

CSE 5330 – Database Systems – 005

Project 2 – Part 3

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Overview:

This file contains information about Database System Project 2, Part 3 which was assigned to design and implement a database for keeping track of members, books, the catalog, and the borrowing activity of a university library.

Part – 3: Loading of data, displaying the tables and data from the Library database, and performing Update Transactions and Retrieval queries:

Q1: Loading of data from .csv file to MYSQL Tables using Python Script:

- DB Project_2 folder contains a subfolder named “CSE_5330_005_databaseSystems_Project2_Part3”. The subfolder contains a python script named “**Records_Insertion_Library_Management.py**” python file for loading data from .csv file to MYSQL tables that are created as part of Part 1&2 of Project 2.
- The folder also contains one more subfolder called “Data” containing project data, all 12 .csv files, as 12 tables were created as part of Part 1&2 of Project 2 for Library management.
- Installations required - mysql-connector-python-8.0.30-windows-x86-64bit and python 3.7 version
- Connection is established and data is loaded for the insertion of records.
- Snapshot of the same is spooled (before and after inserting the data into the tables) and stored in a folder named – ‘**CSE_5330_005_Project 2_Part 3_Spool File - Output**’

Problem_2 - Notepad

File Edit Format View Help

```
use pxs9233;
```

```
SELECT * FROM Library;
SELECT * FROM Publisher;
SELECT * FROM Books;
SELECT * FROM Member;
SELECT * FROM Author;
SELECT * FROM Book_author;
SELECT * FROM Book_available;
SELECT * FROM Book_require;
SELECT * FROM Lib_staff;
SELECT * FROM Book_issue;
SELECT * FROM Lib_staff_member;
SELECT * FROM Member_phone;
```

- The output for the same is captured using file spooling as **OUTPUT2_Part3.lst** and the text file is transferred via File Zilla from the omega server under the 'CSE_5330_005_Project 2_Part 3_Spool File – Output' subfolder.

Q3: Query to retrieve and print a report for weekly Borrowing activity by Subject area, by Author, number of copies and number of days loaned out:

- The folder named '**CSE_5330_005_Project_2_Part_3_Queries**' contains a file named **Problem_3.txt** containing queries that are written to retrieve and print the data that was loaded as shown above.
- The below shown query is also used within the java program to generate a weekly borrowing activity report upon selection when given by the user to generate the report. This part of the program using java is discussed in the later part of the document.

Problem_3 - Notepad

File Edit Format View Help

```
use pxs9233;
```

```
SELECT A.Isbn,A.Title,count(B.ISBN) AS No_of_copies,week(B.Issue_date) AS
Week_No,SUM(datediff(B.Notice_date,B.Issue_date)) AS
No_of_Days_Loaned_Out,A.Subject_area,C.Author_fname, C.Author_lname from Books as
A INNER JOIN Book_issue as B ON A.ISBN=B.ISBN INNER JOIN Book_author as C ON
A.Author_id=C.Author_id GROUP BY A.Subject_area,A.Author_id,C.Author_fname,
C.Author_lname,B.ISBN,week(B.Issue_date);
```

```

public static void Generate_weekly_borrowing_activity_report(Connection conn) {
    try {
        Statement stmt = conn.createStatement();
        stmt.executeQuery("USE pxs9233");
        System.out.println("\n Weekly Borrowing Activity Report Of Library: \n\n");
        ResultSet result = stmt.executeQuery("SELECT A.Isbn,A.Title,count(B.ISBN) AS No_of_copies,week(B.Issue_date) AS Week_No,SUM(datediff(B.Notice_date,B.Issue_date)) AS No_of_Days_Loaned_Out,A.Subject_area,C.Author_fname, C.Author_lname from Books as A INNER JOIN Book_issue as B ON A.ISBN=B.ISBN INNER JOIN Book_author as C ON A.Author_id=C.Author_id GROUP BY A.Subject_area,A.Author_id,C.Author_fname, C.Author_lname,B.ISBN,week(B.Issue_date);");
        System.out.print("ISBN "); space(15, b: 4);
        System.out.print("Book Title "); space(40, b: 10);
        System.out.print("No._of_copies "); space(14, b: 13);
        System.out.print("Week_No. "); space(9, b: 8);
        System.out.print("No_of_Days_Loaned_Out "); space(22, b: 21);
        System.out.print("Subject Area "); space(40, b: 12);
        System.out.println("Author First Name \n");
        while(result.next()){
            System.out.print(result.getString( columnIndex: 1)+" "); space(15, result.getString( columnIndex: 1).length());
            System.out.print(result.getString( columnIndex: 2)+" "); space(40, result.getString( columnIndex: 2).length());
            System.out.print(result.getString( columnIndex: 3)+" "); space(14, result.getString( columnIndex: 3).length());
            System.out.print(result.getString( columnIndex: 4)+" "); space(9, result.getString( columnIndex: 4).length());
            System.out.print(result.getString( columnIndex: 5)+" "); space(22, result.getString( columnIndex: 5).length());
            System.out.print(result.getString( columnIndex: 6)+" "); space(40, result.getString( columnIndex: 6).length());
            System.out.print(result.getString( columnIndex: 7)+" \n");
        }
        stmt.close();
        System.out.println("\n");
    }catch(SQLException e) {
        System.out.println("Weekly_borrowing_activity_report function Exception: "+e);
    }
}

```

- The output for the same is captured using file spooling as **OUTPUT3_Part3.lst** and the text file is transferred via File Zilla from the omega server under the ‘CSE_5330_005_Project 2_Part 3_Spool File – Output’ subfolder.

```

mysql> SELECT A.Isbn,A.Title,count(B.ISBN) AS No_of_copies,week(B.Issue_date) AS Week_No,SUM(datediff(B.Notice_date,B.Issue_date)) AS No_of_Days_Loaned_Out,A.Subject_area,C.Author_fname, C.Author_lname from Books as A INNER JOIN Book_issue as B ON A.ISBN=B.ISBN INNER JOIN Book_author as C ON A.Author_id=C.Author_id GROUP BY A.Subject_area,A.Author_id,C.Author_fname, C.Author_lname,B.ISBN,week(B.Issue_date);
+-----+-----+-----+-----+-----+-----+-----+-----+
| Isbn | Title | No_of_copies | Week_No | No_of_Days_Loaned_Out | Subject_area | Author_fname | Author_lname |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 8523696542 | Wings of Fire | 1 | 40 | 27 | Cultural | Tui | T. Sutherland |
| 1254547264 | The Double | 1 | 18 | 29 | Literature | Azalia | Rojas |
| 9854542541 | Calculus | 1 | 29 | 29 | Mathematics | Azalia | Rojas |
| 9278161757 | The Lone Star Ranger | 1 | 25 | 29 | Medicine & Nursing | Azalia | Rojas |
| 9278161657 | Who Moved my cheese | 1 | 45 | 28 | Literature | Azalia | Rojas |
| 9855755624 | A Foregone Conclusion | 1 | 21 | 103 | Nature | Sage | Rowe |
| 9568755624 | The Great Fire of London | 1 | 41 | 28 | Nature | Sage | Rowe |
| 5636284254 | The Desert and the Sown | 1 | 47 | 99 | Literature | Daphne | Mcneil |
| 8523696542 | Wings of Fire | 1 | 47 | 99 | Cultural | Tui | T. Sutherland |
| 6422625263 | The End of Eternity | 1 | 39 | 28 | Current Affairs & Politics | Macy | Swanson |
| 7288227188 | A Touch of Sun and Other Stories | 1 | 37 | 30 | Diet, Health & Fitness | Scarlett | Buckner |
| 7355755625 | My Mark Twain | 1 | 42 | 29 | Nature | Sage | Rowe |
| 7355755628 | Harry Potter and Half Blood Prince | 1 | 23 | 30 | Fiction | Carolyn | Rios |
| 7492133892 | World War 2 | 1 | 24 | 106 | History | Julie | Raymond |
| 7492133292 | Short Stories From American History | 1 | 32 | 105 | Literature | Jane | Wilkerson |
| 8498738145 | The Unlived Life of Little Mary Ellen | 1 | 44 | 28 | Humor | Jaquelyn | Rivera |
| 8648347264 | Edith Bonham | 1 | 35 | 28 | Computer Science | Bertha | French |
+-----+-----+-----+-----+-----+-----+-----+-----+
17 rows in set (0.01 sec)

mysql> notee;
Outfile disabled.
mysql>

```

Q4: Transactions to be performed on Library database - Adding New member/book, Borrow/return book:

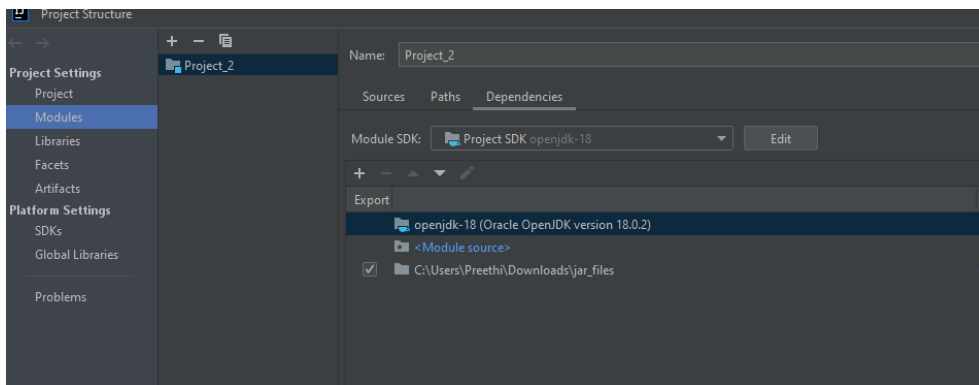
The below contains the snapshots of the Library Management project created to print the tables, perform transactions and perform trigger operations.

The programming language used: Java

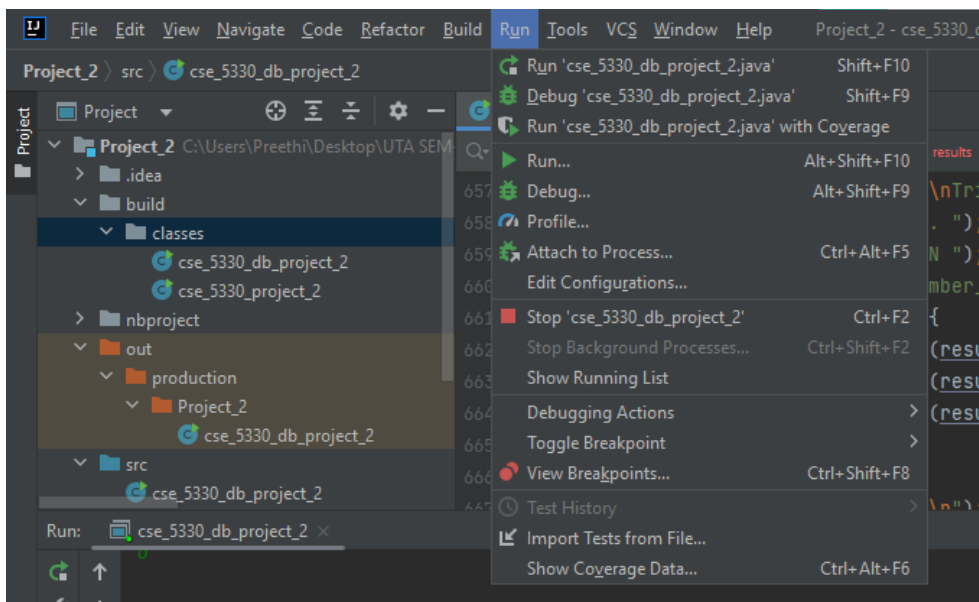
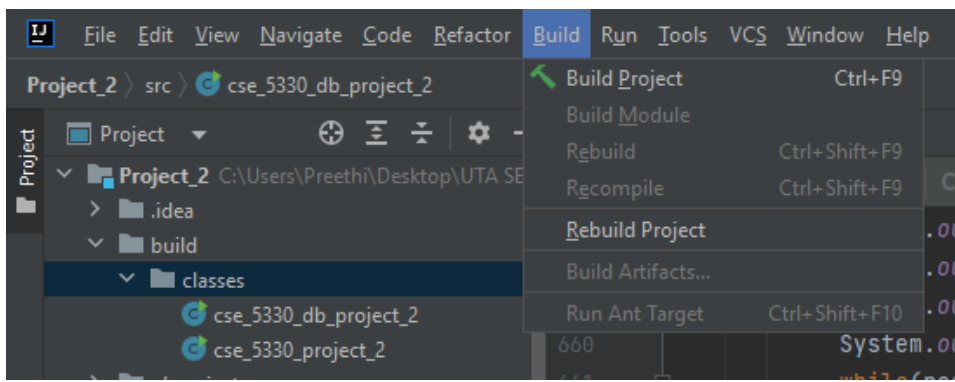
Pre-requisite:

- 1) Requires IntelliJ Ide for better user readability and lookup of final output.
- 2) mysql-connector-java-5.1.48
- 3) JDK for Java (any latest version or version 11)

- Kindly set up the JDK and jar file as modules under Project Structure.



- Once the initial setup is completed, build the project and run the file `cse_5330_db_project2.java` as shown in the below snapshots.



The project has the following 6 operations/executions:

- a) Using the database
- b) Printing and Displaying tables from the library database
- c) Generate weekly borrowing activity report
- d) New transactions on the library database as it has the following sub-operations
 - a. Adding New members to the database
 - b. Adding new book to the database
 - c. To borrow a book from the database
 - d. To return a book to the database
 - e. To renew the membership of the members belonging to the library
- e) Triggers execution for the following actions:
 - a. To notify about the outstanding overdue for the borrowed books
 - b. To notify the members about the membership renewal

a) Using the database:

- Here the command line interface is used to get the input from the user and the action is performed based on the choices listed as shown in the below snapshot.

```
System.out.print("No. of copies "); space( 14, 13);
System.out.print("Week.No. "); space( 9, 8);
System.out.print("No. of Days Loaned Out "); space( 22, 21);
System.out.print("Subject Area "); space( 40, 12);
System.out.println("Author First Name \n");
while(result.next()){
    System.out.print(result.getString( columnIndex: 1)+" "); space( 15, result.getString( columnIndex: 1).length);
    System.out.print(result.getString( columnIndex: 2)+" "); space( 40, result.getString( columnIndex: 2).length);
    System.out.print(result.getString( columnIndex: 3)+" "); space( 14, result.getString( columnIndex: 3).length);
    System.out.print(result.getString( columnIndex: 4)+" "); space( 9, result.getString( columnIndex: 4).length);
    System.out.print(result.getString( columnIndex: 5)+" "); space( 14, result.getString( columnIndex: 5).length);
    System.out.print(result.getString( columnIndex: 6)+" "); space( 14, result.getString( columnIndex: 6).length);
    System.out.print(result.getString( columnIndex: 7)+" "); space( 14, result.getString( columnIndex: 7).length);
    System.out.println();
}
```

```
Run cse_5330_db_project_2
C:\Users\Preethi>openjdk-18.0.2\bin\java.exe --javaagent:C:\Users\Preethi\AppData\Local\JetBrains\IntelliJ IDEA Community Edition 2022.2.1\lib\idea_rt.jar
Mon Nov 21 20:01:25 CST 2022 WARN: Establishing SSL connection without server's identity verification is not recommended. According to MySQL 5.5.45+, 5.6.26+
1. Use database
2. Printing and Displaying tables from Library database
3. Generate Weekly borrowing activity report
4. New Transactions on Library Database
5. Membership Renewal
6. Trigger Execution for Overdue books and Membership renewal
7. Exit
Enter your choice of operation...
Database pxs9233 Selected.
```

b) Part 3 - Problem 2) - To print and display the data within the created tables for Library management:

- The tables are listed (12 tables created as part of Part 1&2 of Project 2) and the command line interface is used to get the input from the user and the action is performed based on the choices listed as shown in the below snapshot.

```

1. Use database
2. Printing and Displaying tables from Library database
3. Generate Weekly borrowing activity report
4. New Transactions on Library Database
5. Membership Renewal
6. Trigger Execution for Overdue books and Membership renewal
7. Exit
Enter your choice of operation...
3

Enter the number of your choice to print the respective table from the Library Database
1. Library
2. Publisher
3. Books
4. Member
5. Author
6. Book_author
7. Book_available
8. Book_require
9. Lib_staff
10. Book_issue
11. Lib_staff_member
12. Member_phone
Enter Your Choice:

```

- The tables are then listed along with the data as shown in the below snapshot
- For instance, from the listed option – 3 is chosen which indicates to the data for the Books table and the below snapshot displays the data within Books table.

Isbn	Book Title	Author_Id	Subject Area	Description
1254547264	The Double	5	Literature	This is the object of everyone's lust
1254789654	In a Glass Darkly	1	Parenting & Family	This needs to be the character everyone
1254854547	Ten Tales from the Decameron	8	Fiction	And finally, you'll tell the reader w
1458789652	Rejection, The Ruling Spirit	2	Pets	This is the object of everyone's lust
1619649059	A Daughter of the Snows	7	Self-Help & Relationships	You'll tell the reader exactly what
1658649059	Python	20	Computer Science	Everyone likes to be part of the in-crc
1961619318	The Near East: 10,000 Years of History	1	Antiques & Collectibles	Dan Kotler just wanted a cup of coffee,
1971233185	The Cocoon: A Rest-Cure Comedy	2	Art, Architecture & Photography	You'll want to capture the reader's
2547896542	Little Dorrit	3	Philosophy	You'll tell the reader exactly what
2729337632	The Freakshow Murders	3	Awards	This will be the person your reader wil
3354698745	The Four-Fifteen Express	4	Psychology	Everyone likes to be part of the in-crc
3773869856	Pharaohs, Fellahs and Explorers	4	Bibles & Christianity	This needs to be the character everyone
4319643959	Hard Times	5	Biography	This is the object of everyone's lust
4789643959	Hard Times	6	Business	You'll tell the reader exactly what

- For instance, from the listed option –2 is chosen which indicates to the data for the Publisher table and the below snapshot displays the data within Publisher table.

```

Enter the number of your choice to print the respective table from the Library Database
1. Library
2. Publisher
3. Books
4. Member
5. Author
6. Book_author
7. Book_available
8. Book_require
9. Lib_staff
10. Book_issue
11. Lib_staff_member
12. Member_phone
Enter Your Choice: 5

Publisher:

Publisher_id  Publisher_name      Publication_year
102598635    HarperCollins       1998
128654736    Callan              1994
145789662    Macmillan           1996
158756955    Midwest Theological Forum 2000
875968545    Robert Molyneux     2006
  
```

- For instance, from the listed option –5 is chosen which indicates to the data for the Author table and the below snapshot displays the data within the Author table.

```

Author:

Author_id  Author_fname  Author_lname
1          Yvette       Monroe
10         Daphne       Mcneil
11         Lael         Hewitt
12         Tui          T. Sutherland
13         Macy         Swanson
14         Scarlett     Buckner
15         Sage         Rowe
16         Carolyn     Rios
17         Julie        Raymond
18         Jane         Wilkerson
19         Jaquelyn    Rivera
2          Winifred     Nash
20         Bertha      French
3          Yael         Reese
4          Georgia      Valentine
5          Azalia       Rojas
6          Kessie       Frank
7          Robert       Kiyosaki
8          Hedge        Mendez
9          Marcia       Richard
  
```

c) Part 3 - Problem 3) - Generate a report for weekly Borrowing activity by Subject area, Author, number of copies, and number of days loaned out:

- For instance, when the user selects option 3 from the functions displayed for the Library management, option 3 is used to generate a report to indicate the weekly borrowing activity by subject area, author, number of copies, and no of days loaned out.

- The below snapshot displays the weekly borrowing activity report of library

Run: cse_5330_db_project_2

Enter your choice of operation...

Weekly Report of Library:

ISBN	Book Title	No._of_copies	Week_No.	No_of_Days_Loaned_Out	Subject Area	Author
8523696542	Wings of Fire	1	40	27	Cultural	Tui
1254547264	The Double	1	18	28	Literature	Azali
9854542541	Calculus	1	29	29	Mathematics	Azali
9278161757	The Lone Star Ranger	1	25	29	Medicine & Nursing	Azali
9278161657	Who Moved my cheese	1	45	28	Literature	Azali
9855755624	A Foregone Conclusion	1	21	103	Nature	Sage
9568755624	The Great Fire of London	1	41	28	Nature	Sage
6422625263	The End of Eternity	1	39	28	Current Affairs & Politics	Macy
7288227188	A Touch of Sun and Other Stories	1	37	30	Diet, Health & Fitness	Scarl
7355755625	My Mark Twain	1	42	29	Nature	Sage
7355755628	Harry Potter and Half Blood Prince	1	23	30	Fiction	Carol
7492133892	World War 2	1	24	106	History	Julie
7492133292	Short Stories From American History	1	32	105	Literature	Jane
8498738145	The Unlived Life of Little Mary Ellen	1	44	28	Humor	Jaque
8648347264	Edith Bonham	1	35	28	Computer Science	Berti

d) Part 3 - Problem 4) - Transactions to be performed on Library database - Adding New member/book, Borrow/return book:

4.1 To add new member to the library database:

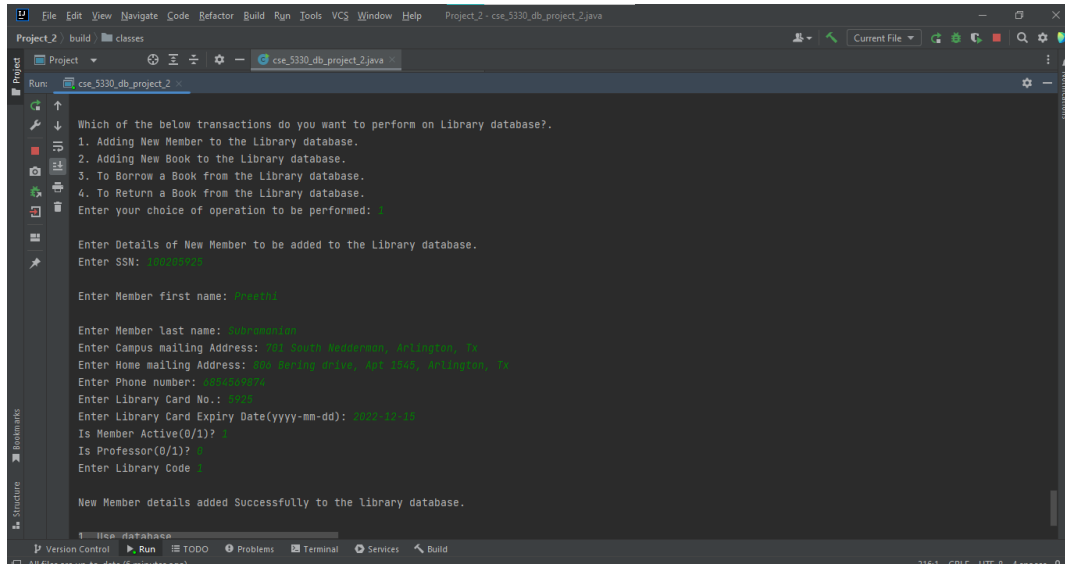
- The transactions are performed
- The user inputs option 4 to perform any transactions on the library database and the below snapshot captures the same.
- Here the user gives input of option 1 under transaction operation which is to add a new member to the library database as shown in the below snapshot.
- The program gets the input from the user using the command line interface and adds the member to the database successfully as shown in the below snapshot.

```
public static void New_transactions_on_library_database (Connection conn) {
    try {
        System.out.println("Which of the below transactions do you want to perform on Library database?.");
        System.out.println("1. Adding New Member to the Library database.");
        System.out.println("2. Adding New Book to the Library database.");
        System.out.println("3. To Borrow a Book from the Library database.");
        System.out.println("4. To Return a Book to the Library database.");
        System.out.print("Enter your choice of operation to be performed: ");
        Scanner sc = new Scanner(System.in);
        int i = sc.nextInt();
    }
}
```

```

// usage
public static void Add_New_Member (Connection conn){
    try {
        System.out.println("\nEnter Details of New Member to be added to the Library database.");
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter SSN: ");
        String ssn = sc.nextLine();
        System.out.print("\nEnter Member first name: ");
        String member_fname = sc.nextLine();
        System.out.print("\nEnter Member last name: ");
        String member_lname = sc.nextLine();
        System.out.print("Enter Campus mailing Address: ");
    }
}

```



4.2 To add new book to the library database:

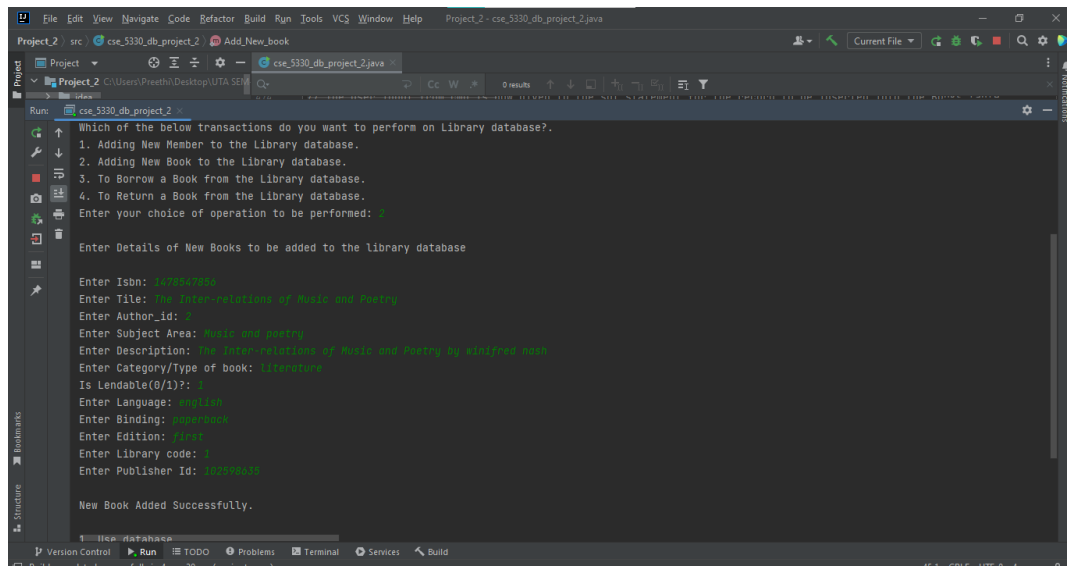
- Here the user gives input of option 2 under transaction operation which is to add a new book to the library database as shown in the below snapshot.
- The program gets the input from the user using the command line interface and adds the book to the database successfully as shown in the below snapshot.

```

//Transaction function for adding new book
1 usage
public static void Add_New_book (Connection conn) {

    try {
        System.out.println("\nEnter Details of New Books to be added to the library database");
        Scanner sc = new Scanner(System.in);
        System.out.print("\nEnter Isbn: ");
        String isbn = sc.nextLine();
        System.out.print("Enter Title: ");
        String title = sc.nextLine();
        System.out.print("Enter Author id: ");
    }
}

```



4.3 To borrow a boom from the library:

- Here the user gives input of option 3 under transaction operation which is to add borrow a book from the library database as shown in the below snapshot.
- The program gets the input from the user using the command line interface and checks if the books are available to be borrowed. If not then the book is not available and the member cannot borrow the book message will be rolled out.

```
//Transaction function for borrowing available from library
1 usage
public static void Book_borrow(Connection conn){

    try {
        System.out.println("\nEnter Details to Borrow a Book.");
        Statement stmt = conn.createStatement();
        stmt.executeQuery( sql: "USE pxs9233");
        System.out.print("\nEnter Your SSN: ");
        Scanner sc = new Scanner(System.in);
        String ssn = sc.nextLine();
        ResultSet result = stmt.executeQuery( sql: "SELECT * FROM Member WHERE SSN="+ssn);
        if(result.next()==false){
```

```
Run: cse_5330_db_project_2
Which of the below transactions do you want to perform on Library database?.
1. Adding New Member to the Library database.
2. Adding New Book to the Library database.
3. To Borrow a Book from the Library database.
4. To Return a Book from the Library database.
Enter your choice of operation to be performed: 4

Enter Details to Borrow a Book.

Enter Your SSN: 45678901
Enter Book ISBN: 9780130321861
Sorry! Book is not Available or Invalid ISBN.

1. Use database
2. Printing and Displaying tables from Library database
3. Generate Weekly borrowing activity report
4. New Transactions on Library Database
5. Membership Renewal
6. Trigger Execution for Overdue books and Membership renewal
7. Exit
Enter your choice of operation...
```

- The program gets the input from the user using the command line interface and allows the members to borrow the book from the database successfully as shown in the below snapshot.

```
Run: cse_5330_db_project_2
Which of the below transactions do you want to perform on Library database?.
1. Adding New Member to the Library database.
2. Adding New Book to the Library database.
3. To Borrow a Book from the Library database.
4. To Return a Book from the Library database.
Enter your choice of operation to be performed: 4

Enter Details to Borrow a Book.

Enter Your SSN: 45678901
Enter Book ISBN: 9780130321861
Book Borrowed Successfully.

1. Use database
2. Printing and Displaying tables from Library database
3. Generate Weekly borrowing activity report
4. New Transactions on Library Database
5. Membership Renewal
6. Trigger Execution for Overdue books and Membership renewal
7. Exit
Enter your choice of operation...
```

4.4 To return a boom from the library:

- Here the user gives input of option 4 under transaction operation which is to return a book to the library database as shown in the below snapshot.
- The program gets the input from the user using the command line interface and allows the members to return the book to the database successfully as shown in the below snapshot.
- While returning the book, the Return details of the book are generated as receipt for Returning the books.

```
//Transaction function for returning a book back to the library
1 usage
public static void Book_return(Connection connn) {

    try {
        System.out.println("\nEnter the below details to Return a Book to the Library.");
        Statement stmt = connn.createStatement();
        stmt.executeQuery( sql: "USE pxs9233");
        Scanner sc = new Scanner(System.in);
        System.out.print("\nEnter Your Ssn: ");
        String ssn = sc.nextLine();
        System.out.print("Enter Book Isbn: ");
```

Run: cse_5330_db_project_2

```
3. To Borrow a Book from the Library database.
4. To Return a Book from the Library database.
Enter your choice of operation to be performed: 4

Enter Details to Return a Book.

Enter Your SSN: 4564577992
Enter Book ISBN: 9674294299
Book Returned Successfully.

Book Return Receipt:
Title                                Total_Borrow_Days  Issue_Date  Return_Date
The Desert and the Sown              0               2022-11-21  2022-11-21

1. Use database
2. Printing and Displaying tables from Library database
3. Generate Weekly borrowing activity report
4. New Transactions on Library Database
5. Membership Renewal
6. Trigger Execution for Overdue books and Membership renewal
7. Exit
Enter your choice of operation...
```

Run: cse_5330_db_project_2

```
3. To Borrow a Book from the Library database.
4. To Return a Book from the Library database.
Enter your choice of operation to be performed: 4

Enter Details to Return a Book.

Enter Your SSN: 4565124497
Enter Book ISBN: 9472628243
Book Returned Successfully.

Book Return Receipt:
Title                                Total_Borrow_Days  Issue_Date  Return_Date
The End of Eternity                 55               2022-09-27  2022-11-21

1. Use database
2. Printing and Displaying tables from Library database
3. Generate Weekly borrowing activity report
4. New Transactions on Library Database
5. Membership Renewal
6. Trigger Execution for Overdue books and Membership renewal
7. Exit
Enter your choice of operation...
|
```

Build completed successfully in 4 sec. 39 ms (6 minutes ago)

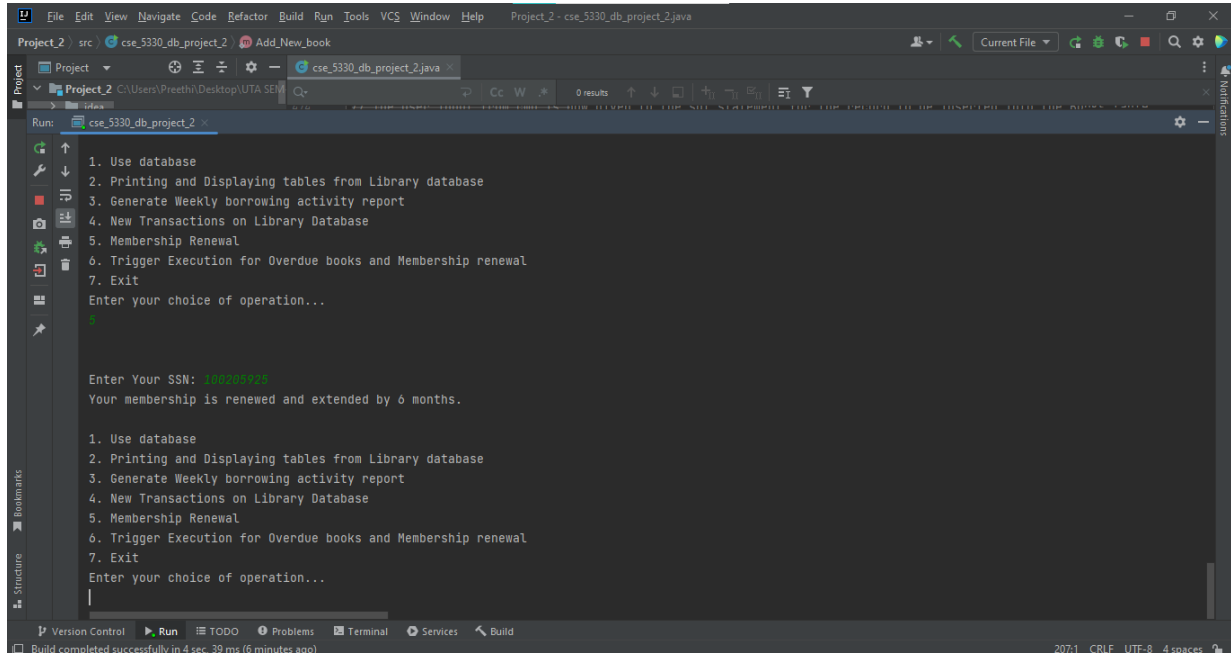
4.5 - Renew Membership:

- The user inputs option 5 to perform membership renewal operation on the library database and the below snapshot captures the same.
- Here the user gives input as SSN number (unique number to identify the member of the library) and if the member is an active member of the library then the membership is renewed for the next 6 months as shown in the below snapshot.

```
//Membership Renewal function created
1 usage
public static void Membership_renewal (Connection conn) {

    try {
        Statement stmt = conn.createStatement();
        stmt.executeQuery( sql: "USE pxs9233");
        Scanner sc = new Scanner(System.in);
        System.out.print("\nEnter Your SSN: ");
        String ssn = sc.nextLine();

        ResultSet result = stmt.executeQuery( sql: "SELECT * from Member where SSN="+ssn);
        if(result.next()==false){
            System.out.println("Sorry! You are not a member of Library or Invalid Ssn. Please");
        }else {
```



Q5: Triggers execution to notify members of the library on overdue of book and membership renewal:

- The user inputs option 6 to notify members on the overdue of books and membership renewal operation on the library database and the below snapshot captures the same.
- The triggers are created for the same and when the insert or update operation takes place in the Book_issue table and renew_membership table, then the triggers will be executed and the members will be notified as shown in the below snapshot.

```
mysql> use pks9233;
Database changed
mysql> CREATE TABLE Book_overdue(
  -> Number int AUTO_INCREMENT,
  -> Ssn Varchar(20),
  -> Isbn varchar (13),
  -> Notice_date date,
  -> PRIMARY KEY (Number)
  -> );
Query OK, 0 rows affected (0.10 sec)

mysql> CREATE TRIGGER Book_overdue_update AFTER UPDATE ON Book_issue FOR EACH ROW INSERT INTO Book_overdue (Ssn, Isbn, Notice_date) SELECT Ssn, Isbn, Notice_date from B
ook_issue where Notice_date < CURRENT_DATE();
Query OK, 0 rows affected (0.03 sec)

mysql> CREATE TRIGGER Book_overdue_insert AFTER INSERT ON Book_issue FOR EACH ROW INSERT INTO Book_overdue (Ssn, Isbn, Notice_date) SELECT Ssn, Isbn, Notice_date from B
ook_issue where Notice_date < CURRENT_DATE();
Query OK, 0 rows affected (0.02 sec)

mysql>
```

```
mysql> CREATE TABLE Renew_membership (
  -> Number int AUTO_INCREMENT,
  -> Ssn Varchar (20),
  -> Member_fname varchar (20),
  -> Member_lname varchar (20),
  -> PRIMARY KEY (Number)
  -> );
Query OK, 0 rows affected (0.08 sec)

mysql> CREATE TRIGGER Renew_membership_update AFTER UPDATE ON Member FOR EACH ROW INSERT INTO Renew_membership (Ssn, Member_fname, Member_lname) SELECT Ssn, Member_fnam
e, Member_lname from Member where Is_member_active = '0';
Query OK, 0 rows affected (0.02 sec)

mysql> CREATE TRIGGER Renew_membership_insert AFTER INSERT ON Member FOR EACH ROW INSERT INTO Renew_membership (Ssn, Member_fname, Member_lname) SELECT Ssn, Member_fnam
e, Member_lname from Member where Is_member_active = '0';
Query OK, 0 rows affected (0.03 sec)

mysql>
```

- When the user adds a new member or a book as part of the Transaction operation and then when option 6 is selected as part of Triggers execution, then a report will be generated to notify members about the overdue book and the members who need to do their membership renewal given they are active member of the library and the below snapshot captures the same.

