# dff9: HW0 and HW1

## Step 3: Test File Import

Replace the UNI in the steps with your UNI.

In [1]:

```
import de2418_HW0
```

In [2]:

```
de2418_HW0.t1()
```

Out[2]:

```
'dff9 says Hello World'
```

The text above should look like my example, but with you UNI.

**Note:** Any time you change the underlying Python file, you must restart the kernel using the menu. You must then re-import and rerun any cells.

## Step 4: Install PyMYSQL and iPython-SQL

- You run the commands below in an Anaconda terminal window.
- Install `pymysql` in your Anaconda environment.
- Install `iPython-SQL` in your Anaconda environment.
- Restart the notebook Kernel.
- The following cell should execute.

In [3]:

```
import pymysql
pymysql.__version__
```

Out[3]:

```
'1.0.2'
```

- In the cell below, replace `dbuser:dbuserdbuser` with your MySQL user ID and password.

In [4]:

```
%load_ext sql

%sql mysql+pymysql://root:Edy990127@localhost
```

Out[4]:

```
'Connected: root@None'
```

- The following is a simple test. You should get similar results, but your might be slightly different.

In [5]:

```
%sql show tables from information_schema
```

```
 * mysql+pymysql://root:***@localhost
79 rows affected.
```

Out[5]:

| Tables_in_information_schema |
|---:|
| ADMINISTRABLE_ROLE_AUTHORIZATIONS |
| APPLICABLE_ROLES |
| CHARACTER_SETS |
| CHECK_CONSTRAINTS |
| COLLATION_CHARACTER_SET_APPLICABILITY |
| COLLATIONS |
| COLUMN_PRIVILEGES |
| COLUMN_STATISTICS |
| COLUMNS |
| COLUMNS_EXTENSIONS |
| ENABLED_ROLES |
| ENGINES |
| EVENTS |
| FILES |
| INNODB_BUFFER_PAGE |
| INNODB_BUFFER_PAGE_LRU |
| INNODB_BUFFER_POOL_STATS |
| INNODB_CACHED_INDEXES |
| INNODB_CMP |
| INNODB_CMP_PER_INDEX |
| INNODB_CMP_PER_INDEX_RESET |
| INNODB_CMP_RESET |
| INNODB_CMPMEM |
| INNODB_CMPMEM_RESET |
| INNODB_COLUMNS |
| INNODB_DATAFILES |
| INNODB_FIELDS |
| INNODB_FOREIGN |
| INNODB_FOREIGN_COLS |
| INNODB_FT_BEING_DELETED |
| INNODB_FT_CONFIG |

| Tables_in_information_schema |
|---:|
| INNODB_FT_DEFAULT_STOPWORD |
| INNODB_FT_DELETED |
| INNODB_FT_INDEX_CACHE |
| INNODB_FT_INDEX_TABLE |
| INNODB_INDEXES |
| INNODB_METRICS |
| INNODB_SESSION_TEMP_TABLESPACES |
| INNODB_TABLES |
| INNODB_TABLESPACES |
| INNODB_TABLESPACES_BRIEF |
| INNODB_TABLESTATS |
| INNODB_TEMP_TABLE_INFO |
| INNODB_TRX |
| INNODB_VIRTUAL |
| KEY_COLUMN_USAGE |
| KEYWORDS |
| OPTIMIZER_TRACE |
| PARAMETERS |
| PARTITIONS |
| PLUGINS |
| PROCESSLIST |
| PROFILING |
| REFERENTIAL_CONSTRAINTS |
| RESOURCE_GROUPS |
| ROLE_COLUMN_GRANTS |
| ROLE_ROUTINE_GRANTS |
| ROLE_TABLE_GRANTS |
| ROUTINES |
| SCHEMA_PRIVILEGES |
| SCHEMATA |
| SCHEMATA_EXTENSIONS |
| ST_GEOMETRY_COLUMNS |
| ST_SPATIAL_REFERENCE_SYSTEMS |

| Tables_in_information_schema |
|---:|
| ST_UNITS_OF_MEASURE |
| STATISTICS |
| TABLE_CONSTRAINTS |
| TABLE_CONSTRAINTS_EXTENSIONS |
| TABLE_PRIVILEGES |
| TABLES |
| TABLES_EXTENSIONS |
| TABLESPACES |
| TABLESPACES_EXTENSIONS |
| TRIGGERS |
| USER_ATTRIBUTES |
| USER_PRIVILEGES |
| VIEW_ROUTINE_USAGE |
| VIEW_TABLE_USAGE |
| VIEWS |

## Step 5: Load Sample Data

- In the directory where you cloned the project, there is a sub-folder `db_book.`

- Start DataGrip.

- In DataGrip, choose `File->New DataSource->MySQL.`
    - Accept the default name for the data source.
    - Set the MySQL user ID and password.
    - You may see a message stating that you need to install database drives. Install the drivers.

- Select the newly created data source. The name will `Run SQL Script` . Navigate to and choose the file `DDL_drop.sql` .

- Do the same for `smallRelationsInsertFile.sql` .

- You will see an icon/text on the side bar labelled `db_book.` It may be greyed-out. Right click on the entry and choose `New query console.` You may see a message `Current schema not introspected and Introspect schema` on the far right. Click on `Introspect schema.`

- Enter `select * from course` in the query console window. Click on the little green arrow to run the query.

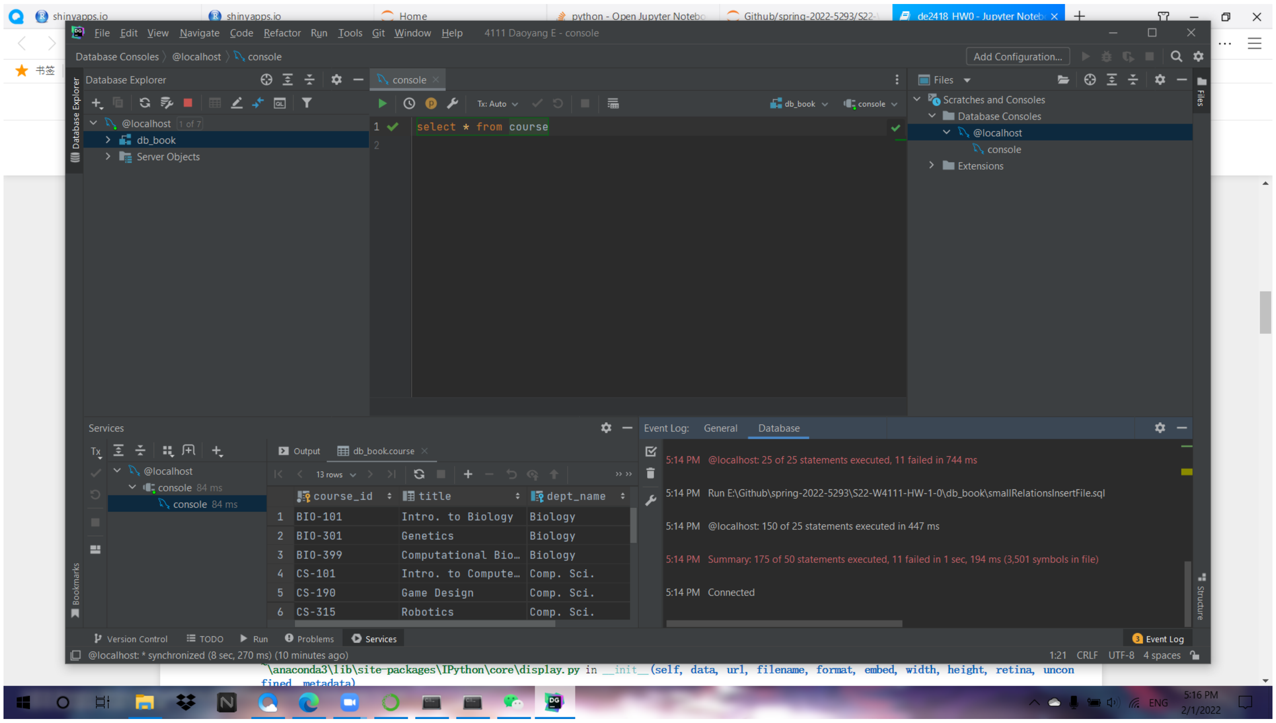
- Take a screen show of your DataGrip window and save the screen show into the folder of the form `dff9_src` using your UNI. Remember the name of the file.
- Set your file name in the cell below replacing the example and run the cell. You should see your screenshot below. Yours will look a little different from mine. As long as yours shows the query result, you are fine.

In [6]:

```
file_name = 'Screenshot datagrip.png'

print("\n")
from IPython.display import Image
Image(filename=file_name)
```

Out[6]:



```
select * from course
```

| | course_id | title | dept_name |
|---|---|---|---|
| 1 | BIO-101 | Intro. to Biology | Biology |
| 2 | BIO-301 | Genetics | Biology |
| 3 | BIO-399 | Computational Bio… | Biology |
| 4 | CS-101 | Intro. to Compute… | Comp. Sci. |
| 5 | CS-190 | Game Design | Comp. Sci. |
| 6 | CS-315 | Robotics | Comp. Sci. |

```
5:14 PM   @localhost: 25 of 25 statements executed, 11 failed in 744 ms

5:14 PM   Run E:\Github\spring-2022-5293\S22-W4111-HW-1-0\db_book\smallRelationsInsertFile.sql

5:14 PM   @localhost: 150 of 25 statements executed in 447 ms

5:14 PM   Summary: 175 of 50 statements executed, 11 failed in 1 sec, 194 ms (3,501 symbols in file)

5:14 PM   Connected
```

@localhost: * synchronized (8 sec, 270 ms) (10 minutes ago)

## Step 6: Very %sql

- Execute the cell below. Your answer will be similar to mine but may not match exactly.

In [7]:

```
%sql select * from db_book.course
```

```
 * mysql+pymysql://root:***@localhost
13 rows affected.
```

Out[7]:

| course_id | title | dept_name | credits |
|---|---|---|---|
| BIO-101 | Intro. to Biology | Biology | 4 |
| BIO-301 | Genetics | Biology | 4 |
| BIO-399 | Computational Biology | Biology | 3 |
| CS-101 | Intro. to Computer Science | Comp. Sci. | 4 |
| CS-190 | Game Design | Comp. Sci. | 4 |

| course_id | title | dept_name | credits |
|---|---|---|---|
| CS-315 | Robotics | Comp. Sci. | 3 |
| CS-319 | Image Processing | Comp. Sci. | 3 |
| CS-347 | Database System Concepts | Comp. Sci. | 3 |
| EE-181 | Intro. to Digital Systems | Elec. Eng. | 3 |
| FIN-201 | Investment Banking | Finance | 3 |
| HIS-351 | World History | History | 3 |
| MU-199 | Music Video Production | Music | 3 |
| PHY-101 | Physical Principles | Physics | 4 |

# Step 7: Pandas, CSV and SQL

- Run the cell below.

In [8]:

```
import pandas
pandas.__version__
```

Out[8]:

```
'1.3.4'
```

- Install SQLAlchemy using an Anaconda prompt.
- Restart the notebook kernel and rerun all cells. Then run the cell below.

In [12]:

```
from sqlalchemy import create_engine
```

- Go into DataGrip. Select your local database, e.g. `@localhost` .
- Open a query console and execute `create database lahmansdb` . Then execute the cell below.

**Note:** Your answer will be different because I have already loaded tables.

In [13]:

```
%sql show tables from lahmansdb;
```

```
 * mysql+pymysql://root:***@localhost
0 rows affected.
```

Out[13]:

| Tables_in_lahmansdb |
|---|

- There is a folder `data` in the project you cloned. There is a file in the folder `People.csv` .
- Execute the following code cell. If you are on Windows, you may have to change the path to the file and may have to replace `/` with `\\` in paths.

- You should see a result similar to mine below.

In [15]:

```
df = pandas.read_csv('../../data/People.csv')
df
```

Out[15]:

| | playerID | birthYear | birthMonth | birthDay | birthCountry | birthState | birthCity | deathYear | dea |
|---|---|---|---|---|---|---|---|---|---|
| **0** | aardsda01 | 1981.0 | 12.0 | 27.0 | USA | CO | Denver | NaN | |
| **1** | aaronha01 | 1934.0 | 2.0 | 5.0 | USA | AL | Mobile | 2021.0 | |
| **2** | aaronto01 | 1939.0 | 8.0 | 5.0 | USA | AL | Mobile | 1984.0 | |
| **3** | aasedo01 | 1954.0 | 9.0 | 8.0 | USA | CA | Orange | NaN | |
| **4** | abadan01 | 1972.0 | 8.0 | 25.0 | USA | FL | Palm Beach | NaN | |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | |
| **20353** | zupofr01 | 1939.0 | 8.0 | 29.0 | USA | CA | San Francisco | 2005.0 | |
| **20354** | zuvelpa01 | 1958.0 | 10.0 | 31.0 | USA | CA | San Mateo | NaN | |
| **20355** | zuverge01 | 1924.0 | 8.0 | 20.0 | USA | MI | Holland | 2014.0 | |
| **20356** | zwilldu01 | 1888.0 | 11.0 | 2.0 | USA | MO | St. Louis | 1978.0 | |
| **20357** | zychto01 | 1990.0 | 8.0 | 7.0 | USA | IL | Monee | NaN | |

20358 rows × 24 columns

- We will now save the data to MySQL. Run the cells below. You will have to change `dbuser:dbuserdbuser` to your MySQL user ID and password.

In [16]:

```
engine = create_engine("mysql+pymysql://root:Edy990127@localhost")
```

In [17]:

```
df.to_sql('people', con=engine, index=False, if_exists='replace', schema='lahmansdb')
```

- Test that you wrote the information to the databases.

In [18]:

```
%sql select * from lahmansdb.people where nameLast='Williams' and bats='L'
```

```
 * mysql+pymysql://root:***@localhost
19 rows affected.
```

Out[18]:

| playerID | birthYear | birthMonth | birthDay | birthCountry | birthState | birthCity | deathYear | deathMonth |
|---|---|---|---|---|---|---|---|---|
| williar01 | 1877.0 | 8.0 | 24.0 | USA | MA | Somerville | 1941.0 | 5.0 |
| willibi01 | 1938.0 | 6.0 | 15.0 | USA | AL | Whistler | None | None |
| willibi02 | 1932.0 | 6.0 | 13.0 | USA | SC | Newberry | 2013.0 | 6.0 |
| willicy01 | 1887.0 | 12.0 | 21.0 | USA | IN | Wadena | 1974.0 | 4.0 |
| willida05 | 1958.0 | 2.0 | 28.0 | USA | NY | Brooklyn | None | None |
| willida07 | 1979.0 | 3.0 | 12.0 | USA | AK | Anchorage | None | None |
| willide01 | 1896.0 | 12.0 | 13.0 | USA | OR | Portland | 1929.0 | 3.0 |
| willigu02 | 1888.0 | 5.0 | 7.0 | USA | NE | Omaha | 1964.0 | 4.0 |
| williju02 | 1995.0 | 8.0 | 20.0 | USA | LA | Houma | None | None |
| willike01 | 1890.0 | 6.0 | 28.0 | USA | OR | Grants Pass | 1959.0 | 1.0 |
| willile03 | 1905.0 | 12.0 | 2.0 | USA | GA | Macon | 1984.0 | 11.0 |
| willima02 | 1953.0 | 7.0 | 28.0 | USA | NY | Elmira | None | None |
| willima07 | 1991.0 | 8.0 | 21.0 | USA | RI | Pawtucket | None | None |
| willimi02 | 1964.0 | 11.0 | 17.0 | USA | CA | Santa Ana | None | None |
| willini01 | 1993.0 | 9.0 | 8.0 | USA | TX | Galveston | None | None |
| willira01 | 1975.0 | 9.0 | 18.0 | USA | TX | Harlingen | None | None |
| williri02 | 1893.0 | 12.0 | 18.0 | USA | CA | Santa Cruz | 1966.0 | 4.0 |
| willist01 | 1892.0 | 1.0 | 31.0 | USA | MT | Cascade | 1979.0 | 6.0 |
| willite01 | 1918.0 | 8.0 | 30.0 | USA | CA | San Diego | 2002.0 | 7.0 |

## Step 7: Done (Non-Programming)

- You are done.

## Programming Track

- Include a screen capture of your PyCharm execution of the web application. Your should look like the one below but may be different.

In [ ]:

```
file_name = 'pycharm.png'

print("\n")
from IPython.display import Image
Image(filename=file_name)
```

- Put a screen capture of access the web page. Yours will look similar to mine but may be slightly different.

In [ ]:

```
file_name = 'browser.png'

print("\n")
from IPython.display import Image
Image(filename=file_name)
```

In [ ]: