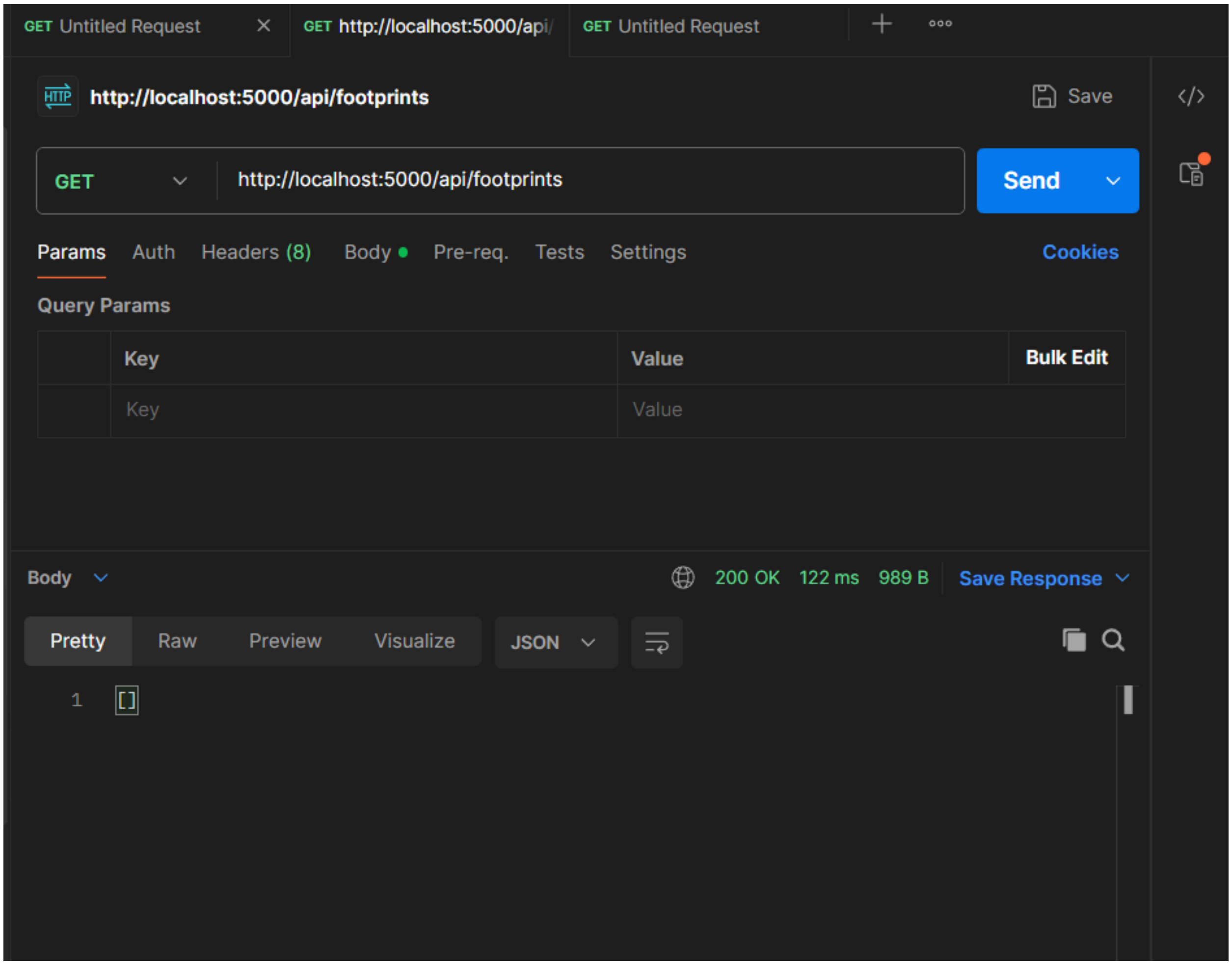


```javascript
module.exports = (err, req, res, next) => {
  console.error(err.stack);
  res.status(err.statusCode || 500).json({ message: err.message || 'Server error' });
};

```



```javascript
const mongoose = require('mongoose');

const conn
  try {
    await mongoose.connect(process.env.MONGO_URI);
    console.log('MongoDB connected');
  } catch (err) {
    console.error(err.message);
    process.exit(1);
  }
};

module.exports = connectDB;
```

OUTPUT:1)Testing Footprints Endpoint (GET/POST) a)footprints (postman+browser)



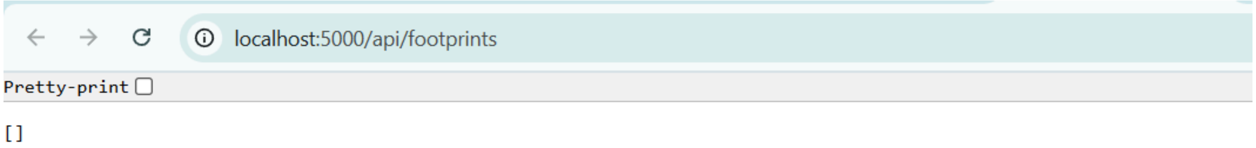
http://localhost:5000/api/footprints

GET http://localhost:5000/api/footprints

Key	Value
Key	Value

200 OK 122 ms 989 B

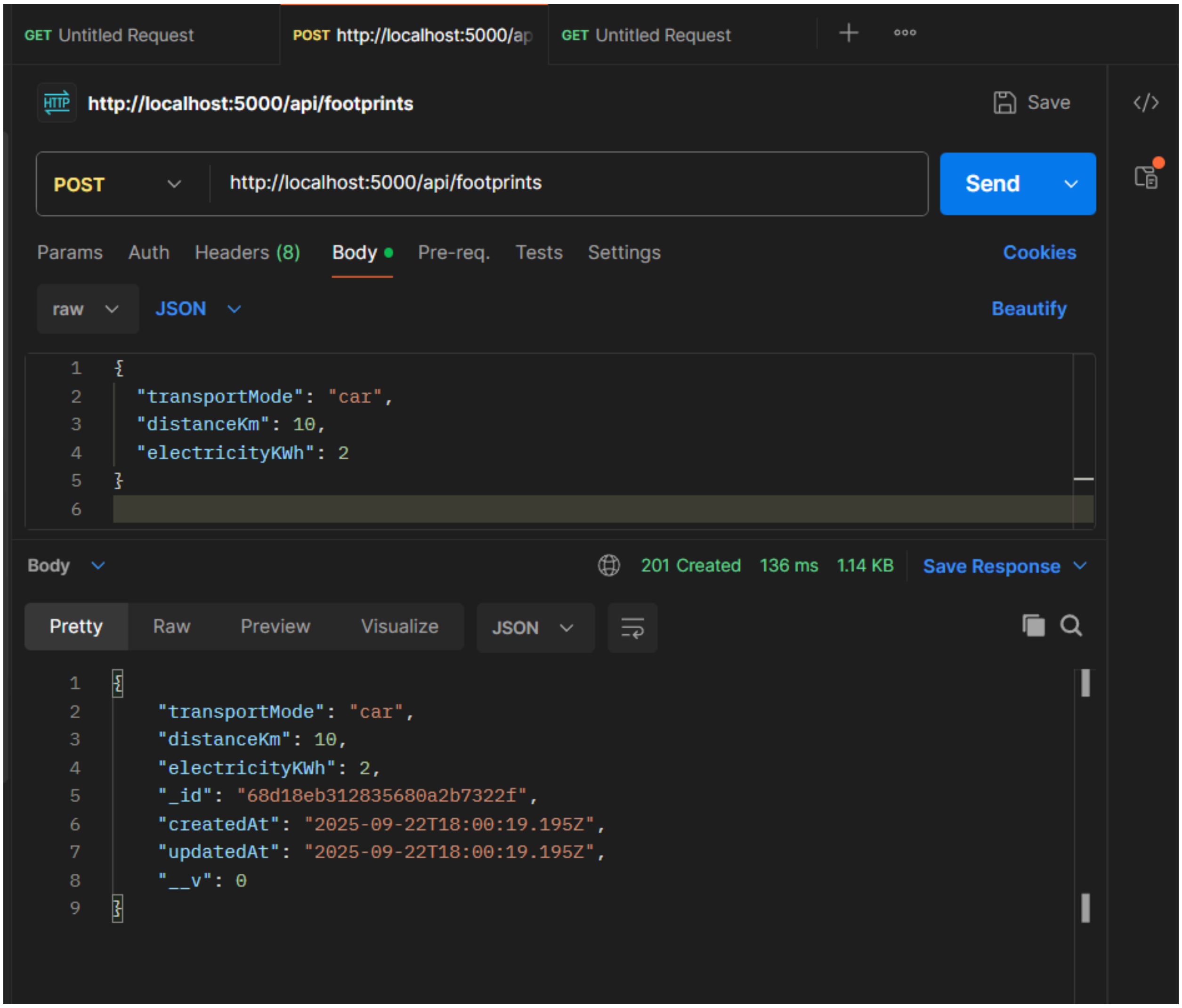
```
[]
```



localhost:5000/api/footprints

Pretty-print □

```
[]
```



http://localhost:5000/api/footprints

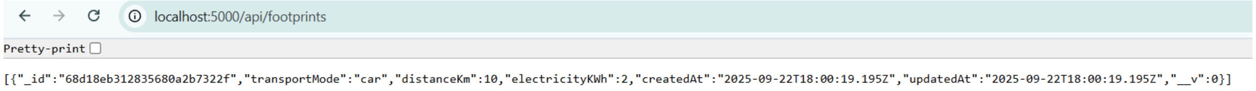
POST http://localhost:5000/api/footprints

```
{
  "transportMode": "car",
  "distanceKm": 10,
  "electricityKWh": 2
}
```

Body 201 Created 136 ms 1.14 KB

JSON

```
{
    "transportMode": "car",
    "distanceKm": 10,
    "electricityKWh": 2,
    "_id": "68d18eb312835680a2b7322f",
    "createdAt": "2025-09-22T18:00:19.195Z",
    "updatedAt": "2025-09-22T18:00:19.195Z",
    "__v": 0
}
```

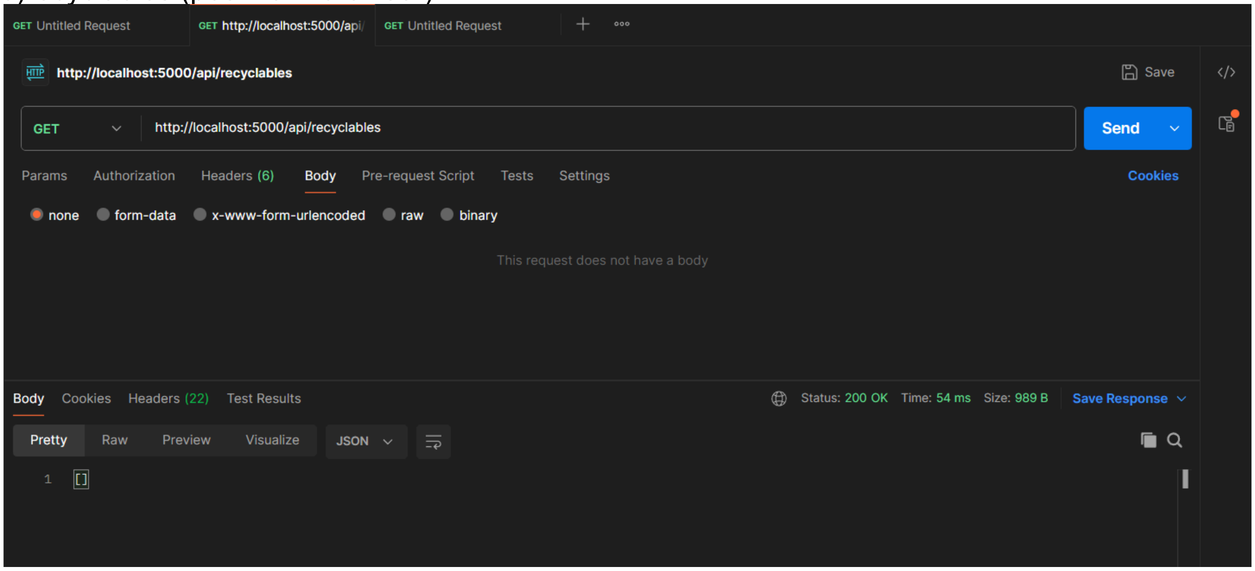


localhost:5000/api/footprints

Pretty-print □

```
[{"_id":"68d18eb312835680a2b7322f","transportMode":"car","distanceKm":10,"electricityKWh":2,"createdAt":"2025-09-22T18:00:19.195Z","updatedAt":"2025-09-22T18:00:19.195Z","__v":0}]
```

b)recyclables (postman+browser)



http://localhost:5000/api/recyclables

GET http://localhost:5000/api/recyclables

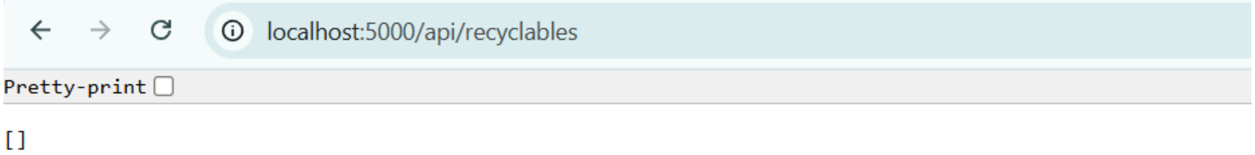
● none ○ form-data ○ x-www-form-urlencoded ○ raw ○ binary

This request does not have a body

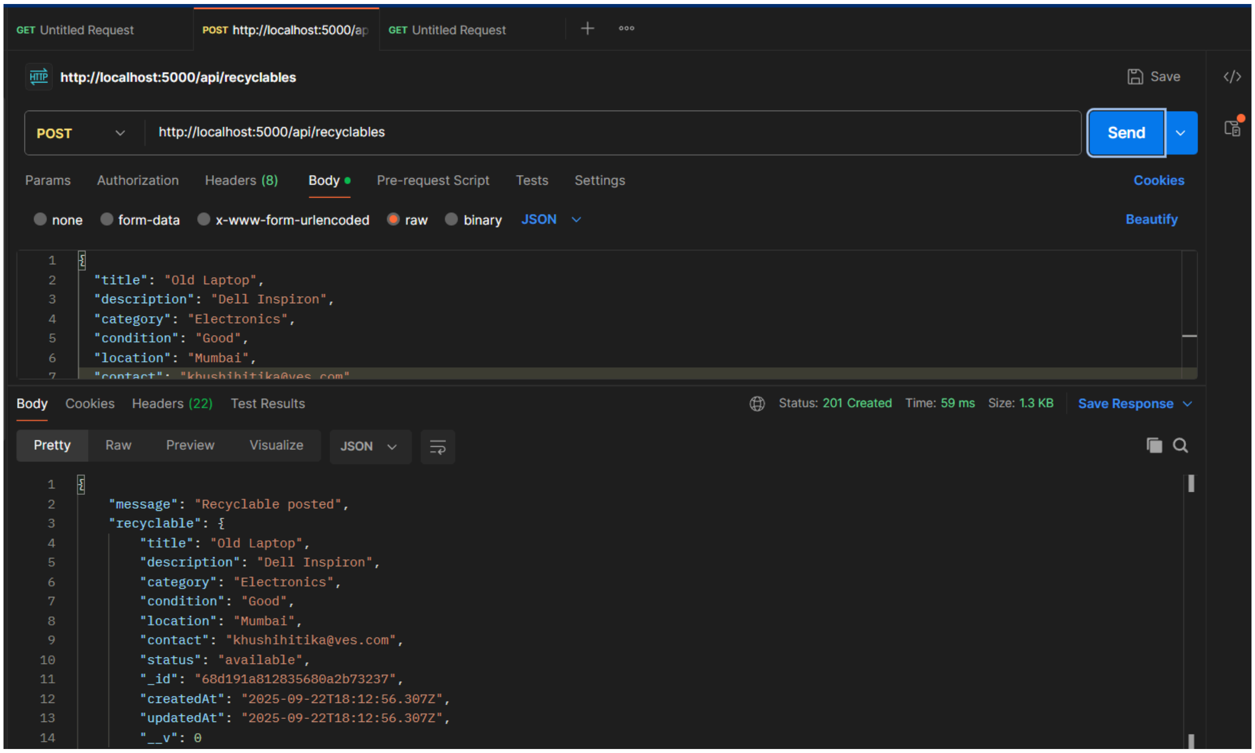
Status: 200 OK Time: 54 ms Size: 989 B

JSON

```
[]
```



```
[]
```



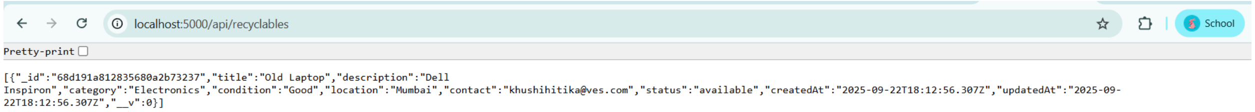
POST http://localhost:5000/api/recyclables

○ none ○ form-data ○ x-www-form-urlencoded ● raw ○ binary JSON

```
{
"title": "Old Laptop",
"description": "Dell Inspiron",
"category": "Electronics",
"condition": "Good",
"location": "Mumbai",
"contact": "khushihitika@ves.com"
```

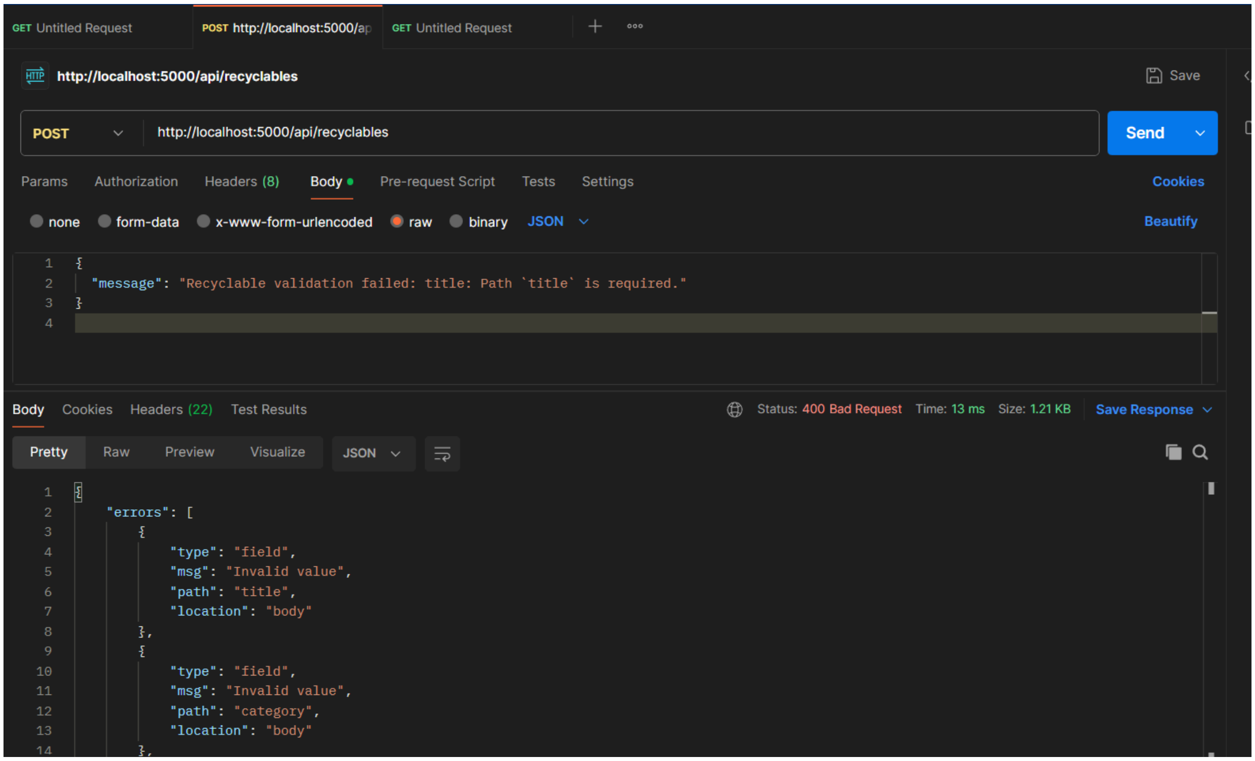
Status: 201 Created Time: 59 ms Size: 1.3 KB

```
{
    "message": "Recyclable posted",
    "recyclable": {
        "title": "Old Laptop",
        "description": "Dell Inspiron",
        "category": "Electronics",
        "condition": "Good",
        "location": "Mumbai",
        "contact": "khushihitika@ves.com",
        "status": "available",
        "_id": "68d191a812835680a2b73237",
        "createdAt": "2025-09-22T18:12:56.307Z",
        "updatedAt": "2025-09-22T18:12:56.307Z",
        "__v": 0
```



```
[{"_id":"68d191a812835680a2b73237","title":"Old Laptop","description":"Dell
Inspiron","category":"Electronics","condition":"Good","location":"Mumbai","contact":"khushihitika@ves.com","status":"available","createdAt":"2025-09-22T18:12:56.307Z","updatedAt":"2025-09-
22T18:12:56.307Z","__v":0}]
```

Some security features: a)input validation



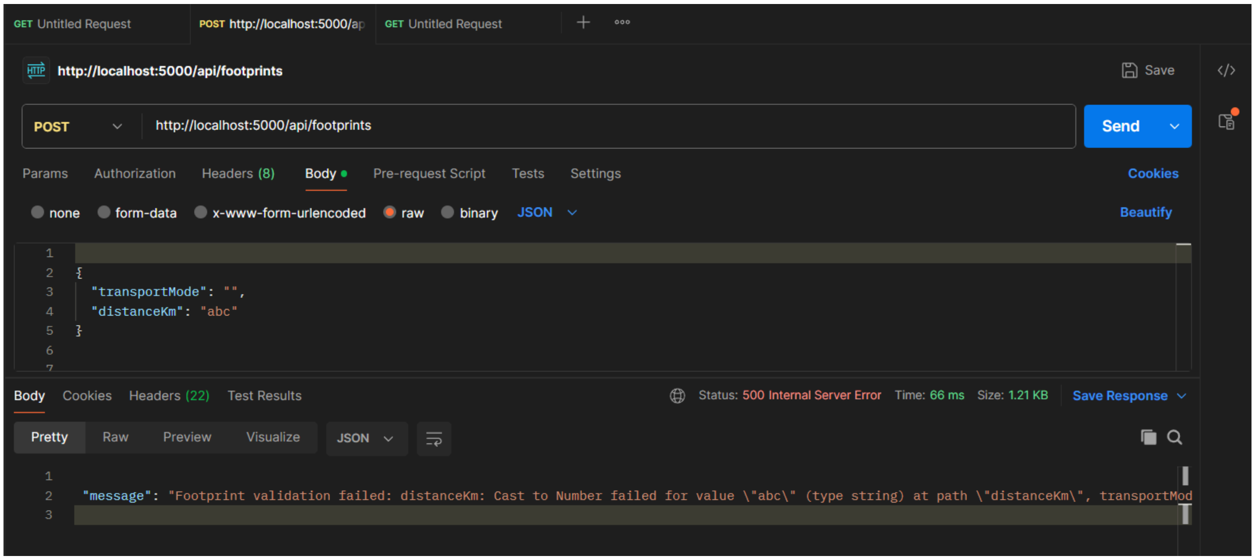
http://localhost:5000/api/recyclables

POST http://localhost:5000/api/recyclables

```
{
  "message": "Recyclable validation failed: title: Path `title` is required."
}
```

Status: 400 Bad Request Time: 13 ms Size: 1.21 KB

```
{
    "errors": [
        {
            "type": "field",
            "msg": "Invalid value",
            "path": "title",
            "location": "body"
        },
        {
            "type": "field",
            "msg": "Invalid value",
            "path": "category",
            "location": "body"
        },
```



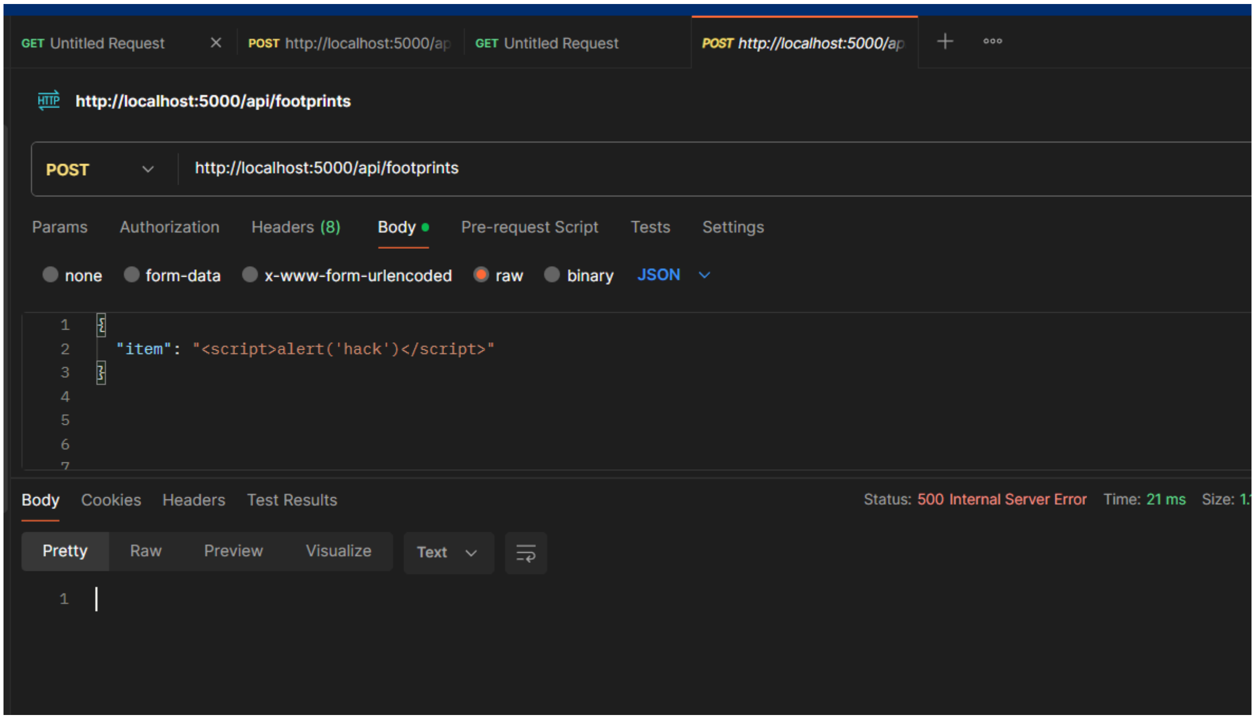
http://localhost:5000/api/footprints

POST http://localhost:5000/api/footprints

```

{
  "transportMode": "",
  "distanceKm": "abc"
}
```

Status: 500 Internal Server Error Time: 66 ms Size: 1.21 KB

```

 "message": "Footprint validation failed: distanceKm: Cast to Number failed for value \"abc\" (type string) at path \"distanceKm\", transportMod
```



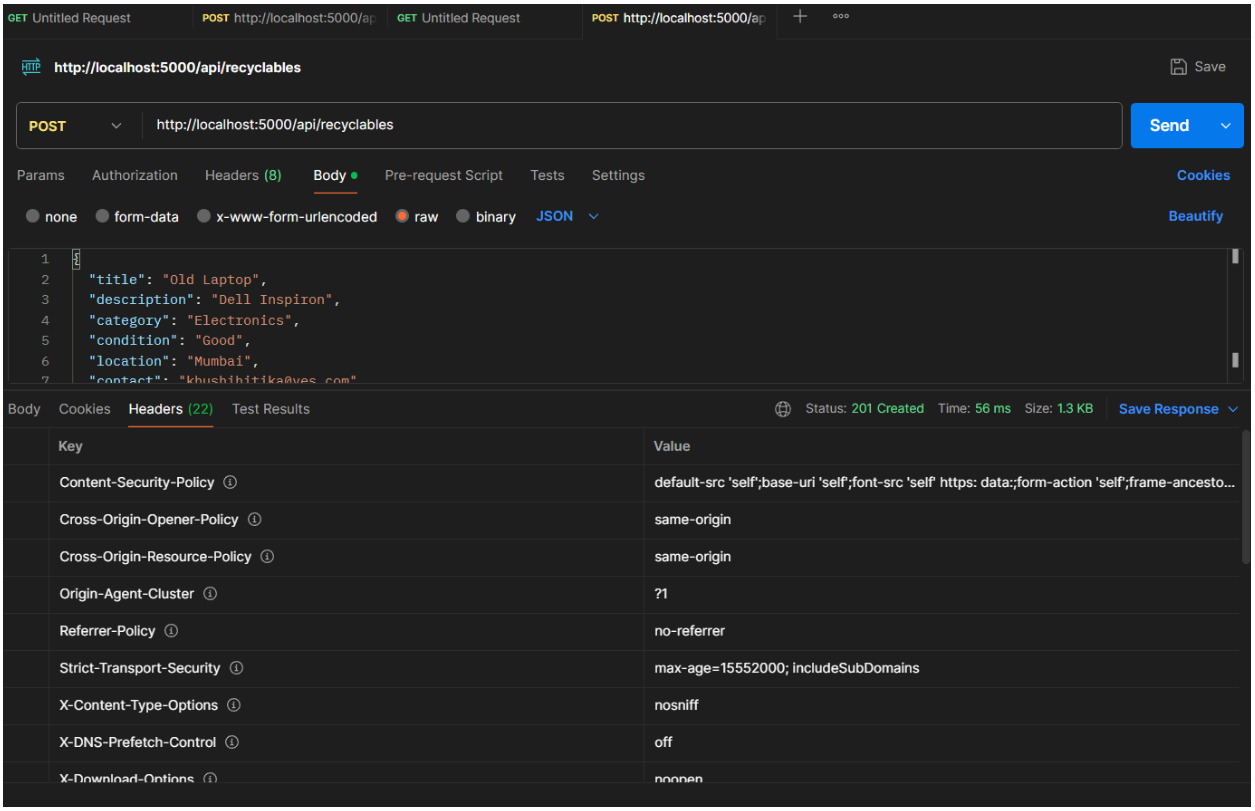
http://localhost:5000/api/footprints

POST http://localhost:5000/api/footprints

```
{
  "item": "<script>alert('hack')</script>"
}
```

Status: 500 Internal Server Error Time: 21 ms Size: 1.

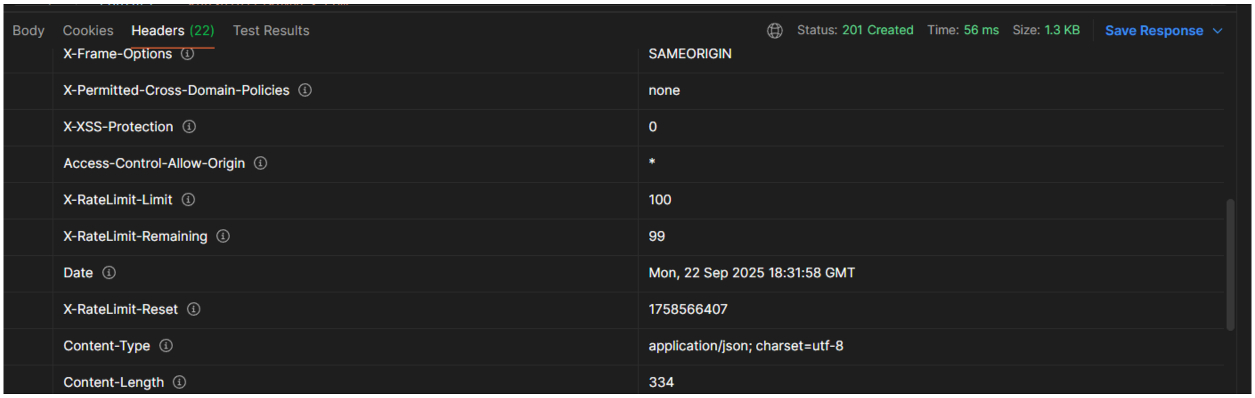
b) Helmet(Check response headers in Postman → `X-Content-Type-Options`, `Content-Security-Policy`)



```
{
  "title": "Old Laptop",
  "description": "Dell Inspiron",
  "category": "Electronics",
  "condition": "Good",
  "location": "Mumbai",
  "contact": "khushibitika@ves.com"
```

Status: 201 Created Time: 56 ms Size: 1.3 KB

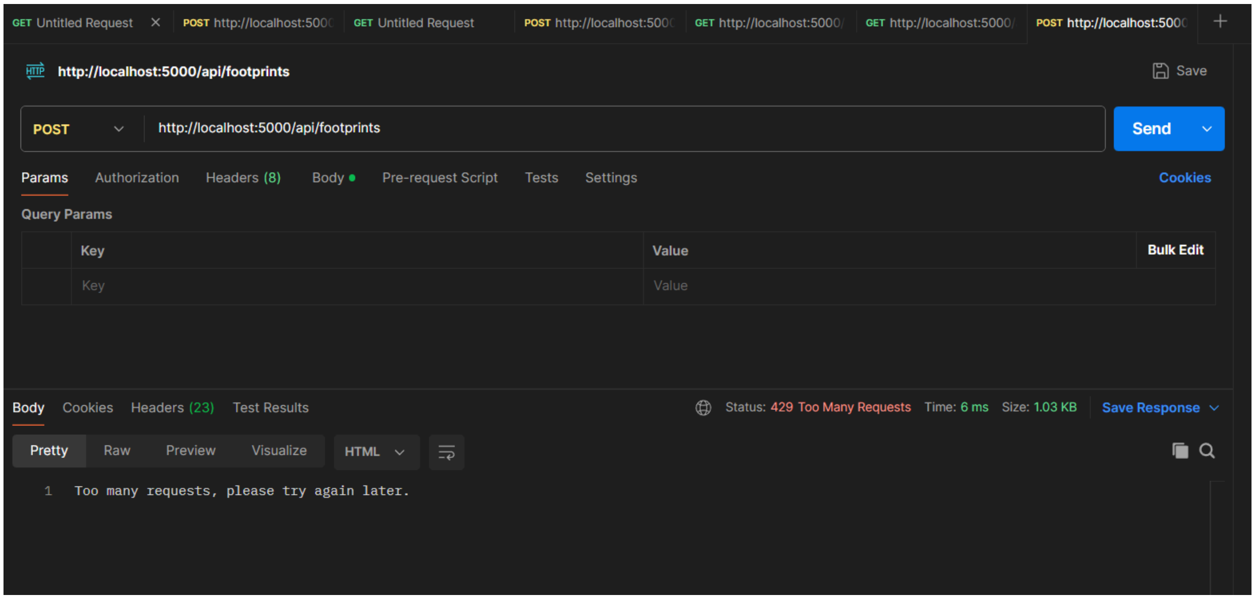
Key	Value
Content-Security-Policy	default-src 'self';base-uri 'self';font-src 'self' https: data:;form-action 'self';frame-ancesto...
Cross-Origin-Opener-Policy	same-origin
Cross-Origin-Resource-Policy	same-origin
Origin-Agent-Cluster	?1
Referrer-Policy	no-referrer
Strict-Transport-Security	max-age=15552000; includeSubDomains
X-Content-Type-Options	nosniff
X-DNS-Prefetch-Control	off
X-Download-Options	noopen



Status: 201 Created Time: 56 ms Size: 1.3 KB

X-Frame-Options	SAMEORIGIN
X-Permitted-Cross-Domain-Policies	none
X-XSS-Protection	0
Access-Control-Allow-Origin	*
X-RateLimit-Limit	100
X-RateLimit-Remaining	99
Date	Mon, 22 Sep 2025 18:31:58 GMT
X-RateLimit-Reset	1758566407
Content-Type	application/json; charset=utf-8
Content-Length	334

c)rate limiter



http://localhost:5000/api/footprints

POST http://localhost:5000/api/footprints

Status: 429 Too Many Requests Time: 6 ms Size: 1.03 KB

```
Too many requests, please try again later.
```