

## Tietokannat ja rajapinnat kotitehtävä 16. Tietokantayhteys ja CRUD Nodella ja Expressillä:

Luodaan book ja borrower -taulut MySQL:ssä.

```
mysql> CREATE TABLE book(id_book INT primary key auto_increment,name  
VARCHAR(255),author VARCHAR(255),isbn VARCHAR(20));
```

```
mysql> desc book;
```

Field	Type	Null	Key	Default	Extra
id_book	int	NO	PRI	NULL	auto_increment
name	varchar(255)	YES		NULL	
author	varchar(255)	YES		NULL	
isbn	varchar(20)	YES		NULL	

Lisäillään muutama kirja tauluun:

```
mysql> INSERT INTO book(name,author,isbn) VALUES('PHP Basic','Bob  
Jones','123-456-789-111-x');
```

```
mysql> INSERT INTO book(name,author,isbn) VALUES('Statistics','Lisa  
Smith','222-333-444-555-y');
```

```
mysql> INSERT INTO book(name,author,isbn) VALUES('Basics of C-  
programming','Matthew Smith','222-333-444-667-z');
```

```
mysql> select * from book;
```

id_book	name	author	isbn
1	PHP Basic	Bob Jones	123-456-789-111-x
2	Statistics	Lisa Smith	222-333-444-555-y
3	Basics of C-programming	Matthew Smith	222-333-444-667-z

3 rows in set (0.00 sec)

Luodaan borrowers-taulu:

```
mysql> CREATE TABLE borrower(id_borrower INT primary key auto_increment,  
fname VARCHAR(40),lname VARCHAR(40), streetAddress VARCHAR(50));
```

```
mysql> desc borrower;
```

Tietokannat ja rajapinnat  
IN00DL11-3001

```
+-----+-----+-----+-----+-----+-----+
| Field      | Type      | Null | Key | Default | Extra      |
+-----+-----+-----+-----+-----+-----+
| id_borrower | int       | NO   | PRI | NULL    | auto_increment |
| fname      | varchar(40) | YES  |     | NULL    |               |
| lname      | varchar(40) | YES  |     | NULL    |               |
| streetAddress | varchar(50) | YES  |     | NULL    |               |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.01 sec)
```

Lisätään muutama lainaaja borrowers-tauluun:

```
mysql> INSERT INTO borrower(id_borrower,fname,lname,streetAddress)
VALUES(NULL,'Aku','Ankka','Paratiisitie 13');
```

```
mysql> INSERT INTO borrower(id_borrower,fname,lname,streetAddress)
VALUES(NULL,'Roope','Ankka','Rahasäiliökukkula 1');
```

```
mysql> INSERT INTO borrower(id_borrower,fname,lname,streetAddress)
VALUES(NULL,'Iines','Ankka','Tammelantie 12');
```

```
mysql> select* from borrower;
+-----+-----+-----+-----+
| id_borrower | fname | lname | streetAddress      |
+-----+-----+-----+-----+
| 1           | Aku   | Ankka | Paratiisitie 13    |
| 2           | Roope | Ankka | Rahasäiliökukkula 1 |
| 3           | Iines | Ankka | Tammelantie 12     |
+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

CRUD-operaatiot book-taululle:

The screenshot shows a REST client interface with the following components:

- Overview** tab selected. URL: `localhost:3000/book/4`. Method: `GET`. Status: `200 OK`. Response time: `117 ms`. Response size: `336 B`.
- Params** tab: No parameters are listed.
- Authorization** tab: No authorization is set.
- Headers (8)** tab: No headers are listed.
- Body** tab: Selected. Content type: `x-www-form-urlencoded`. No body content is present.
- Pre-request Script** tab: No script is present.
- Tests** tab: No tests are present.
- Settings** tab: No settings are present.
- Cookies** tab: No cookies are present.
- Response** tab: Selected. Shows the JSON response in `JSON` format.

KEY	VALUE	DESCRIPTION
<input checked="" type="checkbox"/> id_book	4	
<input checked="" type="checkbox"/> name	Säästämisen jalo taito	
<input checked="" type="checkbox"/> author	Roope Ankka	
<input checked="" type="checkbox"/> isbn	123-456-789-888-a	

```
1 {
2   "id_book": 4,
3   "name": "Säästämisen jalo taito",
4   "author": "Roope Ankka",
5   "isbn": "123-456-789-888-a"
6 }
```

1. GET-operaatio, jossa haetaan book-taulusta id\_book=4 tiedot.

## Tietokannat ja rajapinnat

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The screenshot shows a REST client interface with the following details:

- Overview** tab selected.
- Method: **POST**, URL: **localhost:3000/book/**
- Body type: **x-www-form-urlencoded** (selected).
- Body content (JSON):

```
{  "id_book": "NULL",  "name": "Osakesijoittamisen ABS",  "author": "Kroisos Pennonen",  "isbn": "123-456-789-999-b"}
```
- Response status: **200 OK**, Time: **25 ms**, Size: **341 B**.
- Response body (JSON):

```
{  "id_book": "NULL",  "name": "Osakesijoittamisen ABS",  "author": "Kroisos Pennonen",  "isbn": "123-456-789-999-b"}
```

#### 2. POST-operaatio, jossa book-tauluun listään kirja

```
mysql> select* from book;
```

id_book	name	author	isbn
1	PHP Basic	Bob Jones	123-456-789-111-x
2	Statistics	Lisa Smith	222-333-444-555-y
3	Basics of C-programming	Matthew Smith	222-333-444-667-z
4	Säästämisen jalo taito	Roope Ankka	123-456-789-888-a
5	Osakesijoittamisen ABS	Kroisos Pennonen	123-456-789-999-b

5 rows in set (0.00 sec)

## Tietokannat ja rajapinnat

### IN00DL11-3001

Overview PUT localhost:3000/book/5 RP2

localhost:3000/book/5 Save

PUT localhost:3000/book/5 Send

Params Authorization Headers (8) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary GraphQL

KEY	VALUE	DESCRIPTION
id_book	NULL	
name	Osakesijoittamisen ABC	
author	Kroisos Pennonen	
isbn	123-456-789-999-b	

Body Cookies Headers (7) Test Results 200 OK 15 ms 404 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {
2   "fieldCount": 0,
3   "affectedRows": 1,
4   "insertId": 0,
5   "serverStatus": 2,
6   "warningCount": 0,
7   "message": "(Rows matched: 1 Changed: 1 Warnings: 0)",
8   "protocol41": true,
9   "changedRows": 1
10 }
```

3. PUT-operaatio, jossa book-taulun id\_book=5 kirjan nimen virhe korjataan päivittämällä tiedot.

```
mysql> select* from book;
```

id_book	name	author	isbn
1	PHP Basic	Bob Jones	123-456-789-111-x
2	Statistics	Lisa Smith	222-333-444-555-y
3	Basics of C-programming	Matthew Smith	222-333-444-667-z
4	Säästämisen jalo taito	Roope Ankka	123-456-789-888-a
5	Osakesijoittamisen ABC	Kroisos Pennonen	123-456-789-999-b

5 rows in set (0.00 sec)

## Tietokannat ja rajapinnat

### IN00DL11-3001

Overview DEL localhost:3000/book/5 RP2 + ... RP2

localhost:3000/book/5 Save Send

DELETE localhost:3000/book/5 Send

Params Authorization Headers (8) **Body** Pre-request Script Tests Settings Cookies

☐ none ☐ form-data ☒ x-www-form-urlencoded ☐ raw ☐ binary ☐ GraphQL

	KEY	VALUE	DESCRIPTION	...	Bulk Edit
<input checked="" type="checkbox"/>	id_book	NULL			
<input checked="" type="checkbox"/>	name	Osakesijoittamisen ABC			
<input checked="" type="checkbox"/>	author	Kroisos Pennonen			
<input checked="" type="checkbox"/>	isbn	123-456-789-999-b			
	Key	Value	Description		

Body Cookies Headers (7) Test Results 200 OK 12 ms 363 B Save Response

Pretty Raw Preview Visualize JSON ↔

```
1 {
2   "fieldCount": 0,
3   "affectedRows": 1,
4   "insertId": 0,
5   "serverStatus": 2,
6   "warningCount": 0,
7   "message": "",
8   "protocol41": true,
9   "changedRows": 0
10 }
```

4.DELETE-operaatio, jossa poistetaan book-taulusta kirja, jonka id\_book=5

```
mysql> select* from book;
```

id_book	name	author	isbn
1	PHP Basic	Bob Jones	123-456-789-111-x
2	Statistics	Lisa Smith	222-333-444-555-y
3	Basics of C-programming	Matthew Smith	222-333-444-667-z
4	Säästämisen jalo taito	Roope Ankka	123-456-789-888-a

4 rows in set (0.00 sec)

Tietokannat ja rajapinnat  
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Ja samat operaatiot borrower-taululle:

GET localhost:3000/borrower/3

Params Authorization Headers (6) **Body** Pre-request Script Tests Settings Cookies

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

KEY	VALUE	DESCRIPTION	...	Bulk Edit
Key	Value	Description		

Body Cookies Headers (7) Test Results 200 OK 10 ms 319 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {
2   "id_borrower": 3,
3   "fname": "Iines",
4   "lname": "Ankka",
5   "streetAddress": "Tammelantie 12"
6 }
```

5.GET-operaatio borrower-taulu

localhost:3000/borrower

POST localhost:3000/borrower

Params Authorization Headers (8) **Body** Pre-request Script Tests Settings Cookies

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

KEY	VALUE	DESCRIPTION	...	Bulk Edit
<input checked="" type="checkbox"/> id_borrower	NULL			
<input checked="" type="checkbox"/> fname	Hannu			
<input checked="" type="checkbox"/> lname	Hanhi			
<input checked="" type="checkbox"/> streetAddress	Neliapilaniitti 7			
Key	Value	Description		

Body Cookies Headers (7) Test Results 200 OK 10 ms 325 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {
2   "id_borrower": "NULL",
3   "fname": "Hannu",
4   "lname": "Hanhi",
5   "streetAddress": "Neliapilaniitti 7"
6 }
```

6. POST-operaatio borrower-taulu

## Tietokannat ja rajapinnat

### IN00DL11-3001

PUT localhost:3000/borrower/4 Send

Params Authorization Headers (8) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary GraphQL

	KEY	VALUE	DESCRIPTION	...	Bulk Edit
<input checked="" type="checkbox"/>	id_borrower	NULL			
<input checked="" type="checkbox"/>	fname	Hannu			
<input checked="" type="checkbox"/>	lname	Hanhi			
<input checked="" type="checkbox"/>	streetAddress	Neliapilaniitty 7			
	Key	Value	Description		

Body Cookies Headers (7) Test Results 200 OK 14 ms 404 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {
2   "fieldCount": 0,
3   "affectedRows": 1,
4   "insertId": 0,
5   "serverStatus": 2,
6   "warningCount": 0,
7   "message": "(Rows matched: 1 Changed: 1 Warnings: 0",
8   "protocol41": true,
9   "changedRows": 1
10 }
```

#### 7.PUT-operaatio borrower-taulu

DELETE localhost:3000/borrower/4 Send

Params Authorization Headers (8) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary GraphQL

	KEY	VALUE	DESCRIPTION	...	Bulk Edit
<input checked="" type="checkbox"/>	id_borrower	NULL			
<input checked="" type="checkbox"/>	fname	Hannu			
<input checked="" type="checkbox"/>	lname	Hanhi			
<input checked="" type="checkbox"/>	streetAddress	Neliapilaniitty 7			
	Key	Value	Description		

Body Cookies Headers (7) Test Results 200 OK 10 ms 363 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {
2   "fieldCount": 0,
3   "affectedRows": 1,
4   "insertId": 0,
5   "serverStatus": 2,
6   "warningCount": 0,
7   "message": "",
8   "protocol41": true,
9   "changedRows": 0
10 }
```

#### 8.DELETE-operaatio borrower-taulu