CS313 : DataBases and Information Systems Lab

Assignment 6 (Project 1)

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1   Part A: J2EE Project

All the program related to part A is inside the `Part_A/J2EEProject` directory.

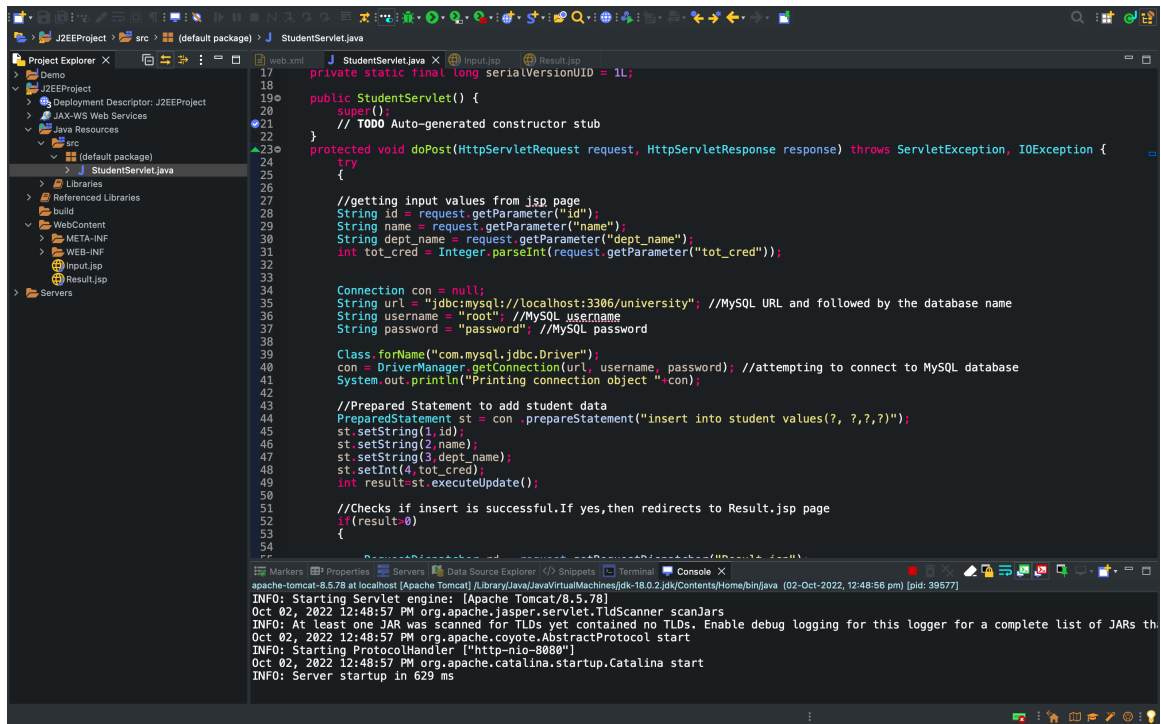## 1.1   Executing the sample project given (J2EEProject.zip) and understanding the execution flow.

Figure 1: IDE Screenshot

Figure 2: Data Insertion

Figure 3: Result

Figure 4: Showing the newly inserted data

2 Part B: Library Management System

2.1 Features of Library Management System

- While adding the book, we check if the book_id already exists, otherwise add the book details to the book table using a servlet named AddServlet.java. Then it displays the result accordingly.

- While issuing the book, we add the issue details in the issue table if a student with given student_id and book with given book_id exists using a servlet named Issue-Servlet.java. Then it displays the result accordingly.

2.2 Setup and Implementation

- All the program files related to part B are inside the `Part_B` directory.

- For the programs related to task1 and task2 for the things like creating tables and inserting data into them, can checkout the `b1.sql` , `b2.sql` and `b3.sql` files.

- For task3, Open the `LibraryProject` directory inside Eclipse by clicking on File →
  Open Project From File System. After that can do the required setup.

- Can follow the handout given if any errors occur while setting up the project.

- Now, after setting everything, right click on project name, then click Build Path →
  Configure build path. After that choose apache tomcat server and click on the Apply and Close button.

- To run the application, right click the project → Run as → Run on server.

- Once the server is up, access the following URL:

  http://localhost:8080/LibraryProject/Home.jsp

2.3   Task 1: Designing the database Library and creating tables.

Query

```sql
-- creating Library database
CREATE DATABASE Library;
SHOW DATABASES;
```

Result

Figure 5: Creation of new Library database

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Query

```sql
-- creating tables
USE Library;

-- book(book_id, title,category,author);
CREATE TABLE book(
  book_id VARCHAR(5),
  title VARCHAR(40),
  category VARCHAR(20),
  author VARCHAR(20),
  PRIMARY KEY (book_id)
);

-- student(student_id,name,dept_name,year,semester);
CREATE TABLE student(
  student_id VARCHAR(5),
  name VARCHAR(20),
  dept_name VARCHAR(20),
  year numeric(4,0),
  semester VARCHAR(6) CHECK
      (semester IN ('Fall', 'Winter', 'Spring', 'Summer')),
  PRIMARY KEY (student_id)
);

-- issue(student_id,book_id,issue_date,return_date);
CREATE TABLE issue(
  student_id VARCHAR(5),
  book_id VARCHAR(5),
  issue_date DATE,
  return_date DATE,
  PRIMARY KEY (student_id, book_id, issue_date),
  FOREIGN KEY (student_id) REFERENCES student(student_id)
      ON DELETE CASCADE,
  FOREIGN KEY (book_id) REFERENCES book(book_id)
      ON DELETE CASCADE
);
```

Result

Figure 6: Creation of tables inside Library database

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2.4 Task 2: Loading data into the tables

2.4.1 Query

```sql
-- inserting data into tables
-- book table
INSERT INTO book
    VALUES('10001', 'Concepts of Physics', 'Educational', 'H.C.Verma');
INSERT INTO book
    VALUES('10002', 'Harry Potter: Deathly Hallows', 'Fantasy',
            'J.K.Rowling');
INSERT INTO book
    VALUES('10003', 'Atomic Habits', 'Self-Help', 'James Clear');
INSERT INTO book
    VALUES('10004', 'Ikigai', 'Self-Help', 'FM & HC');
INSERT INTO book
    VALUES('10005', 'Rich Dad Poor Dad', 'Finance', 'RK & SL');
INSERT INTO book
    VALUES('10006', 'Security Analysis', 'Finance', 'BG & DD');

-- student table
INSERT INTO student VALUES('20001', 'Eren', 'MMAE', 2020, 'Summer');
INSERT INTO student VALUES('20002', 'Mikasa', 'CSE', 2021, 'Winter');
INSERT INTO student VALUES('20003', 'Armin', 'EE', 2022, 'Spring');
INSERT INTO student VALUES('20004', 'Reiner', 'EE', 2020, 'Fall');
INSERT INTO student VALUES('20005', 'Levi', 'CSE', 2021, 'Summer');
INSERT INTO student VALUES('20006', 'Erwin', 'MMAE', 2022, 'Winter');

-- issue table
INSERT INTO issue VALUES ('20001', '10003', '2020-08-28', '2020-09-18');
INSERT INTO issue VALUES ('20001', '10004', '2022-09-07', '2022-09-27');
INSERT INTO issue VALUES ('20002', '10002', '2021-05-02', '2021-05-22');
INSERT INTO issue VALUES ('20002', '10001', '2022-05-02', '2022-05-22');
INSERT INTO issue VALUES ('20003', '10005', '2022-06-12', '2022-06-30');
INSERT INTO issue VALUES ('20003', '10006', '2021-08-28', '2021-09-18');
INSERT INTO issue VALUES ('20004', '10003', '2021-10-06', '2021-10-26');
INSERT INTO issue VALUES ('20004', '10004', '2020-12-07', '2020-12-27');
INSERT INTO issue VALUES ('20005', '10001', '2020-11-28', '2020-12-18');
INSERT INTO issue VALUES ('20006', '10006', '2022-07-13', '2022-08-03');
```

2.4.2 Results

```
[mysql> source eclipse/Part_B/b3.sql
Query OK, 1 row affected (0.02 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.01 sec)
```

Figure 7: Insertion of data into those tables

```
[mysql> SELECT * FROM book;
+---------+------------------------------+-------------+-------------+
| book_id | title                        | category    | author      |
+---------+------------------------------+-------------+-------------+
| 10001   | Concepts of Physics          | Educational | H.C.Verma   |
| 10002   | Harry Potter: Deathly Hallows | Fantasy    | J.K.Rowling |
| 10003   | Atomic Habits                | Self-Help   | James Clear |
| 10004   | Ikigai                       | Self-Help   | FM & HC     |
| 10005   | Rich Dad Poor Dad            | Finance     | RK & SL     |
| 10006   | Security Analysis            | Finance     | BG & DD     |
+---------+------------------------------+-------------+-------------+
6 rows in set (0.00 sec)
```

Figure 8: Book table

```
[mysql> SELECT * FROM student;
+------------+--------+-----------+------+----------+
| student_id | name   | dept_name | year | semester |
+------------+--------+-----------+------+----------+
| 20001      | Eren   | MMAE      | 2020 | Summer   |
| 20002      | Mikasa | CSE       | 2021 | Winter   |
| 20003      | Armin  | EE        | 2022 | Spring   |
| 20004      | Reiner | EE        | 2020 | Fall     |
| 20005      | Levi   | CSE       | 2021 | Summer   |
| 20006      | Erwin  | MMAE      | 2022 | Winter   |
+------------+--------+-----------+------+----------+
6 rows in set (0.00 sec)
```

Figure 9: Student table

```
[mysql> SELECT * FROM issue;
+------------+---------+------------+-------------+
| student_id | book_id | issue_date | return_date |
+------------+---------+------------+-------------+
| 20001      | 10003   | 2020-08-28 | 2020-09-18  |
| 20001      | 10004   | 2022-09-07 | 2022-09-27  |
| 20002      | 10001   | 2022-05-02 | 2022-05-22  |
| 20002      | 10002   | 2021-05-02 | 2021-05-22  |
| 20003      | 10005   | 2022-06-12 | 2022-06-30  |
| 20003      | 10006   | 2021-08-28 | 2021-09-18  |
| 20004      | 10003   | 2021-10-06 | 2021-10-26  |
| 20004      | 10004   | 2020-12-07 | 2020-12-27  |
| 20005      | 10001   | 2020-11-28 | 2020-12-18  |
| 20006      | 10006   | 2022-07-13 | 2022-08-03  |
+------------+---------+------------+-------------+
10 rows in set (0.00 sec)
```

Figure 10: Issue table

2.5 Task 3: Creating a Java-J2EE project
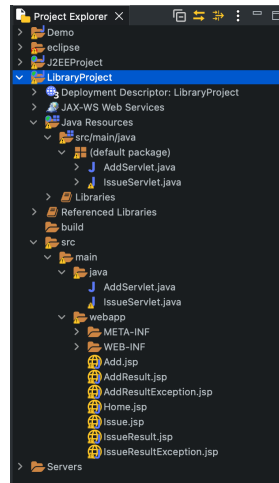
2.5.1 Workspace Screenshots
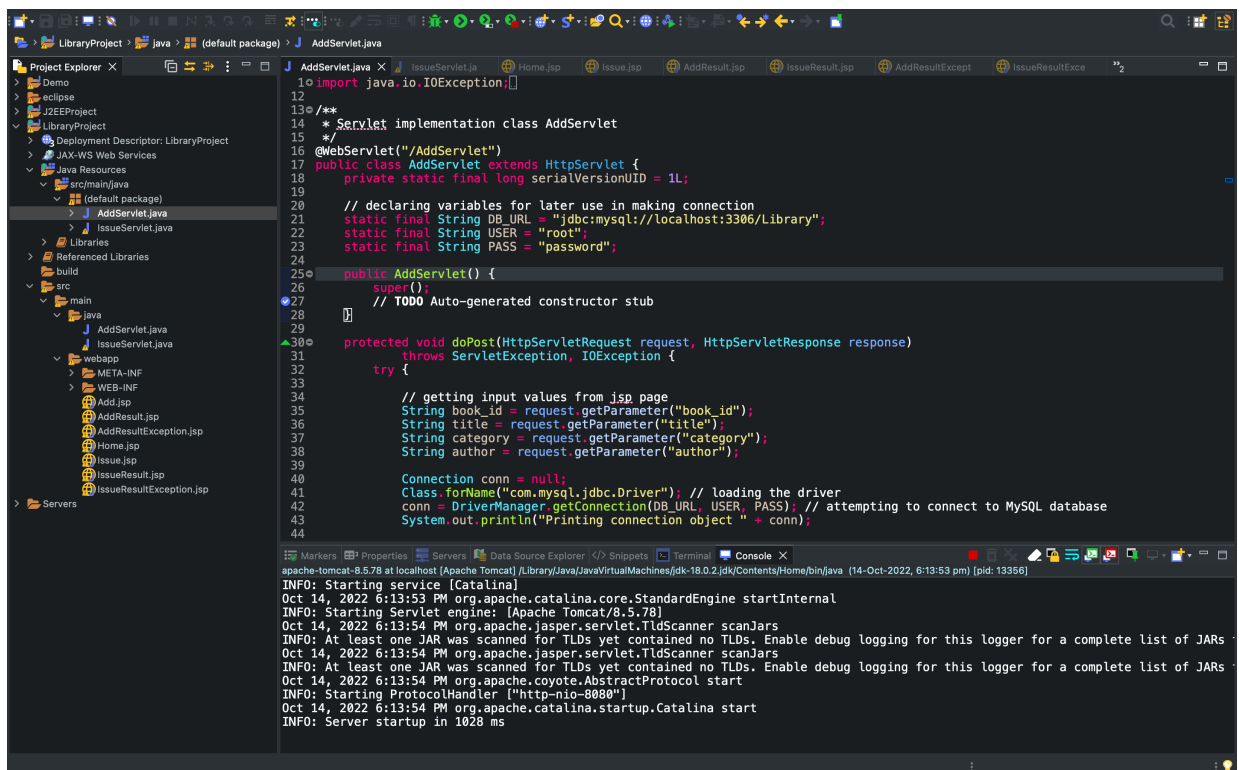

Figure 11: Workspace directory files

Figure 12: Workspace screen with running server
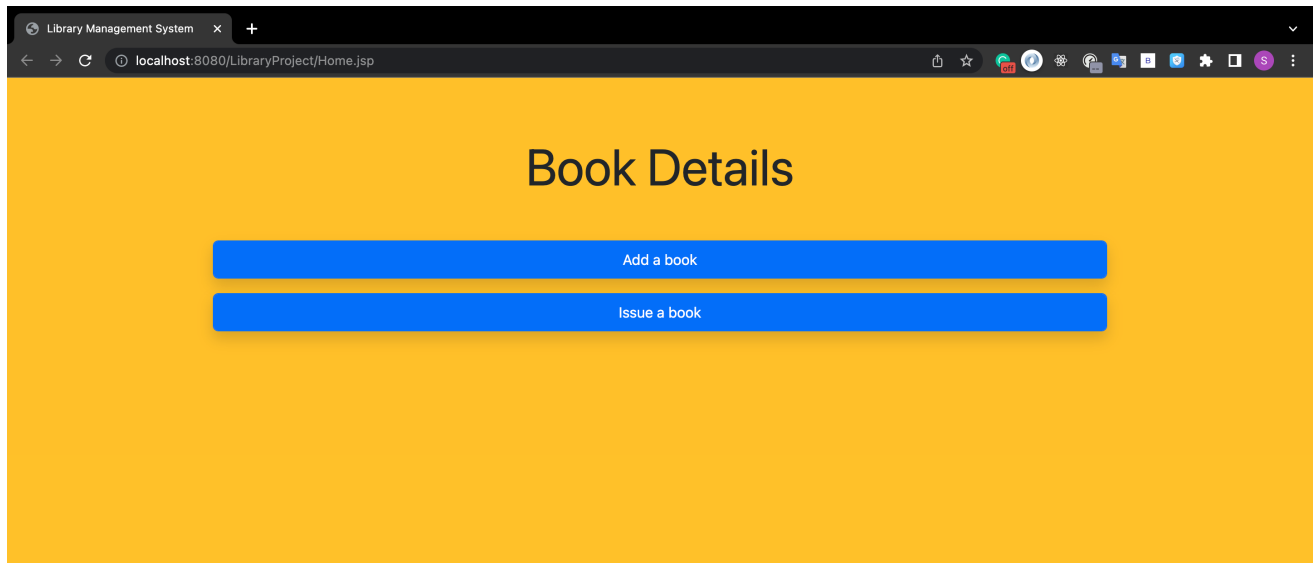
10

2.5.2   View of webpages created

Figure 13: Home.jsp
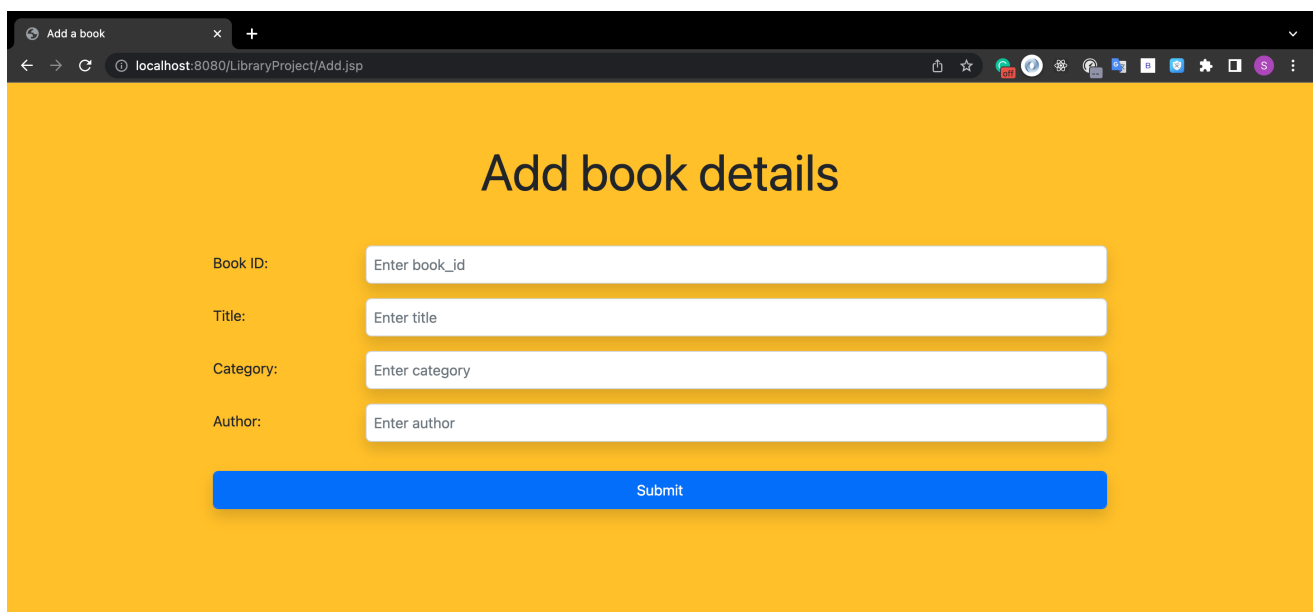

Figure 14: Add.jsp
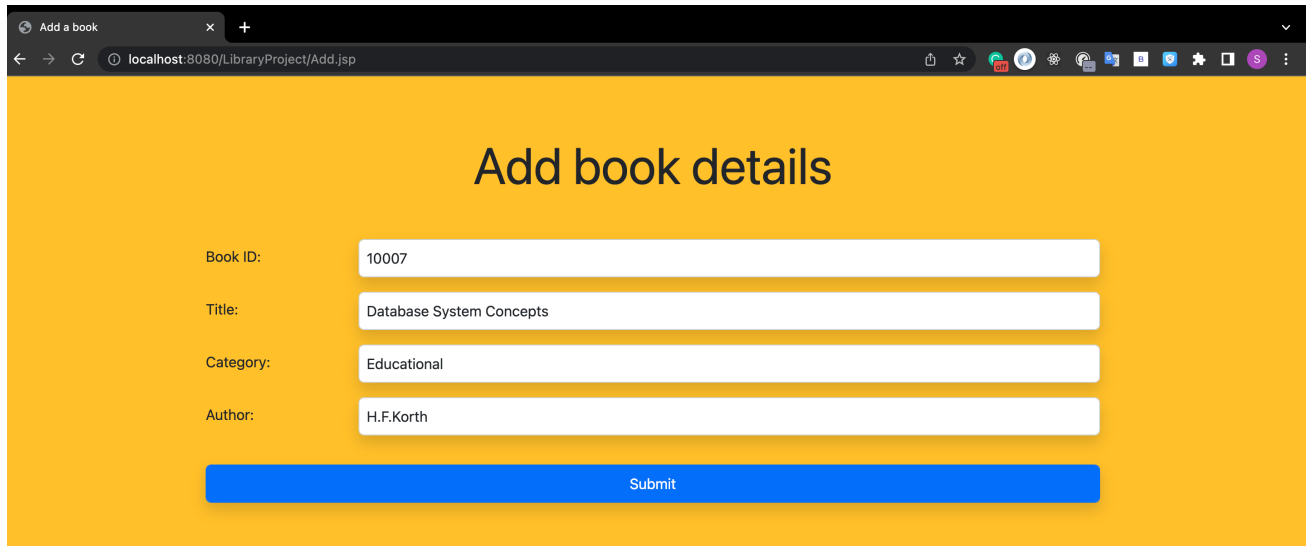
Figure 15: Issue.jsp

2.5.3 Adding a book

Figure 16: Add.jsp with the inputs
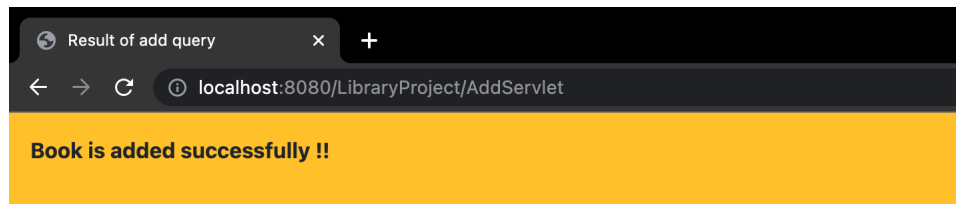
Figure 17: AddResult.jsp with successful insertion of add query
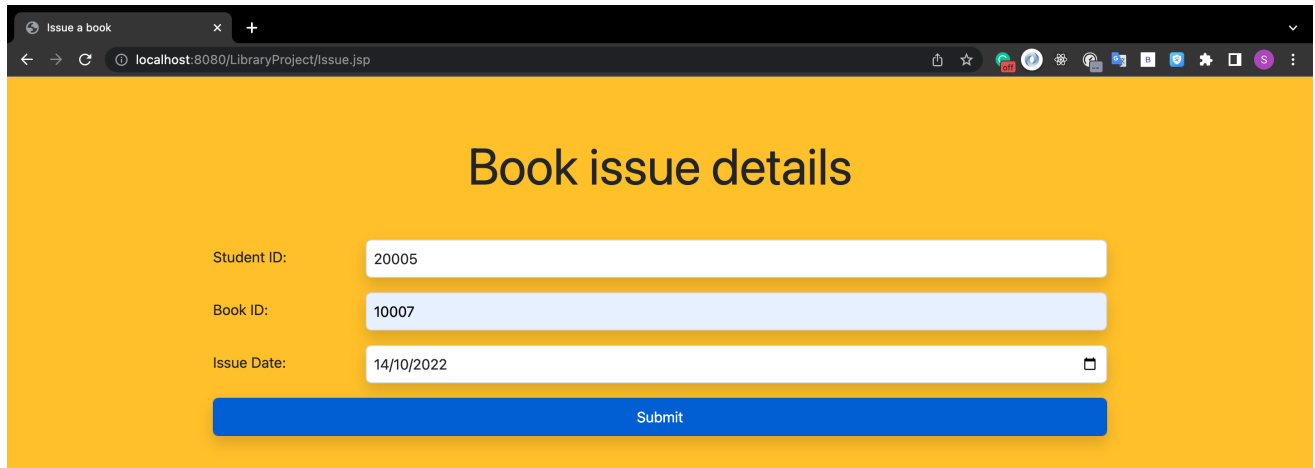
```
[mysql> SELECT * FROM book;
+----------+------------------------------+-------------+--------------+
| book_id  | title                        | category    | author       |
+----------+------------------------------+-------------+--------------+
| 10001    | Concepts of Physics          | Educational | H.C.Verma    |
| 10002    | Harry Potter: Deathly Hallows| Fantasy     | J.K.Rowling  |
| 10003    | Atomic Habits                | Self-Help   | James Clear  |
| 10004    | Ikigai                       | Self-Help   | FM & HC      |
| 10005    | Rich Dad Poor Dad            | Finance     | RK & SL      |
| 10006    | Security Analysis            | Finance     | BG & DD      |
| 10007    | Database System Concepts     | Educational | H.F.Korth    |
+----------+------------------------------+-------------+--------------+
7 rows in set (0.00 sec)
```

Figure 18: Updated `book` table

2.5.4 Issuing a book

Figure 19: Issue.jsp with the inputs
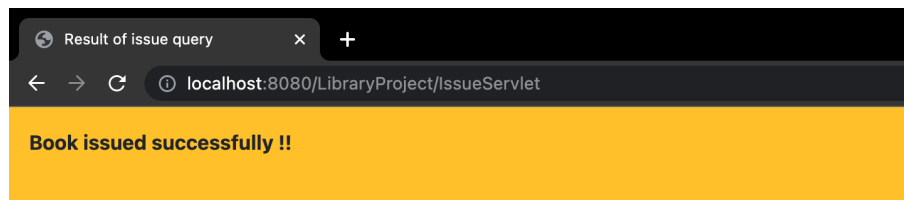
Figure 20: IssueResult.jsp with successful execution of issue query
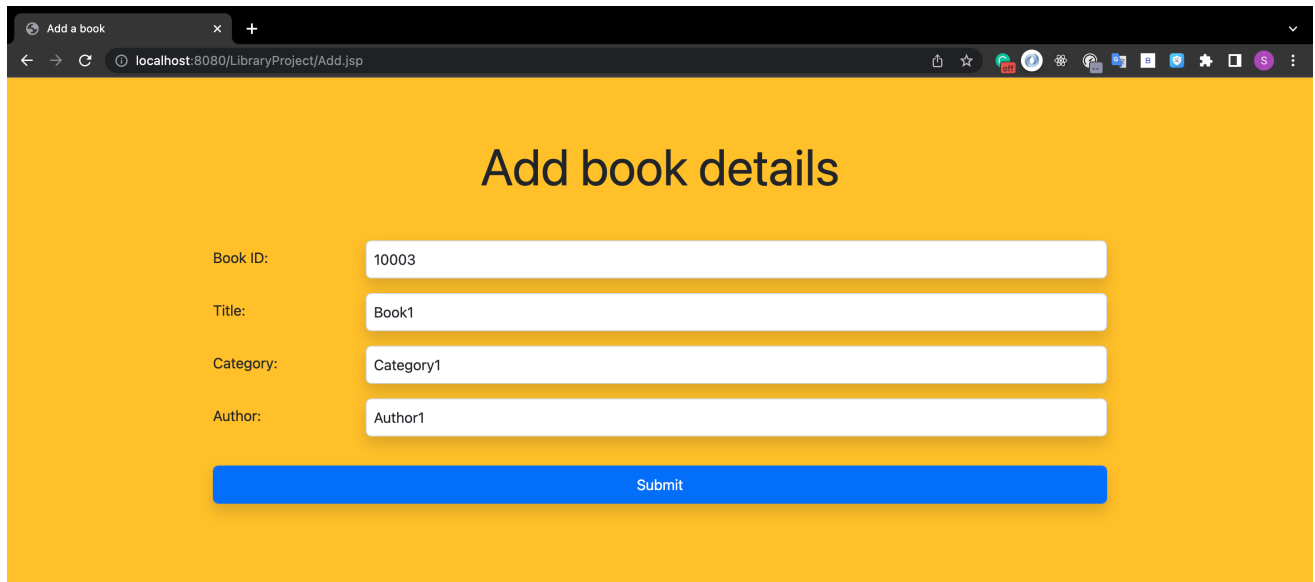
```
mysql> SELECT * FROM issue;
+------------+---------+------------+-------------+
| student_id | book_id | issue_date | return_date |
+------------+---------+------------+-------------+
| 20001      | 10003   | 2020-08-28 | 2020-09-18  |
| 20001      | 10004   | 2022-09-07 | 2022-09-27  |
| 20002      | 10001   | 2022-05-02 | 2022-05-22  |
| 20002      | 10002   | 2021-05-02 | 2021-05-22  |
| 20003      | 10005   | 2022-06-12 | 2022-06-30  |
| 20003      | 10006   | 2021-08-28 | 2021-09-18  |
| 20004      | 10003   | 2021-10-06 | 2021-10-26  |
| 20004      | 10004   | 2020-12-07 | 2020-12-27  |
| 20005      | 10001   | 2020-11-28 | 2020-12-18  |
| 20005      | 10007   | 2022-10-14 | NULL        |
| 20006      | 10006   | 2022-07-13 | 2022-08-03  |
+------------+---------+------------+-------------+
11 rows in set (0.01 sec)
```

Figure 21: Updated `issue` table

2.5.5 Adding the book with existing book_id

Figure 22: Add.jsp with the inputs
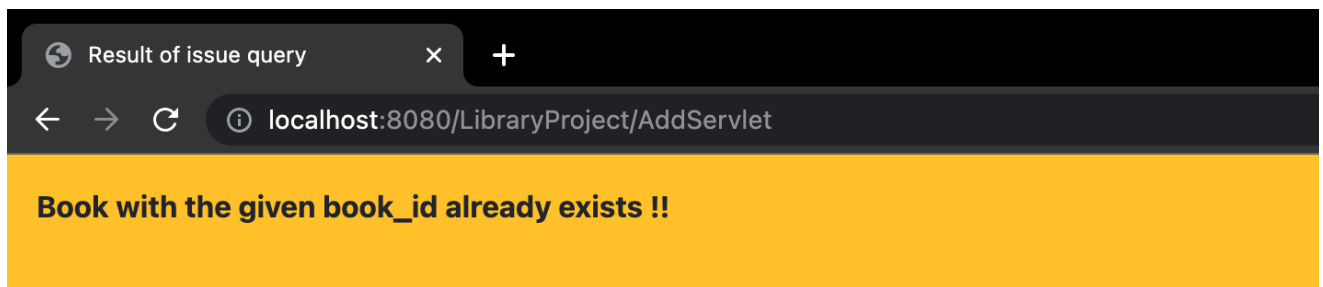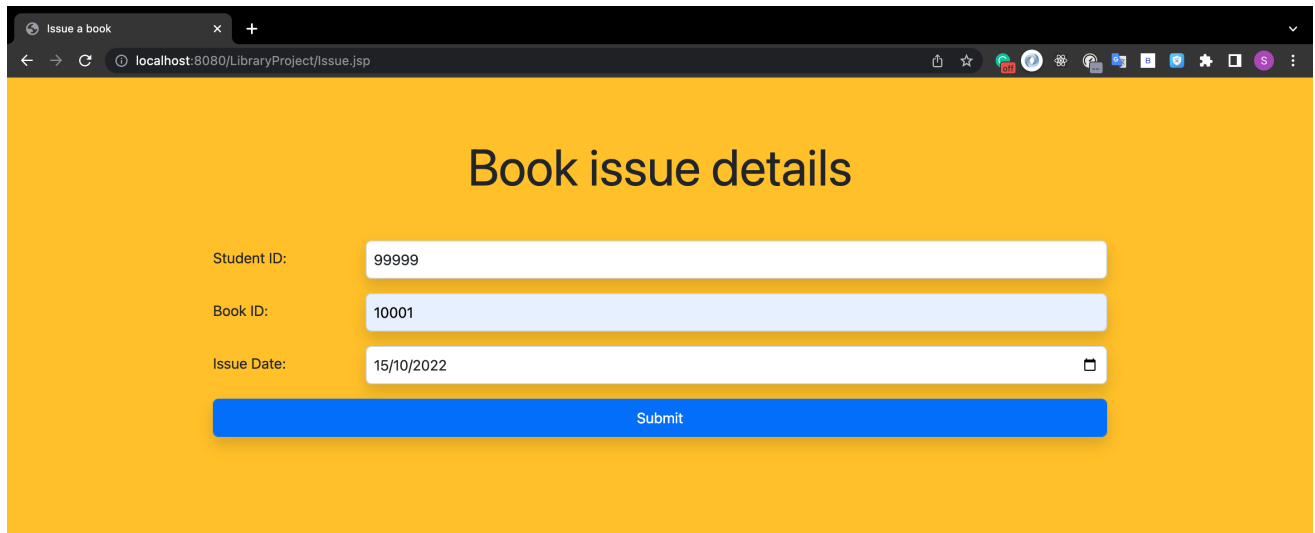
Figure 23: AddResultException.jsp with result of add query

2.5.6 Issuing a book with incorrect student_id

Figure 24: Issue.jsp with the inputs
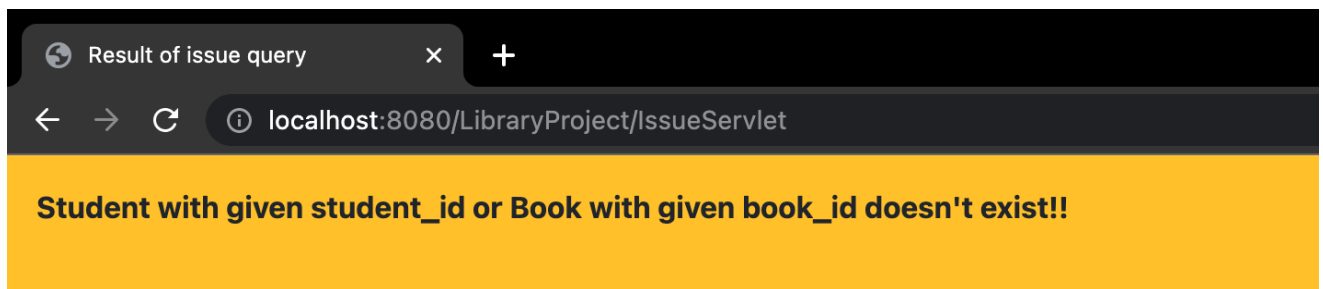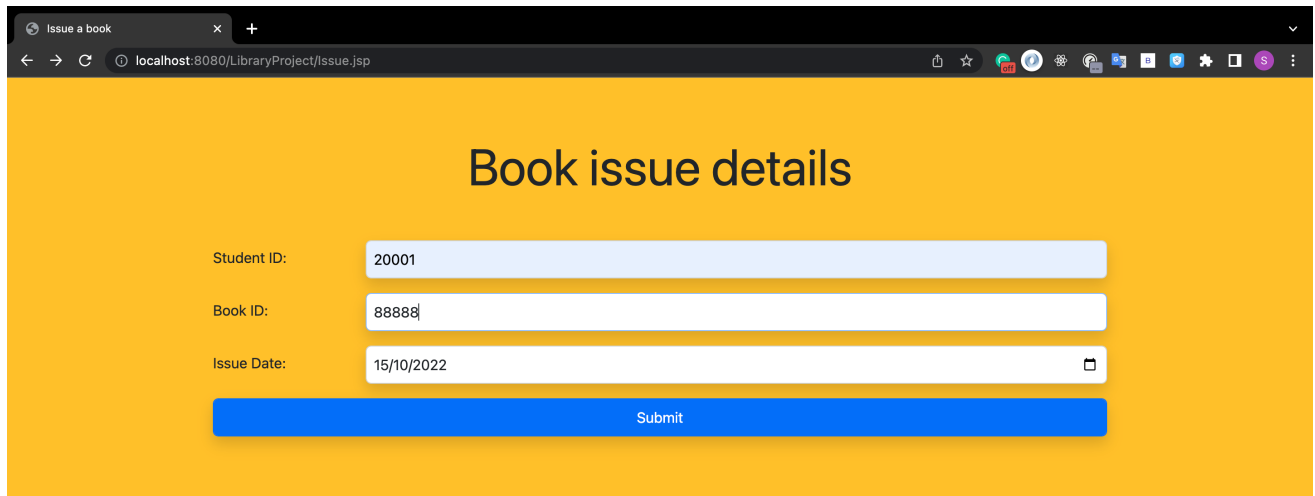
Figure 25: IssueResultException.jsp with result of issue query

2.5.7 Issuing a book with incorrect book_id
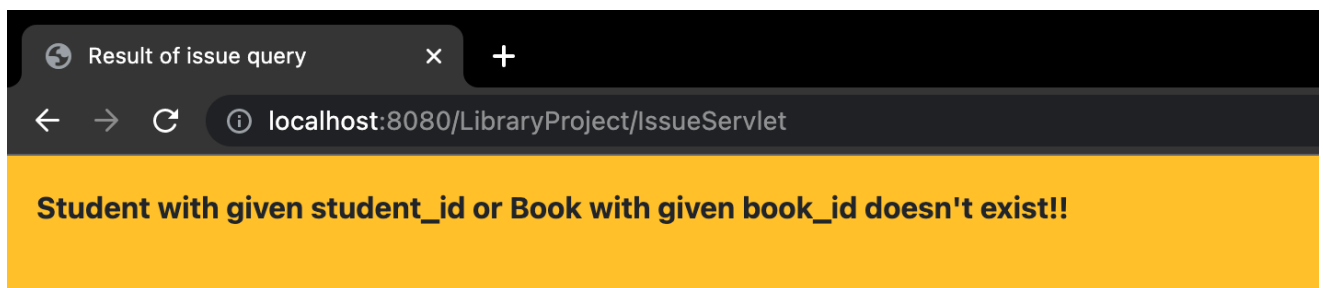

Figure 26: Issue.jsp with the inputs

Figure 27: IssueResultException.jsp with result of issue query

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