Lab. Python Database Programming

1. MySQL / MariaDB

1)cmd as Administrator

-If you're used to using the "Run" box to open apps, you can use that to launch Command Prompt with admin privileges.

-Press Windows+R to open the "Run" box.

-Type "cmd" into the box and then press Ctrl+Shift+Enter to run the command as an administrator.

2)pip install PyMySQL

3)Create Database mycompany;

4)mariadb.py

```
import pymysql

# Open database connection
conn = pymysql.connect(host='lab-db-instance.cxlhah81ocl3.ap-northeast-2.rds.amazonaws.com', port=3306,
user='admin', password='pythonmysql', database='mycompany', charset='utf8', autocommit=True)

# prepare a cursor object using cursor() method
cursor = conn.cursor()

# execute SQL query using execute() method.
cursor.execute("SELECT VERSION()")

# Fetch a single row using fetchone() method.
data = cursor.fetchone()
print ("Database version : %s " % data)

# disconnect from server
conn.close()
```

5)use mycompany;

6)

```
CREATE TABLE supermarket(
Itemno   INT   NULL,
Category  CHAR(20)  NULL,
FoodName  CHAR(30)  NULL,
Company   CHAR(20)   NULL,
Price INT  NULL);
```

7)

```
INSERT INTO supermarket VALUES(1, '과일', '자몽', '마트', 1500)
INSERT INTO supermarket VALUES(2, '음료수', '망고주스', '편의점', 1000)
INSERT INTO supermarket VALUES(3, '음료수', '식혜', '시장', 1000)
INSERT INTO supermarket VALUES(4, '과자', '머랭', '조각케익가게', 3000)
```

8)SELECT * FROM supermarket;

9)mariadb1.py

```
import pymysql

server = 'ec2-3-38-162-157.ap-northeast-2.compute.amazonaws.com'
port = 3306
user = 'root'
password = 'pythonmysql'
dbname = 'mycompany'

conn = pymysql.connect(host=server, port=port, user=user, password=password, database=dbname, charset='utf8')
cursor = conn.cursor()
cursor.execute('SELECT * FROM supermarket;')
row = cursor.fetchone()

while row:
    print(str(row[0]) + " " + str(row[1]) + " " + str(row[2]) + " " + str(row[3]) + " " + str(row[4]))
    row = cursor.fetchone()

conn.close()
```

10)mariadb2.py

```
import pymysql

server = 'ec2-3-38-162-157.ap-northeast-2.compute.amazonaws.com'
port = 3306
user = 'root'
password = 'pythonmysql'
dbname = 'mycompany'

# Open database connection
conn = pymysql.connect(host=server, port=port, user=user, password=password, database=dbname, charset='utf8')

# prepare a cursor object using cursor() method
cursor = conn.cursor()
```

```
    # Drop table if it already exist using execute() method.
    cursor.execute("DROP TABLE IF EXISTS EMPLOYEE")

    # Create table as per requirement
    sql = """CREATE TABLE EMPLOYEE (
      FIRST_NAME  CHAR(20) NOT NULL,
      LAST_NAME  CHAR(20),
      AGE INT,
      SEX CHAR(1),
      INCOME FLOAT )"""

    cursor.execute(sql)

    # disconnect from server
    conn.close()


11)mariadb3.py
    import pymysql

    server = 'ec2-3-38-162-157.ap-northeast-2.compute.amazonaws.com'
    port = 3306
    user = 'root'
    password = 'pythonmysql'
    dbname = 'mycompany'

    # Open database connection
    conn = pymysql.connect(host=server, port=port, user=user, password=password, database=dbname, charset='utf8')

    # prepare a cursor object using cursor() method
    cursor = conn.cursor()

    # Prepare SQL query to INSERT a record into the database.
    sql = """INSERT INTO EMPLOYEE(FIRST_NAME,
      LAST_NAME, AGE, SEX, INCOME)
      VALUES ('Mac', 'Mohan', 20, 'M', 2000)"""
    try:
      # Execute the SQL command
      cursor.execute(sql)
      # Commit your changes in the database
      conn.commit()
    except:
      # Rollback in case there is any error
      conn.rollback()

    # disconnect from server
    conn.close()


12)mariadb4.py
    import pymysql

    server = 'ec2-3-38-162-157.ap-northeast-2.compute.amazonaws.com'
    port = 3306
    user = 'root'
    password = 'pythonmysql'
    dbname = 'mycompany'

    # Open database connection
    conn = pymysql.connect(host=server, port=port, user=user, password=password, database=dbname, charset='utf8')

    # prepare a cursor object using cursor() method
    cursor = conn.cursor()

    # Prepare SQL query to INSERT a record into the database.
    sql = "SELECT * FROM EMPLOYEE \
         WHERE INCOME > '%d'" % (1000)
    try:
      # Execute the SQL command
      cursor.execute(sql)
      # Fetch all the rows in a list of lists.
      results = cursor.fetchall()
      for row in results:
        fname = row[0]
        lname = row[1]
        age = row[2]
        sex = row[3]
        income = row[4]
        # Now print fetched result
        print ("fname = %s,lname = %s,age = %d,sex = %s,income = %d" % \
          (fname, lname, age, sex, income ))
    except:
      print ("Error: unable to fetch data")
```

```
    # disconnect from server
    conn.close()
```

13)mariadb5.py

```
    import pymysql

    server = 'ec2-3-38-162-157.ap-northeast-2.compute.amazonaws.com'
    port = 3306
    user = 'root'
    password = 'pythonmysql'
    dbname = 'mycompany'

    # Open database connection
    db = pymysql.connect(host=server, port=port, user=user, password=password, database=dbname, charset='utf8')

    # prepare a cursor object using cursor() method
    cursor = db.cursor()

    # Prepare SQL query to UPDATE required records
    sql = "UPDATE EMPLOYEE SET AGE = AGE + 1
                        WHERE SEX = '%c'" % ('M')
    try:
      # Execute the SQL command
      cursor.execute(sql)
      # Commit your changes in the database
      db.commit()
    except:
      # Rollback in case there is any error
      db.rollback()

    # disconnect from server
    db.close()
```

14)mariadb6.py

```
    import pymysql

    server = 'ec2-3-38-162-157.ap-northeast-2.compute.amazonaws.com'
    port = 3306
    user = 'root'
    password = 'pythonmysql'
    dbname = 'mycompany'

    # Open database connection
    db = pymysql.connect(host=server, port=port, user=user, password=password, database=dbname, charset='utf8')

    # prepare a cursor object using cursor() method
    cursor = db.cursor()

    # Prepare SQL query to DELETE required records
    sql = "DELETE FROM EMPLOYEE WHERE AGE > '%d'" % (20)
    try:
      # Execute the SQL command
      cursor.execute(sql)
      # Commit your changes in the database
      db.commit()
    except:
      # Rollback in case there is any error
      db.rollback()

    # disconnect from server
    db.close()
```

2. MySQL World database 이용하기

1)World database 다운로드하기

-https://dev.mysql.com/doc/index-other.html

-Example Databases에서 [World database] 'TGZ' link 클릭

-다운로드 후 Jupyter Notebook Upload

```
~/PythonHome$ tar xvfz world-db.tar.gz
```

2)MySQL login한다.

```
$ mysql -h localhost -u root -p
```

3)world.sql 실행

```
mysql>source /home/ubuntu/PythonHome/world.sql
```

4)World database의 table을 확인한다.

```
mysql> show tables;
```

5)mariadb.py

```
import pymysql

server = 'ec2-3-38-162-157.ap-northeast-2.compute.amazonaws.com'
port = 3306
user = 'root'
password = 'pythonmysql'
dbname = 'world'

# Open database connection
db = pymysql.connect(host=server, port=port, user=user, password=password, database=dbname, charset='utf8')

# prepare a cursor object using cursor() method
cursor = db.cursor()

sql = "SELECT ID, Name, CountryCode, District, Population FROM city WHERE CountryCode='KOR'"

try:
   # Execute the SQL command
   cursor.execute(sql)
   # Fetch all the rows in a list of lists.
   results = cursor.fetchall()
   for row in results:
       print('ID = %d, Name = %s, CountryCode = %s, District = %s, Popluation = %d' % (row[0], row[1], row[2],
       row[3],row[4]))
except:
   print ("Error: unable to fetch data")

# disconnect from server
db.close()
```