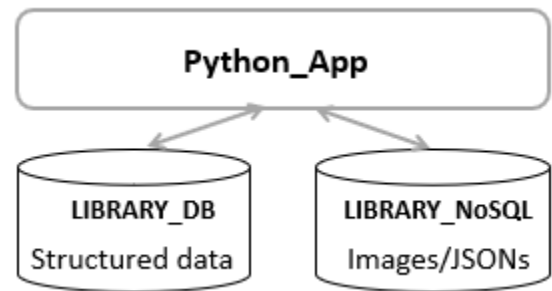


CSE 4701, Fall 2023 Project 2

Part II: Due **Nov 28, 2023 (Tue)** 11:59 pm at HuskyCT (100 points)

The goal of Project 2 Part II is to help you learn how to develop a small python app that interconnects two different types of database instances, one built with MySQL (from Project 1) and one built with MongoDB (from Project 2 Part 1). In this exercise, you will learn how to write “embedded SQL” statements also. That is, you include SQL statements inside your code and manipulate the result obtained from running SQL statements in subsequent steps.



The figure given here summarizes your code development plan. Recall the LIBRARY_DB that you built in Project 1. In Project 2 Part 1 you also built a standalone LIBRARY_NoSQL database which includes some non-structured data for each book such as JSONs and images. In Part 2, your Python application will access both types of database instances.

You do the following two steps:

1. Consider a scenario in which you are interested in seeing what type of books “Ramesh Narayan” borrowed by printing the cover pages of the books that “Ramesh Narayan” loaned out from the library branches. It can be easily done in two steps in your program: (i) Write an embedded SQL query interrogating BORROWER and BOOK_LOANS tables to find all the book identifiers that “Ramesh Narayan” borrowed, and (ii) Now interrogate LIBRARY_NoSQL database to retrieve book cover images and display all of them. Show the code of your program (one piece, not two separate programs) and the outcome (images) that your code produces. (50 points)
2. Consider a scenario in which you are interested in knowing the total amount of dollars that each library branch invested in purchasing books (only the paper copies). You are required to produce a simple table having two columns, as shown below.

Branch_id	Investment
BR1	\$xxx
BR2	\$xxx
BR3	\$xxx
BR4	\$xxx
BR5	\$xxx

Note that to find the total amount of dollars invested by each branch, all you need to do is (i) multiply No_of_copies of each book each branch is holding with the price for the book available in LIBRARY-NoSQL and (ii) sum the outcomes from (i) for all the books that each branch is holding. Show your code (again one piece) and the table outcome that your code produces. (50 points)

Report Format: Your report must be a PDF document with your full name as the file name (e.g., JohnDoe.pdf). The top portion of your report must include “Project 2 Part I, Your full name, Date” for easy identification for grading purposes and the problem numbers/answers in sequence as illustrated below —Note: Penalty for not following this requirement.

Late submission penalty, **5% off per day**. **Submission cut-off** is 12/1/2023 (Fri) 11:59 pm.

Various Help Docs and Q&A

Embedded SQL in Python

Q. How do I use SQL in Python?

A. First, you install a mySQL connector for Python. The easiest way to do this is by downloading and installing "MySQL Connector". Open up your terminal and run the following pip command:

```
python3 -m pip install mysql-connector-python
```

Once you have it installed, import “mysql.connector” into your Python script. To do the actual connection, you must have the connection string in your script like so:

```
my_db = mysql.connector.connect(  
    host= "localhost",  
    user= "<username>",  
    password= "<password>" // (if applicable, otherwise just leave it as "")  
    database= "LIBRARY_DB"  
)
```

Make sure to fill in each of the contents in < > with your own information.

Once this is established, create a cursor so that you can execute the mySQL statements in Python like so:

```
cursor = my_db.cursor()
```

With the following example you can execute mySQL commands:

```
cursor.execute("SELECT * FROM CUSTOMER WHERE Cname = 'Jose Lopez'")
```

Other Useful Cursor() Functions

- cursor.fetchall() - fetches all the rows from the last executed statement
- cursor.close() - disconnects database connection

Q. How do I print binary into an image in Python?

A. For the sake of this project, you can simply write the images to a .jpeg file and demonstrate that you have successfully extracted the correct images by screenshotting the saved files. In Python specifically, you will be retrieving the binary data from your NoSQL database, then you can use the “wb” flag in your file writing operation, and the output file name ends

in .jpeg in order to write the bytes out to an image properly. There are other methods to do this with external libraries, which are OK to use as well.

Helpful Documentation on Connecting MySQL to Python:

<https://dev.mysql.com/doc/connector-python/en/connector-python-example-connecting.html>

https://www.w3schools.com/mysql/mysql_drop_table.asp

<https://www.datacamp.com/tutorial/mysql-python>

PyMongo Documentation:

<https://pymongo.readthedocs.io/en/stable/>

Other Helpful Python Libraries/Documentation:

<https://pandas.pydata.org/>

<https://www.geeksforgeeks.org/python-write-bytes-to-file/#>

Project 2 Part 2 Deliverable

Q. What are the deliverables for Project 2 Part 2?

A. Submit one PDF file that includes your code and output for problems 1 and 2; Screenshots are allowed. The report format should be given as below.

Name:_____

Project 2 Part 2

Date:_____

1.

2.