ENTERPRISE APPLICATION DEVELOPMENT – LAB 1

C15478448

ENTERPRISE APPLICATION DEVELOPMENT

COURSE: DT228/4

Lab 1

Table of Contents

Folder Structure

Massive-Express – Contains Parts 1-3

Sequelize-ORM – Contains Parts 4-6

Document – This Document in .docx and .pdf

Screenshots – Screenshots for all Outputs

Note:

- To run this project you must enter in the following command in the **Massive-Express** and **Sequelize-ORM** folder: *npm install*

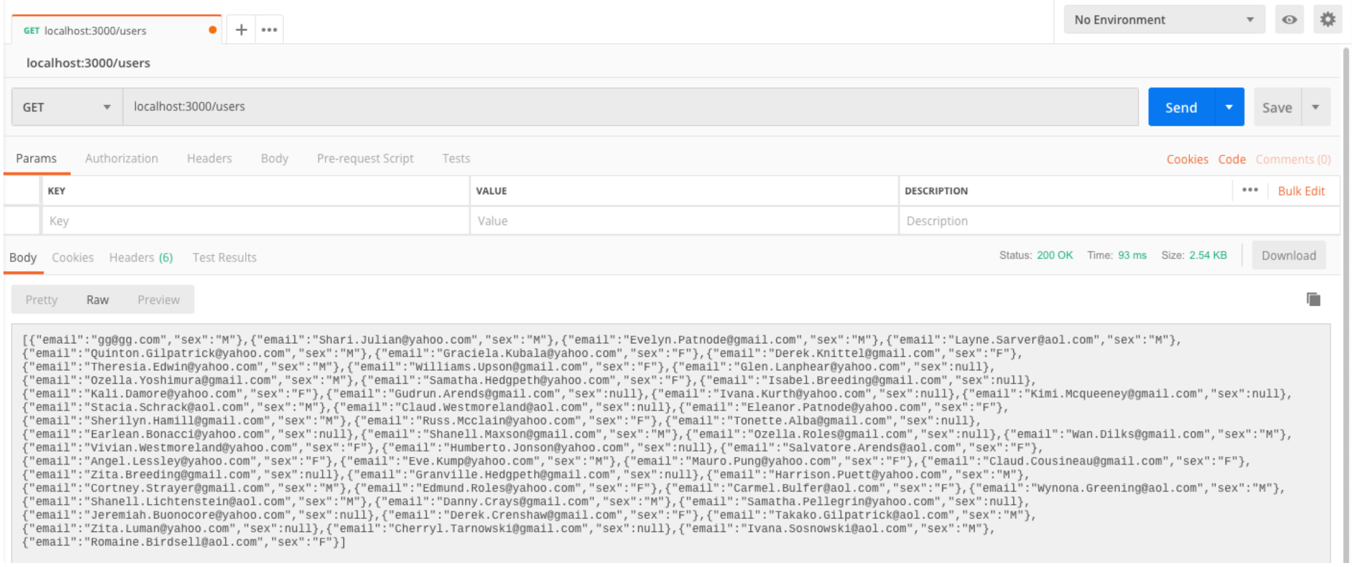
- Sequelize-ORM contains a ***README.txt*** which contains all of the commands on how to set up the models, migrations and seeders

Problem Sets

Part 1 – HTTP API Endpoints

GET /users

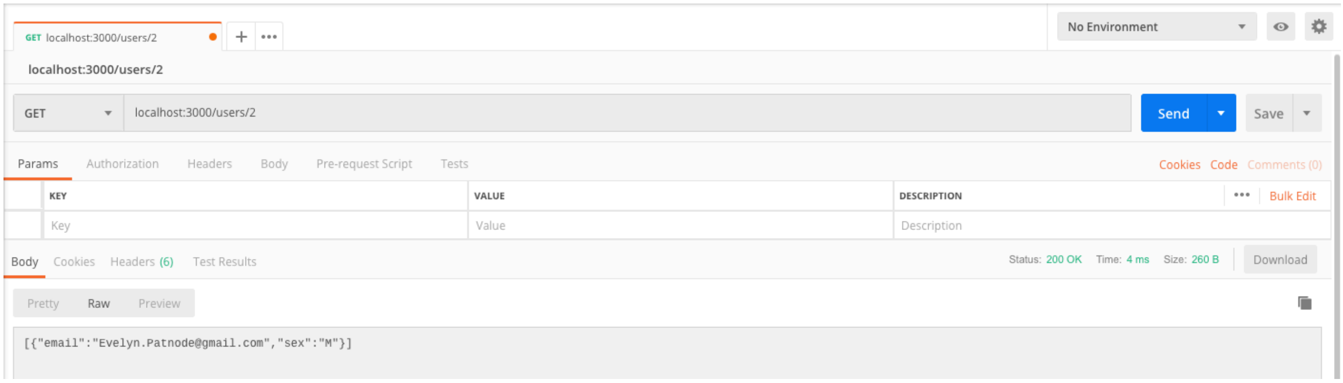
Details: List all users email and sex in order of most recently created. Do not include password hash in your output.



```
[{"email":"gg@gg.com","sex":"M"},{"email":"Shari.Julian@yahoo.com","sex":"M"},{"email":"Evelyn.Patnode@gmail.com","sex":"M"},{"email":"Layne.Sarver@aol.com","sex":"M"},
{"email":"Quinton.Gilpatrick@yahoo.com","sex":"M"},{"email":"Graciela.Kubala@yahoo.com","sex":"F"},{"email":"Derek.Knittel@gmail.com","sex":"F"},
{"email":"Theresia.Edwin@yahoo.com","sex":"M"},{"email":"Williams.Upson@gmail.com","sex":"F"},{"email":"Glen.Lanphear@yahoo.com","sex":null},
{"email":"Ozella.Yoshimura@gmail.com","sex":"M"},{"email":"Samatha.Hedgpeth@yahoo.com","sex":"F"},{"email":"Isabel.Breeding@gmail.com","sex":null},
{"email":"Kali.Damore@yahoo.com","sex":"F"},{"email":"Gudrun.Arends@gmail.com","sex":null},{"email":"Ivana.Kurth@yahoo.com","sex":null},{"email":"Kimi.Mcqueeney@gmail.com","sex":null},
{"email":"Stacia.Schrack@aol.com","sex":"M"},{"email":"Claud.Westmoreland@aol.com","sex":null},{"email":"Eleanor.Patnode@yahoo.com","sex":"F"},
{"email":"Sherilyn.Hamill@gmail.com","sex":"M"},{"email":"Russ.Mcclain@yahoo.com","sex":"F"},{"email":"Tonette.Alba@gmail.com","sex":null},
{"email":"Earlean.Bonacci@yahoo.com","sex":null},{"email":"Shanell.Maxson@gmail.com","sex":"M"},{"email":"Ozella.Roles@gmail.com","sex":null},{"email":"Wan.Dilks@gmail.com","sex":"M"},
{"email":"Vivian.Westmoreland@yahoo.com","sex":"F"},{"email":"Humberto.Jonson@yahoo.com","sex":null},{"email":"Salvatore.Arends@aol.com","sex":"F"},
{"email":"Angel.Lessley@yahoo.com","sex":"F"},{"email":"Eve.Kump@yahoo.com","sex":"M"},{"email":"Mauro.Pung@yahoo.com","sex":"F"},{"email":"Claud.Cousineau@gmail.com","sex":"F"},
{"email":"Zita.Breeding@gmail.com","sex":null},{"email":"Granville.Hedgpeth@gmail.com","sex":null},{"email":"Harrison.Puett@yahoo.com","sex":"M"},
{"email":"Cortney.Strayer@gmail.com","sex":"M"},{"email":"Edmund.Roles@yahoo.com","sex":"F"},{"email":"Carmel.Bulfer@aol.com","sex":"F"},{"email":"Wynona.Greening@aol.com","sex":"M"},
{"email":"Shanell.Lichtenstein@aol.com","sex":"M"},{"email":"Danny.Crays@gmail.com","sex":"M"},{"email":"Samatha.Pellegrin@yahoo.com","sex":null},
{"email":"Jeremiah.Buonocore@yahoo.com","sex":null},{"email":"Derek.Crenshaw@gmail.com","sex":"F"},{"email":"Takako.Gilpatrick@aol.com","sex":"M"},
{"email":"Zita.Luman@yahoo.com","sex":null},{"email":"Cherryl.Tarnowski@gmail.com","sex":null},{"email":"Ivana.Sosnowski@aol.com","sex":"M"},
{"email":"Romaine.Birdsell@aol.com","sex":"F"}]
```

GET /users/:id

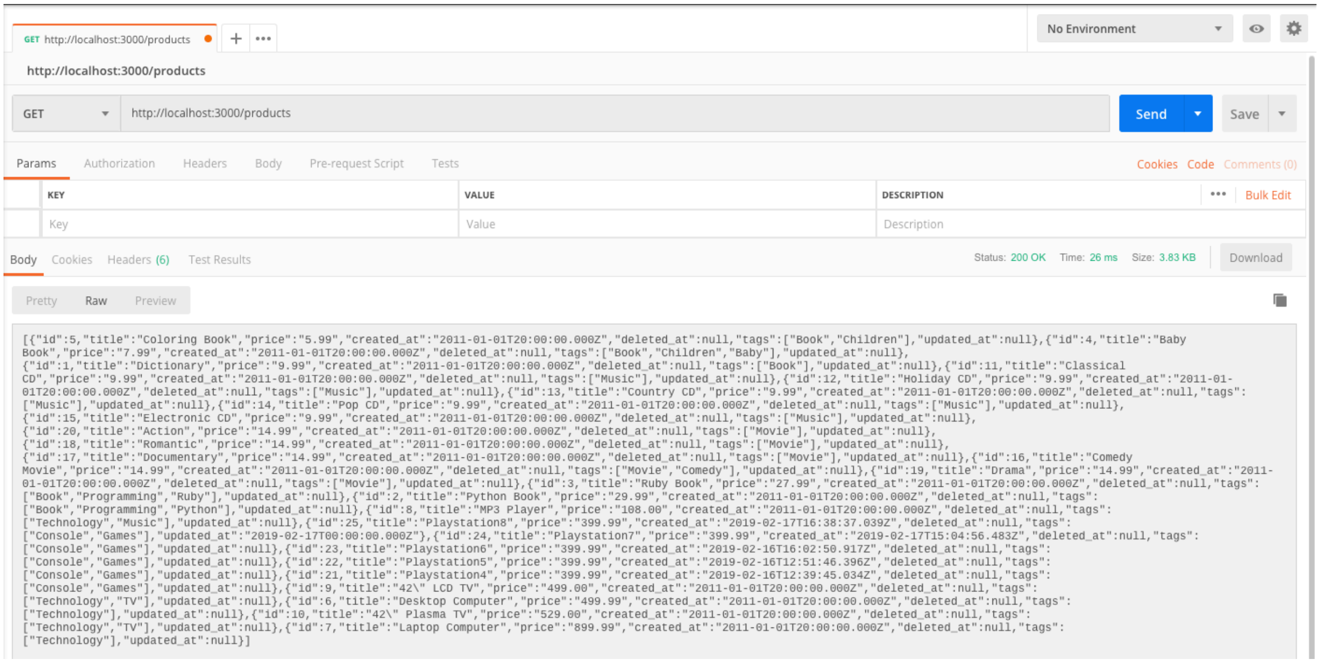
Show above details of the specified user.


GET localhost:3000/users/2
No Environment
localhost:3000/users/2
GET
localhost:3000/users/2
Send
Save
Params Authorization Headers Body Pre-request Script Tests
Cookies Code Comments (0)
KEY VALUE DESCRIPTION
Bulk Edit
Key Value Description
Body Cookies Headers (6) Test Results
Status: 200 OK Time: 4 ms Size: 260 B
Download
Pretty Raw Preview

```
[{"email":"Evelyn.Patnode@gmail.com","sex":"M"}]
```

GET /products

List all products in ascending order of price.



http://localhost:3000/products

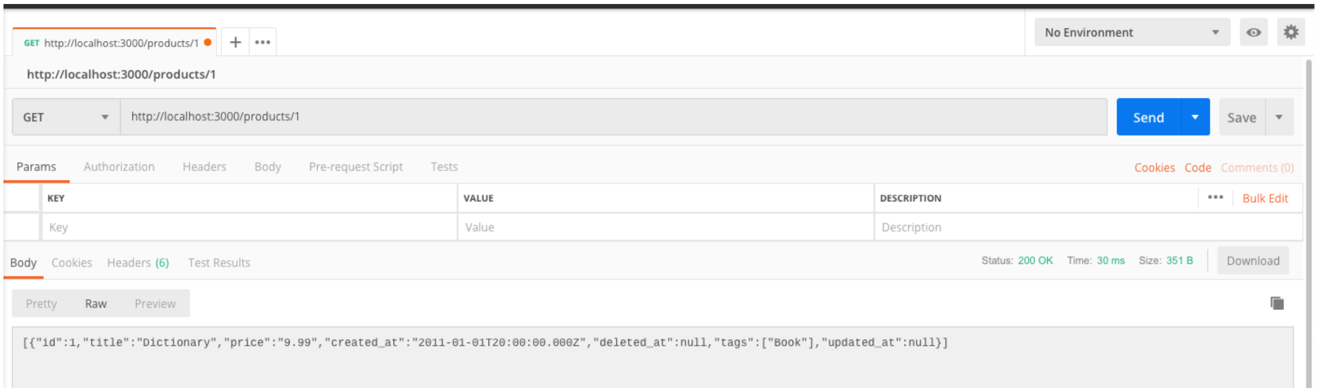
GET http://localhost:3000/products

Status: 200 OK Time: 26 ms Size: 3.83 KB

```
[{"id":5,"title":"Coloring Book","price":"5.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Book","Children"],"updated_at":null},{"id":4,"title":"Baby
Book","price":"7.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Book","Children","Baby"],"updated_at":null},
{"id":1,"title":"Dictionary","price":"9.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Book"],"updated_at":null},{"id":11,"title":"Classical
CD","price":"9.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Music"],"updated_at":null},{"id":12,"title":"Holiday CD","price":"9.99","created_at":"2011-01-
01T20:00:00.000Z","deleted_at":null,"tags":["Music"],"updated_at":null},{"id":13,"title":"Country CD","price":"9.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":
["Music"],"updated_at":null},{"id":14,"title":"Pop CD","price":"9.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Music"],"updated_at":null},
{"id":15,"title":"Electronic CD","price":"9.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Music"],"updated_at":null},
{"id":20,"title":"Action","price":"14.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Movie"],"updated_at":null},
{"id":18,"title":"Romantic","price":"14.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Movie"],"updated_at":null},
{"id":17,"title":"Documentary","price":"14.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Movie"],"updated_at":null},{"id":16,"title":"Comedy
Movie","price":"14.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Movie","Comedy"],"updated_at":null},{"id":19,"title":"Drama","price":"14.99","created_at":"2011-
01-01T20:00:00.000Z","deleted_at":null,"tags":["Movie"],"updated_at":null},{"id":3,"title":"Ruby Book","price":"27.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":
["Book","Programming","Ruby"],"updated_at":null},{"id":2,"title":"Python Book","price":"29.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":
["Book","Programming","Python"],"updated_at":null},{"id":8,"title":"MP3 Player","price":"108.00","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":
["Technology","Music"],"updated_at":null},{"id":25,"title":"Playstation8","price":"399.99","created_at":"2019-02-17T16:38:37.039Z","deleted_at":null,"tags":
["Console","Games"],"updated_at":"2019-02-17T00:00:00.000Z"},{"id":24,"title":"Playstation7","price":"399.99","created_at":"2019-02-17T15:04:56.483Z","deleted_at":null,"tags":
["Console","Games"],"updated_at":null},{"id":23,"title":"Playstation6","price":"399.99","created_at":"2019-02-16T16:02:50.917Z","deleted_at":null,"tags":
["Console","Games"],"updated_at":null},{"id":22,"title":"Playstation5","price":"399.99","created_at":"2019-02-16T12:51:46.396Z","deleted_at":null,"tags":
["Console","Games"],"updated_at":null},{"id":21,"title":"Playstation4","price":"399.99","created_at":"2019-02-16T12:39:45.034Z","deleted_at":null,"tags":
["Console","Games"],"updated_at":null},{"id":9,"title":"42\" LCD TV","price":"499.00","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":
["Technology","TV"],"updated_at":null},{"id":6,"title":"Desktop Computer","price":"499.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":
["Technology"],"updated_at":null},{"id":10,"title":"42\" Plasma TV","price":"529.00","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":
["Technology","TV"],"updated_at":null},{"id":7,"title":"Laptop Computer","price":"899.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":
["Technology"],"updated_at":null}]
```

GET /products/:id

Show details of the specified products.



http://localhost:3000/products/1

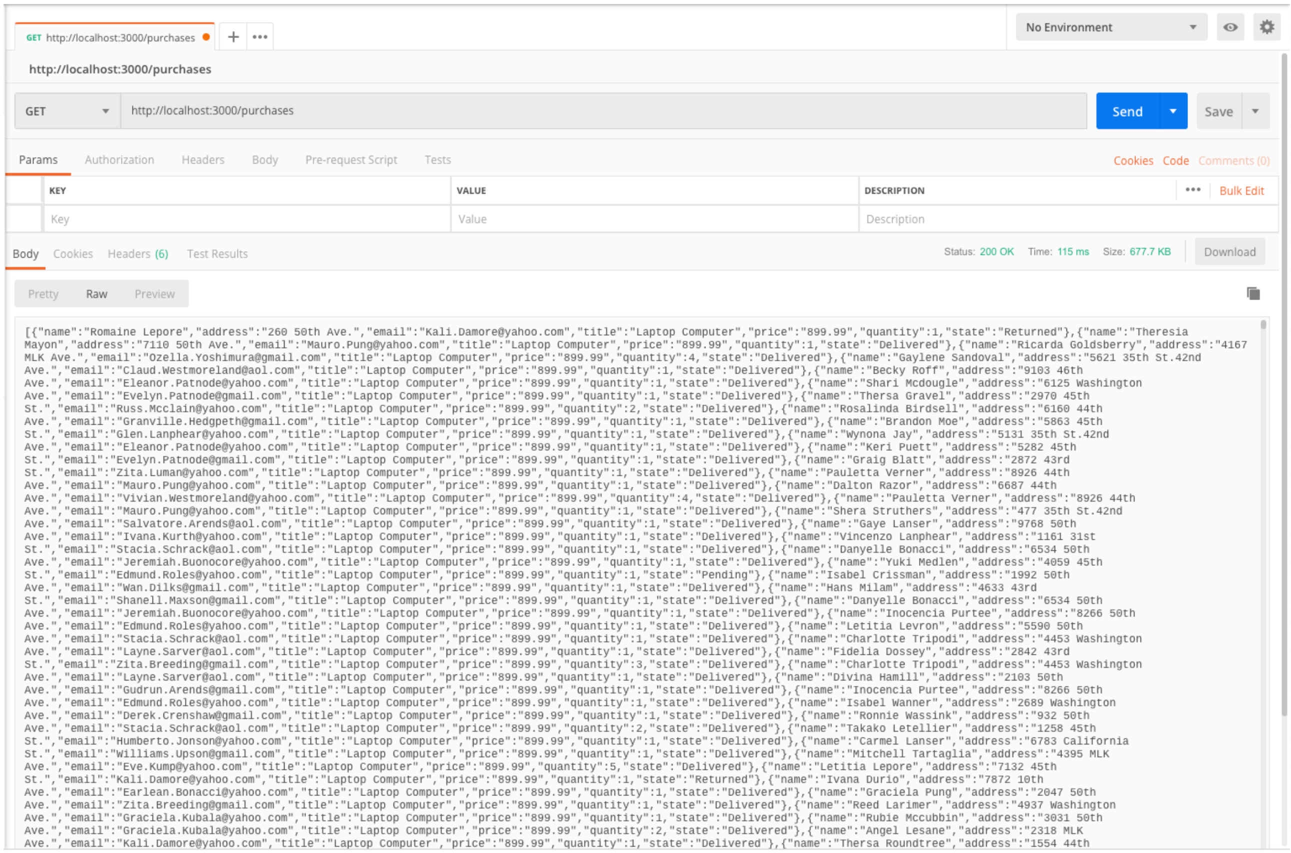
GET http://localhost:3000/products/1

Status: 200 OK Time: 30 ms Size: 351 B

```
[{"id":1,"title":"Dictionary","price":"9.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Book"],"updated_at":null}]
```

GET /purchases

List purchase items to include the receiver's name and, address, the purchaser's email address and the price, quantity and delivery status of the purchased item. Order by price in descending order.



http://localhost:3000/purchases

GET http://localhost:3000/purchases

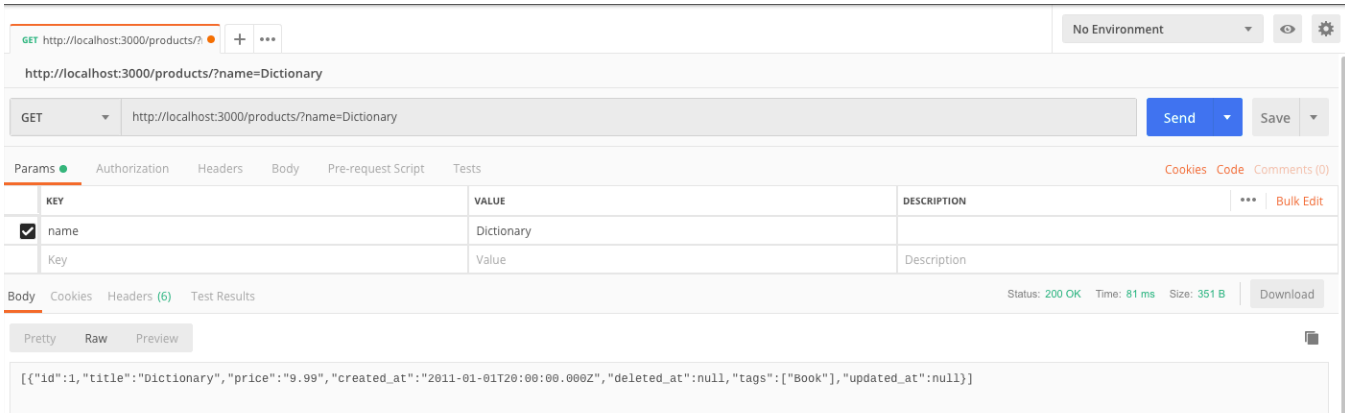
Status: 200 OK Time: 115 ms Size: 677.7 KB

```
[{"name":"Romaine Lepore","address":"260 50th Ave.","email":"Kali.Damore@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Returned"},{"name":"Theresia
Mayon","address":"7110 50th Ave.","email":"Mauro.Pung@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Ricarda Goldsberry","address":"4167
MLK Ave.","email":"Ozella.Yoshimura@gmail.com","title":"Laptop Computer","price":"899.99","quantity":4,"state":"Delivered"},{"name":"Gaylene Sandoval","address":"5621 35th St.42nd
Ave.","email":"Claud.Westmoreland@aol.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Becky Roff","address":"9103 46th
Ave.","email":"Eleanor.Patnode@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Shari Mcdougle","address":"6125 Washington
Ave.","email":"Evelyn.Patnode@gmail.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Thersa Gravel","address":"2970 45th
St.","email":"Russ.Mcclain@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":2,"state":"Delivered"},{"name":"Rosalinda Birdsell","address":"6160 44th
Ave.","email":"Granville.Hedgpeth@gmail.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Brandon Moe","address":"5863 45th
St.","email":"Glen.Lanphear@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Wynona Jay","address":"5131 35th St.42nd
Ave.","email":"Eleanor.Patnode@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Keri Puett","address":"5282 45th
St.","email":"Evelyn.Patnode@gmail.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Graig Blatt","address":"2872 43rd
St.","email":"Zita.Luman@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Pauletta Verner","address":"8926 44th
Ave.","email":"Mauro.Pung@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Dalton Razor","address":"6687 44th
Ave.","email":"Vivian.Westmoreland@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":4,"state":"Delivered"},{"name":"Pauletta Verner","address":"8926 44th
Ave.","email":"Mauro.Pung@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Shera Struthers","address":"477 35th St.42nd
Ave.","email":"Salvatore.Arends@aol.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Gaye Lanser","address":"9768 50th
Ave.","email":"Ivana.Kurth@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Vincenzo Lanphear","address":"1161 31st
St.","email":"Stacia.Schrack@aol.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Danyelle Bonacci","address":"6534 50th
Ave.","email":"Jeremiah.Buonocore@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Yuki Medlen","address":"4059 45th
St.","email":"Edmund.Roles@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Pending"},{"name":"Isabel Crissman","address":"1992 50th
Ave.","email":"Wan.Dilks@gmail.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Hans Milam","address":"4633 43rd
St.","email":"Shanell.Maxson@gmail.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Danyelle Bonacci","address":"6534 50th
Ave.","email":"Jeremiah.Buonocore@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Inocencia Purtee","address":"8266 50th
Ave.","email":"Edmund.Roles@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Letitia Levron","address":"5590 50th
Ave.","email":"Stacia.Schrack@aol.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Charlotte Tripodi","address":"4453 Washington
Ave.","email":"Layne.Sarver@aol.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Fidelia Dossey","address":"2842 43rd
St.","email":"Zita.Breeding@gmail.com","title":"Laptop Computer","price":"899.99","quantity":3,"state":"Delivered"},{"name":"Charlotte Tripodi","address":"4453 Washington
Ave.","email":"Layne.Sarver@aol.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Divina Hamill","address":"2103 50th
Ave.","email":"Gudrun.Arends@gmail.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Inocencia Purtee","address":"8266 50th
Ave.","email":"Edmund.Roles@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Isabel Wanner","address":"2689 Washington
Ave.","email":"Derek.Crenshaw@gmail.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Ronnie Wassink","address":"932 50th
Ave.","email":"Stacia.Schrack@aol.com","title":"Laptop Computer","price":"899.99","quantity":2,"state":"Delivered"},{"name":"Takako Letellier","address":"1258 45th
St.","email":"Humberto.Jonson@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Carmel Lanser","address":"6783 California
St.","email":"Williams.Upson@gmail.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Mitchell Tartaglia","address":"4395 MLK
Ave.","email":"Eve.Kump@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":5,"state":"Delivered"},{"name":"Letitia Lepore","address":"7132 45th
St.","email":"Kali.Damore@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Returned"},{"name":"Ivana Durio","address":"7872 10th
Ave.","email":"Earlean.Bonacci@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Graciela Pung","address":"2047 50th
Ave.","email":"Zita.Breeding@gmail.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Reed Larimer","address":"4937 Washington
Ave.","email":"Graciela.Kubala@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Rubie Mccubbin","address":"3031 50th
Ave.","email":"Graciela.Kubala@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":2,"state":"Delivered"},{"name":"Angel Lesane","address":"2318 MLK
Ave.","email":"Kali.Damore@yahoo.com","title":"Laptop Computer","price":"899.99","quantity":1,"state":"Delivered"},{"name":"Thersa Roundtree","address":"1554 44th
```

All endpoints serve the expected data as checked with the database against it, explanation is in the code.

Part 2 – Products Extension + SQL Injection

GET products[?name=string]



http://localhost:3000/products/?name=Dictionary

GET http://localhost:3000/products/?name=Dictionary

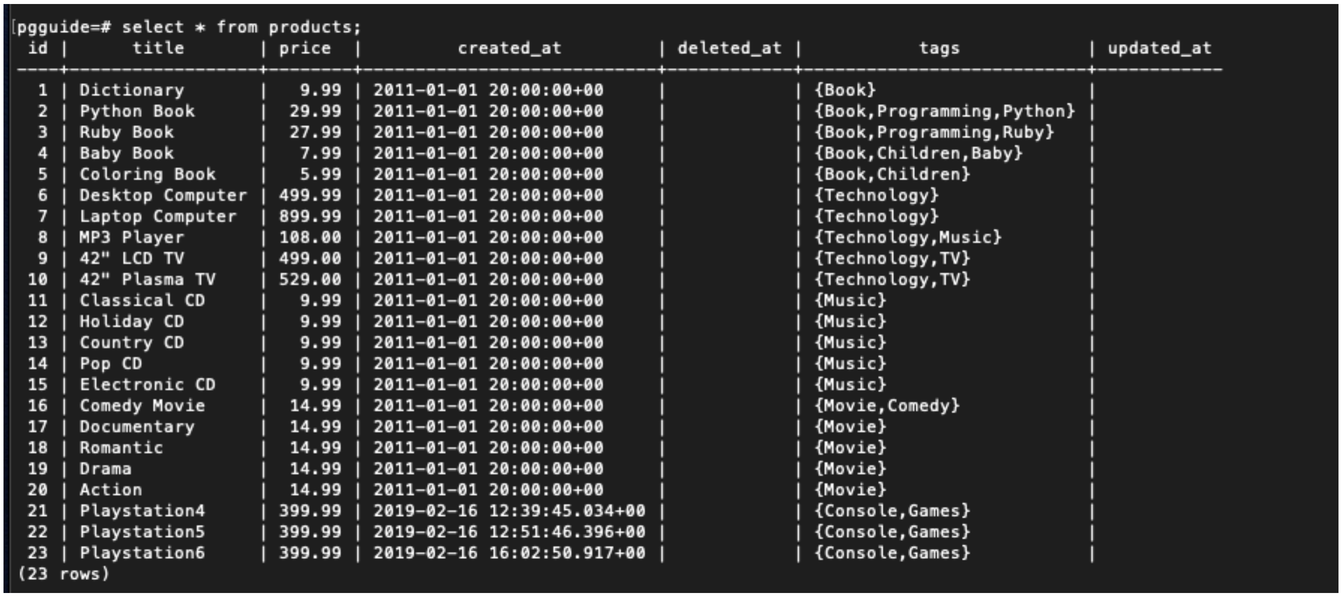
	KEY	VALUE	DESCRIPTION
☑	name	Dictionary	
	Key	Value	Description

Status: 200 OK Time: 81 ms Size: 351 B

```
[{"id":1,"title":"Dictionary","price":"9.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Book"],"updated_at":null}]
```

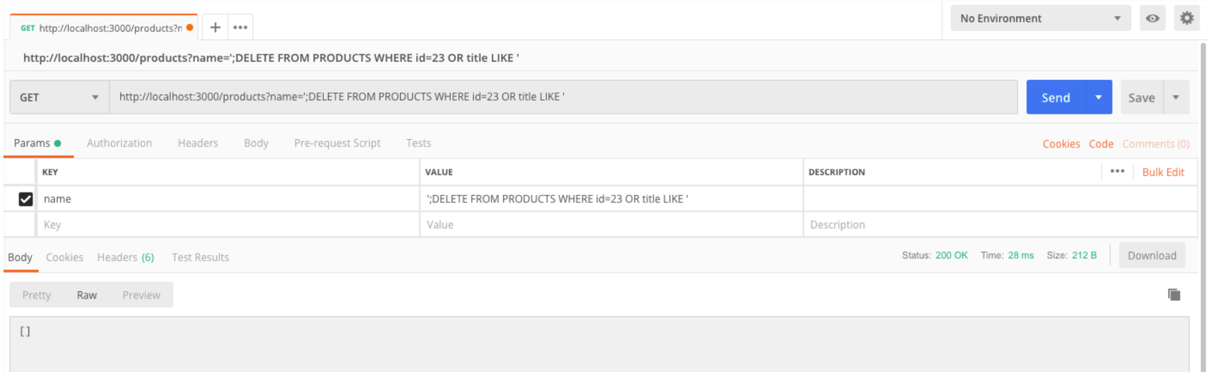
SQL Injection

Database before the query.



```
[pgguide=# select * from products;
 id |      title       | price  |         created_at         | deleted_at |           tags            | updated_at
----+------------------+--------+----------------------------+------------+---------------------------+------------
  1 | Dictionary       |   9.99 | 2011-01-01 20:00:00+00     |            | {Book}                    |
  2 | Python Book      |  29.99 | 2011-01-01 20:00:00+00     |            | {Book,Programming,Python} |
  3 | Ruby Book        |  27.99 | 2011-01-01 20:00:00+00     |            | {Book,Programming,Ruby}   |
  4 | Baby Book        |   7.99 | 2011-01-01 20:00:00+00     |            | {Book,Children,Baby}      |
  5 | Coloring Book    |   5.99 | 2011-01-01 20:00:00+00     |            | {Book,Children}           |
  6 | Desktop Computer | 499.99 | 2011-01-01 20:00:00+00     |            | {Technology}              |
  7 | Laptop Computer  | 899.99 | 2011-01-01 20:00:00+00     |            | {Technology}              |
  8 | MP3 Player       | 108.00 | 2011-01-01 20:00:00+00     |            | {Technology,Music}        |
  9 | 42" LCD TV       | 499.00 | 2011-01-01 20:00:00+00     |            | {Technology,TV}           |
 10 | 42" Plasma TV    | 529.00 | 2011-01-01 20:00:00+00     |            | {Technology,TV}           |
 11 | Classical CD     |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                   |
 12 | Holiday CD       |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                   |
 13 | Country CD       |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                   |
 14 | Pop CD           |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                   |
 15 | Electronic CD    |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                   |
 16 | Comedy Movie     |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie,Comedy}            |
 17 | Documentary      |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                   |
 18 | Romantic         |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                   |
 19 | Drama            |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                   |
 20 | Action           |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                   |
 21 | Playstation4     | 399.99 | 2019-02-16 12:39:45.034+00 |            | {Console,Games}           |
 22 | Playstation5     | 399.99 | 2019-02-16 12:51:46.396+00 |            | {Console,Games}           |
 23 | Playstation6     | 399.99 | 2019-02-16 16:02:50.917+00 |            | {Console,Games}           |
(23 rows)
```

Entering in the query.



http://localhost:3000/products?name=';DELETE FROM PRODUCTS WHERE id=23 OR title LIKE '

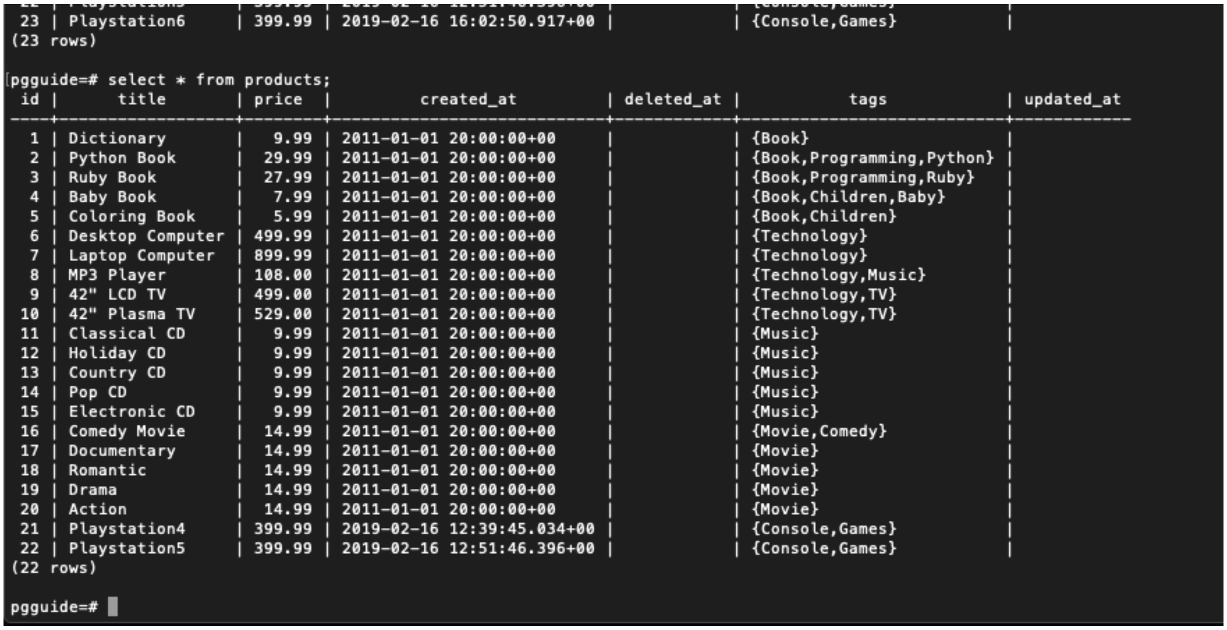
GET http://localhost:3000/products?name=';DELETE FROM PRODUCTS WHERE id=23 OR title LIKE '

	KEY	VALUE	DESCRIPTION
☑	name	';DELETE FROM PRODUCTS WHERE id=23 OR title LIKE '	
	Key	Value	Description

Status: 200 OK Time: 28 ms Size: 212 B

```
[]
```

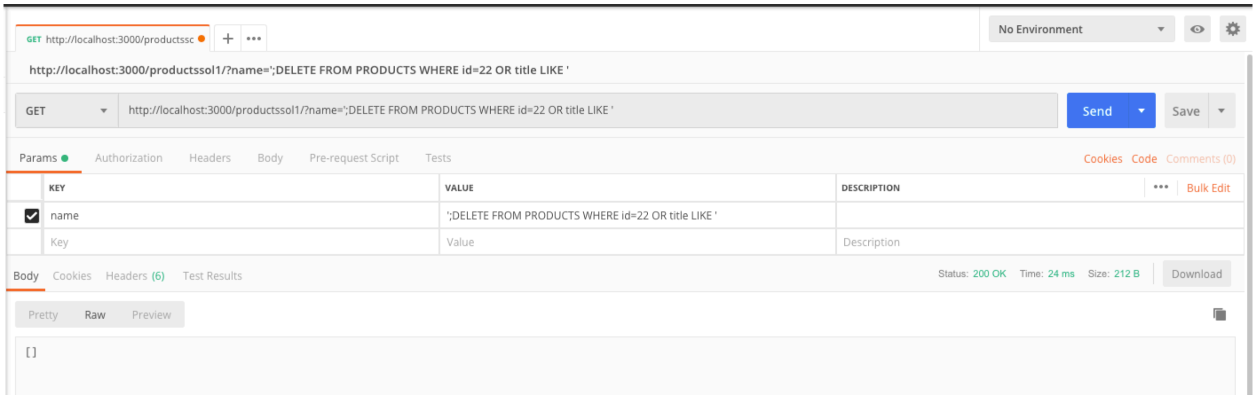
Database after the query.



```
 23 | Playstation6      | 399.99 | 2019-02-16 16:02:50.917+00 |            | {Console,Games}              |
(23 rows)

[pgguide=# select * from products;
 id |       title       | price  |         created_at         | deleted_at |             tags             | updated_at
----+-------------------+--------+----------------------------+------------+------------------------------+------------
  1 | Dictionary        |   9.99 | 2011-01-01 20:00:00+00     |            | {Book}                       |
  2 | Python Book       |  29.99 | 2011-01-01 20:00:00+00     |            | {Book,Programming,Python}    |
  3 | Ruby Book         |  27.99 | 2011-01-01 20:00:00+00     |            | {Book,Programming,Ruby}      |
  4 | Baby Book         |   7.99 | 2011-01-01 20:00:00+00     |            | {Book,Children,Baby}         |
  5 | Coloring Book     |   5.99 | 2011-01-01 20:00:00+00     |            | {Book,Children}              |
  6 | Desktop Computer  | 499.99 | 2011-01-01 20:00:00+00     |            | {Technology}                 |
  7 | Laptop Computer   | 899.99 | 2011-01-01 20:00:00+00     |            | {Technology}                 |
  8 | MP3 Player        | 108.00 | 2011-01-01 20:00:00+00     |            | {Technology,Music}           |
  9 | 42" LCD TV        | 499.00 | 2011-01-01 20:00:00+00     |            | {Technology,TV}              |
 10 | 42" Plasma TV     | 529.00 | 2011-01-01 20:00:00+00     |            | {Technology,TV}              |
 11 | Classical CD      |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                      |
 12 | Holiday CD        |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                      |
 13 | Country CD        |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                      |
 14 | Pop CD            |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                      |
 15 | Electronic CD     |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                      |
 16 | Comedy Movie      |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie,Comedy}               |
 17 | Documentary       |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                      |
 18 | Romantic          |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                      |
 19 | Drama             |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                      |
 20 | Action            |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                      |
 21 | Playstation4      | 399.99 | 2019-02-16 12:39:45.034+00 |            | {Console,Games}              |
 22 | Playstation5      | 399.99 | 2019-02-16 12:51:46.396+00 |            | {Console,Games}              |
(22 rows)

pgguide=# 
```

Part 3 – Two Solutions to Eliminate Security Holes

Parameterised Query



GET http://localhost:3000/productssc

http://localhost:3000/productssol1/?name=';DELETE FROM PRODUCTS WHERE id=22 OR title LIKE '

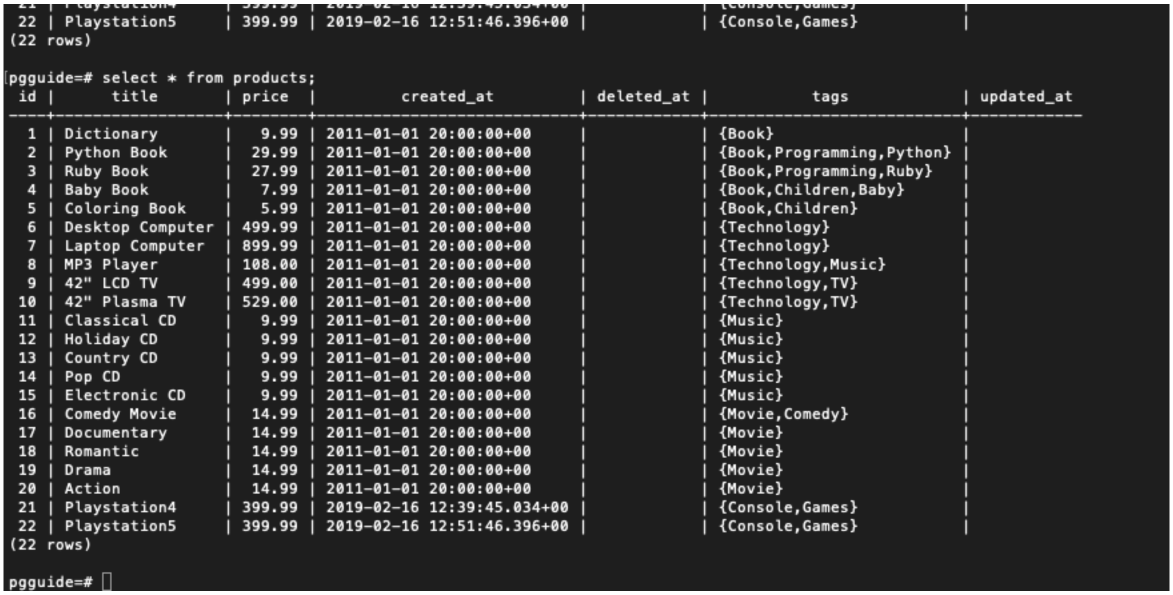
GET http://localhost:3000/productssol1/?name=';DELETE FROM PRODUCTS WHERE id=22 OR title LIKE '

	KEY	VALUE	DESCRIPTION
☑	name	';DELETE FROM PRODUCTS WHERE id=22 OR title LIKE '	
	Key	Value	Description

Status: 200 OK Time: 24 ms Size: 212 B

```
[]
```

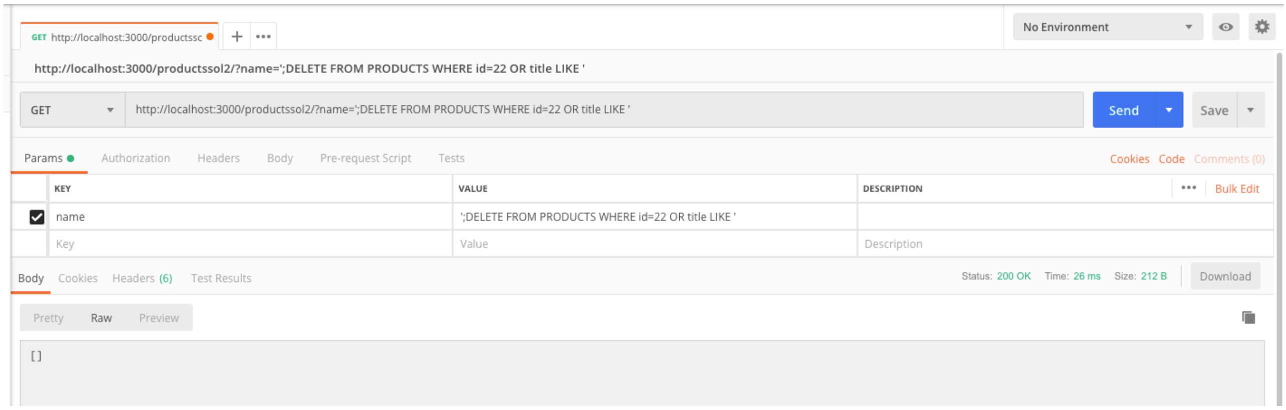
After entering in the query, it does not delete from the database as it is prone to SQL Injection.



```
 22 | Playstation5     | 399.99 | 2019-02-16 12:51:46.396+00 |            | {Console,Games}              |
(22 rows)

[pgguide=# select * from products;
 id |      title       | price  |         created_at         | deleted_at |            tags              | updated_at
----+------------------+--------+----------------------------+------------+------------------------------+------------
  1 | Dictionary       |   9.99 | 2011-01-01 20:00:00+00     |            | {Book}                       |
  2 | Python Book      |  29.99 | 2011-01-01 20:00:00+00     |            | {Book,Programming,Python}    |
  3 | Ruby Book        |  27.99 | 2011-01-01 20:00:00+00     |            | {Book,Programming,Ruby}      |
  4 | Baby Book        |   7.99 | 2011-01-01 20:00:00+00     |            | {Book,Children,Baby}         |
  5 | Coloring Book    |   5.99 | 2011-01-01 20:00:00+00     |            | {Book,Children}              |
  6 | Desktop Computer | 499.99 | 2011-01-01 20:00:00+00     |            | {Technology}                 |
  7 | Laptop Computer  | 899.99 | 2011-01-01 20:00:00+00     |            | {Technology}                 |
  8 | MP3 Player       | 108.00 | 2011-01-01 20:00:00+00     |            | {Technology,Music}           |
  9 | 42" LCD TV       | 499.00 | 2011-01-01 20:00:00+00     |            | {Technology,TV}              |
 10 | 42" Plasma TV    | 529.00 | 2011-01-01 20:00:00+00     |            | {Technology,TV}              |
 11 | Classical CD     |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                      |
 12 | Holiday CD       |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                      |
 13 | Country CD       |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                      |
 14 | Pop CD           |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                      |
 15 | Electronic CD    |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                      |
 16 | Comedy Movie     |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie,Comedy}               |
 17 | Documentary      |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                      |
 18 | Romantic         |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                      |
 19 | Drama            |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                      |
 20 | Action           |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                      |
 21 | Playstation4     | 399.99 | 2019-02-16 12:39:45.034+00 |            | {Console,Games}              |
 22 | Playstation5     | 399.99 | 2019-02-16 12:51:46.396+00 |            | {Console,Games}              |
(22 rows)

pgguide=# 
```

The database is unaffected after entering in the SQL Injection query.

Stored Procedure



http://localhost:3000/productssol2/?name=';DELETE FROM PRODUCTS WHERE id=22 OR title LIKE '

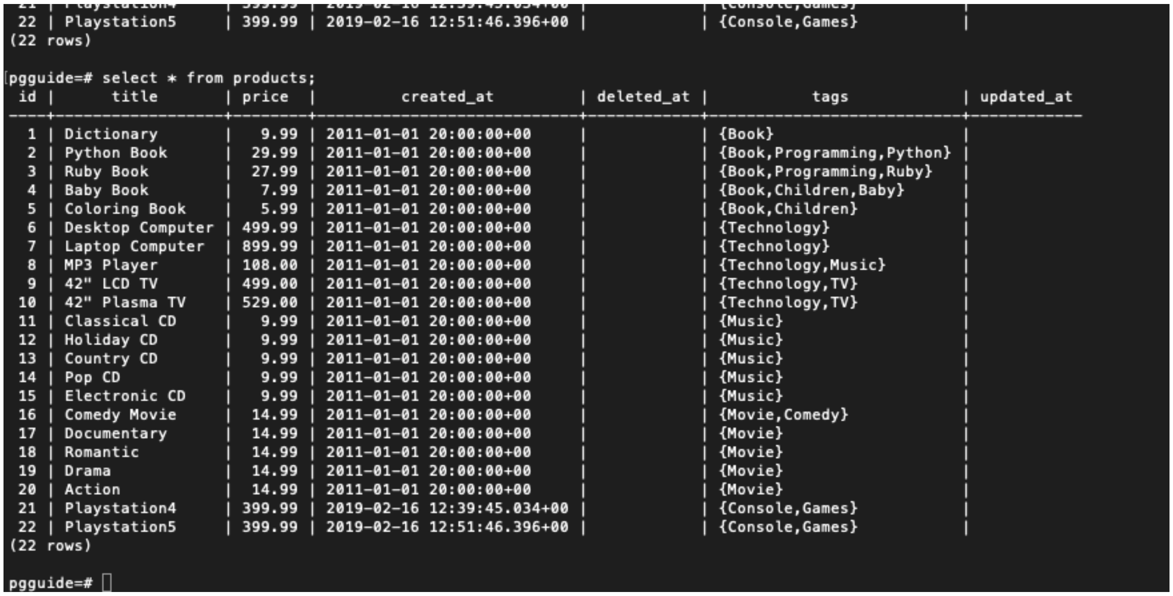
GET http://localhost:3000/productssol2/?name=';DELETE FROM PRODUCTS WHERE id=22 OR title LIKE '

	KEY	VALUE	DESCRIPTION
☑	name	';DELETE FROM PRODUCTS WHERE id=22 OR title LIKE '	
	Key	Value	Description

Status: 200 OK Time: 26 ms Size: 212 B

```
[]
```

After entering in the query, it does not delete from the database as it is prone to SQL Injection.



```
 21 | Playstation4      | 399.99 | 2019-02-16 12:39:45.034+00 |            | {Console,Games}          |
 22 | Playstation5      | 399.99 | 2019-02-16 12:51:46.396+00 |            | {Console,Games}          |
(22 rows)

pgguide=# select * from products;
 id |       title       | price  |         created_at         | deleted_at |           tags           | updated_at
----+-------------------+--------+----------------------------+------------+--------------------------+------------
  1 | Dictionary        |   9.99 | 2011-01-01 20:00:00+00     |            | {Book}                   |
  2 | Python Book       |  29.99 | 2011-01-01 20:00:00+00     |            | {Book,Programming,Python} |
  3 | Ruby Book         |  27.99 | 2011-01-01 20:00:00+00     |            | {Book,Programming,Ruby}  |
  4 | Baby Book         |   7.99 | 2011-01-01 20:00:00+00     |            | {Book,Children,Baby}     |
  5 | Coloring Book     |   5.99 | 2011-01-01 20:00:00+00     |            | {Book,Children}          |
  6 | Desktop Computer  | 499.99 | 2011-01-01 20:00:00+00     |            | {Technology}             |
  7 | Laptop Computer   | 899.99 | 2011-01-01 20:00:00+00     |            | {Technology}             |
  8 | MP3 Player        | 108.00 | 2011-01-01 20:00:00+00     |            | {Technology,Music}       |
  9 | 42" LCD TV        | 499.00 | 2011-01-01 20:00:00+00     |            | {Technology,TV}          |
 10 | 42" Plasma TV     | 529.00 | 2011-01-01 20:00:00+00     |            | {Technology,TV}          |
 11 | Classical CD      |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                  |
 12 | Holiday CD        |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                  |
 13 | Country CD        |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                  |
 14 | Pop CD            |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                  |
 15 | Electronic CD     |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                  |
 16 | Comedy Movie      |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie,Comedy}           |
 17 | Documentary       |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                  |
 18 | Romantic          |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                  |
 19 | Drama             |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                  |
 20 | Action            |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                  |
 21 | Playstation4      | 399.99 | 2019-02-16 12:39:45.034+00 |            | {Console,Games}          |
 22 | Playstation5      | 399.99 | 2019-02-16 12:51:46.396+00 |            | {Console,Games}          |
(22 rows)

pgguide=#
```

The database is unaffected after entering in the SQL Injection query.

Note:

- /products/?name=… - Ability to perform SQL Injection
- /productssol1/?name=… - Parameterised Query (SQL Injection Prevention)
- /productssol2/?name=… - Stored Procedure (SQL Injection Prevention)

All is explained in the code on how this is done.

Part 4 – Sequelize ORM

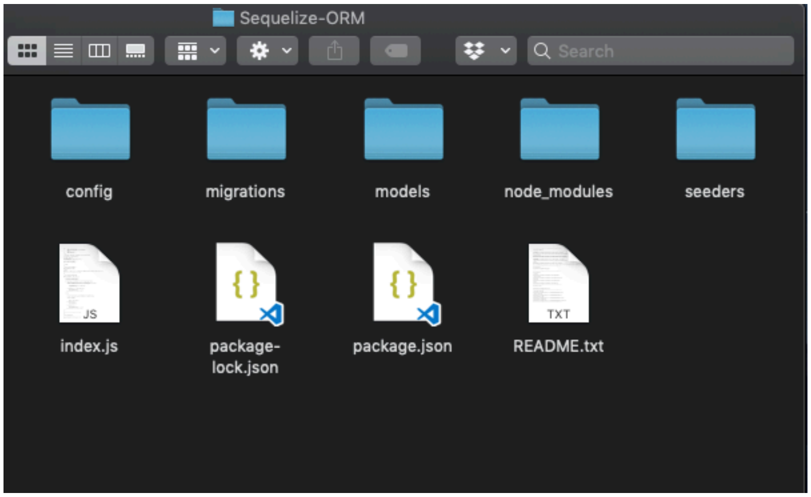
Setup

1. npm install --save sequelize-cli
2. node_modules/.bin/sequelize init

The following folders are created:

- config
- models
- migrations
- seeders

Folder Structure



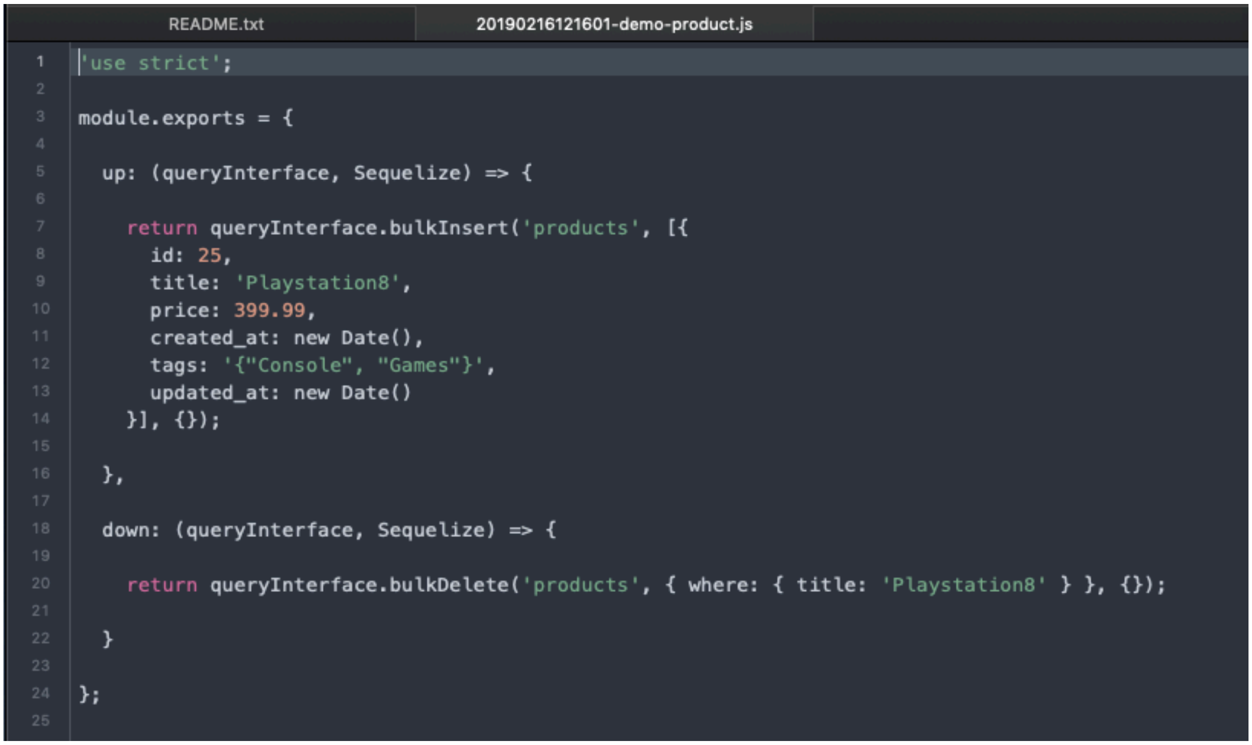
Inside the folder **Sequelize-ORM** the *README.txt* contains the setup commands in creating models and migrations.

Note

- It's important to add the "**updated_at"** column to ensure that the appropriate associations are all set up and working with the models.

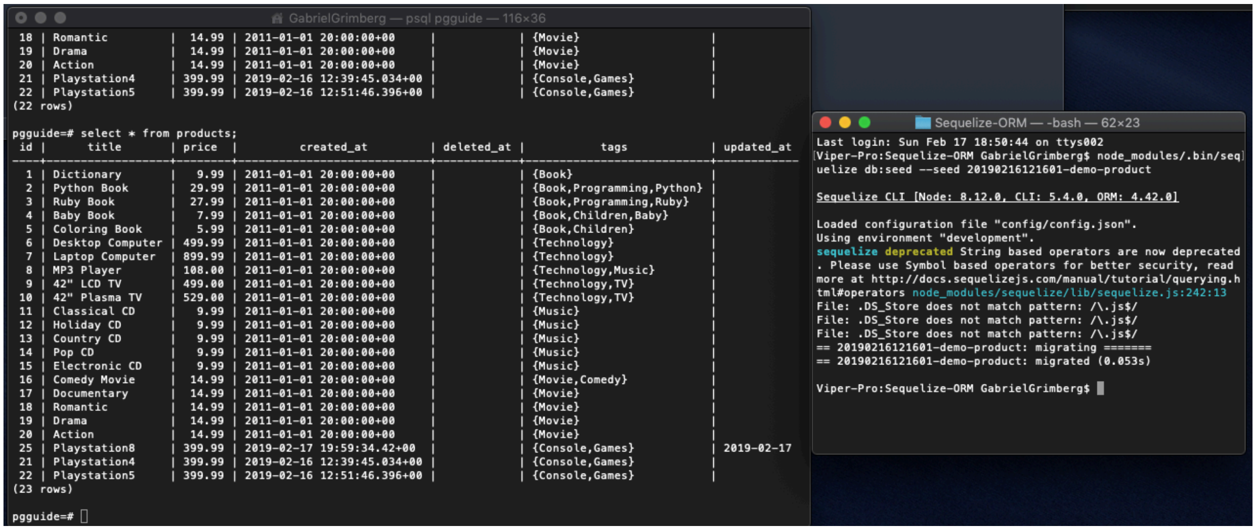
Part 5 – Test Data (Seeders)

Product – Sample Data



```
'use strict';

module.exports = {

  up: (queryInterface, Sequelize) => {

    return queryInterface.bulkInsert('products', [{
      id: 25,
      title: 'Playstation8',
      price: 399.99,
      created_at: new Date(),
      tags: '{"Console", "Games"}',
      updated_at: new Date()
    }], {});

  },

  down: (queryInterface, Sequelize) => {

    return queryInterface.bulkDelete('products', { where: { title: 'Playstation8' } }, {});

  }

};
```

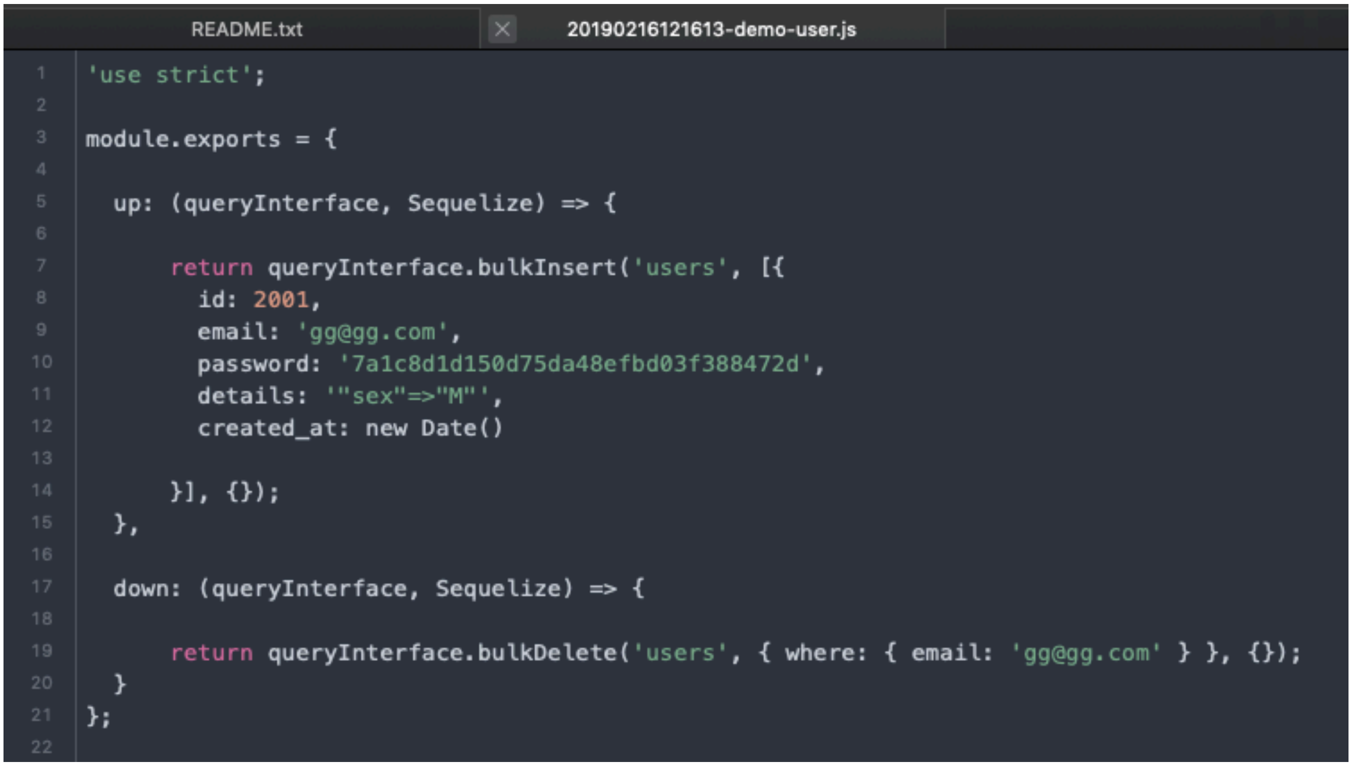
Output


GabrielGrimberg — psql pgguide — 116×36
Sequelize-ORM — -bash — 62×23

```
 18 | Romantic          |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                   |
 19 | Drama             |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                   |
 20 | Action            |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                   |
 21 | Playstation4      | 399.99 | 2019-02-16 12:39:45.034+00 |            | {Console,Games}           |
 22 | Playstation5      | 399.99 | 2019-02-16 12:51:46.396+00 |            | {Console,Games}           |
(22 rows)

pgguide=# select * from products;
 id |      title        | price  |         created_at         | deleted_at |           tags            | updated_at
----+-------------------+--------+----------------------------+------------+---------------------------+------------
  1 | Dictionary        |   9.99 | 2011-01-01 20:00:00+00     |            | {Book}                    |
  2 | Python Book       |  29.99 | 2011-01-01 20:00:00+00     |            | {Book,Programming,Python} |
  3 | Ruby Book         |  27.99 | 2011-01-01 20:00:00+00     |            | {Book,Programming,Ruby}   |
  4 | Baby Book         |   7.99 | 2011-01-01 20:00:00+00     |            | {Book,Children,Baby}      |
  5 | Coloring Book     |   5.99 | 2011-01-01 20:00:00+00     |            | {Book,Children}           |
  6 | Desktop Computer  | 499.99 | 2011-01-01 20:00:00+00     |            | {Technology}              |
  7 | Laptop Computer   | 899.99 | 2011-01-01 20:00:00+00     |            | {Technology}              |
  8 | MP3 Player        | 108.00 | 2011-01-01 20:00:00+00     |            | {Technology,Music}        |
  9 | 42" LCD TV        | 499.00 | 2011-01-01 20:00:00+00     |            | {Technology,TV}           |
 10 | 42" Plasma TV     | 529.00 | 2011-01-01 20:00:00+00     |            | {Technology,TV}           |
 11 | Classical CD      |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                   |
 12 | Holiday CD        |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                   |
 13 | Country CD        |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                   |
 14 | Pop CD            |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                   |
 15 | Electronic CD     |   9.99 | 2011-01-01 20:00:00+00     |            | {Music}                   |
 16 | Comedy Movie      |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie,Comedy}            |
 17 | Documentary       |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                   |
 18 | Romantic          |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                   |
 19 | Drama             |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                   |
 20 | Action            |  14.99 | 2011-01-01 20:00:00+00     |            | {Movie}                   |
 25 | Playstation8      | 399.99 | 2019-02-17 19:59:34.42+00  |            | {Console,Games}           | 2019-02-17
 21 | Playstation4      | 399.99 | 2019-02-16 12:39:45.034+00 |            | {Console,Games}           |
 22 | Playstation5      | 399.99 | 2019-02-16 12:51:46.396+00 |            | {Console,Games}           |
(23 rows)

pgguide=# 
```

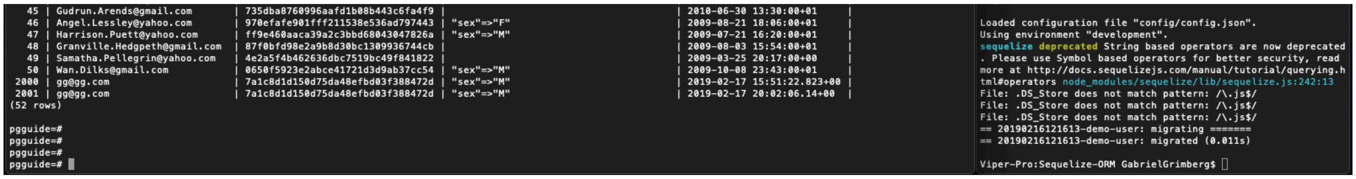
```
Last login: Sun Feb 17 18:50:44 on ttys002
Viper-Pro:Sequelize-ORM GabrielGrimberg$ node_modules/.bin/seq
uelize db:seed --seed 20190216121601-demo-product

Sequelize CLI [Node: 8.12.0, CLI: 5.4.0, ORM: 4.42.0]

Loaded configuration file "config/config.json".
Using environment "development".
sequelize deprecated String based operators are now deprecated
. Please use Symbol based operators for better security, read
more at http://docs.sequelizejs.com/manual/tutorial/querying.h
tml#operators node_modules/sequelize/lib/sequelize.js:242:13
File: .DS_Store does not match pattern: /\.js$/
File: .DS_Store does not match pattern: /\.js$/
File: .DS_Store does not match pattern: /\.js$/
== 20190216121601-demo-product: migrating =======
== 20190216121601-demo-product: migrated (0.053s)

Viper-Pro:Sequelize-ORM GabrielGrimberg$ 
```

User – Sample Data



```
'use strict';

module.exports = {

  up: (queryInterface, Sequelize) => {

      return queryInterface.bulkInsert('users', [{
        id: 2001,
        email: 'gg@gg.com',
        password: '7a1c8d1d150d75da48efbd03f388472d',
        details: '"sex"=>"M"',
        created_at: new Date()

      }], {});
  },

  down: (queryInterface, Sequelize) => {

      return queryInterface.bulkDelete('users', { where: { email: 'gg@gg.com' } }, {});
  }
};

```

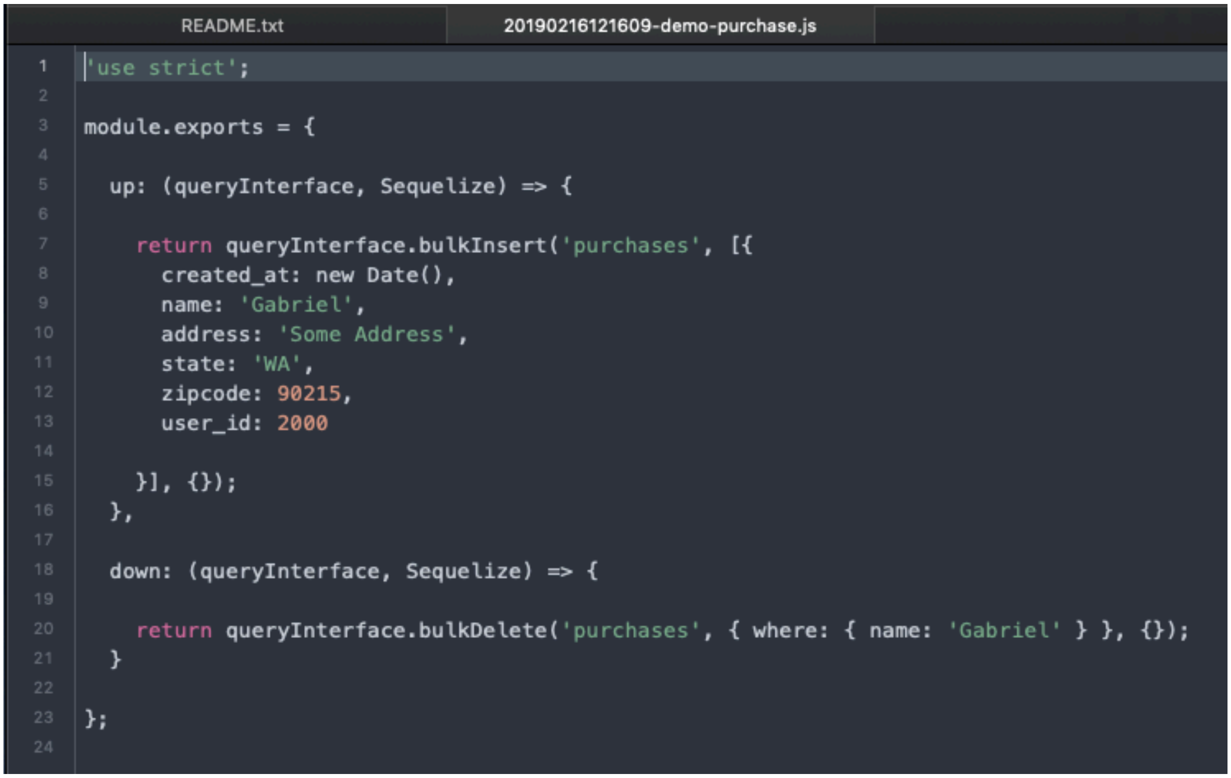
Output



```
   45 | Gudrun.Arends@gmail.com        | 735dba8760996aafd1b08b443c6fa4f9 |                                      | 2010-06-30 13:30:00+01     |
   46 | Angel.Lessley@yahoo.com        | 970efafe901fff211538e536ad797443 | "sex"=>"F"                           | 2009-08-21 18:06:00+01     |
   47 | Harrison.Puett@yahoo.com       | ff9e460aaca39a2c3bbd68043047826a | "sex"=>"M"                           | 2009-07-21 16:20:00+01     |
   48 | Granville.Hedgpeth@gmail.com   | 87f0bfd98e2a9b8d30bc1309936744cb |                                      | 2009-08-03 15:54:00+01     |
   49 | Samatha.Pellegrin@yahoo.com    | 4e2a5f4b462636dbc7519bc49f841822 |                                      | 2009-03-25 20:17:00+00     |
   50 | Wan.Dilks@gmail.com            | 0650f5923e2abce41721d3d9ab37cc54 | "sex"=>"M"                           | 2009-10-08 23:43:00+01     |
 2000 | gg@gg.com                      | 7a1c8d1d150d75da48efbd03f388472d | "sex"=>"M"                           | 2019-02-17 15:51:22.823+00 |
 2001 | gg@gg.com                      | 7a1c8d1d150d75da48efbd03f388472d | "sex"=>"M"                           | 2019-02-17 20:02:06.14+00  |
(52 rows)

pgguide=#
pgguide=#
pgguide=#
pgguide=#
```

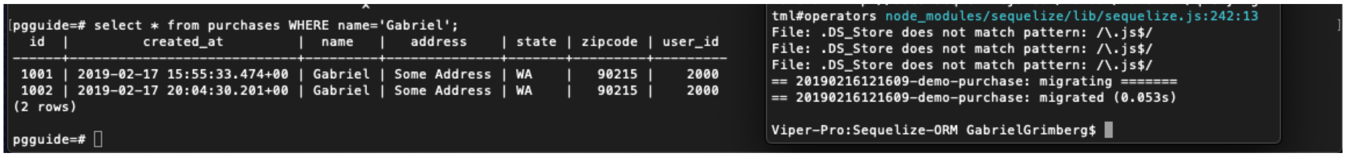
```

Loaded configuration file "config/config.json".
Using environment "development".
sequelize deprecated String based operators are now deprecated
. Please use Symbol based operators for better security, read
more at http://docs.sequelizejs.com/manual/tutorial/querying.h
tml#operators node_modules/sequelize/lib/sequelize.js:242:13
File: .DS_Store does not match pattern: /\.js$/
File: .DS_Store does not match pattern: /\.js$/
File: .DS_Store does not match pattern: /\.js$/
== 20190216121613-demo-user: migrating =======
== 20190216121613-demo-user: migrated (0.011s)

Viper-Pro:Sequelize-ORM GabrielGrimberg$
```

Purchase – Sample Data



```
'use strict';

module.exports = {

  up: (queryInterface, Sequelize) => {

    return queryInterface.bulkInsert('purchases', [{
      created_at: new Date(),
      name: 'Gabriel',
      address: 'Some Address',
      state: 'WA',
      zipcode: 90215,
      user_id: 2000

    }], {});
  },

  down: (queryInterface, Sequelize) => {

    return queryInterface.bulkDelete('purchases', { where: { name: 'Gabriel' } }, {});
  }

};
```

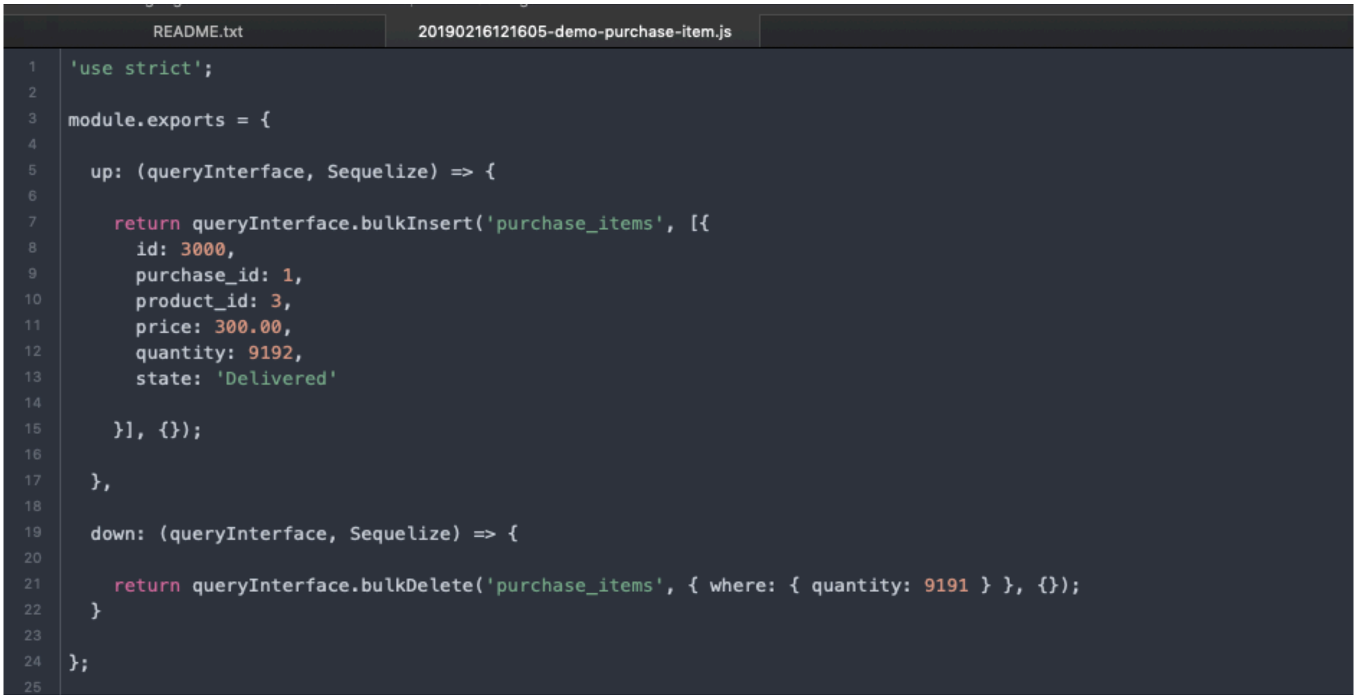
Output



```
pgguide=# select * from purchases WHERE name='Gabriel';
  id  |         created_at         |  name   |   address    | state | zipcode | user_id
------+----------------------------+---------+--------------+-------+---------+---------
 1001 | 2019-02-17 15:55:33.474+00 | Gabriel | Some Address | WA    |   90215 |    2000
 1002 | 2019-02-17 20:04:30.201+00 | Gabriel | Some Address | WA    |   90215 |    2000
(2 rows)

pgguide=# 
```

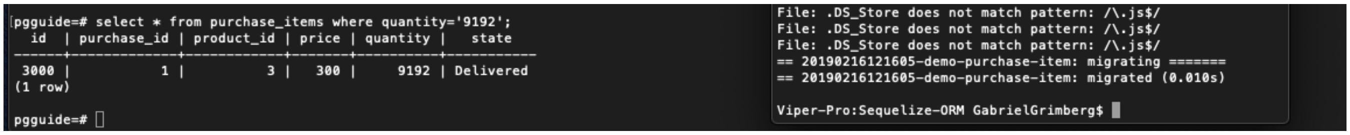
```
tml#operators node_modules/sequelize/lib/sequelize.js:242:13
File: .DS_Store does not match pattern: /\.js$/
File: .DS_Store does not match pattern: /\.js$/
File: .DS_Store does not match pattern: /\.js$/
== 20190216121609-demo-purchase: migrating =======
== 20190216121609-demo-purchase: migrated (0.053s)

Viper-Pro:Sequelize-ORM GabrielGrimberg$ 
```

Purchase Item – Sample Data



```
'use strict';

module.exports = {

  up: (queryInterface, Sequelize) => {

    return queryInterface.bulkInsert('purchase_items', [{
      id: 3000,
      purchase_id: 1,
      product_id: 3,
      price: 300.00,
      quantity: 9192,
      state: 'Delivered'

    }], {});

  },

  down: (queryInterface, Sequelize) => {

    return queryInterface.bulkDelete('purchase_items', { where: { quantity: 9191 } }, {});
  }

};
```

Output

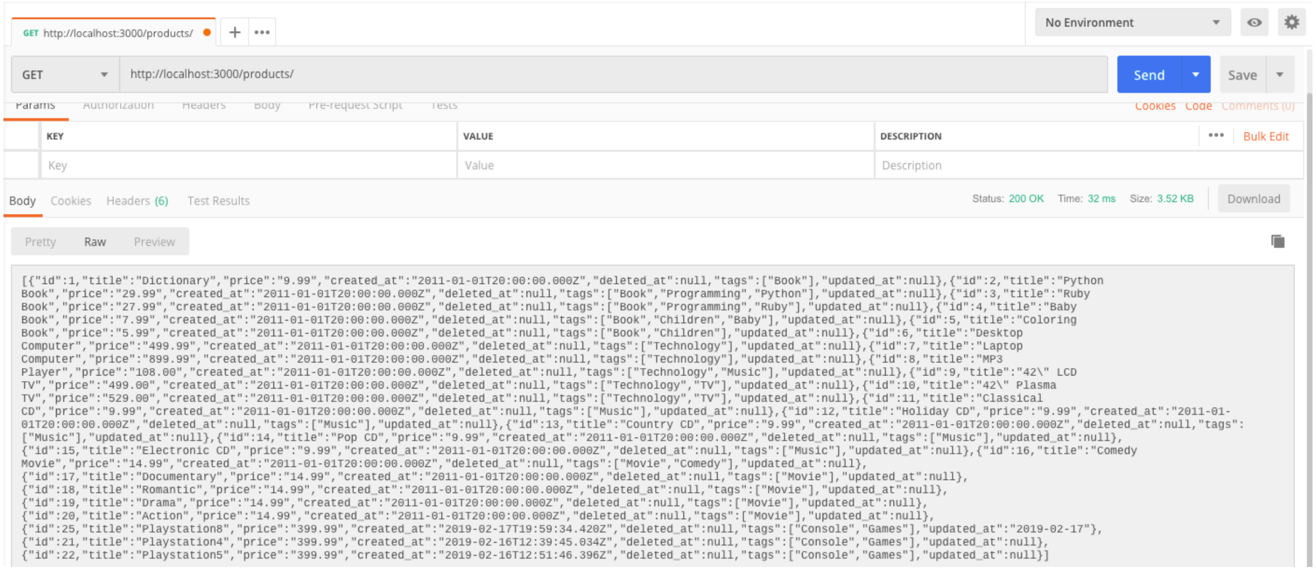


```
pgguide=# select * from purchase_items where quantity='9192';
  id  | purchase_id | product_id | price | quantity |   state
------+-------------+------------+-------+----------+-----------
 3000 |           1 |          3 |   300 |     9192 | Delivered
(1 row)

pgguide=# 
```

```
File: .DS_Store does not match pattern: /\.js$/
File: .DS_Store does not match pattern: /\.js$/
File: .DS_Store does not match pattern: /\.js$/
== 20190216121605-demo-purchase-item: migrating =======
== 20190216121605-demo-purchase-item: migrated (0.010s)

Viper-Pro:Sequelize-ORM GabrielGrimberg$ 
```

Part 6 – RESTful API

GET /products[?name=string]

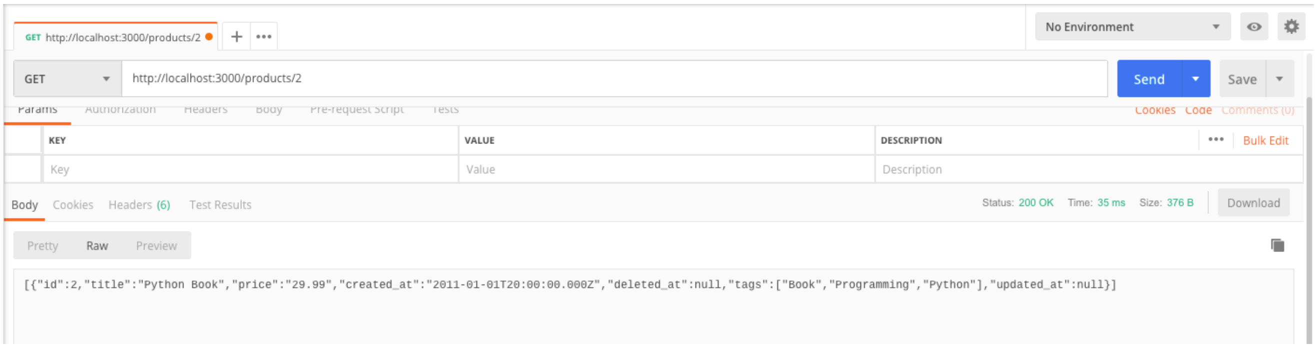

GET http://localhost:3000/products/
No Environment
Params Authorization Headers Body Pre-request Script Tests
Cookies Code Comments (0)
KEY
VALUE
DESCRIPTION
Bulk Edit
Key
Value
Description
Body Cookies Headers (6) Test Results
Download
Pretty Raw Preview

GET http://localhost:3000/products/ Send Save

Status: 200 OK Time: 32 ms Size: 3.52 KB

```
[{"id":1,"title":"Dictionary","price":"9.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Book"],"updated_at":null},{"id":2,"title":"Python
Book","price":"29.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Book","Programming","Python"],"updated_at":null},{"id":3,"title":"Ruby
Book","price":"27.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Book","Programming","Ruby"],"updated_at":null},{"id":4,"title":"Baby
Book","price":"7.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Book","Children","Baby"],"updated_at":null},{"id":5,"title":"Coloring
Book","price":"5.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Book","Children"],"updated_at":null},{"id":6,"title":"Desktop
Computer","price":"499.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Technology"],"updated_at":null},{"id":7,"title":"Laptop
Computer","price":"899.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Technology"],"updated_at":null},{"id":8,"title":"MP3
Player","price":"108.00","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Technology","Music"],"updated_at":null},{"id":9,"title":"42\" LCD
TV","price":"499.00","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Technology","TV"],"updated_at":null},{"id":10,"title":"42\" Plasma
TV","price":"529.00","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Technology","TV"],"updated_at":null},{"id":11,"title":"Classical
CD","price":"9.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Music"],"updated_at":null},{"id":12,"title":"Holiday CD","price":"9.99","created_at":"2011-01-
01T20:00:00.000Z","deleted_at":null,"tags":["Music"],"updated_at":null},{"id":13,"title":"Country CD","price":"9.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":
["Music"],"updated_at":null},{"id":14,"title":"Pop CD","price":"9.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Music"],"updated_at":null},
{"id":15,"title":"Electronic CD","price":"9.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Music"],"updated_at":null},{"id":16,"title":"Comedy
Movie","price":"14.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Movie","Comedy"],"updated_at":null},
{"id":17,"title":"Documentary","price":"14.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Movie"],"updated_at":null},
{"id":18,"title":"Romantic","price":"14.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Movie"],"updated_at":null},
{"id":19,"title":"Drama","price":"14.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Movie"],"updated_at":null},
{"id":20,"title":"Action","price":"14.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Movie"],"updated_at":null},
{"id":25,"title":"Playstation8","price":"399.99","created_at":"2019-02-17T19:59:34.420Z","deleted_at":null,"tags":["Console","Games"],"updated_at":"2019-02-17"},
{"id":21,"title":"Playstation4","price":"399.99","created_at":"2019-02-16T12:39:45.034Z","deleted_at":null,"tags":["Console","Games"],"updated_at":null},
{"id":22,"title":"Playstation5","price":"399.99","created_at":"2019-02-16T12:51:46.396Z","deleted_at":null,"tags":["Console","Games"],"updated_at":null}]
```

GET /products/:id

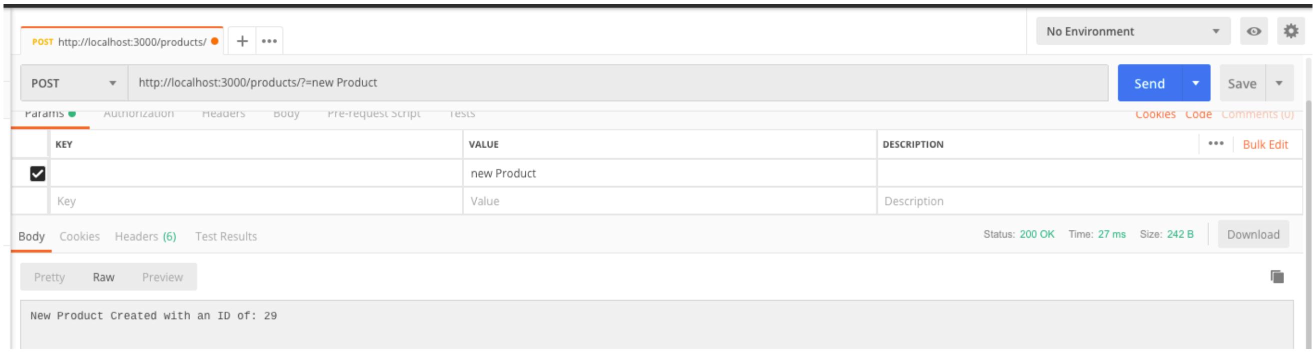

GET http://localhost:3000/products/2
No Environment
Params Authorization Headers Body Pre-request Script Tests
Cookies Code Comments (0)
KEY
VALUE
DESCRIPTION
Bulk Edit
Key
Value
Description
Body Cookies Headers (6) Test Results
Download
Pretty Raw Preview

GET http://localhost:3000/products/2 Send Save

Status: 200 OK Time: 35 ms Size: 376 B

```
[{"id":2,"title":"Python Book","price":"29.99","created_at":"2011-01-01T20:00:00.000Z","deleted_at":null,"tags":["Book","Programming","Python"],"updated_at":null}]
```

POST /products



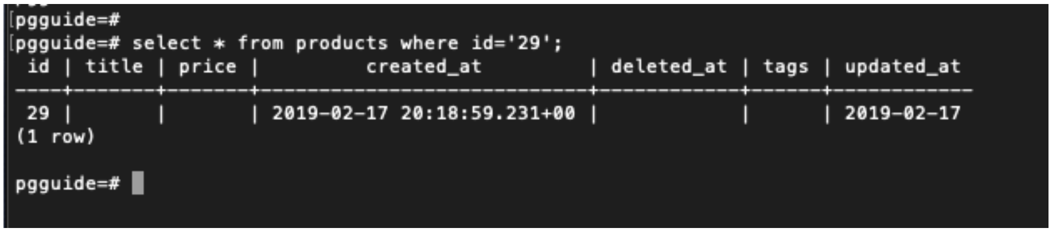
POST http://localhost:3000/products/?=new Product

KEY	VALUE	DESCRIPTION
☑	new Product	

Status: 200 OK Time: 27 ms Size: 242 B

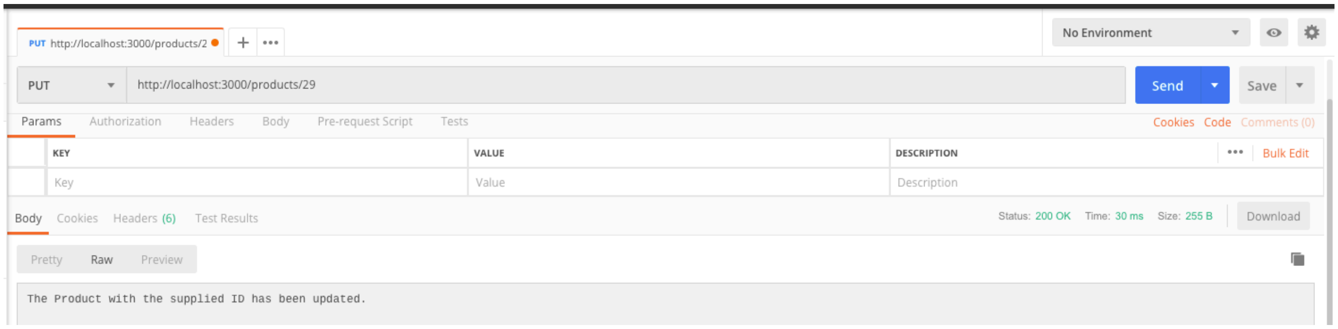
```
New Product Created with an ID of: 29
```

New Instance Confirmation



```
[pgguide=#
[pgguide=# select * from products where id='29';
 id | title | price |          created_at          | deleted_at | tags | updated_at
----+-------+-------+------------------------------+------------+------+------------
 29 |       |       | 2019-02-17 20:18:59.231+00 |            |      | 2019-02-17
(1 row)

pgguide=# 
```

PUT /products/:id



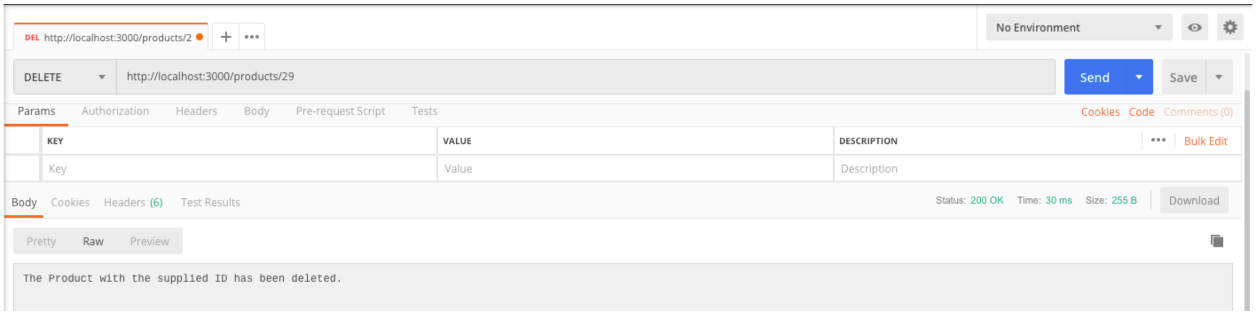
PUT http://localhost:3000/products/29

Status: 200 OK Time: 30 ms Size: 255 B

```
The Product with the supplied ID has been updated.
```

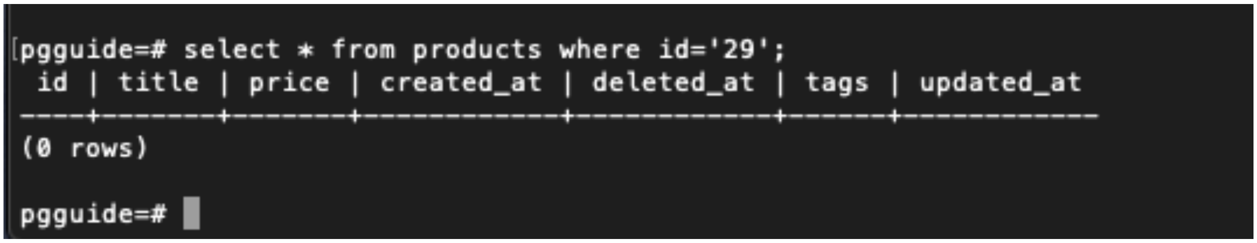
You supply the ID and the updated_at field gets updated, that's why this column is needed.

DELETE /products/:id



```
The Product with the supplied ID has been deleted.
```

Deletion Confirmation



```
[pgguide=# select * from products where id='29';
  id | title | price | created_at | deleted_at | tags | updated_at
----+-------+-------+------------+------------+------+------------
(0 rows)

pgguide=# 
```