2022년 IoT기반 스마트 솔루션 개발자 양성과정

Programming : Python

17-MariaDB

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SQL

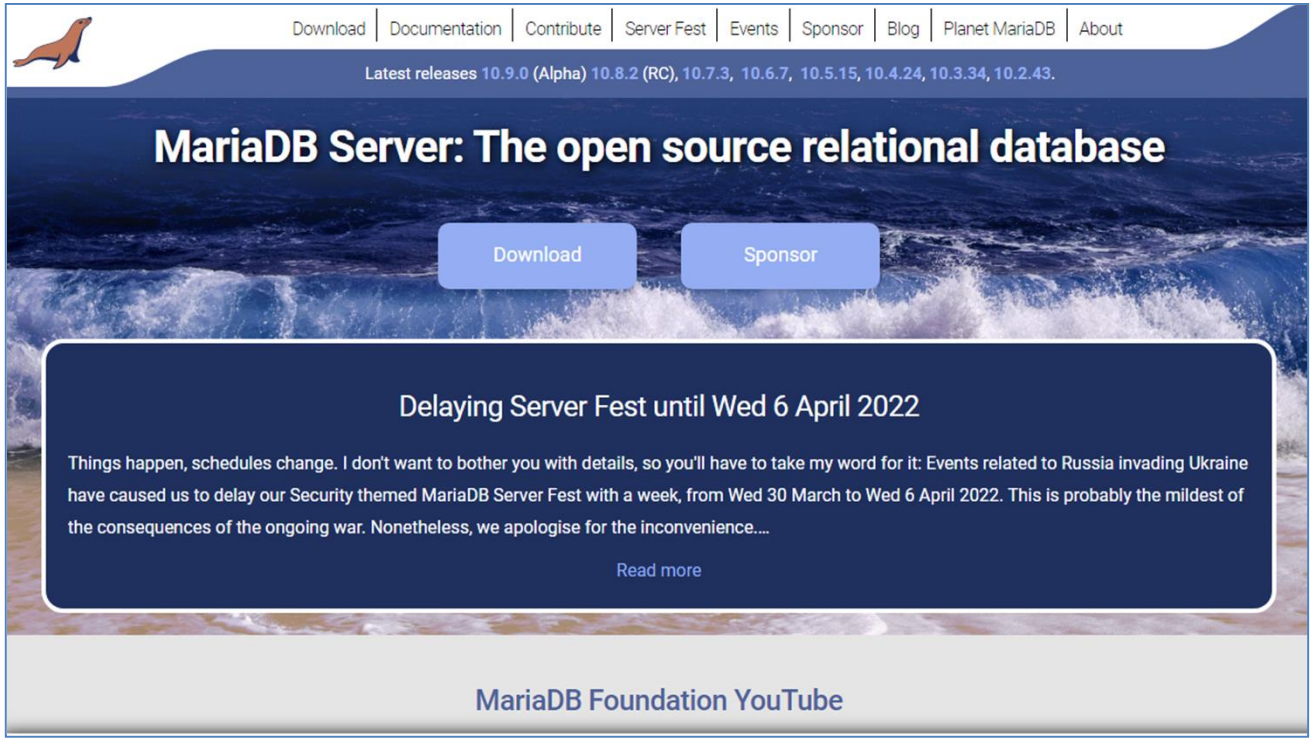
- SQL [Structured Query Language]
- 관계형 데이터베이스 관리 시스템(RDBMS)의 데이터를 관리하기 위해 설계된 특수 목적의 프로그래밍 언어
- 자료의 검색과 관리, 데이터베이스 스키마 생성과 수정, 데이터베이스 객체 접근 조정 관리
- SQL 구문
  - 데이터 정의 언어 (DDL : Data Definition Language)
  - 데이터 조작 언어 (DML : Data Manipulation Language)
  - 데이터 제어 언어 (DCL : Data Control Language)

mySQL

- https://www.mysql.com/

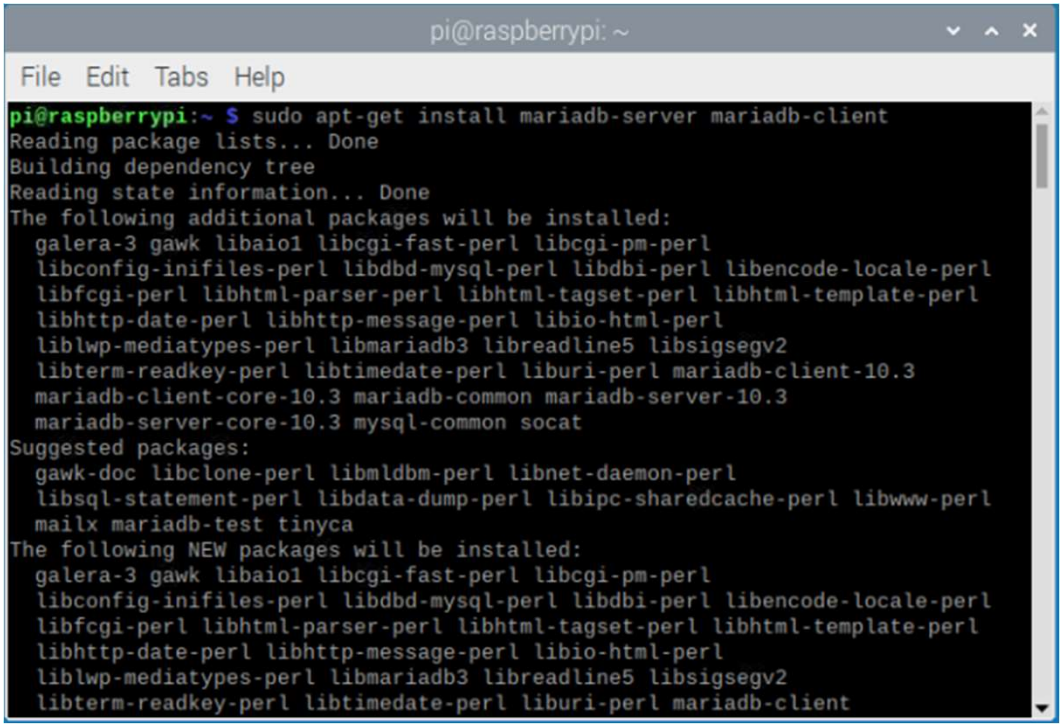
MariaDB

- https://mariadb.org/

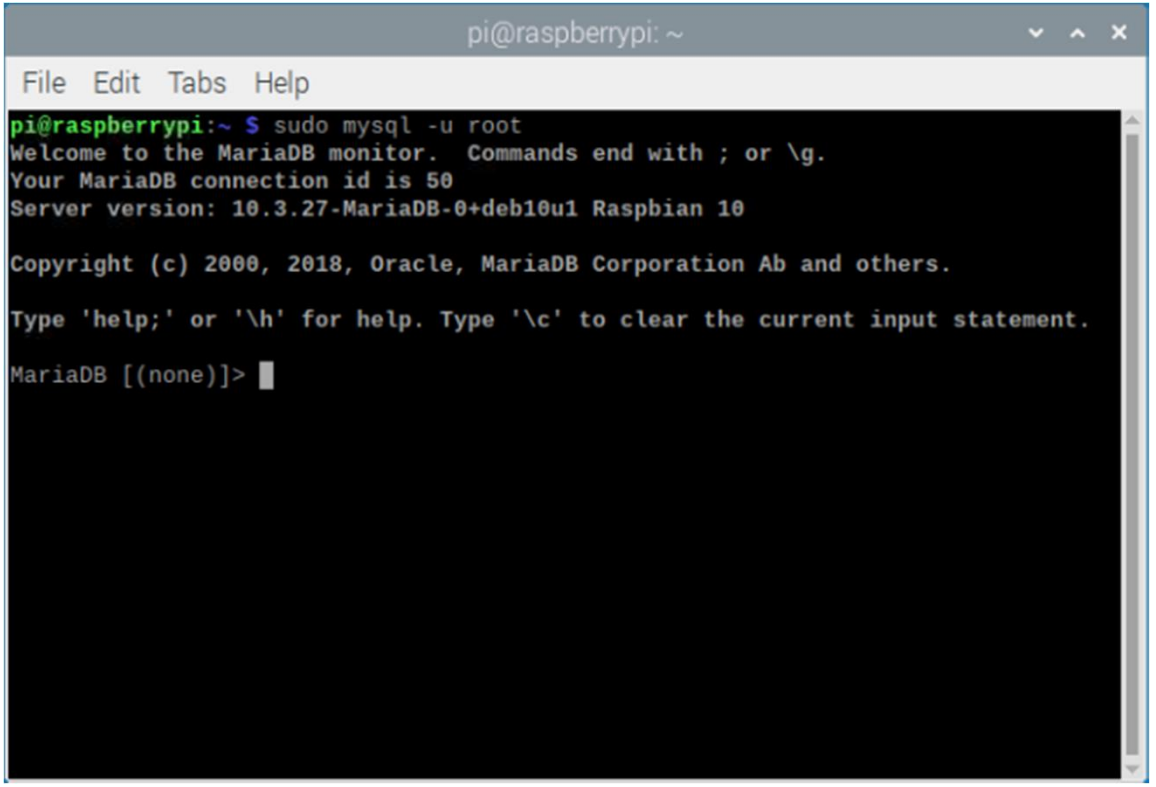


Install mariadb-server, client

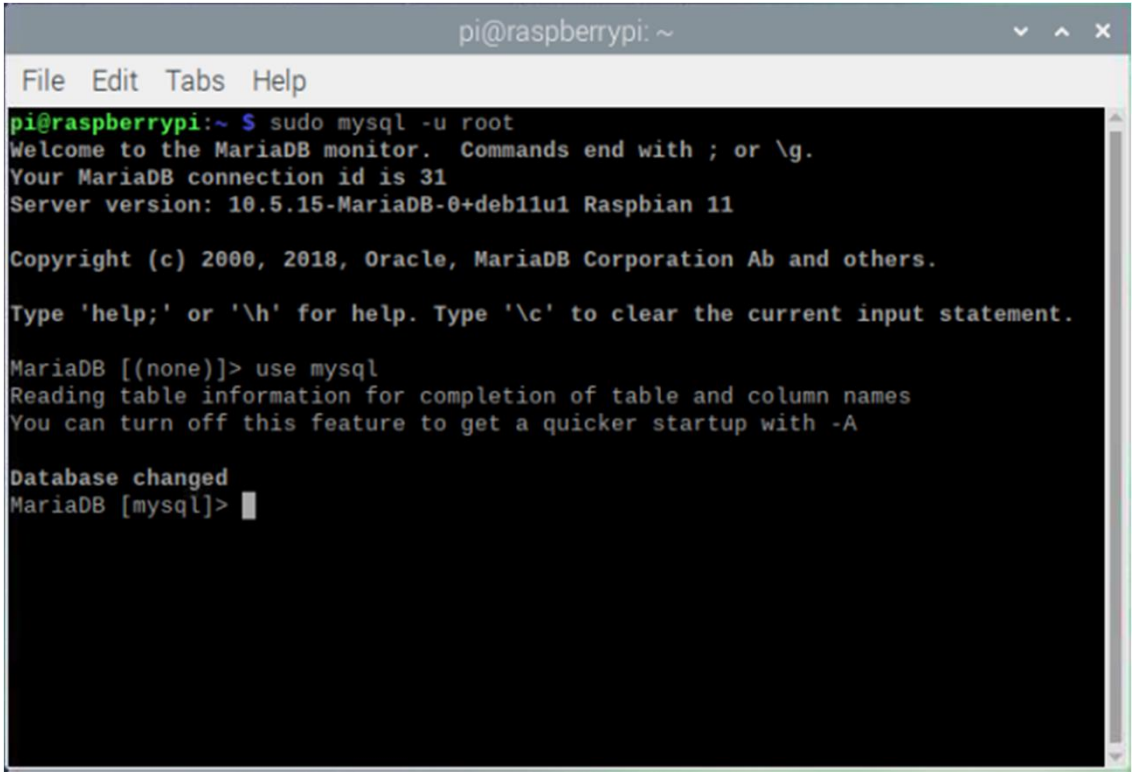
- sudo apt-get install mariadb-server mariadb-client



sudo mysql –u root

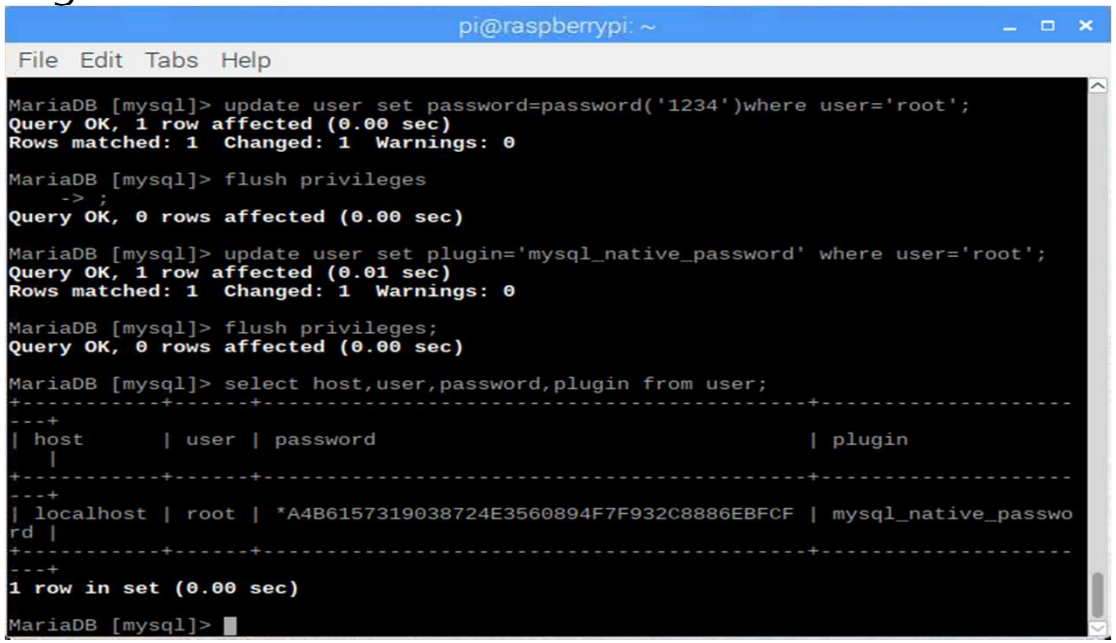


use mysql


pi@raspberrypi: ~
File Edit Tabs Help
pi@raspberrypi:~ $ sudo mysql -u root
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 31
Server version: 10.5.15-MariaDB-0+deb11u1 Raspbian 11
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 [(none)]> use mysql
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A
Database changed
MariaDB [mysql]>

user, password, plugin

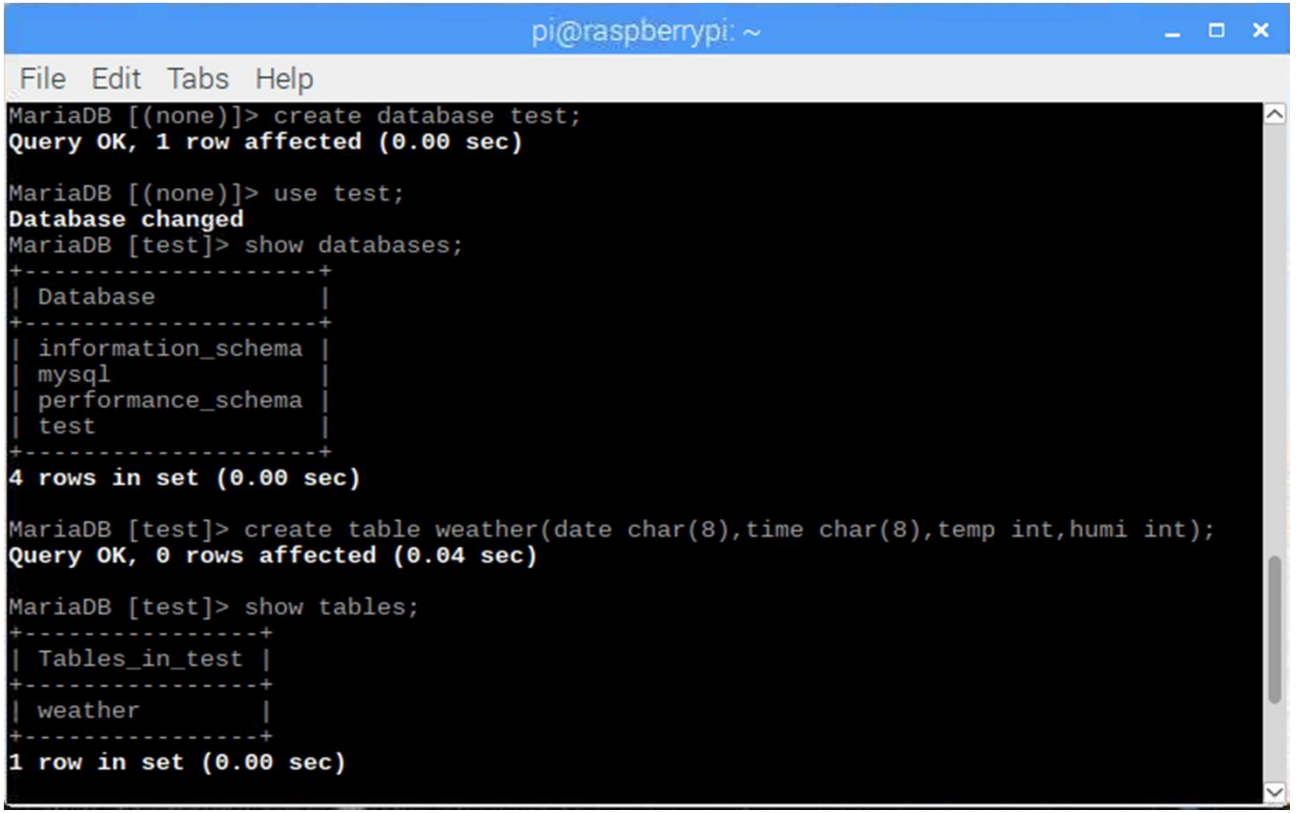
[mysql]> update user set password=password('1234') where user='root';
[mysql]> flush privileges
[mysql]> update user set plugin='mysql_native_password' where user='root'
[mysql]> flush privileges



SQL DLM구문

- 보기
  - show databases;
  - show tables;
  - select * from [tb];
- 생성
  - create database [db];
  - create table [tb] (fd type, fd type.....);
  - insert into [tb] values(val, val, val.....);
- 삭제
  - drop database [db];
  - drop table [tb];
  - delete from [tb] where [cond.];

Create database, table



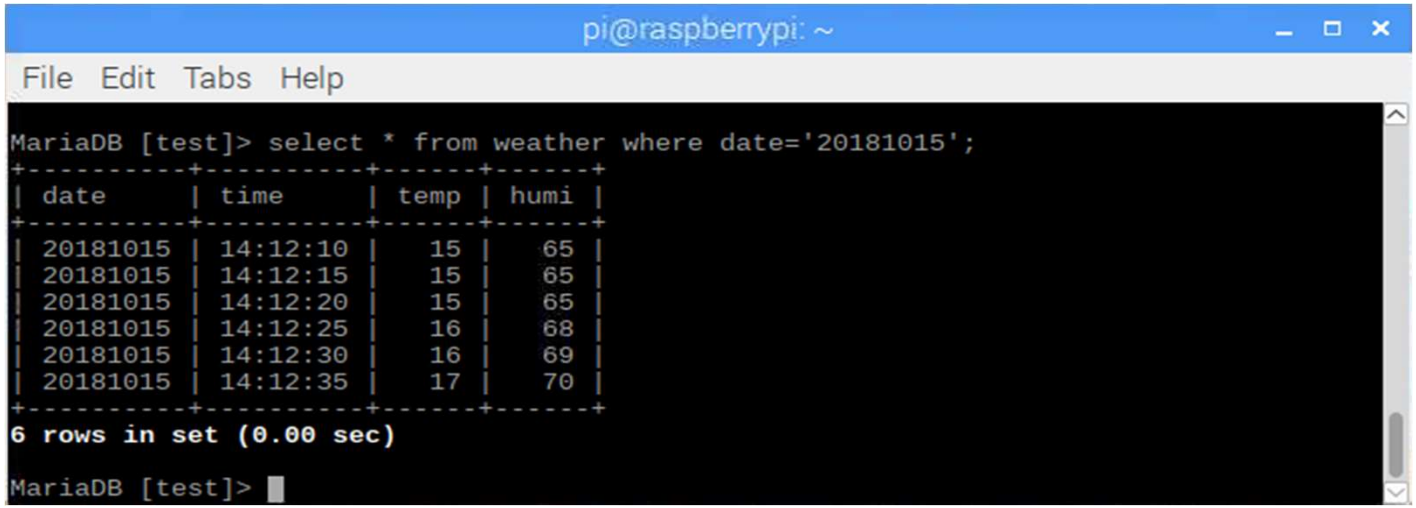
Insert field data

pi@raspberrypi: ~

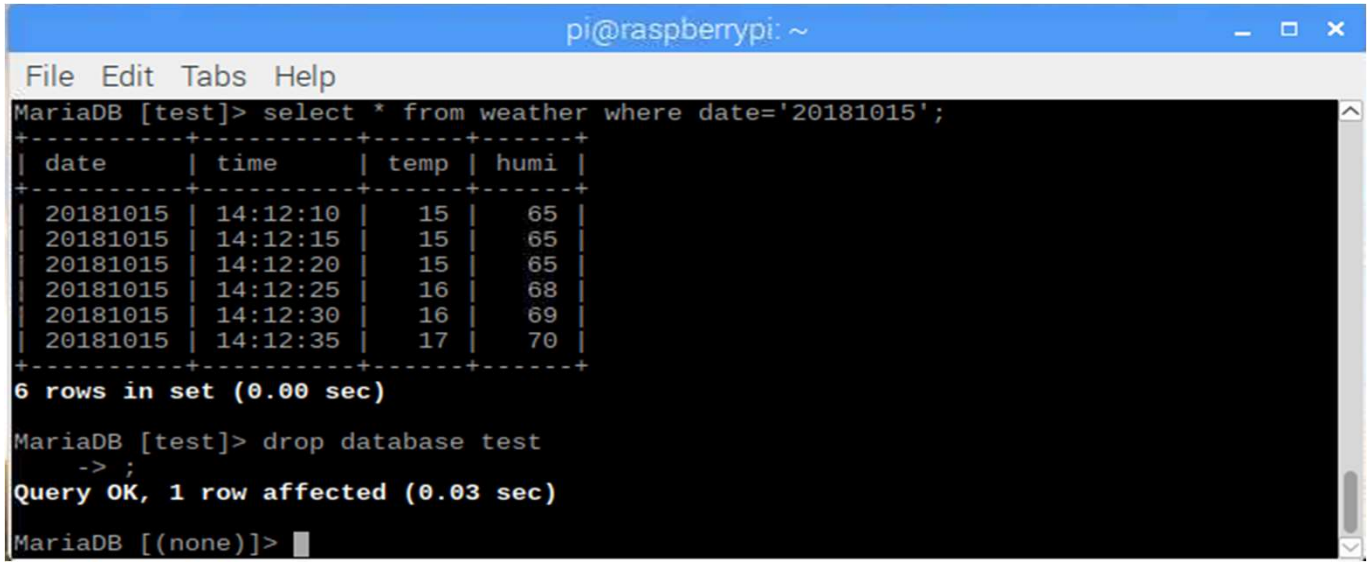
File Edit Tabs Help

```
MariaDB [test]> insert into weather values("20181015","14:12:25",16,68);
Query OK, 1 row affected (0.01 sec)

MariaDB [test]> insert into weather values("20181015","14:12:30",16,69);
Query OK, 1 row affected (0.00 sec)

MariaDB [test]> insert into weather values("20181015","14:12:35",17,70);
Query OK, 1 row affected (0.01 sec)

MariaDB [test]> select * from weather;
+----------+----------+------+------+
| date     | time     | temp | humi |
+----------+----------+------+------+
| 20181014 | 12:36:45 |   14 |   72 |
| 20181012 | 12:36:55 |   15 |   73 |
| 20181014 | 12:37:05 |  115 |   72 |
| 20181015 | 14:12:10 |   15 |   65 |
| 20181015 | 14:12:15 |   15 |   65 |
| 20181015 | 14:12:20 |   15 |   65 |
| 20181015 | 14:12:25 |   16 |   68 |
| 20181015 | 14:12:30 |   16 |   69 |
| 20181015 | 14:12:35 |   17 |   70 |
+----------+----------+------+------+
9 rows in set (0.00 sec)

MariaDB [test]>
```

Select * from [tb] where [cond]

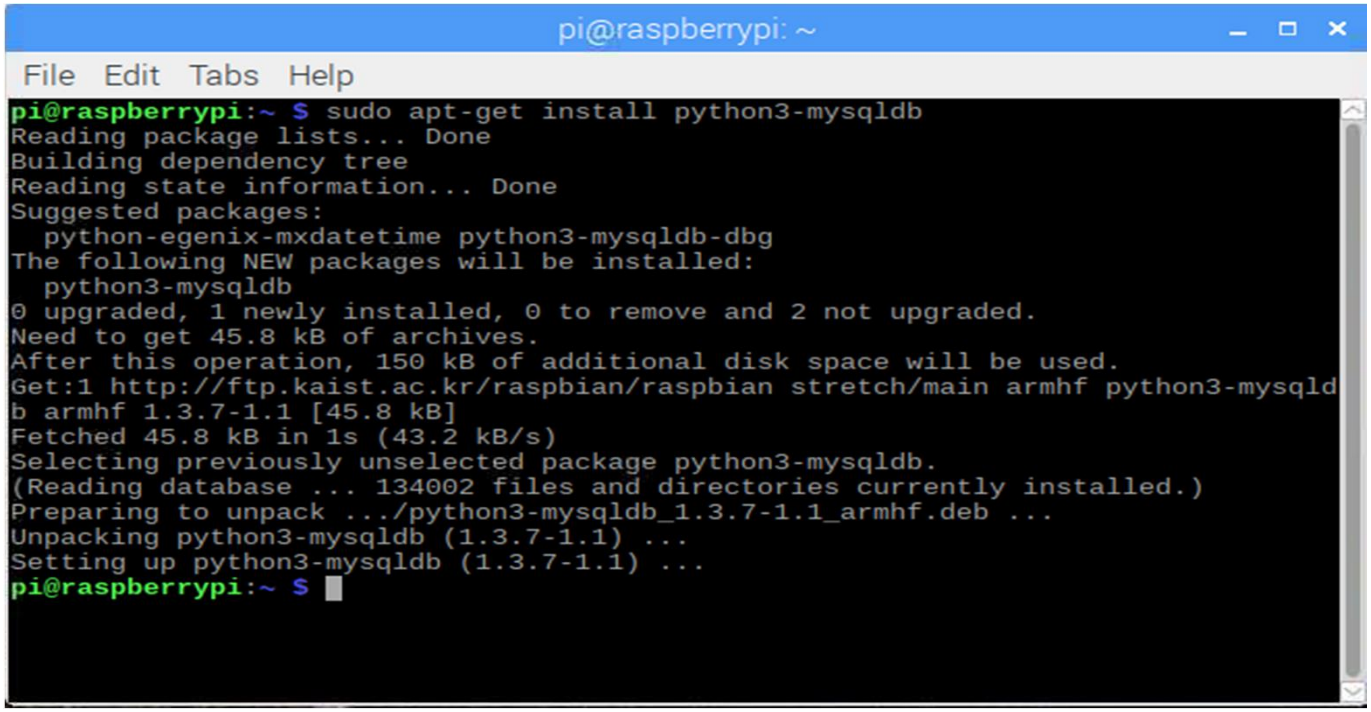


Drop database



Install python3-mysqldb

- $ sudo apt-get install python3-mysqldb



Ex1 : Create dataBase

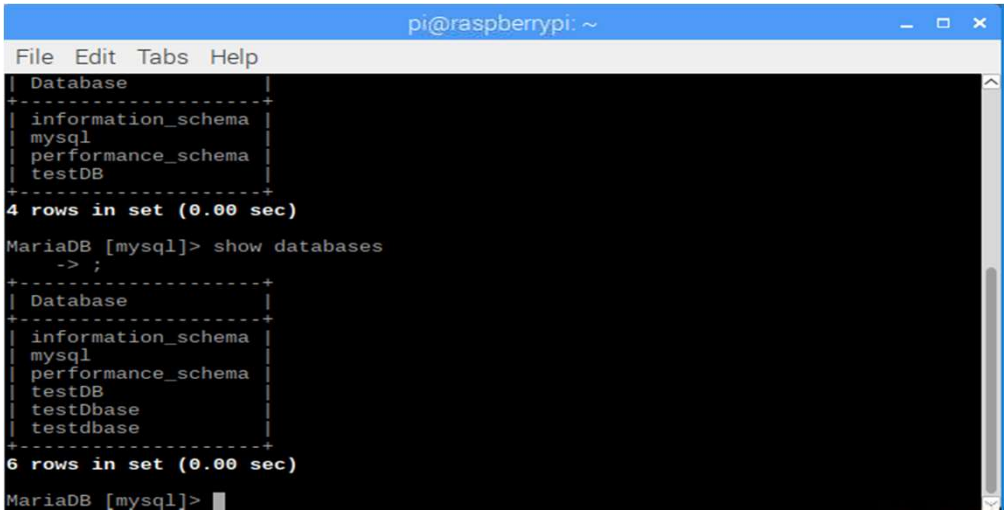
mySQL-1.py

```
1   import MySQLdb
2
3   dbase=MySQLdb.connect(host='localhost', user='root', passwd="1234")
4   mycursor=dbase.cursor()
5
6   dbname=input ("database name : ")
7   try:
8       sql="create database " + dbname + ";"
9       print (sql)
10      mycursor.execute(sql)
11      dbase.commit()
12      mycursor.execute("show databases")
13
14      for x in mycursor:
15          print (x)
16
17  finally:
18      dbase.close()
19
```

Ex1 : Run

Shell

```
>>> %Run mySQL-1.py

  database name : testdbase
  create database testdbase;
  ('information_schema',)
  ('mysql',)
  ('performance_schema',)
  ('testDB',)
  ('testDbase',)
  ('testdbase',)

>>> %Reset
```



Ex2 : Create Table, field

mySQL-2.py *

```
1   import MySQLdb
2
3   dbase=MySQLdb.connect(host='localhost', user='root', passwd="1234",db="testDB
4   mycursor=dbase.cursor()
5
6   try:
7       sql="create table randnum(Time char(8),Random int, evenOdd int);"
8       print (sql)
9       mycursor.execute(sql)
10      dbase.commit()
11
12      mycursor.execute("show tables")
13      for x in mycursor:
14          print (x)
15
16  finally:
17      dbase.close()
18
```

Ex2 : Run

Shell

```
  ('mysql',)
  ('performance_schema',)
  ('testDB',)
  ('testDbase',)
  ('testdbase',)

>>> %Run mySQL-2.py

  create table randnum(Time char(8),Random int, evenOdd int);
  ('randnum',)

>>>
```

Ex3 : Insert into table

mySQL-3.py

```
1   import MySQLdb
2   from time import localtime,strftime,sleep
3   import random
4
5   dbase=MySQLdb.connect(host='localhost', user='root', passwd="1234",db="testDB")
6   mycursor=dbase.cursor()
7
8   try:
9       for k in range(100):
10          dtime=strftime("%H:%M:%S",localtime())
11          rand=random.randrange(0,101)
12          even=rand % 2
13          sql="""insert into randnum(Time,Random,even0dd) values( "%s", %d, %d);"""\
14              %(dtime,rand,even)
15          print (sql)
16          mycursor.execute(sql)
17          sleep(1)
18
19      dbase.commit()
20
21  finally:
22      dbase.close()
```

Ex3 : run

Shell

```
insert into randnum(Time,Random,evenOdd) values( "18:10:01", 80, 0);
insert into randnum(Time,Random,evenOdd) values( "18:10:02", 46, 0);
insert into randnum(Time,Random,evenOdd) values( "18:10:03", 68, 0);
insert into randnum(Time,Random,evenOdd) values( "18:10:04", 93, 1);
insert into randnum(Time,Random,evenOdd) values( "18:10:05", 29, 1);
insert into randnum(Time,Random,evenOdd) values( "18:10:06", 67, 1);
insert into randnum(Time,Random,evenOdd) values( "18:10:07", 7, 1);
insert into randnum(Time,Random,evenOdd) values( "18:10:08", 16, 0);
insert into randnum(Time,Random,evenOdd) values( "18:10:09", 100, 0);
insert into randnum(Time,Random,evenOdd) values( "18:10:10", 5, 1);
insert into randnum(Time,Random,evenOdd) values( "18:10:11", 93, 1);
insert into randnum(Time,Random,evenOdd) values( "18:10:12", 78, 0);
insert into randnum(Time,Random,evenOdd) values( "18:10:13", 22, 0);
insert into randnum(Time,Random,evenOdd) values( "18:10:14", 71, 1);
insert into randnum(Time,Random,evenOdd) values( "18:10:15", 86, 0);
insert into randnum(Time,Random,evenOdd) values( "18:10:16", 77, 1);
insert into randnum(Time,Random,evenOdd) values( "18:10:17", 41, 1);
insert into randnum(Time,Random,evenOdd) values( "18:10:18", 70, 0);
>>>
```

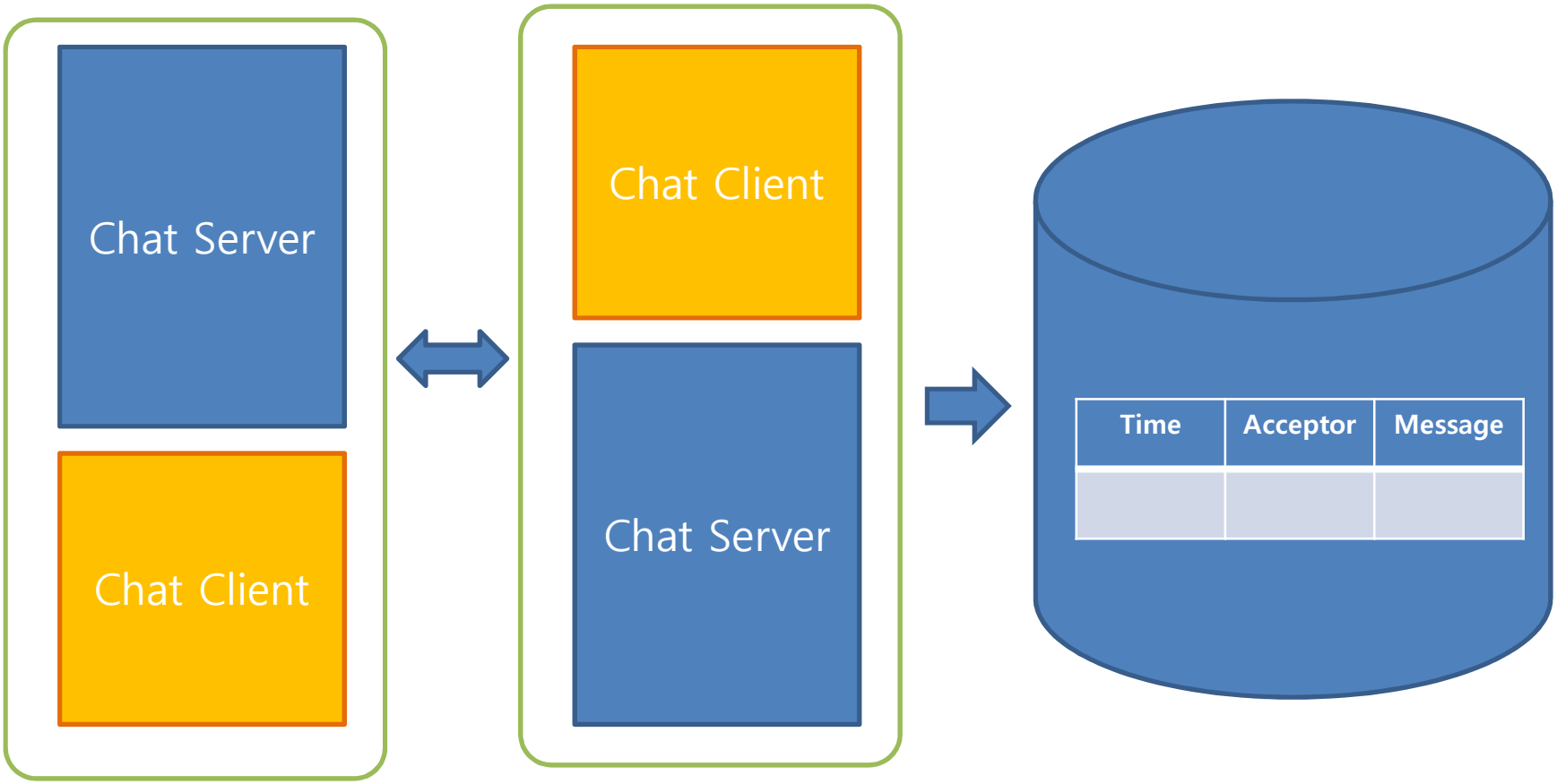
Ex4 : select * frim [tb]

mySQL-4.py

```
1   import MySQLdb
2   from time import localtime,strftime,sleep
3   import random
4
5   dbase=MySQLdb.connect(host='localhost', user='root', passwd="1234",db="testDB")
6   mycursor=dbase.cursor()
7
8   try:
9       while True:
10          sql=input ("SQL: ")
11          mycursor.execute(sql)
12
13          for x in mycursor:
14              print (x)
15
16  finally:
```

Ex4 : Run

Shell

```
( 18:10:18 , 70, 0)
SQL: select * from randnum where evenOdd=1;
('18:10:40', 43, 1)
('18:10:42', 81, 1)
('18:10:43', 31, 1)
('18:10:44', 47, 1)
('18:10:45', 91, 1)
('18:10:51', 79, 1)
('18:10:52', 85, 1)
('18:10:53', 11, 1)
('18:10:54', 11, 1)
('18:10:55', 77, 1)
('18:10:56', 33, 1)
('18:10:03', 53, 1)
('18:10:07', 89, 1)
('18:10:08', 87, 1)
('18:10:09', 19, 1)
```

실습 : TCP Chat DB