

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.

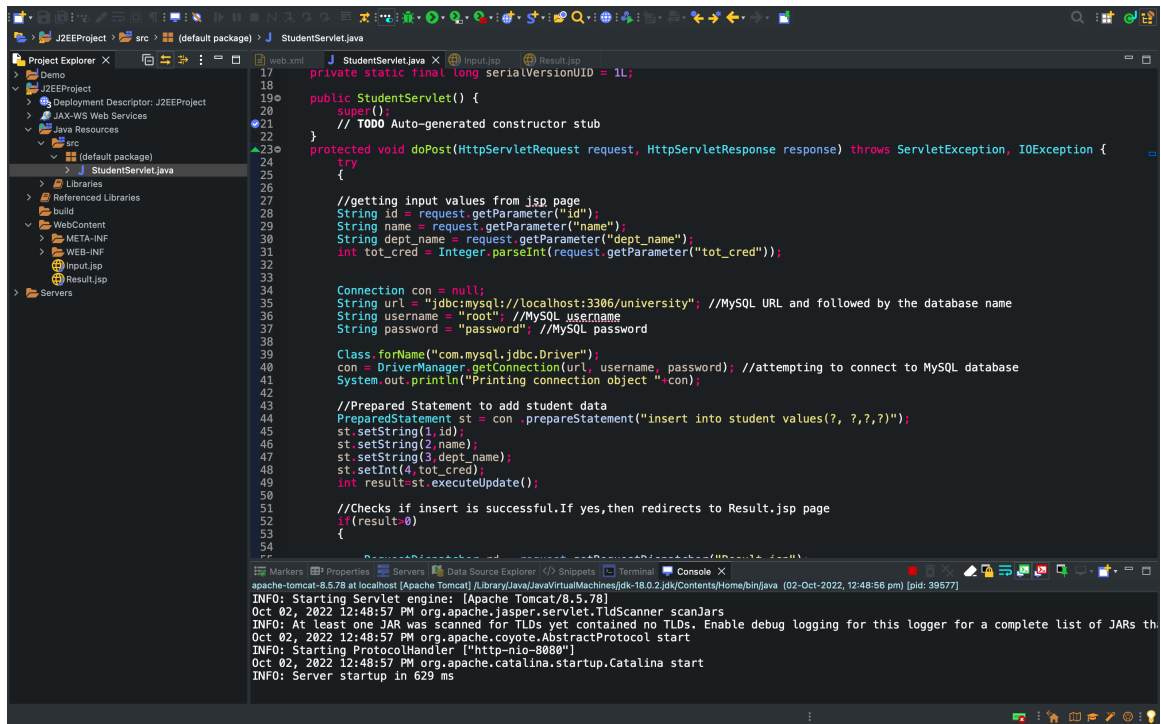


Figure 1: IDE Screenshot

Student Addition Form

localhost:8080/J2EEProject/

Student Details

Student Id	<input type="text" value="34567"/>
Student Name	<input type="text" value="student1"/>
Student Department	<input type="text" value="Finance"/>
Student Total Credits	<input type="text" value="45"/>
<input type="button" value="Submit"/>	

Figure 2: Data Insertion



Figure 3: Result

```
Last login: Fri Sep 30 19:51:54 on ttys000
~ $ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 13
Server version: 8.0.30 MySQL Community Server - GPL

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> use university;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> select * from student;
+-----+-----+-----+-----+
| ID    | name   | dept_name | tot_cred |
+-----+-----+-----+-----+
| 00128 | Zhang  | Comp. Sci. | 102      |
| 12345 | Shankar | Comp. Sci. | 32       |
| 19991 | Brandt | History   | 80       |
| 23121 | Chavez | Finance   | 110      |
| 34567 | student1 | Finance   | 45       |
| 44553 | Peltier | Physics   | 56       |
| 45678 | Levy   | Physics   | 46       |
| 54321 | Williams | Comp. Sci. | 54       |
| 55739 | Sanchez | Music     | 38       |
| 70557 | Snow   | Physics   | 0        |
| 76543 | Brown  | Comp. Sci. | 58       |
| 76653 | Aoi    | Elec. Eng. | 60       |
| 98765 | Bourikas | Elec. Eng. | 98       |
| 98988 | Tanaka | Biology   | 120      |
+-----+-----+-----+-----+
14 rows in set (0.00 sec)

mysql>
```

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 IssueServlet.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

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

Result

```
mysql> show databases;  
+-----+  
| Database |  
+-----+  
| information_schema |  
| mydb |  
| mysql |  
| performance_schema |  
| sys |  
| university |  
+-----+  
6 rows in set (0.00 sec)  
  
mysql> CREATE DATABASE Library;  
Query OK, 1 row affected (0.02 sec)  
  
mysql> show databases;  
+-----+  
| Database |  
+-----+  
| information_schema |  
| Library |  
| mydb |  
| mysql |  
| performance_schema |  
| sys |  
| university |  
+-----+  
7 rows in set (0.00 sec)  
  
mysql> █
```

Figure 5: Creation of new Library database

Query

```
-- 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

```
[mysql> source eclipse/Part_B/b2.sql
Database changed
Query OK, 0 rows affected (0.05 sec)

Query OK, 0 rows affected (0.01 sec)

Query OK, 0 rows affected (0.01 sec)

[mysql> SHOW TABLES;
+-----+
| Tables_in_library |
+-----+
| book               |
| issue              |
| student            |
+-----+
3 rows in set (0.00 sec)
```

Figure 6: Creation of tables inside Library database

2.4 Task 2: Loading data into the tables

2.4.1 Query

```
-- 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

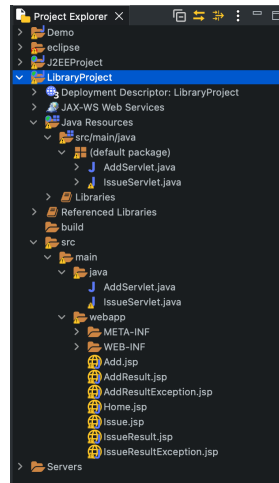


Figure 11: Workspace directory files

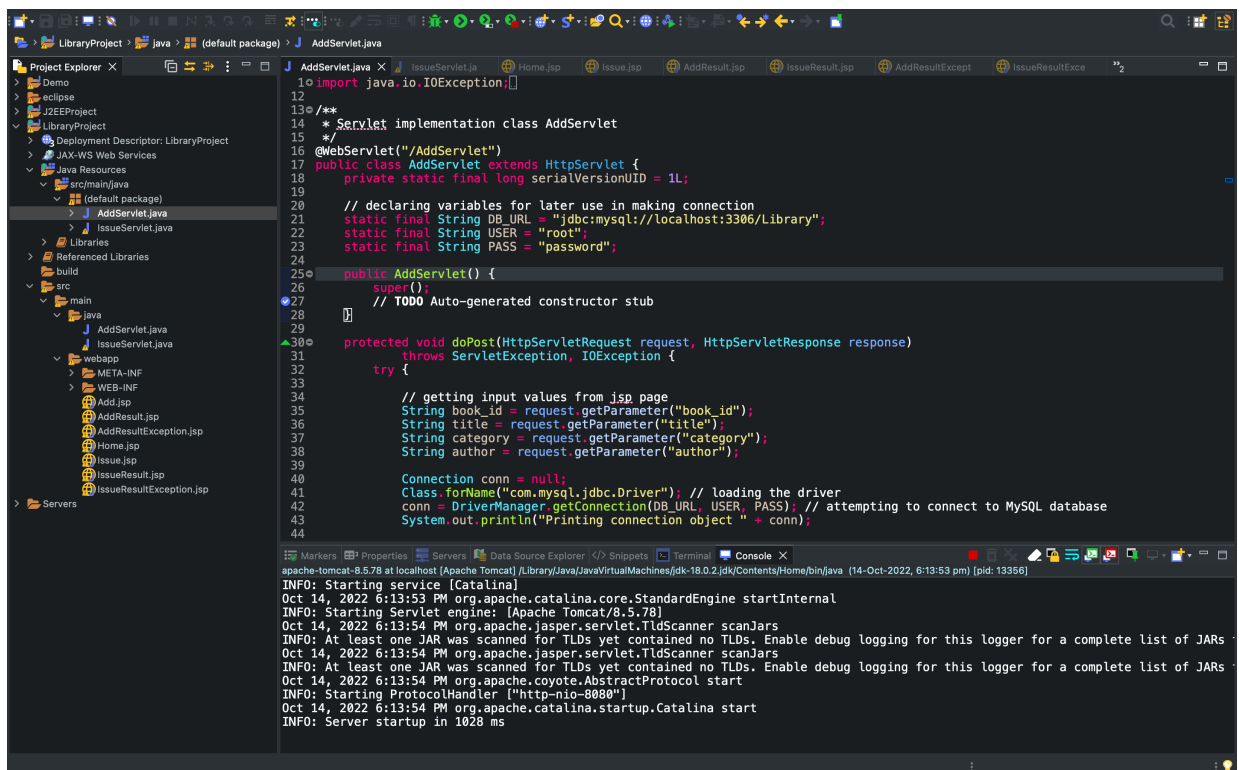


Figure 12: Workspace screen with running server

2.5.2 View of webpages created

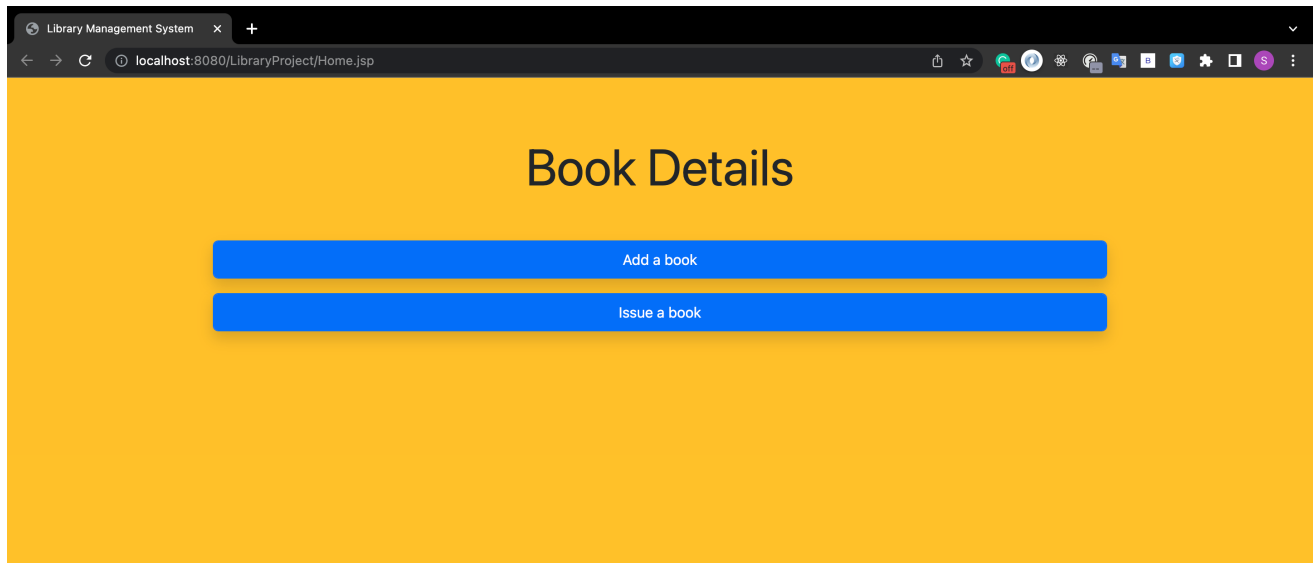


Figure 13: Home.jsp

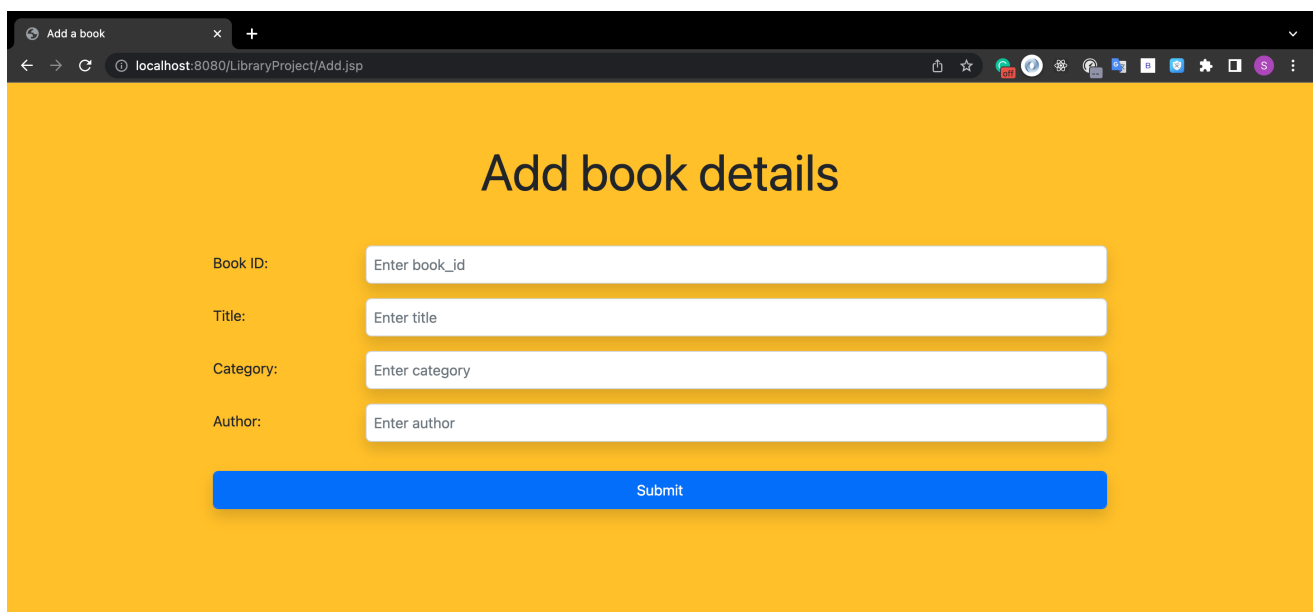


Figure 14: Add.jsp

Issue a book

localhost:8080/LibraryProject/Issue.jsp

Book issue details

Student ID:

Book ID:


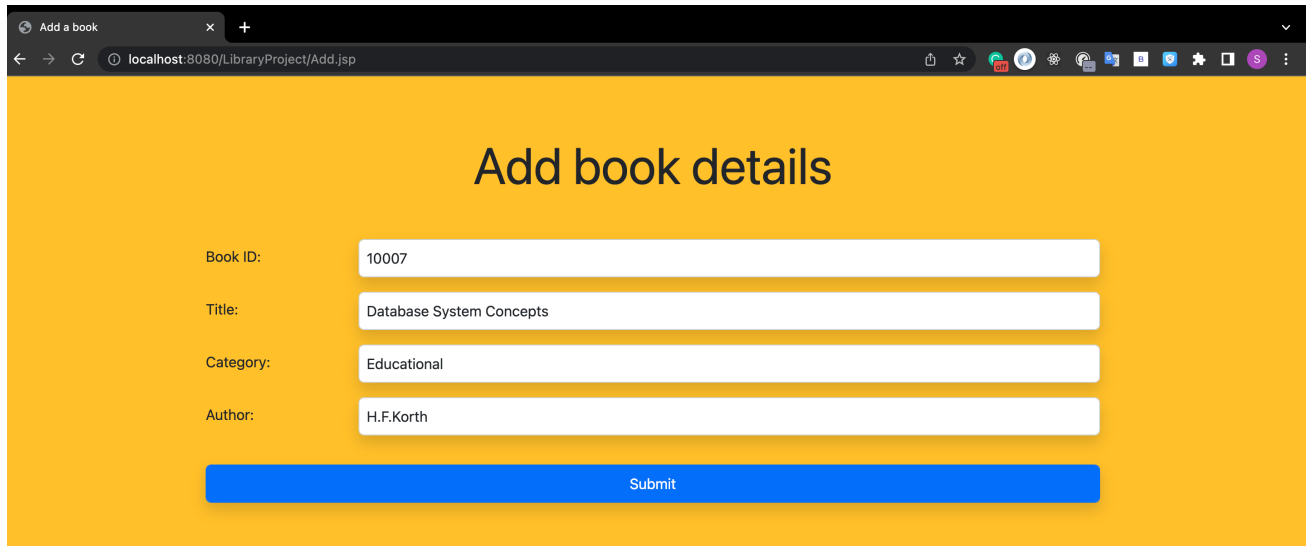
Issue Date: 

Figure 15: Issue.jsp

2.5.3 Adding a book



Add book details

Book ID: 10007

Title: Database System Concepts

Category: Educational

Author: H.F.Korth

Submit

Figure 16: Add.jsp with the inputs

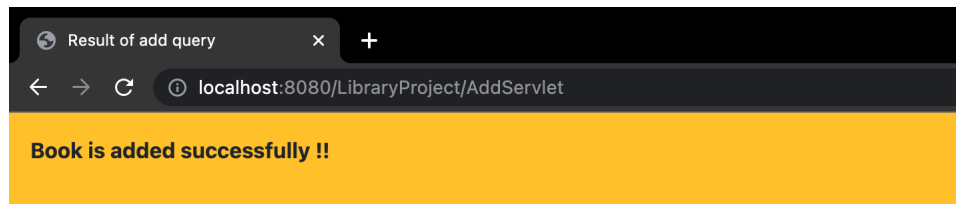


Figure 17: AddResult.jsp with successful insertion of add query

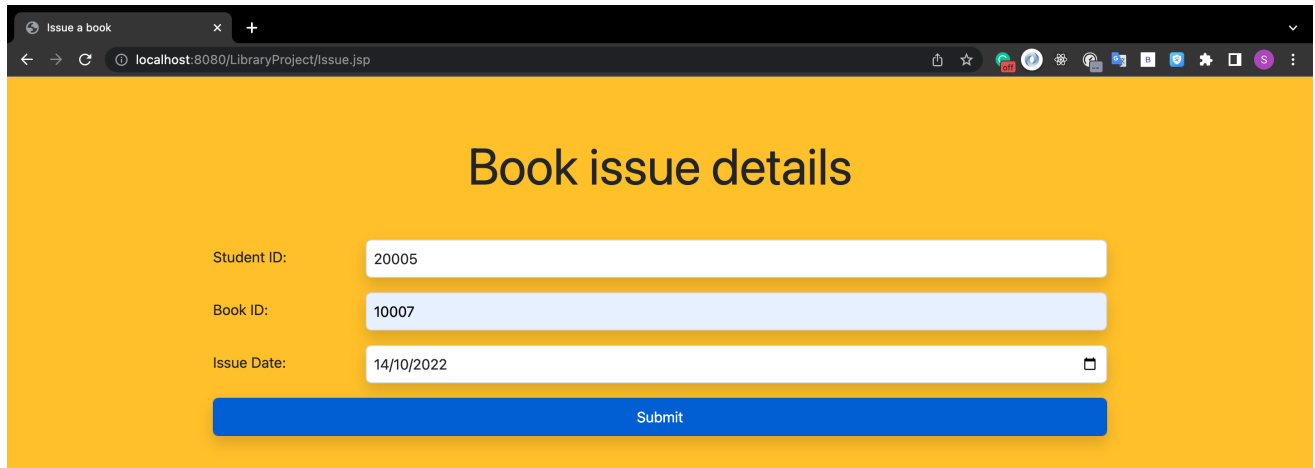
```
mysql> SELECT * FROM book;
```

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



Book issue details

Student ID: 20005

Book ID: 10007

Issue Date: 14/10/2022

Submit

Figure 19: Issue.jsp with the inputs

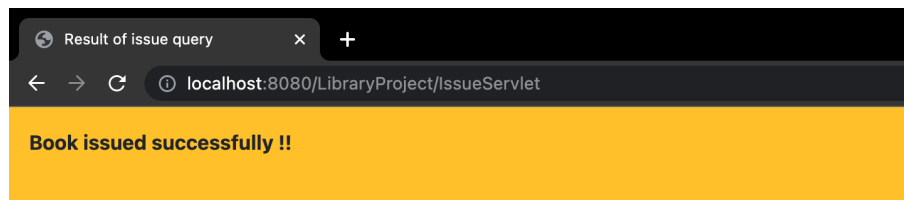


Figure 20: IssueResult.jsp with successful execution of issue query

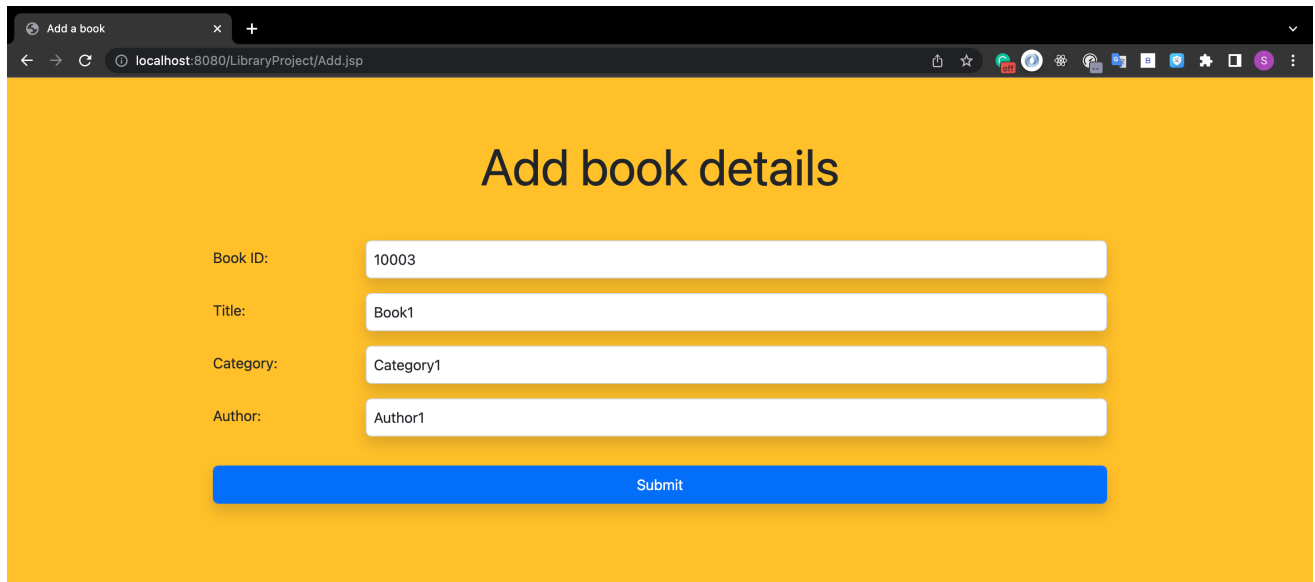
```
[mysql> SELECT * FROM issue;
```

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



A screenshot of a web browser showing a form titled "Add book details". The form is set against a solid orange background. It contains four input fields, each with a label to its left: "Book ID:" with the value "10003", "Title:" with "Book1", "Category:" with "Category1", and "Author:" with "Author1". Below these fields is a wide blue button labeled "Submit". The browser's address bar shows the URL "localhost:8080/LibraryProject/Add.jsp".

Figure 22: Add.jsp with the inputs

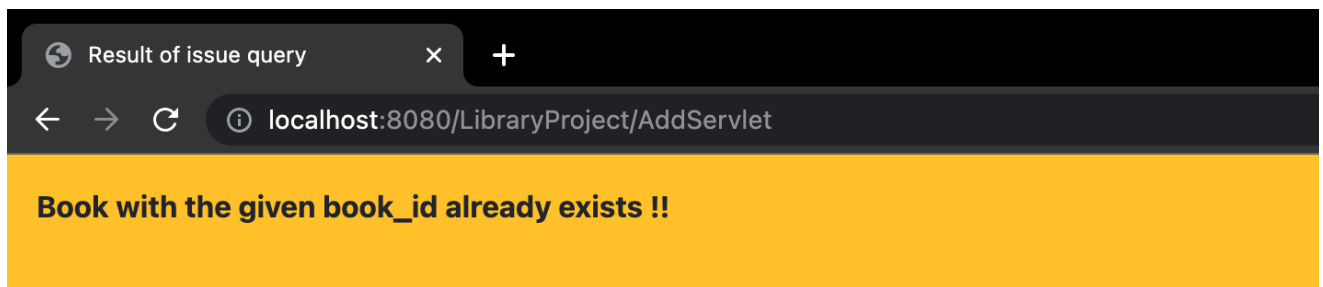
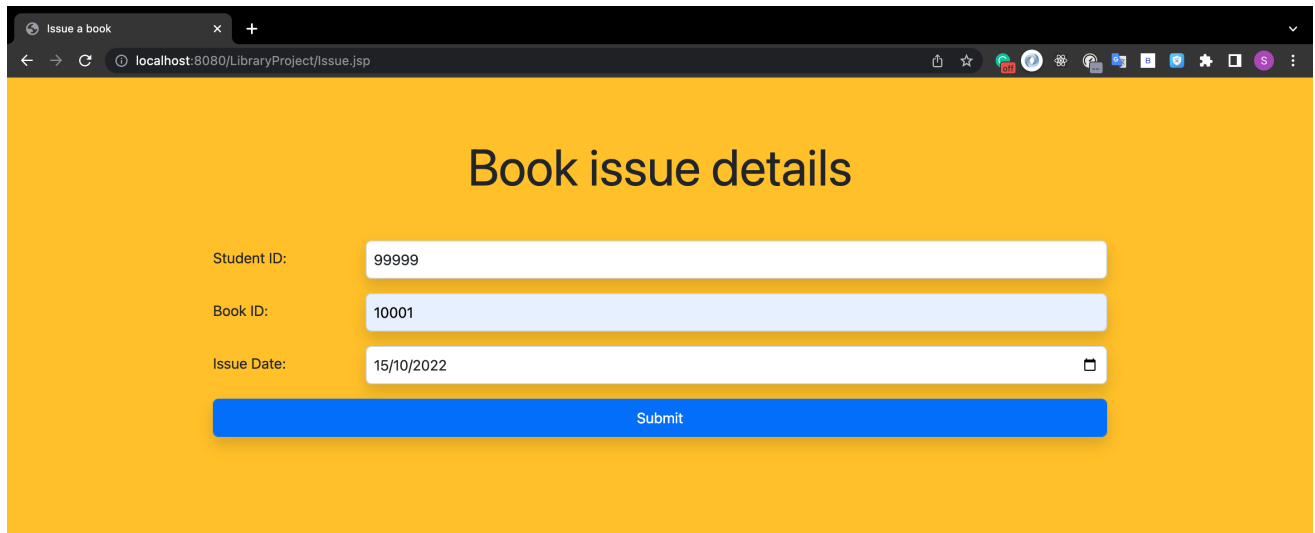


Figure 23: AddResultException.jsp with result of add query

2.5.6 Issuing a book with incorrect student_id



Issue a book

localhost:8080/LibraryProject/Issue.jsp

Book issue details

Student ID:

Book ID:

Issue Date:

Figure 24: Issue.jsp with the inputs

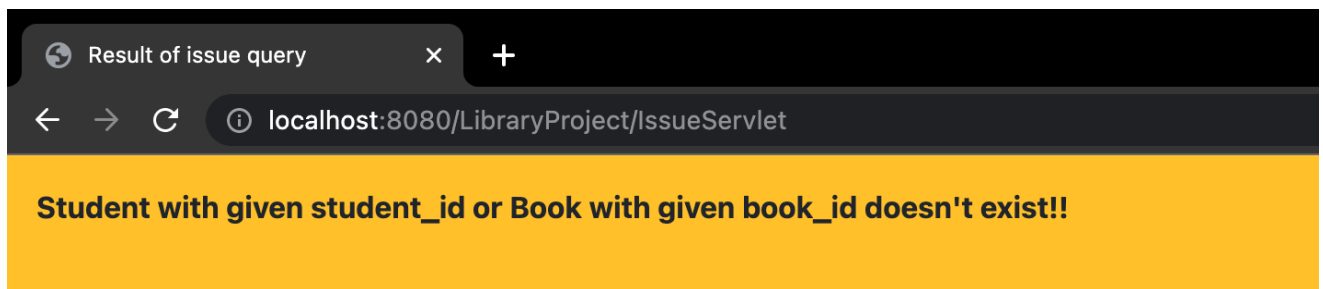
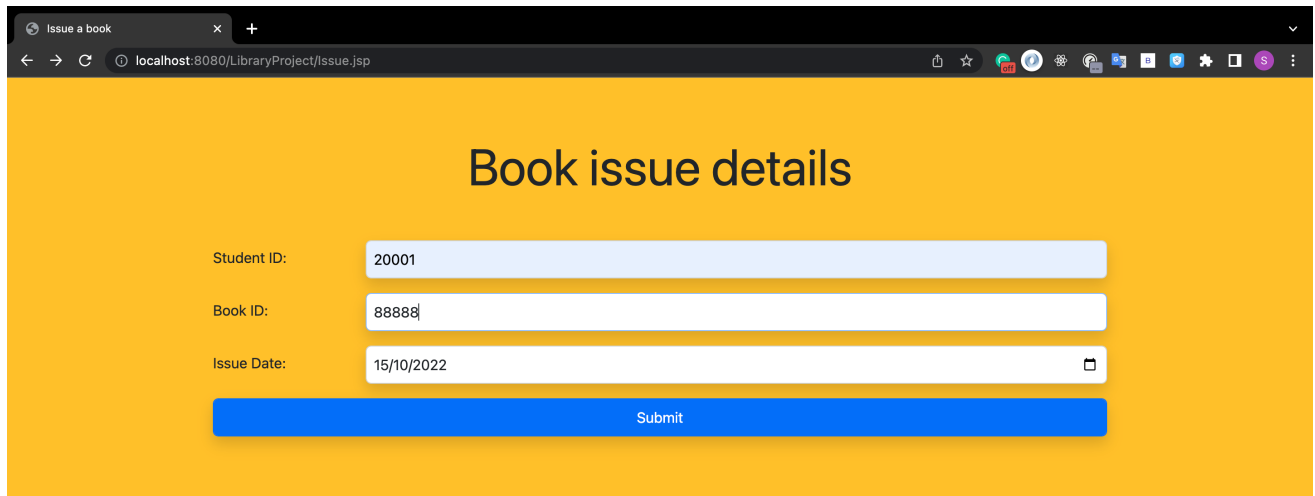


Figure 25: IssueResultException.jsp with result of issue query

2.5.7 Issuing a book with incorrect book_id



The screenshot shows a web browser window with the title 'Issue a book'. The address bar shows 'localhost:8080/LibraryProject/Issue.jsp'. The page has a yellow background and is titled 'Book issue details'. It contains three input fields: 'Student ID' with the value '20001', 'Book ID' with the value '88888', and 'Issue Date' with the value '15/10/2022'. A blue 'Submit' button is at the bottom.

Figure 26: Issue.jsp with the inputs

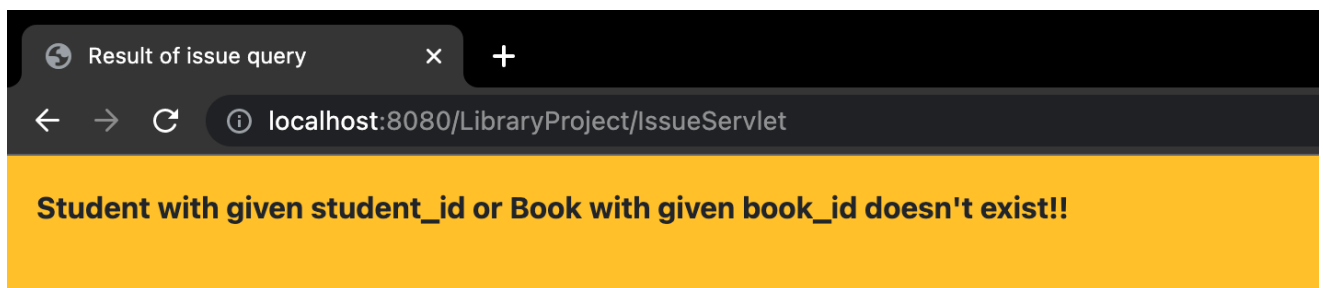


Figure 27: IssueResultException.jsp with result of issue query