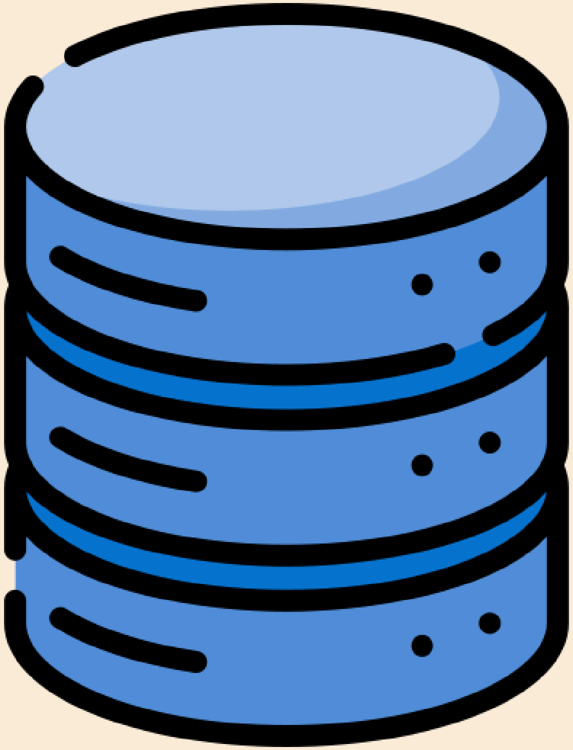
Databases Demo



Homelab Club at UMD Meeting 2025-04-21

Welcome!

While we are waiting to get started, you can:

1. Open a web browser, log in to packetfence & ensure your time is correct.
    1. If your time is not syncing, stop and start NTP
        1. `sudo timedatectl set-ntp False`
        2. `timedatectl status`
        3. `sudo timedatectl set-ntp True`
        4. `timedatectl status`
2. Run updates:
    2. `sudo apt update && sudo apt upgrade -y`

See also: https://mariadb.com/wp-content/uploads/2021/08/mariadb-standard-developer_cheat-sheet_1113.pdf

Data

Employee Number	First Name	Last Name	Department	Phone Number	Date of Hire	Hourly Salary
001	Eugene	Krabs	Management	(555) 123-0003	1984-05-15	9999.99
002	SpongeBob	SquarePants	Fry Cook	(555) 123-0001	1999-07-17	12.50
003	Squidward	Tentacles	Cashier	(555) 123-0002	1999-07-18	11.00

Package Installation

```
sudo apt install mariadb-server
```

Initial Connection

Initially, connect using the root user

```
sudo mysql -uroot
```

No password? Not ideal.

```
exit
```

Password for Root

```
sudo mysql_secure_installation
```

- *Press enter to continue (no password by default).*
- *Switch to unix_socket authentication [Y/n] Y*
- *Change the root password? [Y/n] Y*
- *Enter a new password for root.*
- *Remove anonymous users? [Y/n] Y*
- *Disallow root login remotely? [Y/n] Y*
- *Remove test database and access to it? [Y/n] Y*
- *Reload privilege tables now? [Y/n] Y*

Second Connection

Connect using the password you configured for root

```
sudo mysql -uroot -p
```

But still... connecting using sudo as root? Not ideal. But we will continue for now.

Create a Database

```
CREATE DATABASE <database_name>;
```

e.g. `CREATE DATABASE KrustyKrab;`

Create a new user

Create a new user:

```
CREATE USER '<username>'@'localhost' IDENTIFIED BY '<password>';
```

Allow this new user to do anything to the database we created:

```
GRANT ALL PRIVILEGES ON <dbname>.* TO '<username>'@'localhost';
```

Reload the permissions:

```
FLUSH PRIVILEGES;
```

```
exit
```

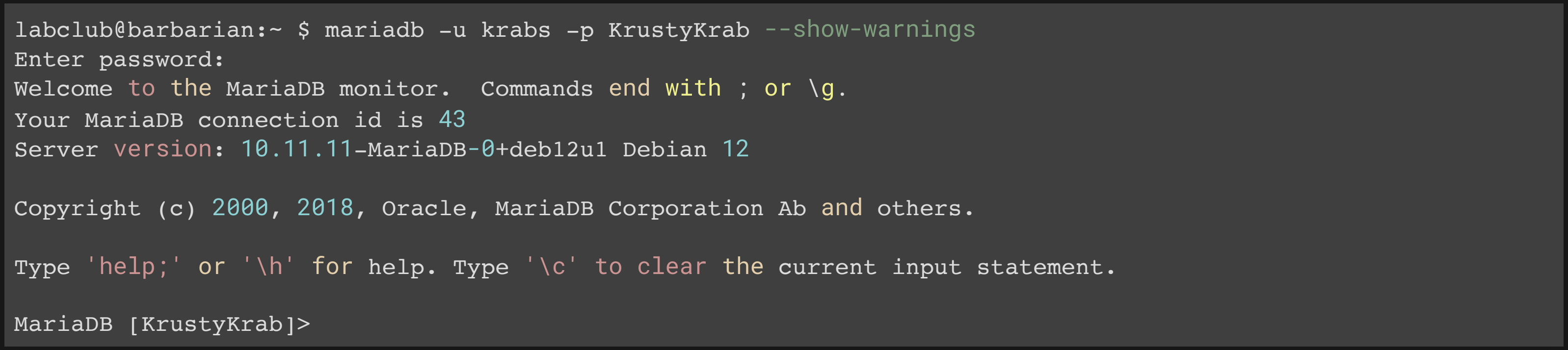
e.g.

```
CREATE USER 'krabs'@'localhost' IDENTIFIED BY 'money';
GRANT ALL PRIVILEGES ON KrustyKrab.* TO 'krabs'@'localhost';
FLUSH PRIVILEGES;
```

Third times the charm

mariadb -u <username> -p <database> --show-warnings

e.g. *mariadb -u krabs -p KrustyKrab --show-warnings*

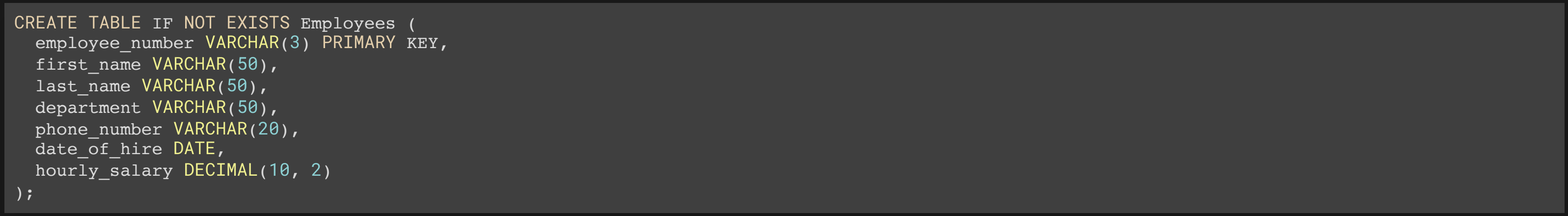


```
labclub@barbarian:~ $ mariadb -u krabs -p KrustyKrab --show-warnings
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 43
Server version: 10.11.11-MariaDB-0+deb12u1 Debian 12

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [KrustyKrab]>
```

Create a table

CREATE TABLE [IF NOT EXISTS] <table_name> (<field_name> <field_type>);

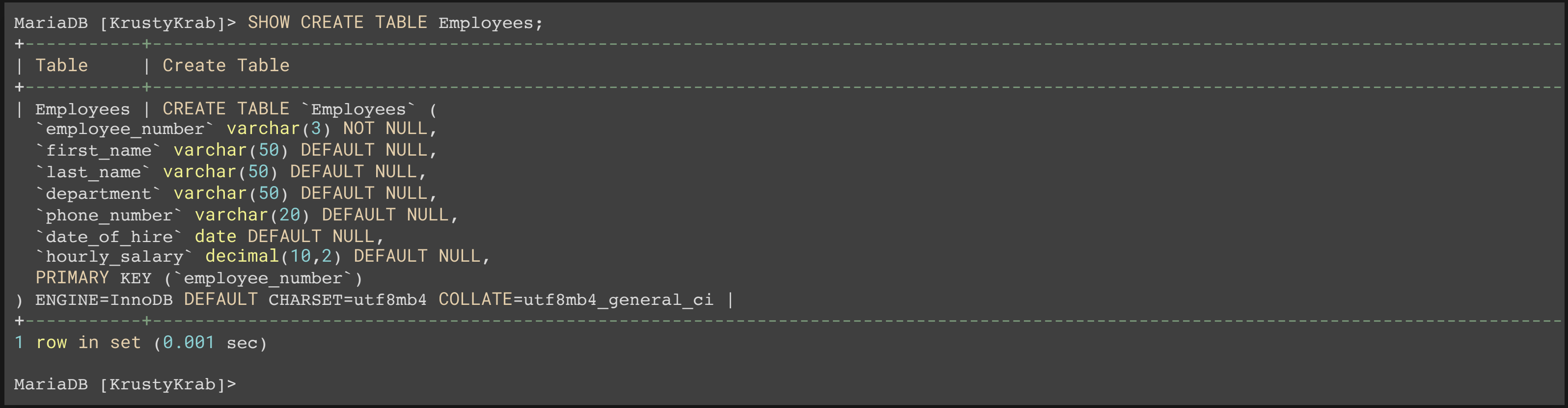
e.g.



```
CREATE TABLE IF NOT EXISTS Employees (
  employee_number VARCHAR(3) PRIMARY KEY,
  first_name VARCHAR(50),
  last_name VARCHAR(50),
  department VARCHAR(50),
  phone_number VARCHAR(20),
  date_of_hire DATE,
  hourly_salary DECIMAL(10, 2)
);
```

SHOW CREATE TABLE <table_name>;

e.g.

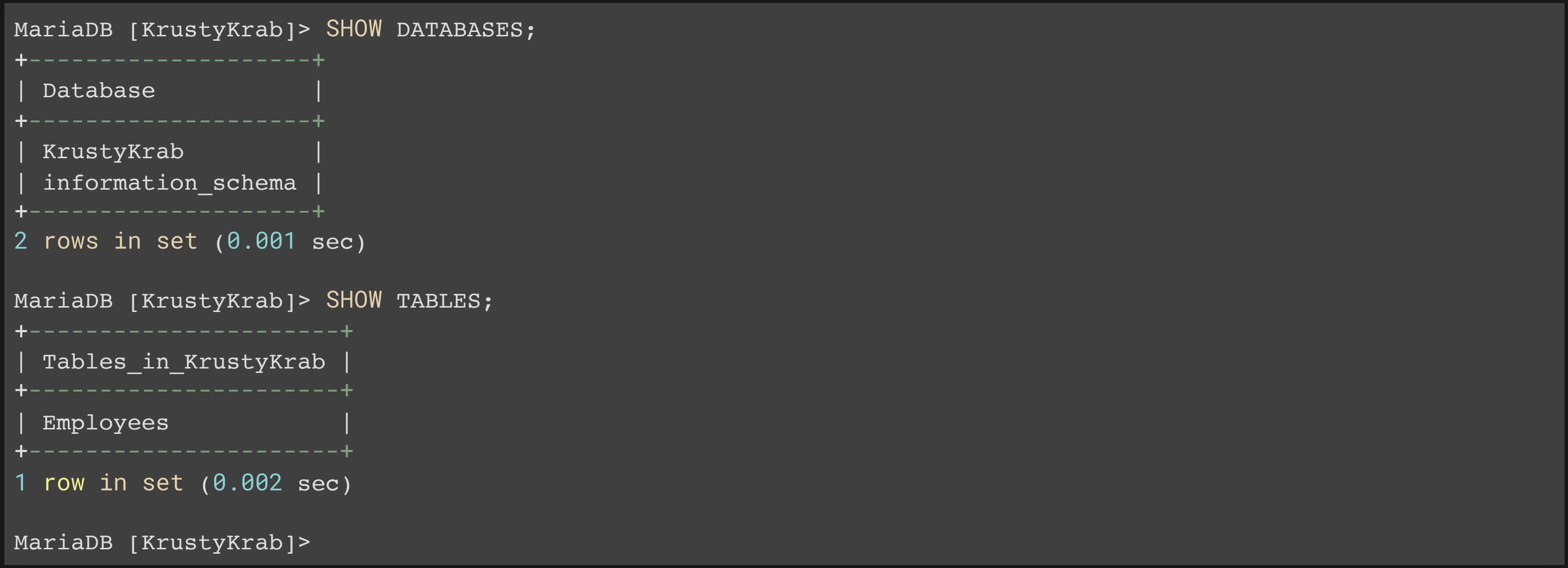


```
MariaDB [KrustyKrab]> SHOW CREATE TABLE Employees;
+-----------+---------------------------------------------------------------------------------------------------------------------------+
| Table     | Create Table
+-----------+---------------------------------------------------------------------------------------------------------------------------+
| Employees | CREATE TABLE `Employees` (
  `employee_number` varchar(3) NOT NULL,
  `first_name` varchar(50) DEFAULT NULL,
  `last_name` varchar(50) DEFAULT NULL,
  `department` varchar(50) DEFAULT NULL,
  `phone_number` varchar(20) DEFAULT NULL,
  `date_of_hire` date DEFAULT NULL,
  `hourly_salary` decimal(10,2) DEFAULT NULL,
  PRIMARY KEY (`employee_number`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci |
+-----------+---------------------------------------------------------------------------------------------------------------------------+
1 row in set (0.001 sec)

MariaDB [KrustyKrab]>
```

Show

```
SHOW DATABASES;
SHOW TABLES;
```

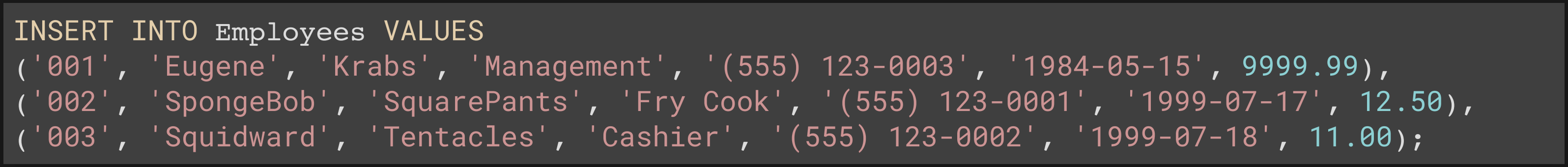
e.g.



```
MariaDB [KrustyKrab]> SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| KrustyKrab         |
| information_schema |
+--------------------+
2 rows in set (0.001 sec)

MariaDB [KrustyKrab]> SHOW TABLES;
+----------------------+
| Tables_in_KrustyKrab |
+----------------------+
| Employees            |
+----------------------+
1 row in set (0.002 sec)

MariaDB [KrustyKrab]>
```

Insert

```
INSERT INTO <table_name> (<field_name> [, <field_name>, ...]) VALUES (<value> [, <value>, …]);
```



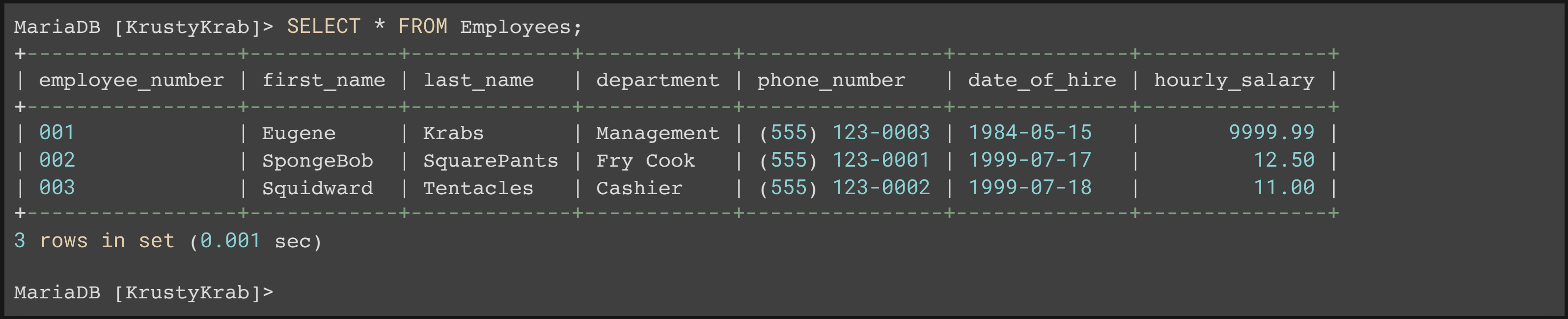
```sql
INSERT INTO Employees VALUES
('001', 'Eugene', 'Krabs', 'Management', '(555) 123-0003', '1984-05-15', 9999.99),
('002', 'SpongeBob', 'SquarePants', 'Fry Cook', '(555) 123-0001', '1999-07-17', 12.50),
('003', 'Squidward', 'Tentacles', 'Cashier', '(555) 123-0002', '1999-07-18', 11.00);
```

Query

SELECT <field_list> FROM <table_name> WHERE <condition>;

Select all:

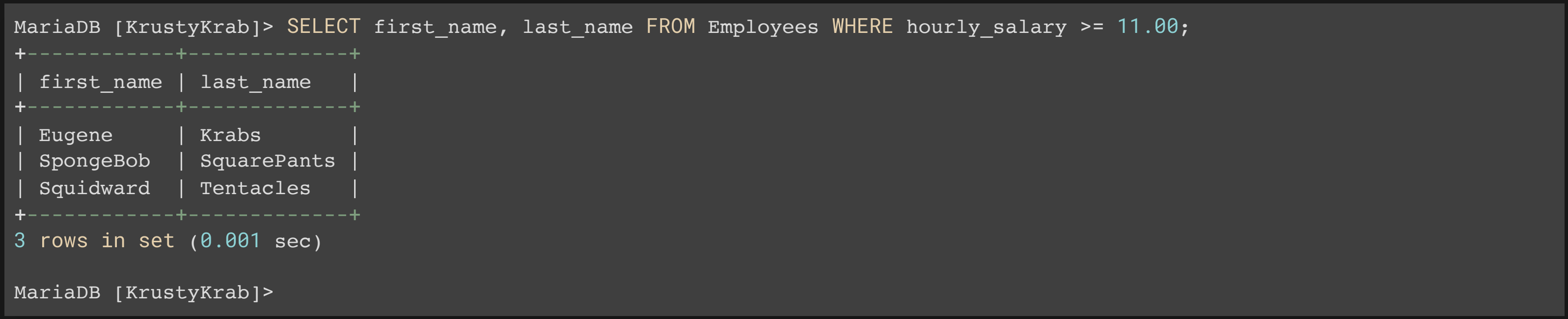
*SELECT * FROM Employees;*



```
MariaDB [KrustyKrab]> SELECT * FROM Employees;
+-----------------+------------+-------------+------------+----------------+--------------+---------------+
| employee_number | first_name | last_name   | department | phone_number   | date_of_hire | hourly_salary |
+-----------------+------------+-------------+------------+----------------+--------------+---------------+
| 001             | Eugene     | Krabs       | Management | (555) 123-0003 | 1984-05-15   |       9999.99 |
| 002             | SpongeBob  | SquarePants | Fry Cook   | (555) 123-0001 | 1999-07-17   |         12.50 |
| 003             | Squidward  | Tentacles   | Cashier    | (555) 123-0002 | 1999-07-18   |         11.00 |
+-----------------+------------+-------------+------------+----------------+--------------+---------------+
3 rows in set (0.001 sec)

MariaDB [KrustyKrab]>
```

More specific selection:

SELECT first_name, last_name FROM Employees WHERE hourly_salary >= 11.00;



```
MariaDB [KrustyKrab]> SELECT first_name, last_name FROM Employees WHERE hourly_salary >= 11.00;
+------------+-------------+
| first_name | last_name   |
+------------+-------------+
| Eugene     | Krabs       |
| SpongeBob  | SquarePants |
| Squidward  | Tentacles   |
+------------+-------------+
3 rows in set (0.001 sec)

MariaDB [KrustyKrab]>
```

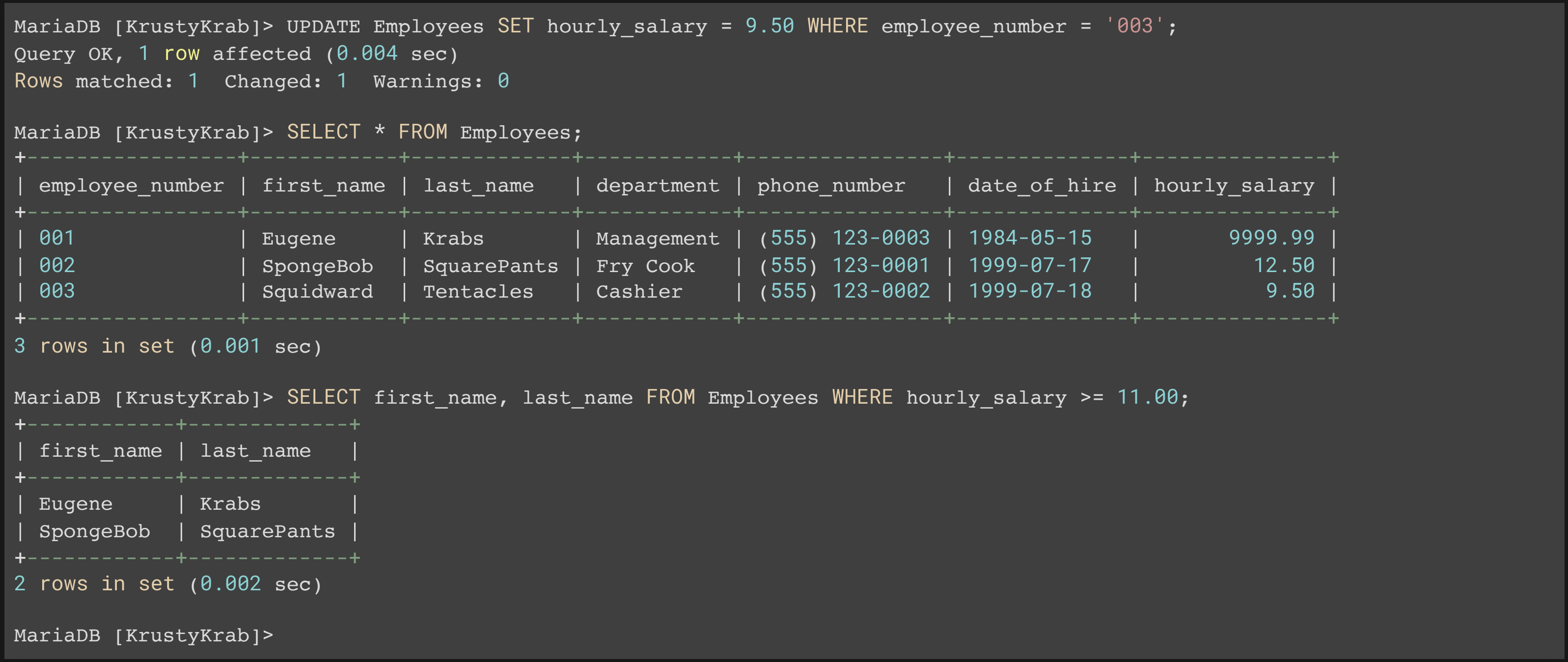
Update

Squidward is clearly getting paid a little too much. Let's fix that.

UPDATE <table_name> SET <field_name> = <value> [, <field_name> = <value>, …])
[WHERE <condition>];

e.g.

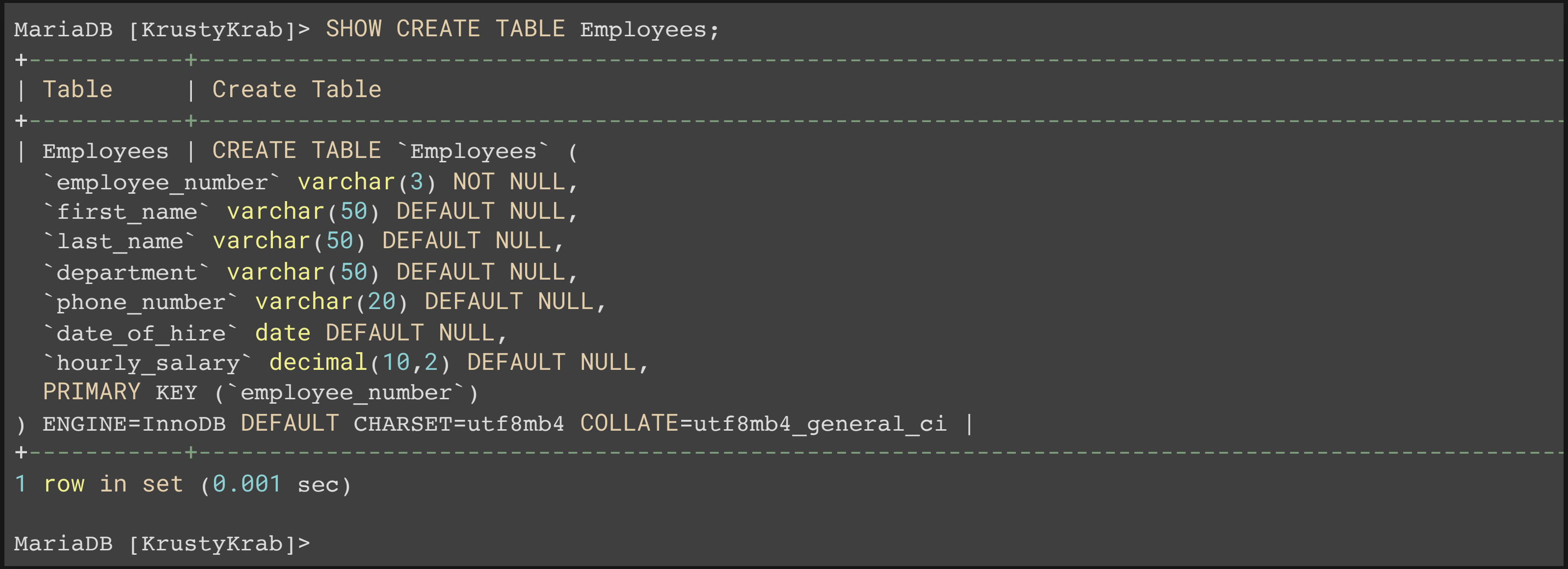
UPDATE Employees SET hourly_salary = 9.50 WHERE employee_number = '003';



```
MariaDB [KrustyKrab]> UPDATE Employees SET hourly_salary = 9.50 WHERE employee_number = '003';
Query OK, 1 row affected (0.004 sec)
Rows matched: 1  Changed: 1  Warnings: 0

MariaDB [KrustyKrab]> SELECT * FROM Employees;
+-----------------+------------+------------+------------+----------------+--------------+---------------+
| employee_number | first_name | last_name  | department | phone_number   | date_of_hire | hourly_salary |
+-----------------+------------+------------+------------+----------------+--------------+---------------+
| 001             | Eugene     | Krabs      | Management | (555) 123-0003 | 1984-05-15   |       9999.99 |
| 002             | SpongeBob  | SquarePants | Fry Cook  | (555) 123-0001 | 1999-07-17   |         12.50 |
| 003             | Squidward  | Tentacles  | Cashier    | (555) 123-0002 | 1999-07-18   |          9.50 |
+-----------------+------------+------------+------------+----------------+--------------+---------------+
3 rows in set (0.001 sec)

MariaDB [KrustyKrab]> SELECT first_name, last_name FROM Employees WHERE hourly_salary >= 11.00;
+------------+-------------+
| first_name | last_name   |
+------------+-------------+
| Eugene     | Krabs       |
| SpongeBob  | SquarePants |
+------------+-------------+
2 rows in set (0.002 sec)

MariaDB [KrustyKrab]>
```

Alter Table

Recall:



```
MariaDB [KrustyKrab]> SHOW CREATE TABLE Employees;
+-----------+-------------------------------------------------------------------------------------------------
| Table     | Create Table
+-----------+-------------------------------------------------------------------------------------------------
| Employees | CREATE TABLE `Employees` (
  `employee_number` varchar(3) NOT NULL,
  `first_name` varchar(50) DEFAULT NULL,
  `last_name` varchar(50) DEFAULT NULL,
  `department` varchar(50) DEFAULT NULL,
  `phone_number` varchar(20) DEFAULT NULL,
  `date_of_hire` date DEFAULT NULL,
  `hourly_salary` decimal(10,2) DEFAULT NULL,
  PRIMARY KEY (`employee_number`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci |
+-----------+-------------------------------------------------------------------------------------------------
1 row in set (0.001 sec)

MariaDB [KrustyKrab]>
```

Alter Table (cont.)

Add a new employee:

```
INSERT INTO Employees (
employee_number, first_name, last_name, date_of_hire, hourly_salary
) VALUES (
'004', 'Pearl', 'Krabs', '2025-04-21', 10.00
);
```

```
MariaDB [KrustyKrab]> INSERT INTO Employees (
    -> employee_number, first_name, last_name, date_of_hire, hourly_salary
    -> ) VALUES (
    -> '004', 'Pearl', 'Krabs', '2025-04-21', 10.00
    -> );
Query OK, 1 row affected (0.003 sec)

MariaDB [KrustyKrab]> SELECT * FROM Employees;
+-----------------+------------+-------------+------------+----------------+--------------+---------------+
| employee_number | first_name | last_name   | department | phone_number   | date_of_hire | hourly_salary |
+-----------------+------------+-------------+------------+----------------+--------------+---------------+
| 001             | Eugene     | Krabs       | Management | (555) 123-0003 | 1984-05-15   |       9999.99 |
| 002             | SpongeBob  | SquarePants | Fry Cook   | (555) 123-0001 | 1999-07-17   |         12.50 |
| 003             | Squidward  | Tentacles   | Cashier    | (555) 123-0002 | 1999-07-18   |          9.50 |
| 004             | Pearl      | Krabs       | NULL       | NULL           | 2025-04-21   |         10.00 |
+-----------------+------------+-------------+------------+----------------+--------------+---------------+
4 rows in set (0.001 sec)

MariaDB [KrustyKrab]>
```

Alter Table (cont.)

```
ALTER TABLE <table_name> MODIFY [COLUMN] <field_name> [NOT NULL];
```

Modify the department to now allow null values:

```
ALTER TABLE Employees MODIFY department VARCHAR(50) NOT NULL;
```

You will get an error - see the next slide.

Alter Table (cont.)

You will get an error, because we have a row that has a null value for department.

```
MariaDB [KrustyKrab]> ALTER TABLE Employees MODIFY department VARCHAR(50) NOT NULL;
ERROR 1265 (01000): Data truncated for column 'department' at row 4
Error (Code 1265): Data truncated for column 'department' at row 4
Error (Code 1138): Invalid use of NULL value
MariaDB [KrustyKrab]>
```

Delete the offending row, and try again:

DELETE FROM table_name [WHERE condition];

e.g.
DELETE FROM Employees WHERE employee_number = '004';
ALTER TABLE Employees MODIFY department VARCHAR(50) NOT NULL;

And what happens when we try to add Pearl again?

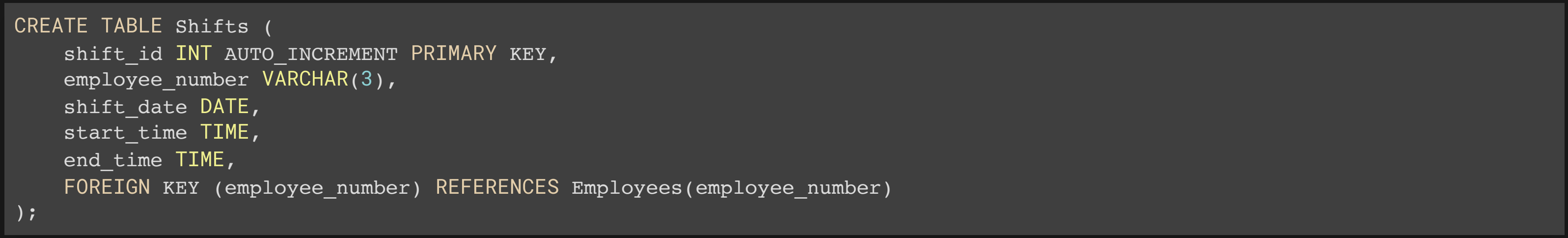
```
INSERT INTO Employees (
employee_number, first_name, last_name, date_of_hire, hourly_salary
) VALUES (
'004', 'Pearl', 'Krabs', '2025-04-21', 10.00
);
```

Second Table

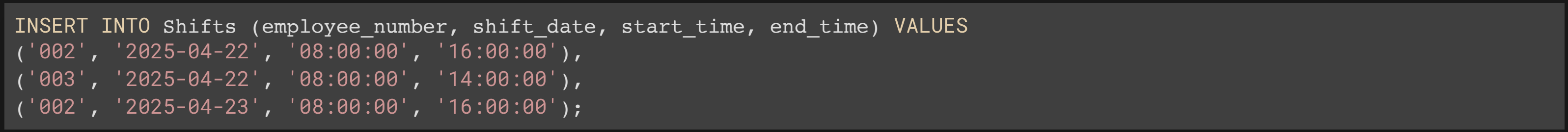
CREATE TABLE <table_name>(<columns_list>,

.....

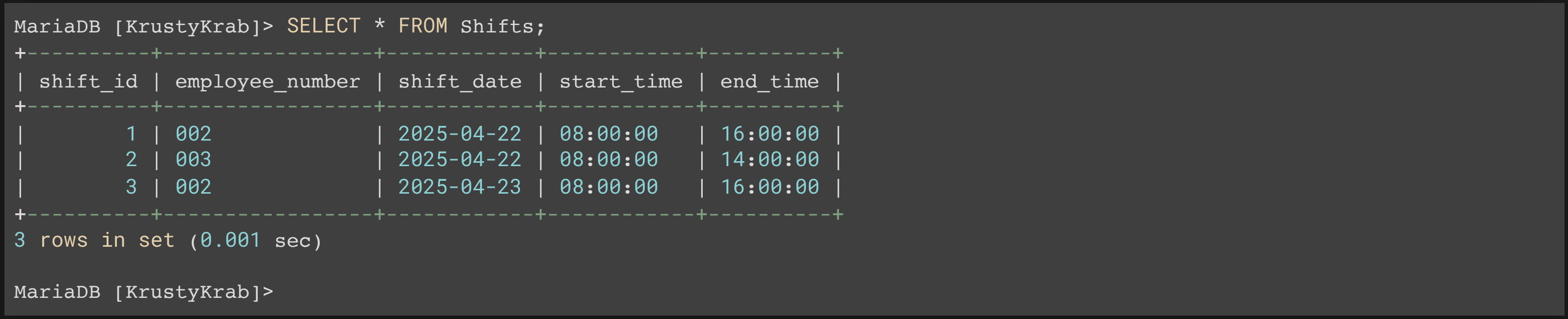
FOREIGN KEY (<column_name>) REFERENCES <parent_table_name>(<column_name>)



```
CREATE TABLE Shifts (
    shift_id INT AUTO_INCREMENT PRIMARY KEY,
    employee_number VARCHAR(3),
    shift_date DATE,
    start_time TIME,
    end_time TIME,
    FOREIGN KEY (employee_number) REFERENCES Employees(employee_number)
);
```



```
INSERT INTO Shifts (employee_number, shift_date, start_time, end_time) VALUES
('002', '2025-04-22', '08:00:00', '16:00:00'),
('003', '2025-04-22', '08:00:00', '14:00:00'),
('002', '2025-04-23', '08:00:00', '16:00:00');
```



```
MariaDB [KrustyKrab]> SELECT * FROM Shifts;
+----------+-----------------+------------+------------+----------+
| shift_id | employee_number | shift_date | start_time | end_time |
+----------+-----------------+------------+------------+----------+
|        1 | 002             | 2025-04-22 | 08:00:00   | 16:00:00 |
|        2 | 003             | 2025-04-22 | 08:00:00   | 14:00:00 |
|        3 | 002             | 2025-04-23 | 08:00:00   | 16:00:00 |
+----------+-----------------+------------+------------+----------+
3 rows in set (0.001 sec)

MariaDB [KrustyKrab]>
```

Also take note of the AUTO_INCREMENT for the shift_id.

Query: Join

Look at the Shifts using info from our Employees table.

```
SELECT
    s.shift_id,
    e.first_name AS employee_name,
    s.shift_date,
    s.start_time,
    s.end_time
FROM Shifts s
JOIN Employees e ON s.employee_number = e.employee_number;
```

Output:

```
MariaDB [KrustyKrab]> SELECT
    ->     s.shift_id,
    ->     e.first_name AS employee_name,
    ->     s.shift_date,
    ->     s.start_time,
    ->     s.end_time
    -> FROM Shifts s
    -> JOIN Employees e ON s.employee_number = e.employee_number;
+----------+---------------+------------+------------+----------+
| shift_id | employee_name | shift_date | start_time | end_time |
+----------+---------------+------------+------------+----------+
|        1 | SpongeBob     | 2025-04-22 | 08:00:00   | 16:00:00 |
|        3 | SpongeBob     | 2025-04-23 | 08:00:00   | 16:00:00 |
|        2 | Squidward     | 2025-04-22 | 08:00:00   | 14:00:00 |
+----------+---------------+------------+------------+----------+
3 rows in set (0.001 sec)

MariaDB [KrustyKrab]>
```

Query: Join (cont.)

Get all employees and their shifts (if any):

```sql
SELECT
    e.first_name,
    e.department,
    s.shift_date,
    s.start_time,
    s.end_time
FROM Employees e
LEFT JOIN Shifts s ON e.employee_number = s.employee_number
ORDER BY e.first_name;
```

Output:

```
MariaDB [KrustyKrab]> SELECT
    ->     e.first_name,
    ->     e.department,
    ->     s.shift_date,
    ->     s.start_time,
    ->     s.end_time
    -> FROM Employees e
    -> LEFT JOIN Shifts s ON e.employee_number = s.employee_number
    -> ORDER BY e.first_name;
+------------+------------+------------+------------+----------+
| first_name | department | shift_date | start_time | end_time |
+------------+------------+------------+------------+----------+
| Eugene     | Management | NULL       | NULL       | NULL     |
| SpongeBob  | Fry Cook   | 2025-04-22 | 08:00:00   | 16:00:00 |
| SpongeBob  | Fry Cook   | 2025-04-23 | 08:00:00   | 16:00:00 |
| Squidward  | Cashier    | 2025-04-22 | 08:00:00   | 14:00:00 |
+------------+------------+------------+------------+----------+
4 rows in set (0.002 sec)

MariaDB [KrustyKrab]>
```

Query: Join (cont.)

Count employee shifts:

```
SELECT
    e.first_name,
    COUNT(s.shift_id) AS total_shifts
FROM Employees e
LEFT JOIN Shifts s ON e.employee_number = s.employee_number
GROUP BY e.first_name
ORDER BY total_shifts DESC;
```

Output:

```
MariaDB [KrustyKrab]> SELECT
    ->     e.first_name,
    ->     COUNT(s.shift_id) AS total_shifts
    -> FROM Employees e
    -> LEFT JOIN Shifts s ON e.employee_number = s.employee_number
    -> GROUP BY e.first_name
    -> ORDER BY total_shifts DESC;
+------------+--------------+
| first_name | total_shifts |
+------------+--------------+
| SpongeBob  |            2 |
| Squidward  |            1 |
| Eugene     |            0 |
+------------+--------------+
3 rows in set (0.003 sec)

MariaDB [KrustyKrab]>
```

Query: Join (cont.)

Find who worked on a specific day:

```
SELECT
    e.first_name,
    s.shift_date,
    s.start_time,
    s.end_time
FROM Shifts s
JOIN Employees e ON s.employee_number = e.employee_number
WHERE s.shift_date = '2025-04-22';
```

Output:

```
MariaDB [KrustyKrab]> SELECT
    ->     e.first_name,
    ->     s.shift_date,
    ->     s.start_time,
    ->     s.end_time
    -> FROM Shifts s
    -> JOIN Employees e ON s.employee_number = e.employee_number
    -> WHERE s.shift_date = '2025-04-22';
+------------+------------+------------+----------+
| first_name | shift_date | start_time | end_time |
+------------+------------+------------+----------+
| SpongeBob  | 2025-04-22 | 08:00:00   | 16:00:00 |
| Squidward  | 2025-04-22 | 08:00:00   | 14:00:00 |
+------------+------------+------------+----------+
2 rows in set (0.002 sec)

MariaDB [KrustyKrab]>
```

Query: Join (cont.)

Calculate shift time:

```
SELECT
    e.first_name,
    SUM(TIMESTAMPDIFF(HOUR, s.start_time, s.end_time)) AS total_hours
FROM Shifts s
JOIN Employees e ON s.employee_number = e.employee_number
GROUP BY e.first_name;
```

Output:

```
MariaDB [KrustyKrab]> SELECT
    ->     e.first_name,
    ->     SUM(TIMESTAMPDIFF(HOUR, s.start_time, s.end_time)) AS total_hours
    -> FROM Shifts s
    -> JOIN Employees e ON s.employee_number = e.employee_number
    -> GROUP BY e.first_name;
+------------+-------------+
| first_name | total_hours |
+------------+-------------+
| SpongeBob  |          16 |
| Squidward  |           6 |
+------------+-------------+
2 rows in set (0.003 sec)

MariaDB [KrustyKrab]>
```

Even more

```
CREATE TABLE menu_items (
    item_id INT AUTO_INCREMENT PRIMARY KEY,
    item_name VARCHAR(50) NOT NULL,
    price DECIMAL(5,2) NOT NULL
);
```

```
CREATE TABLE sales (
    sale_id INT AUTO_INCREMENT PRIMARY KEY,
    item_id INT,
    employee_number VARCHAR(3),
    sale_date DATETIME,
    quantity INT DEFAULT 1,
    FOREIGN KEY (item_id) REFERENCES menu_items(item_id),
    FOREIGN KEY (employee_number) REFERENCES Employees(employee_number)
);
```

```
INSERT INTO menu_items (item_name, price) VALUES
('Krabby Patty', 3.99),
('Double Krabby Patty', 5.49),
('Kelp Fries', 2.29),
('Coral Soda', 1.49);
```

```
INSERT INTO sales (item_id, employee_number, sale_date, quantity) VALUES
(1, '003', '2025-04-20 12:34:00', 2),
(3, '003', '2025-04-20 13:15:00', 1),
(2, '002', '2025-04-21 11:45:00', 1),
(4, '003', '2025-04-21 14:00:00', 3);
```

Even more (cont.)

Info about each sale using menu:

```
SELECT s.sale_id, m.item_name, m.price, s.quantity, s.sale_date
FROM sales s
JOIN menu_items m ON s.item_id = m.item_id;
```

Output:

```
MariaDB [KrustyKrab]> SELECT s.sale_id, m.item_name, m.price, s.quantity, s.sale_date
    -> FROM sales s
    -> JOIN menu_items m ON s.item_id = m.item_id;
+---------+---------------------+-------+----------+---------------------+
| sale_id | item_name           | price | quantity | sale_date           |
+---------+---------------------+-------+----------+---------------------+
|       1 | Krabby Patty        |  3.99 |        2 | 2025-04-20 12:34:00 |
|       3 | Double Krabby Patty |  5.49 |        1 | 2025-04-21 11:45:00 |
|       2 | Kelp Fries          |  2.29 |        1 | 2025-04-20 13:15:00 |
|       4 | Coral Soda          |  1.49 |        3 | 2025-04-21 14:00:00 |
+---------+---------------------+-------+----------+---------------------+
4 rows in set (0.001 sec)

MariaDB [KrustyKrab]>
```

Even more (cont.)

Revenue per menu item:

```
SELECT m.item_name, SUM(s.quantity * m.price) AS total_revenue
FROM sales s
JOIN menu_items m ON s.item_id = m.item_id
GROUP BY m.item_name
ORDER BY total_revenue DESC;
```

Output:

```
MariaDB [KrustyKrab]> SELECT m.item_name, SUM(s.quantity * m.price) AS total_revenue
    -> FROM sales s
    -> JOIN menu_items m ON s.item_id = m.item_id
    -> GROUP BY m.item_name
    -> ORDER BY total_revenue DESC;
+---------------------+---------------+
| item_name           | total_revenue |
+---------------------+---------------+
| Krabby Patty        |          7.98 |
| Double Krabby Patty |          5.49 |
| Coral Soda          |          4.47 |
| Kelp Fries          |          2.29 |
+---------------------+---------------+
4 rows in set (0.005 sec)

MariaDB [KrustyKrab]>
```

Even more (cont.)

Revenue from sales per employee:

```
SELECT e.first_name, SUM(s.quantity * m.price) AS employee_revenue
FROM sales s
JOIN Employees e ON s.employee_number = e.employee_number
JOIN menu_items m ON s.item_id = m.item_id
GROUP BY e.first_name
ORDER BY employee_revenue DESC;
```

Output:

```
MariaDB [KrustyKrab]> SELECT e.first_name, SUM(s.quantity * m.price) AS employee_revenue
    -> FROM sales s
    -> JOIN Employees e ON s.employee_number = e.employee_number
    -> JOIN menu_items m ON s.item_id = m.item_id
    -> GROUP BY e.first_name
    -> ORDER BY employee_revenue DESC;
+------------+------------------+
| first_name | employee_revenue |
+------------+------------------+
| Squidward  |            14.74 |
| SpongeBob  |             5.49 |
+------------+------------------+
2 rows in set (0.004 sec)

MariaDB [KrustyKrab]>
```

Views

These queries are getting a bit long... what if want to view the same thing again later?

```
CREATE VIEW employee_sales_summary AS
SELECT
    e.first_name AS employee,
    COUNT(s.sale_id) AS total_sales,
    SUM(s.quantity) AS total_items_sold,
    SUM(s.quantity * m.price) AS total_revenue
FROM sales s
JOIN Employees e ON s.employee_number = e.employee_number
JOIN menu_items m ON s.item_id = m.item_id
GROUP BY e.first_name;
```

```
SELECT * FROM employee_sales_summary;
```

Output:

```
MariaDB [KrustyKrab]> SELECT * FROM employee_sales_summary;
+-----------+-------------+------------------+---------------+
| employee  | total_sales | total_items_sold | total_revenue |
+-----------+-------------+------------------+---------------+
| SpongeBob |           1 |                1 |          5.49 |
| Squidward |           3 |                6 |         14.74 |
+-----------+-------------+------------------+---------------+
2 rows in set (0.002 sec)

MariaDB [KrustyKrab]>
```

Export

First exit out of MariaDB. Then export to CSV:

```
mysql -u krabs -p -e \
"SELECT * FROM employee_sales_summary" KrustyKrab \
> employee_sales_report.csv
```

The file will look like:

```
labclub@barbarian:~ $ cat employee_sales_report.csv
employee    total_sales    total_items_sold    total_revenue
SpongeBob    1    1    5.49
Squidward    3    6    14.74
labclub@barbarian:~ $
```

Thank you!

Don’t forget to join the Discord!

https://suddenlysixam.club/discord