Project 2 Phase 3

Edosa Aigbuza & Brian Shamayev

HONOR CODE

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values
hard work and honest effort in the pursuit of academic excellence.
I promise that I will submit only work that I personally create or that I contribute to group collaborations,
and I will appropriately reference any work from other sources. I will follow the highest standards of
integrity and uphold the spirit of the Honor Code.

CONTRIBUTIONS

Edosa Aigbuza – Query Completion, Python script, GUI management

Brian Shamayev – Query Completion, Python script, GUI management

Task 1: Execute the following queries on the LMS database tables

Query 1:

```
ALTER TABLE BOOK_LOANS ADD Late int;
UPDATE BOOK_LOANS
SET Late = 1
WHERE Returned_date > Due_Date;
UPDATE BOOK_LOANS
SET Late = 0
WHERE Returned_date <= Due_Date;
```

Query 2:

```
ALTER TABLE LIBRARY_BRANCH ADD LateFee float;
UPDATE LIBRARY_BRANCH
SET LateFee = 1.50
WHERE Branch_Id = 1;
UPDATE LIBRARY_BRANCH
SET LateFee = 2.50
WHERE Branch_Id = 2;
UPDATE LIBRARY_BRANCH
SET LateFee = 3.00
WHERE Branch_Id = 3;
UPDATE LIBRARY_BRANCH
SET LateFee = 4.50
WHERE Branch_Id = 4;
UPDATE LIBRARY_BRANCH
SET LateFee = 5.00
WHERE Branch_Id = 5;
```

Query 3:

```
CREATE VIEW vBookLoanInfo
AS SELECT BOR.Card_No, BOR.Name AS Borrower_Name, BL.Date_Out, BL.Due_Date,
BL.Returned_date,
CASE
   WHEN BL.Returned_date IS NOT NULL AND BL.Returned_date != ' NULL'
      THEN (julianday(BL.Returned_date) - julianday(BL.Date_Out))
   ELSE (julianday('now') - julianday(BL.Date_out))
END AS TotalDays,
B.Title AS Book_Title,
CASE
   WHEN BL.Returned_date IS NOT NULL AND BL.Returned_date != 'NULL' AND
julianday(BL.Returned_date) > julianday(BL.Due_Date)
      THEN (julianday(BL.Returned_date) - julianday(BL.Due_Date))
   ELSE 0
END AS Days_Late,
BL.Branch_Id,
CASE
   WHEN BL.Returned_date IS NOT NULL AND BL.Returned_date != 'NULL' AND
julianday(BL.Returned_date) > julianday(BL.Due_Date)
      THEN (julianday(BL.Returned_Date) - julianday(BL.Due_Date)) * LB.LateFee
   ELSE 0
END AS LateFeeBalance

FROM BOOK_LOANS BL
JOIN BOOK B ON BL.Book_Id = B.Book_Id
JOIN BORROWER BOR ON BL.Card_No = BOR.Card_No
JOIN LIBRARY_BRANCH LB ON BL.Branch_Id = LB.Branch_Id;

SELECT * FROM vBookLoanInfo;
```

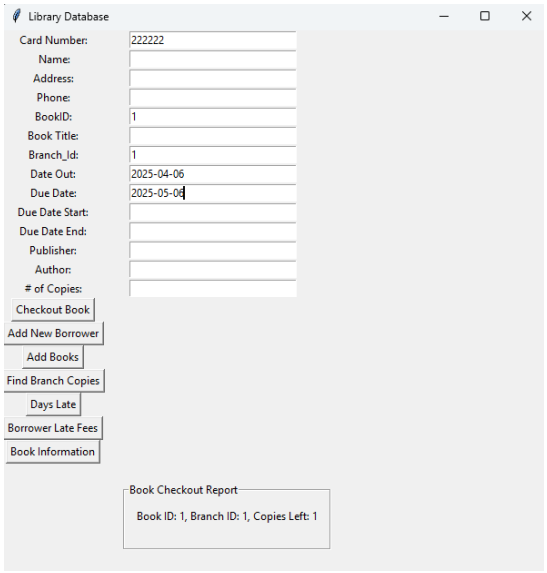
```
sqlite> SELECT * FROM vBookLoanInfo;
+---------+---------------+------------+------------+---------------+--------------------+-----------------------------------+-----------+-----------+-----------------+
| Card_No |  Borrower_Name |  Date_Out  |  Due_Date  | Returned_date |     TotalDays      |            Book_Title             | Days_Late | Branch_Id | LateFeeBalance |
+---------+---------------+------------+------------+---------------+--------------------+-----------------------------------+-----------+-----------+-----------------+
| 123456  | John Smith    | 2022-01-01 | 2022-02-01 | 2022-02-01    | 31.0               | To Kill a Mockingbird             | 0         | 1         | 0               |
| 789012  | Jane Doe      | 2022-01-02 | 2022-02-02 |               | 1214.13740148162   | 1984                              | 0         | 1         | 0               |
| 345678  | Bob Johnson   | 2022-01-03 | 2022-02-03 |               | 1213.13740148162   | Pride and Prejudice               | 0         | 2         | 0               |
| 901234  | Sarah Kim     | 2022-01-04 | 2022-02-04 | 2022-02-04    | 31.0               | The Great Gatsby                  | 0         | 3         | 0               |
| 567890  | Tom Lee       | 2022-01-05 | 2022-02-05 | 2022-02-09    | 35.0               | One Hundred Years of Solitude     | 4.0       | 1         | 6.0             |
| 234567  | Emily Lee     | 2022-01-06 | 2022-02-06 | 2022-02-10    | 35.0               | Animal Farm                       | 4.0       | 2         | 10.0            |
| 890123  | Michael Park  | 2022-01-07 | 2022-02-07 | 2022-03-08    | 60.0               | The Catcher in the Rye            | 29.0      | 2         | 72.5            |
| 456789  | Laura Chen    | 2022-01-08 | 2022-02-08 | 2022-03-10    | 61.0               | Lord of the Flies                 | 30.0      | 3         | 90.0            |
| 111111  | Alex Kim      | 2022-01-09 | 2022-02-09 | 2022-02-06    | 28.0               | Brave New World                   | 0         | 1         | 0               |
| 222222  | Rachel Lee    | 2022-01-10 | 2022-02-10 | 2022-02-07    | 28.0               | The Picture of Dorian Gray        | 0         | 2         | 0               |
| 333333  | William Johnson | 2022-03-01 | 2022-03-08 | 2022-03-08    | 7.0                | The Alchemist                     | 0         | 1         | 0               |
| 444444  | Ethan Martinez | 2022-03-03 | 2022-03-10 | 2022-03-10    | 7.0                | The God of Small Things           | 0         | 3         | 0               |
| 555555  | Grace Hernandez | 2022-02-03 | 2022-03-03 | 2022-02-18    | 15.0               | Wuthering Heights                 | 0         | 3         | 0               |
| 565656  | Sophia Park   | 2022-01-14 | 2022-02-14 | 2022-03-31    | 76.0               | The Hobbit                        | 45.0      | 1         | 67.5            |
| 676767  | Olivia Lee    | 2022-01-15 | 2022-02-15 | 2022-02-21    | 37.0               | The Lord of the Rings             | 6.0       | 3         | 18.0            |
| 787878  | Noah Thompson | 2022-03-05 | 2022-03-12 | 2022-03-24    | 19.0               | The Hitchhiker's Guide to the Galaxy | 12.0   | 2         | 30.0            |
| 989898  | Olivia Smith  | 2022-03-23 | 2022-03-30 | 2022-03-30    | 7.0                | The Diary of a Young Girl         | 0         | 3         | 0               |
| 121212  | Chloe Park    | 2022-01-18 | 2022-02-18 | 2022-02-18    | 31.0               | The Da Vinci Code                 | 0         | 3         | 0               |
| 232323  | William Chen  | 2022-03-24 | 2022-03-31 | 2022-03-31    | 7.0                | The Adventures of Huckleberry Finn | 0        | 1         | 0               |
| 343434  | Olivia Johnson | 2022-01-21 | 2022-02-21 | 2022-02-21    | 31.0               | The Adventures of Tom Sawyer      | 0         | 3         | 0               |
| 454545  | Dylan Kim     | 2022-01-24 | 2022-02-24 | 2022-02-24    | 31.0               | A Tale of Two Cities              | 0         | 3         | 0               |
| 555555  | Grace Hernandez | 2025-04-06 | 2025-05-06 |               | 24.1374014816247   | To Kill a Mockingbird             | 0         | 1         | 0               |
+---------+---------------+------------+------------+---------------+--------------------+-----------------------------------+-----------+-----------+-----------------+
```

Task 2: Create a GUI for the LMS database

Requirement 1:

```
INSERT INTO Book_Loans VALUES(:Book_Id, :Branch_Id, :Card_No, :Date_Out, :Due_Date,
:Returned_date, :Late)
    """, {
        'Book_Id' : int(book_Id.get()),
        'Branch_Id' : int(branch_Id.get()),
        'Card_No' : int(card_number.get()),
        'Date_Out' : date_out.get(),
        'Due_Date' : due_date.get(),
        'Returned_date': None,
        'Late': None,
    })
    submit_cur.execute("""
        SELECT * FROM Book_Copies
        WHERE Book_Id = ? AND Branch_Id = ?
    """, (
        book_Id.get(),
        branch_Id.get()
    ))
```

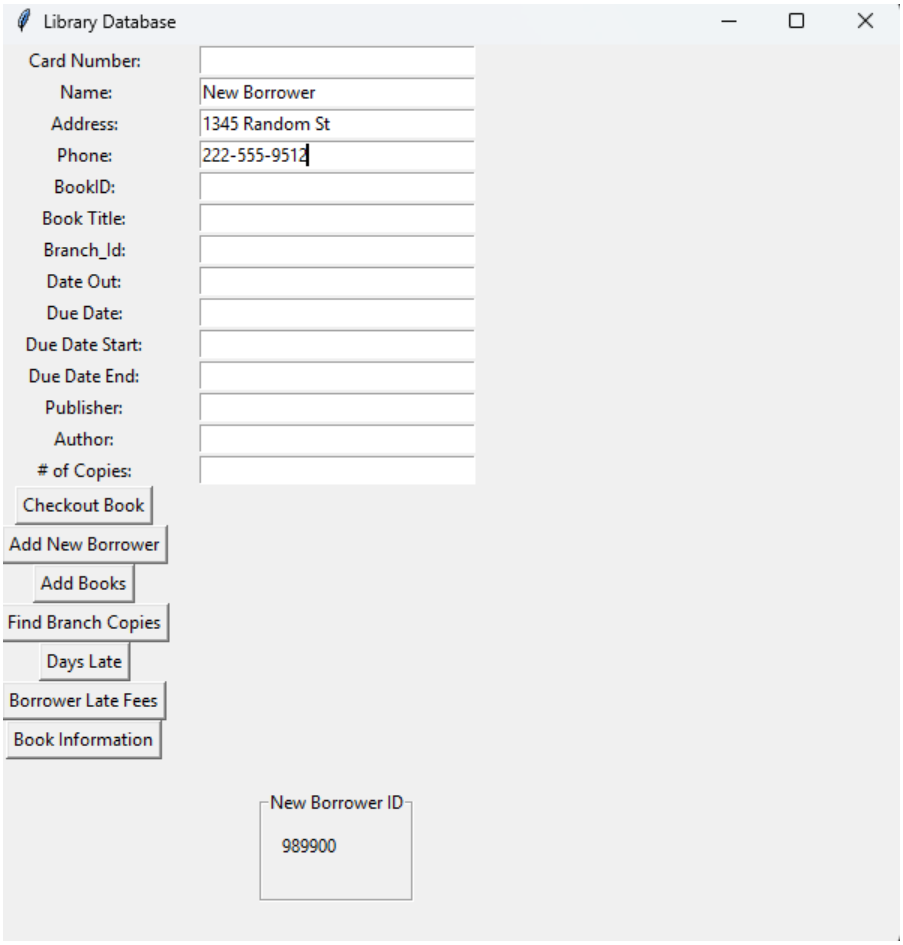
```
CREATE TRIGGER IF NOT EXISTS update_book_copies
                AFTER INSERT ON BOOK_LOANS
                FOR EACH ROW
                BEGIN
                    UPDATE BOOK_COPIES
                    SET No_Of_Copies = No_Of_Copies - 1
                    WHERE Book_Id = NEW.Book_Id AND Branch_Id = NEW.Branch_Id;
                END;
```



Requirement 2:

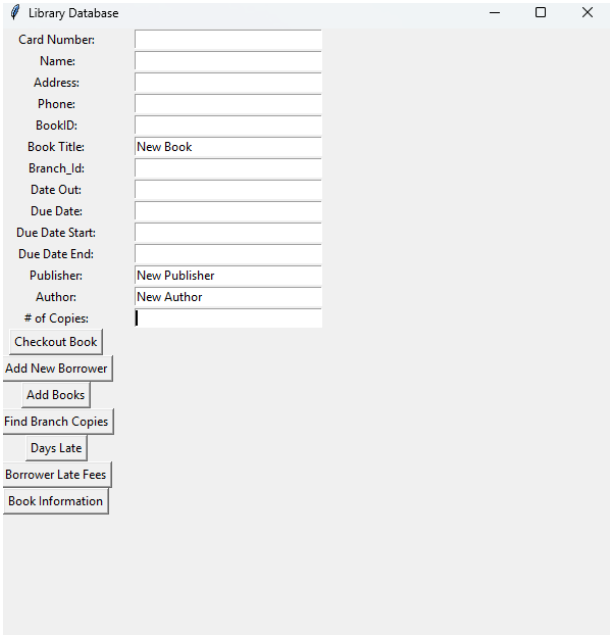
```
submit_cur.execute("INSERT INTO BORROWER(Name, Address, Phone) VALUES(:name, :address, :phone) ",
                   {
                      #'card_number': card_number.get(),
                      'name': name.get(),
                      'address': address.get(),
                      'phone': phone.get(),
                   })
```

```
   submit_cur.execute("SELECT Card_No FROM BORROWER WHERE Name = ? AND Address = ? AND Phone = ?",(name.get(), address.get(), phone.get(),))
```



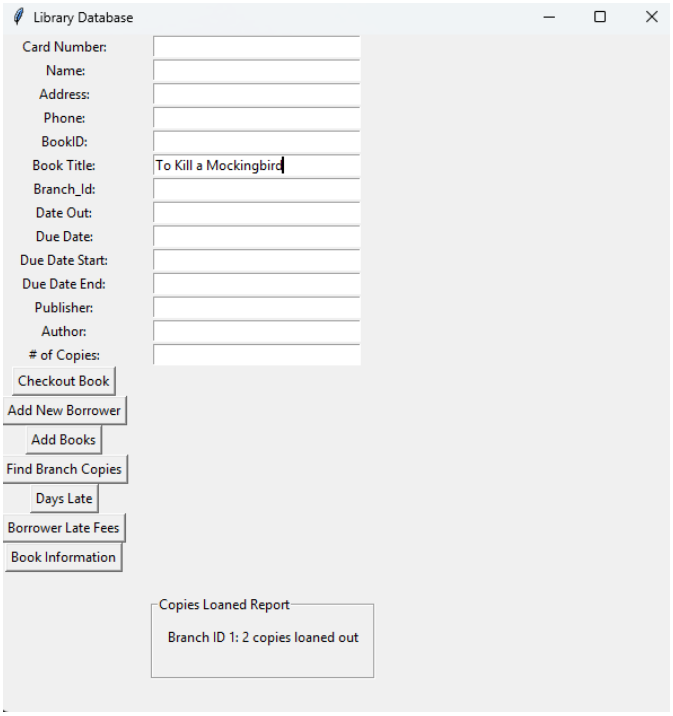
Requirement 3:

```
submit_cur.execute("INSERT INTO Book(Title, Publisher_Name) VALUES(:Title,
:Publisher_Name) ",
            {
               #'Book_Id': book_Id.get(),
               'Title' : booktitle.get(),
               'Publisher_Name' :publisher.get(),
            })

   new_book_id = submit_cur.lastrowid

   submit_cur.execute("INSERT INTO Book_Authors(Author_Name)
VALUES(:Author_Name)",
            {
               #'Book_Id' : book_Id.get(),
               'Author_Name' : author.get(),
            })

   # Add to all 5 branches with 5 copies
   for branch_id in range(1, 6):
      submit_cur.execute("INSERT INTO Book_Copies VALUES(:Book_Id, :Branch_Id,
:No_Of_Copies)",
               {
                  'Book_Id': new_book_id,
                  'Branch_Id': branch_id,
                  'No_Of_Copies': 5,
               })
```



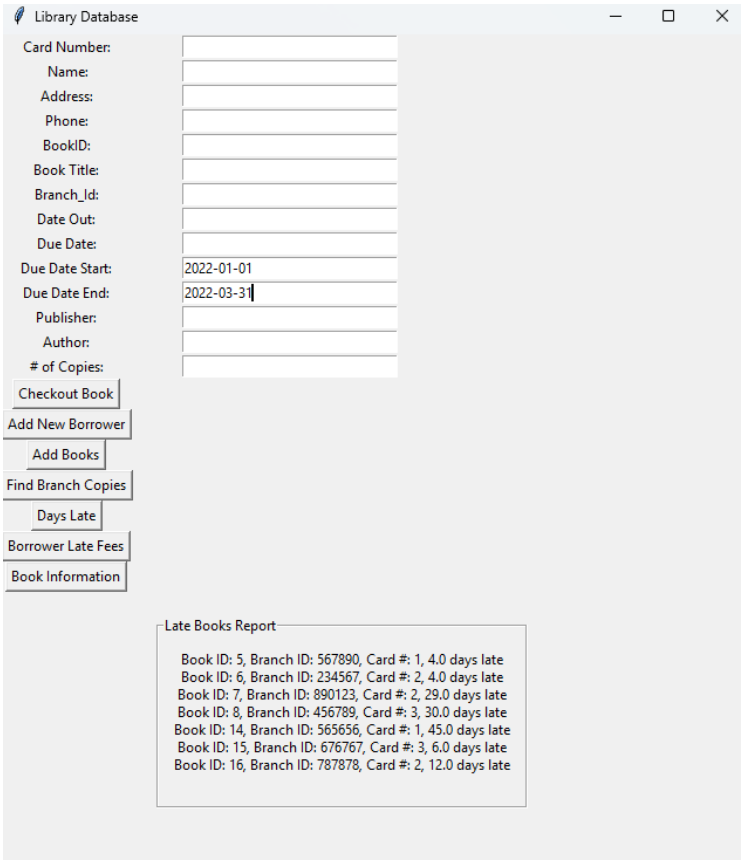
Requirement 4:

```
iq_cur.execute("""
    SELECT B.Branch_Id, COUNT(*) AS Copies_Loaned
    FROM Book_Loans BL
    JOIN Book Bk ON BL.Book_Id = Bk.Book_Id
    JOIN Library_Branch B ON BL.Branch_Id = B.Branch_Id
    WHERE Bk.Title = ?
    GROUP BY B.Branch_Id
  """, (booktitle.get(),))
```



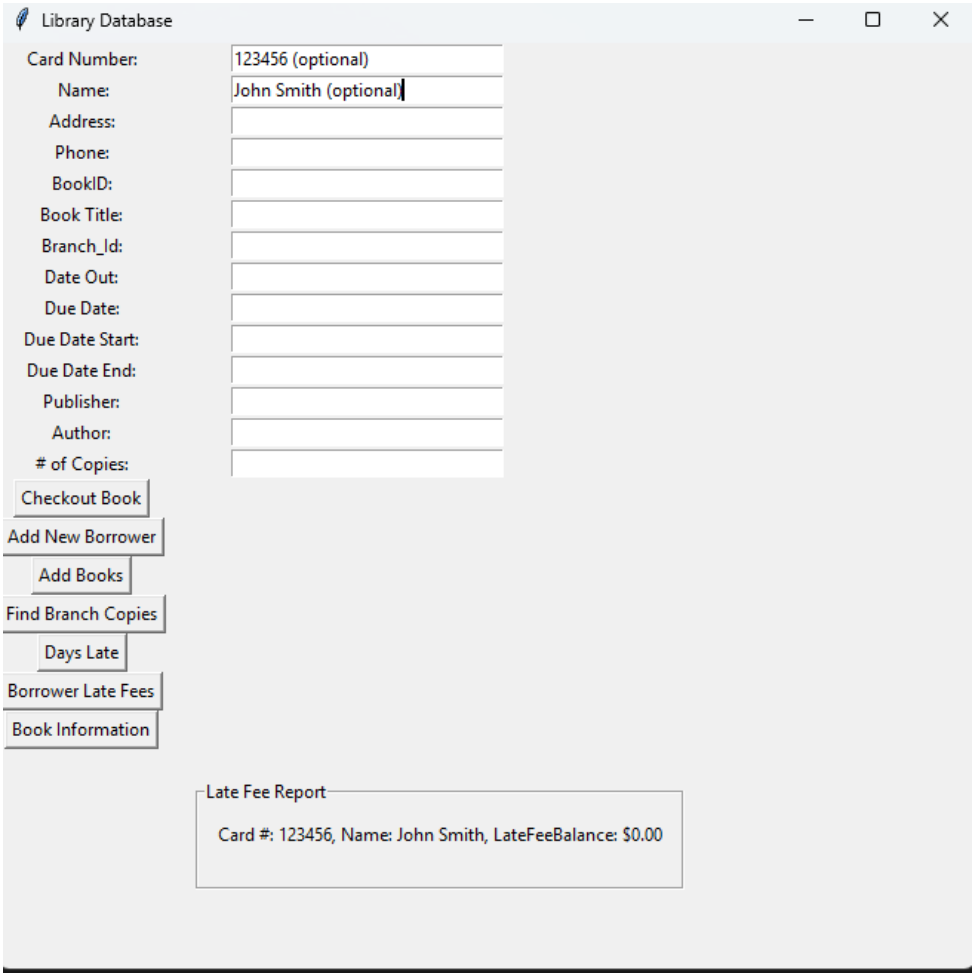
Requirement 5:

```
dl_cur.execute("""
        SELECT
        Book_Id,
        Card_No,
        Branch_Id,
        Due_Date,
        Returned_date,
        julianday(Returned_date) - julianday(Due_Date) AS Days_Late
        FROM BOOK_LOANS
        WHERE Late = 1 AND Due_Date BETWEEN ? AND ? AND Returned_Date IS NOT NULL
    """, (due_date_start.get(), due_date_end.get()))
```



Requirement 6a:

```
query = """
        SELECT
        Card_No,
        Borrower_Name,
        printf('$%.2f', LateFeeBalance)
        FROM vBookLoanInfo
                """
    params = []

    if card_number.get():
        query += " WHERE Card_No = ?"
        params.append(card_number.get())
    if name.get():
        query += " WHERE Borrower_Name LIKE ?"
        params.append(f"%{name.get()}%")
```



Requirement 6b:

```
query = """
    SELECT
        V.Card_No AS "Borrower ID",
        V.Borrower_Name AS "Borrower Name",
        V.Book_Title AS "Book Title",
        V.Branch_Id AS "Branch ID",
        V.Date_Out AS "Date Out",
        V.Due_Date AS "Due Date",
        V.Returned_date AS "Date Returned",
        V.TotalDays AS "Total Days",
        V.Days_Late AS "Days Late",
        CASE
            WHEN V.LateFeeBalance = 0 THEN 'Non-Applicable'
            ELSE printf('$%.2f', V.LateFeeBalance)
        END AS "Late Fee"
    FROM vBookLoanInfo V, BOOK_LOANS BL, BOOK B
    WHERE BL.Book_Id = B.Book_Id AND BL.Card_No = V.Card_No
    """
    params = []

    if card_number.get():
        query += " AND BL.Card_No = ?"
        params.append(card_number.get())

    if book_Id.get():
        query += " AND BL.Book_Id = ?"
        params.append(book_Id.get())
    if booktitle.get():
        query += " AND B.Title LIKE ?"
        params.append(f"%{booktitle.get()}%")
    query += " ORDER BY V.LateFeeBalance DESC"
```