# dff9: HW0 and HW1

## Step 3: Test File Import

Replace the UNI in the steps with your UNI.

In [1]:

```
import js5954_HW0
```

In [2]:

```
js5954_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:123456@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 |
| INNODB_FT_DEFAULT_STOPWORD |
| INNODB_FT_DELETED |
| INNODB_FT_INDEX_CACHE |
| INNODB_FT_INDEX_TABLE |
| INNODB_INDEXES |

| Tables_in_information_schema |
|---:|
| 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 |
| ST_UNITS_OF_MEASURE |
| STATISTICS |
| TABLE_CONSTRAINTS |
| TABLE_CONSTRAINTS_EXTENSIONS |
| TABLE_PRIVILEGES |
| TABLES |
| TABLES_EXTENSIONS |
| TABLESPACES |

| Tables_in_information_schema |
|---:|
| TABLESPACES_EXTENSIONS |
| TRIGGERS |
| USER_ATTRIBUTES |
| USER_PRIVILEGES |
| VIEW_ROUTINE_USAGE |
| VIEW_TABLE_USAGE |
| VIEWS |

## Step 5: Load Sample Data

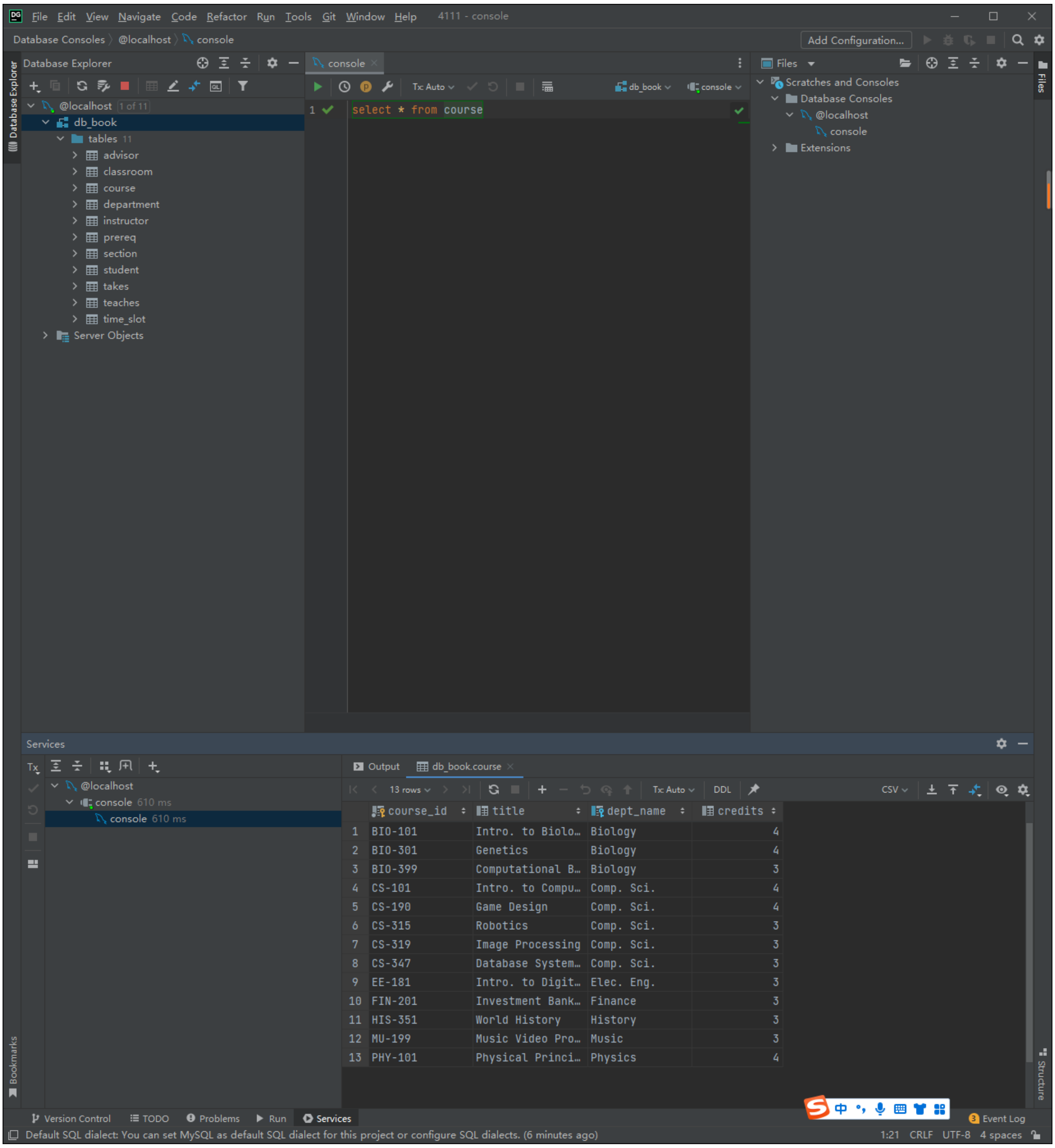
- In the directory where you cloned the project, there is a sub-folder `db_book.`
- Start DataGrip.
- In DataGrip, choose `File->New DataSource->MySQL.`
  - Accept the default name for the data source.
  - Set the MySQL user ID and password.
  - You may see a message stating that you need to install 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]:

```python
file_name = 'Screen Shot 2022-01-28 180038.png'

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

Out[6]:



```
select * from course
```

| | course_id | title | dept_name | credits |
|---|---|---|---|---|
| 1 | BIO-101 | Intro. to Biolo… | Biology | 4 |
| 2 | BIO-301 | Genetics | Biology | 4 |
| 3 | BIO-399 | Computational B… | Biology | 3 |
| 4 | CS-101 | Intro. to Compu… | Comp. Sci. | 4 |
| 5 | CS-190 | Game Design | Comp. Sci. | 4 |
| 6 | CS-315 | Robotics | Comp. Sci. | 3 |
| 7 | CS-319 | Image Processing | Comp. Sci. | 3 |
| 8 | CS-347 | Database System… | Comp. Sci. | 3 |
| 9 | EE-181 | Intro. to Digit… | Elec. Eng. | 3 |
| 10 | FIN-201 | Investment Bank… | Finance | 3 |
| 11 | HIS-351 | World History | History | 3 |
| 12 | MU-199 | Music Video Pro… | Music | 3 |
| 13 | PHY-101 | Physical Princi… | Physics | 4 |

## 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 |
| CS-315 | Robotics | Comp. Sci. | 3 |

| course_id | title | dept_name | credits |
|---|---|---|---|
| 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]:

```
'1.2.4'
```

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

In [9]:

```
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.

In [10]:

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

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

Out[10]:

| Tables_in_lahmansdb |
|---|
| people |

- 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 [11]:

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

Out[11]:

| | playerID | birthYear | birthMonth | birthDay | birthCountry | birthState | birthCity | deathYear |
|---|---|---|---|---|---|---|---|---|
| **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 [12]:

```
engine = create_engine("mysql+pymysql://root:123456@localhost")
```

In [13]:

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

- Test that you wrote the information to the databases.

In [14]:

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

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

Out[14]:

| playerID | birthYear | birthMonth | birthDay | birthCountry | birthState | birthCity | deathYear | deathM |
|---|---|---|---|---|---|---|---|---|
| williar01 | 1877.0 | 8.0 | 24.0 | USA | MA | Somerville | 1941.0 | |
| willibi01 | 1938.0 | 6.0 | 15.0 | USA | AL | Whistler | None | N |
| willibi02 | 1932.0 | 6.0 | 13.0 | USA | SC | Newberry | 2013.0 | |

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

# Step 7: Done

- You are done.

In [15]:

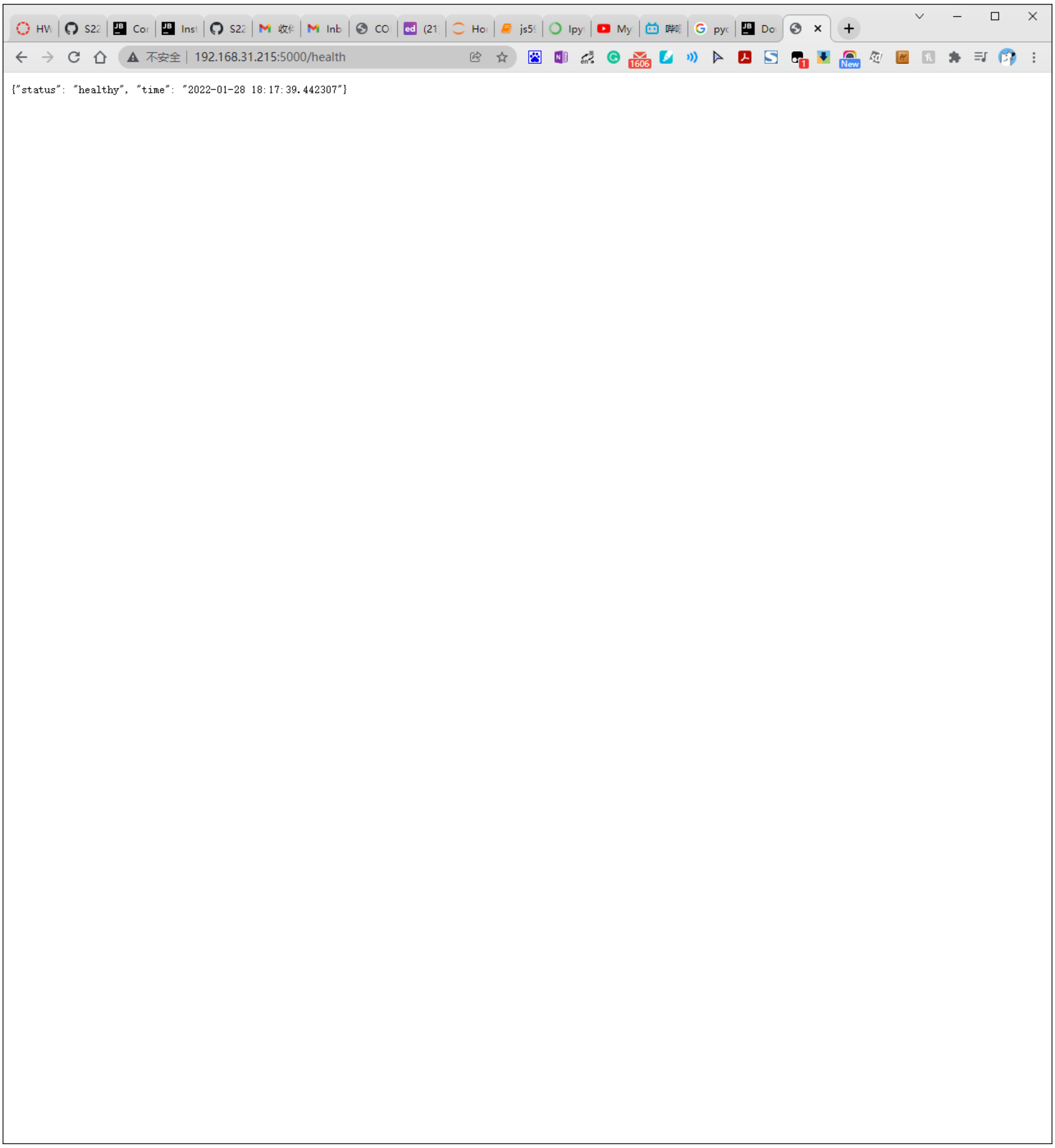
```
## Programming Track
```

In [16]:

```
file_name = 'Screen Shot 2022-01-28 181803.png'
print("\n")

Image(filename=file_name)
```

Out[16]:



不安全 | 192.168.31.215:5000/health

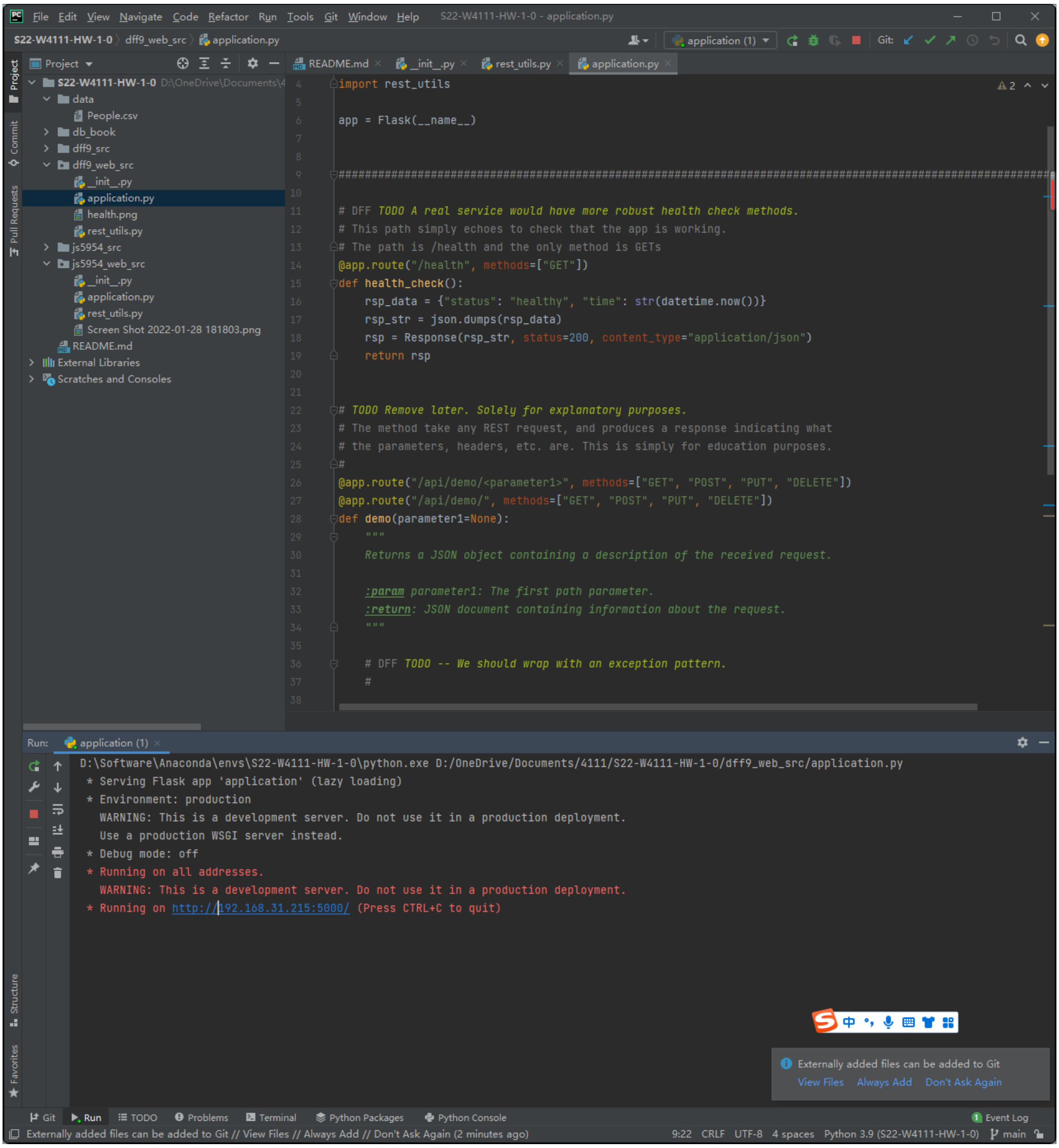
```
{"status": "healthy", "time": "2022-01-28 18:17:39.442307"}
```

In [17]:

```
file_name = ’Screen Shot 2022-01-30 170627.png’

print(”\n”)
Image(filename=file_name)
```

Out[17]:


File Edit View Navigate Code Refactor Run Tools Git Window Help S22-W4111-HW-1-0 - application.py
S22-W4111-HW-1-0 〉 dff9_web_src 〉 application.py
application (1)
Git:
Project
S22-W4111-HW-1-0 D:\OneDrive\Documents\4
data
People.csv
db_book
dff9_src
dff9_web_src
_init_.py
application.py
health.png
rest_utils.py
js5954_src
js5954_web_src
_init_.py
application.py
rest_utils.py
Screen Shot 2022-01-28 181803.png
README.md
External Libraries
Scratches and Consoles
README.md
_init_.py
rest_utils.py
application.py
Run: application (1)
Externally added files can be added to Git
View Files Always Add Don't Ask Again
Git Run TODO Problems Terminal Python Packages Python Console Event Log
Externally added files can be added to Git // View Files // Always Add // Don't Ask Again (2 minutes ago)
9:22 CRLF UTF-8 4 spaces Python 3.9 (S22-W4111-HW-1-0) main

```python
import rest_utils

app = Flask(__name__)


##############################################################################################################


# DFF TODO A real service would have more robust health check methods.
# This path simply echoes to check that the app is working.
# The path is /health and the only method is GETs
@app.route("/health", methods=["GET"])
def health_check():
    rsp_data = {"status": "healthy", "time": str(datetime.now())}
    rsp_str = json.dumps(rsp_data)
    rsp = Response(rsp_str, status=200, content_type="application/json")
    return rsp


# TODO Remove later. Solely for explanatory purposes.
# The method take any REST request, and produces a response indicating what
# the parameters, headers, etc. are. This is simply for education purposes.
#
@app.route("/api/demo/<parameter1>", methods=["GET", "POST", "PUT", "DELETE"])
@app.route("/api/demo/", methods=["GET", "POST", "PUT", "DELETE"])
def demo(parameter1=None):
    """
    Returns a JSON object containing a description of the received request.

    :param parameter1: The first path parameter.
    :return: JSON document containing information about the request.
    """

    # DFF TODO -- We should wrap with an exception pattern.
    #

```

```
D:\Software\Anaconda\envs\S22-W4111-HW-1-0\python.exe D:/OneDrive/Documents/4111/S22-W4111-HW-1-0/dff9_web_src/application.py
 * Serving Flask app 'application' (lazy loading)
 * Environment: production
   WARNING: This is a development server. Do not use it in a production deployment.
   Use a production WSGI server instead.
 * Debug mode: off
 * Running on all addresses.
   WARNING: This is a development server. Do not use it in a production deployment.
 * Running on http://192.168.31.215:5000/ (Press CTRL+C to quit)
```

In [ ]: