

Databases and Information Systems

Lab Assignment 6

Project 1

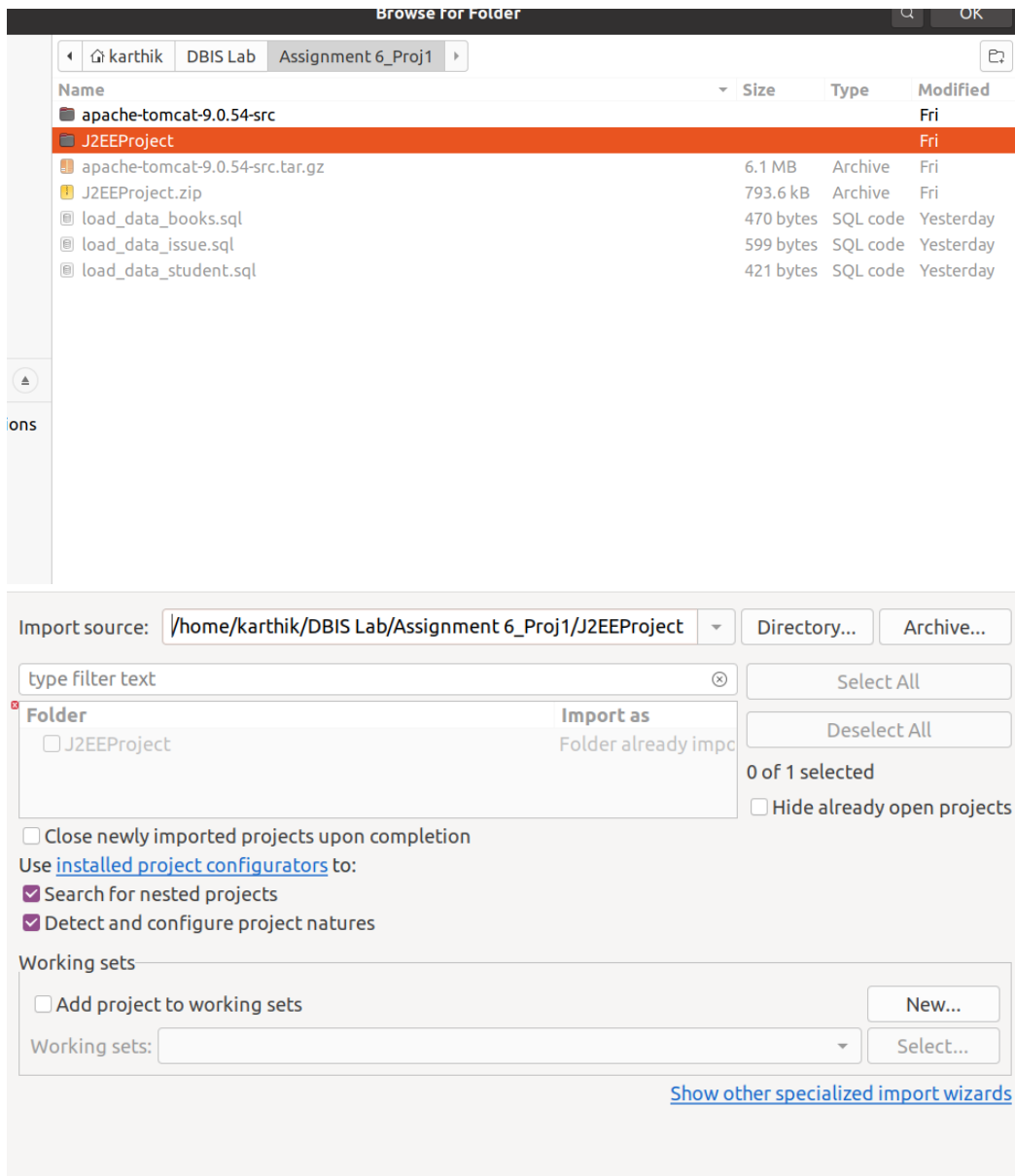
Karthik Kancharla
190020020

October 14th, 2021

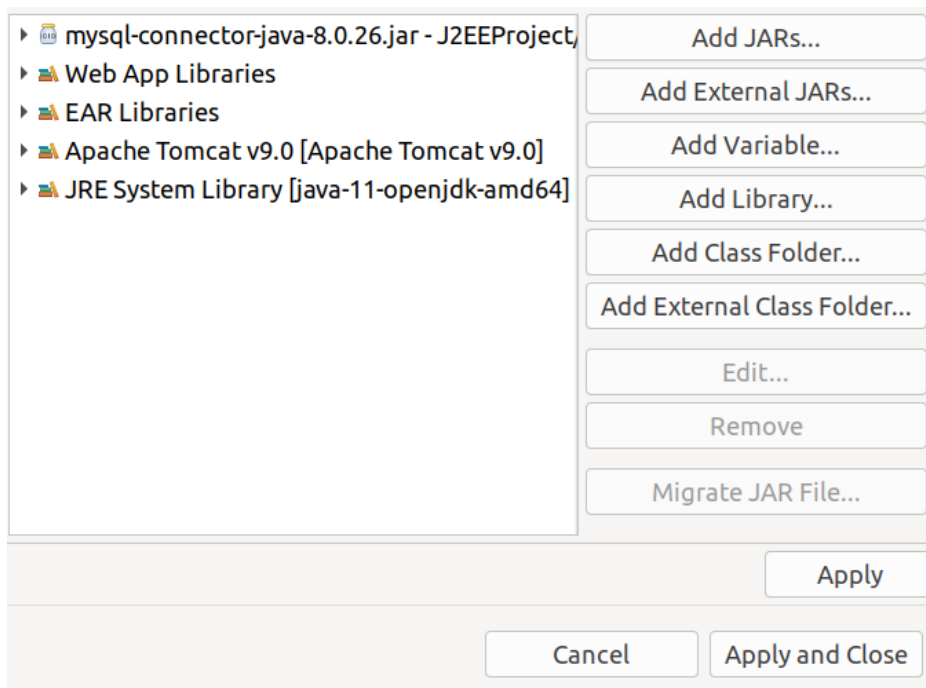
For both the Parts, I have used the same user universityDB0020 and used MYSQL database. Please find below the screenshots and implementation of both the parts.

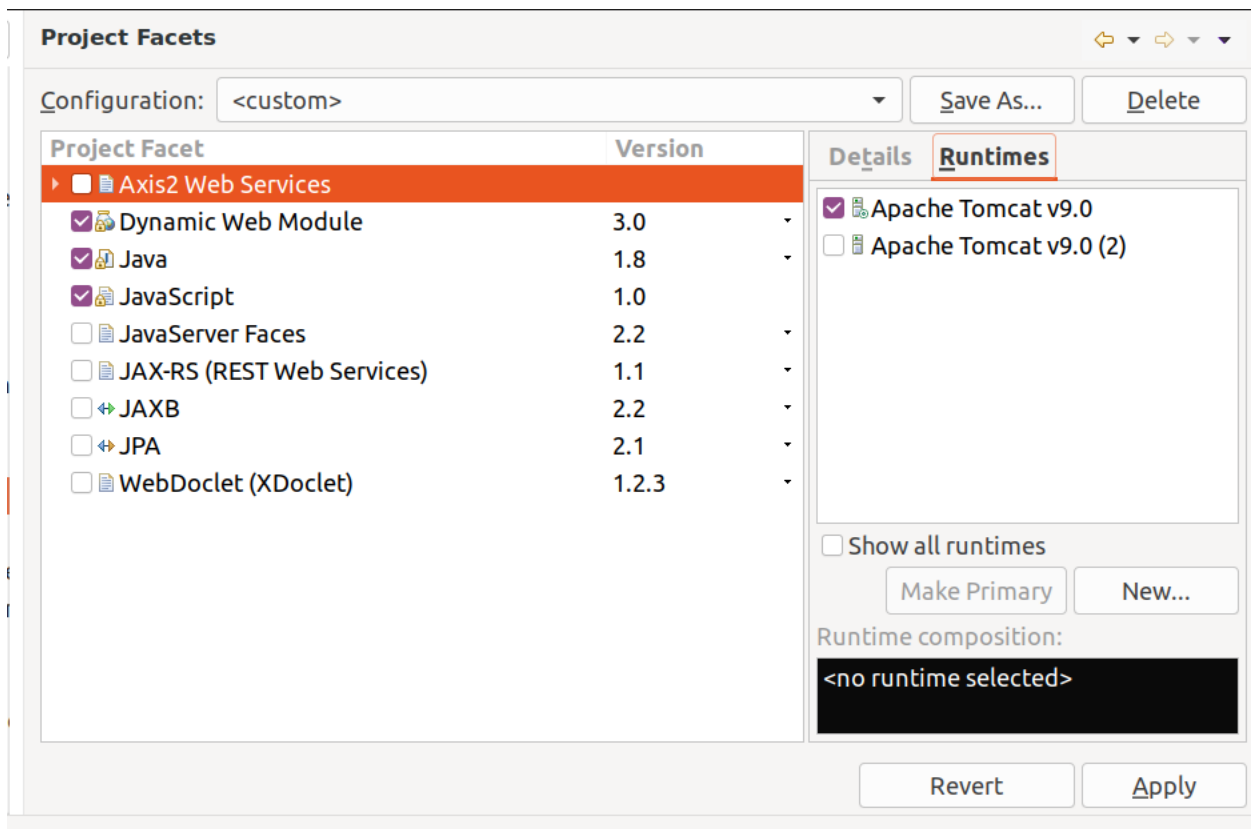
Part A

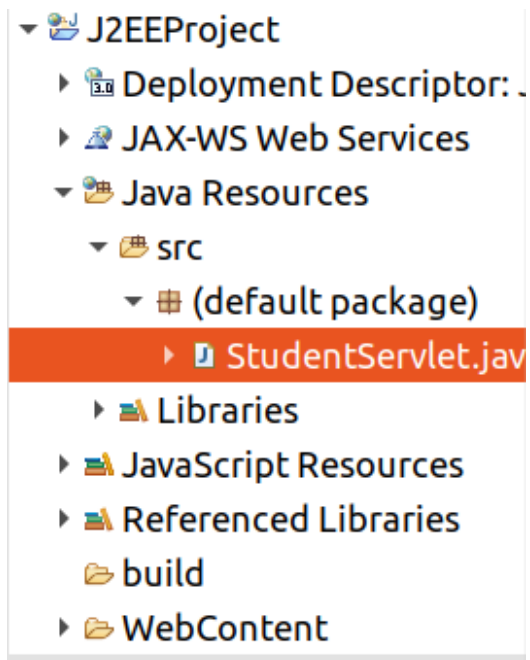
1



2







Project is successfully imported.

2

```
protected void doPost(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException {
    try
    {

        //getting input values from jsp page
        String id = request.getParameter("id");
        String name = request.getParameter("name");
        String dept_name = request.getParameter("dept_name");
        int tot_cred = Integer.parseInt(request.getParameter("tot_cred"));
```

```
        Connection con = null;
        String url = "jdbc:mysql://localhost:3306/university"; //MySQL URL and followed by the database name
        String username = "universityDB0020"; //MySQL username
        String password = "Root@lab4"; //MySQL password
```

```
        Class.forName("com.mysql.jdbc.Driver");
        con = DriverManager.getConnection(url, username, password); //attempting to connect to MySQL database
        System.out.println("Printing connection object "+con);
```

```
        //Prepared Statement to add student data
        PreparedStatement st = con.prepareStatement("insert into student values(?, ?,?,?)");
        st.setString(1,id);
        st.setString(2,name);
```

The screenshot shows an IDE with a project named 'FirstJ2EEProject' and a sub-project 'J2EEProject'. The 'J2EEProject' folder is expanded, showing 'Deployment Descriptor', 'JAX-WS Web Services', 'Java Resources', 'JavaScript Resources', 'Referenced Libraries', 'build', 'lib', 'WebContent', and 'Servers'. The 'WebContent' folder is also expanded. The browser window shows the URL 'http://localhost:8080/J2EEProject/' and displays a form titled 'Student Details'. The form has four input fields: 'Student Id', 'Student Name', 'Student Department', and 'Student Total Credits'. A 'Submit' button is located below the input fields.

Project Explorer: FirstJ2EEProject, J2EEProject, Deployment Descriptors, JAX-WS Web Services, Java Resources, JavaScript Resources, Referenced Libraries, build, lib, WebContent, Servers

StudentServlet.java Student Addition Form

http://localhost:8080/J2EEProject/

Student Details

Student Id:

Student Name:

Student Department:

Student Total Credits:

Markers Properties Servers Data Source Explorer Snippets Console

Tomcat v9.0 Server at localhost [Started, Synchronized]

StudentServlet.java Insert title here

http://localhost:8080/J2EEProject/StudentServlet

Added Student Successfully!!!!

Markers Properties Servers Data Source Explorer Snippets Console

Tomcat v9.0 Server at localhost [Apache Tomcat] /usr/lib/jvm/java-11-openjdk-amd64/bin/java (08-Oct-2021, 10:21:30 PM)

```
Oct 08, 2021 10:21:34 PM org.apache.jasper.servlet.TldScanner scanJars
INFO: At least one JAR was scanned for TLDs yet contained no TLDs. Enable debug logging for this logger for a complete list of
Oct 08, 2021 10:21:34 PM org.apache.jasper.servlet.TldScanner scanJars
INFO: At least one JAR was scanned for TLDs yet contained no TLDs. Enable debug logging for this logger for a complete list of
Oct 08, 2021 10:21:35 PM org.apache.jasper.servlet.TldScanner scanJars
INFO: At least one JAR was scanned for TLDs yet contained no TLDs. Enable debug logging for this logger for a complete list of
Oct 08, 2021 10:21:35 PM org.apache.coyote.AbstractProtocol start
INFO: Starting ProtocolHandler ["http-nio-8080"]
Oct 08, 2021 10:21:35 PM org.apache.catalina.startup.Catalina start
INFO: Server startup in [2098] milliseconds
Loading class `com.mysql.jdbc.Driver'. This is deprecated. The new driver class is `com.mysql.cj.jdbc.Driver'. The driver is au
Printing connection object com.mysql.cj.jdbc.ConnectionImpl@1cbf0087
```

As we can see below, the above inserted student is present in the student table.

<input type="checkbox"/>	 Edit	 Copy	 Delete	34567	student1	Finance	45
--------------------------	--	--	--	-------	----------	---------	----

3

Execution flow:

Firstly, we have a Input.jsp page containing a form. When we enter data and submit the form, it send the data to the StudentServlet.java and there, we make a connection to the database using our credentials, and insert the given data using a PreparedStatement. When the insertion is successful, we redirect to the Output.jsp file which says Added Student Successfully.

Part B

1

```
karthik@karthikubuntu:~$ mysql -u universityDB0020 -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 118
Server version: 8.0.26-0ubuntu0.20.04.2 (Ubuntu)

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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 Library;
Database changed
mysql> create table book(book_id int, title varchar(50), category varchar(20), author varchar(30), primary key(book_id));
Query OK, 0 rows affected (0.09 sec)
```

Query for creating table named book:

```
create table book(book_id int, title varchar(50), category varchar(20),
author varchar(30), primary key(book_id));
```

```
mysql> create table student(student_id int, name varchar(30), dept_name varchar(20), year int, semester int, primary key(student_id));
Query OK, 0 rows affected (0.09 sec)
```

Query for creating table named student:

```
create table student(student_id int, name varchar(50), dept_name varchar(20),
year int, semester int, primary key(student_id));
```

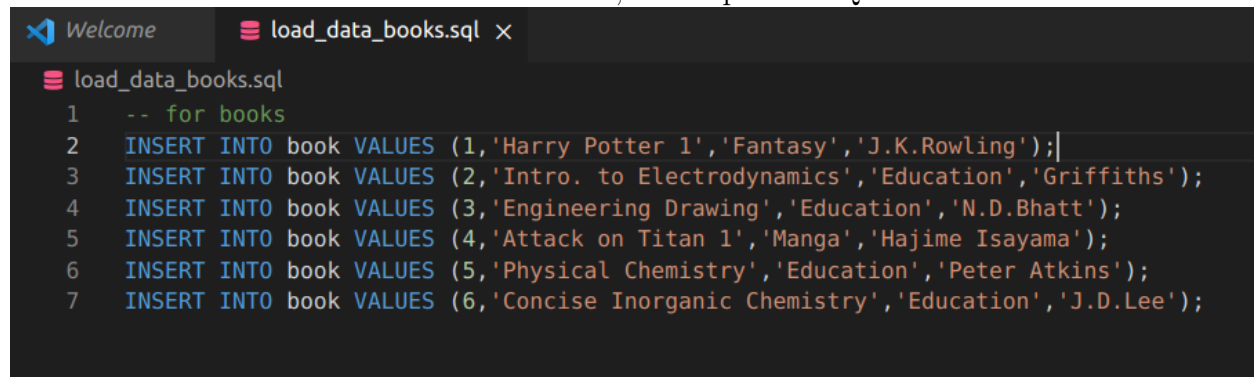
```
mysql> create table issue(student_id int, book_id int, issue_date date, return_date date, primary key(student_id, book_id), foreign key(student_id) references student(student_id), foreign key(book_id) references book(book_id));
Query OK, 0 rows affected (0.07 sec)
```

Query for creating table named issue:

```
create table issue(student_id int, book_id int, issue_date date,  
return_date date, primary_key(student_id, book_id),  
foreign key(student_id) references student(student_id),  
foreign key (book_id) references book(book_id));
```

2

I have submitted the code used to load data, in 3 separate SQL files.



```
load_data_books.sql  
1  -- for books  
2  INSERT INTO book VALUES (1,'Harry Potter 1','Fantasy','J.K.Rowling');  
3  INSERT INTO book VALUES (2,'Intro. to Electrodynamics','Education','Griffiths');  
4  INSERT INTO book VALUES (3,'Engineering Drawing','Education','N.D.Bhatt');  
5  INSERT INTO book VALUES (4,'Attack on Titan 1','Manga','Hajime Isayama');  
6  INSERT INTO book VALUES (5,'Physical Chemistry','Education','Peter Atkins');  
7  INSERT INTO book VALUES (6,'Concise Inorganic Chemistry','Education','J.D.Lee');
```

```
mysql> source load_data_books.sql
Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.00 sec)

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

		book_id	title	category	author
<input type="checkbox"/>	Edit Copy Delete	1	Harry Potter 1	Fantasy	J.K.Rowling
<input type="checkbox"/>	Edit Copy Delete	2	Intro. to Electrodynamics	Education	Griffiths
<input type="checkbox"/>	Edit Copy Delete	3	Engineering Drawing	Education	N.D.Bhatt
<input type="checkbox"/>	Edit Copy Delete	4	Attack on Titan 1	Manga	Hajime Isayama
<input type="checkbox"/>	Edit Copy Delete	5	Physical Chemistry	Education	Peter Atkins
<input type="checkbox"/>	Edit Copy Delete	6	Concise Inorganic Chemistry	Education	J.D.Lee

Welcome
load_data_books.sql
load_data_student.sql x

load_data_student.sql

```

1  -- for student
2  INSERT INTO student VALUES (190020020,'Karthik Kancharla','CS',2021,5);
3  INSERT INTO student VALUES (190010026,'Pranav Nampally','CS',2021,5);
4  INSERT INTO student VALUES (190020018,'J. Pramod Reddy','EE',2021,5);
5  INSERT INTO student VALUES (190030030,'Prajwal Paloju','ME',2021,5);
6  INSERT INTO student VALUES (190010010,'Anand','CS',2021,3);
7  INSERT INTO student VALUES (190010009,'A. Siva Sai','CS',2021,5);

```

```

mysql> source load_data_student.sql
Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.01 sec)

```

	student_id	name	dept_name	year	semester
<input type="checkbox"/> Edit Copy Delete	190010009	A. Siva Sai	CS	2021	5
<input type="checkbox"/> Edit Copy Delete	190010010	Anand	CS	2021	3
<input type="checkbox"/> Edit Copy Delete	190010026	Pranav Nampally	CS	2021	5
<input type="checkbox"/> Edit Copy Delete	190020018	J. Pramod Reddy	EE	2021	5
<input type="checkbox"/> Edit Copy Delete	190020020	Karthik Kancharla	CS	2021	5
<input type="checkbox"/> Edit Copy Delete	190030030	Prajwal Paloju	ME	2021	5

load_data_issue.sql x

load_data_issue.sql

```
1  -- for issuing books
2  INSERT INTO issue VALUES (190020020,1,'2021-09-04','2021-09-09');
3  INSERT INTO issue VALUES (190010026,4,'2021-10-02',NULL);
4  INSERT INTO issue VALUES (190020018,5,'2021-09-04','2021-09-15');
5  INSERT INTO issue VALUES (190020018,1,'2021-09-16','2021-10-01');
6  INSERT INTO issue VALUES (190010010,3,'2021-07-11','2021-07-26');
7  INSERT INTO issue VALUES (190020020,4,'2021-08-18','2021-08-22');
8  INSERT INTO issue VALUES (190030030,6,'2021-08-14',NULL);
9  INSERT INTO issue VALUES (190010026,2,'2020-09-04','2020-09-06');
10 INSERT INTO issue VALUES (190010009,5,'2019-08-04','2020-10-04');
11
```

```
mysql> source load_data_issue.sql
Query OK, 1 row affected (0.09 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)




























Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

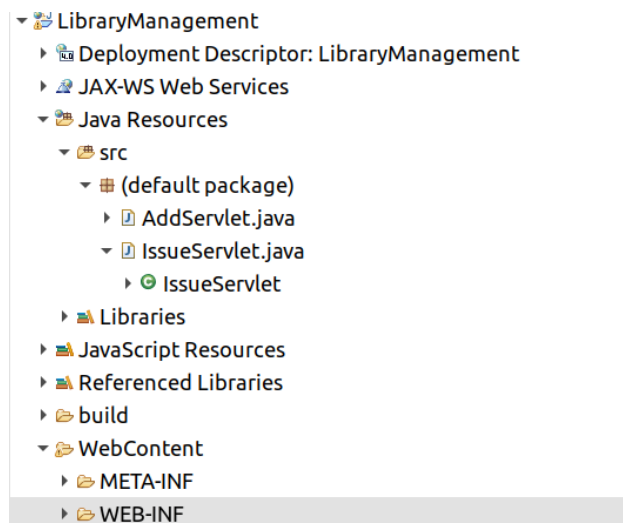
Query OK, 1 row affected (0.00 sec)

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

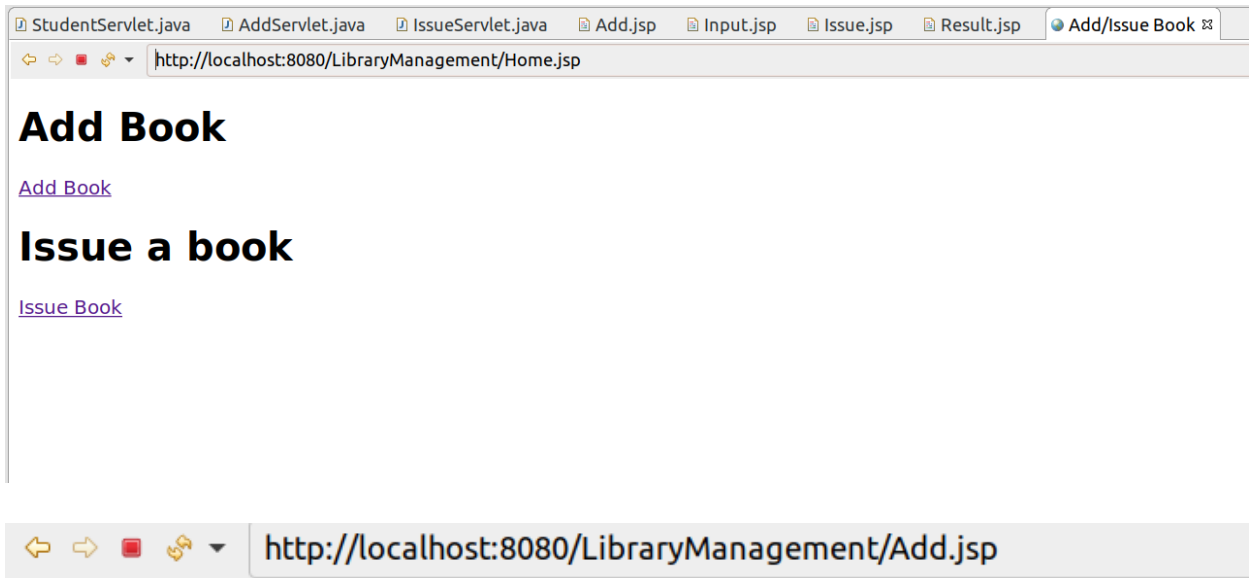
<div><div><div><div></div><div></div><div></div></div></div><div></div></div>				student_id	book_id	issue_date	return_date
<input type="checkbox"/>	 Edit	 Copy	 Delete	190010009	5	2019-08-04	2020-10-04
<input type="checkbox"/>	 Edit	 Copy	 Delete	190010010	3	2021-07-11	2021-07-26
<input type="checkbox"/>	 Edit	 Copy	 Delete	190010026	2	2020-09-04	2020-09-06
<input type="checkbox"/>	 Edit	 Copy	 Delete	190010026	4	2021-10-02	NULL
<input type="checkbox"/>	 Edit	 Copy	 Delete	190020018	1	2021-09-16	2021-10-01
<input type="checkbox"/>	 Edit	 Copy	 Delete	190020018	5	2021-09-04	2021-09-15
<input type="checkbox"/>	 Edit	 Copy	 Delete	190020020	1	2021-09-04	2021-09-09
<input type="checkbox"/>	 Edit	 Copy	 Delete	190020020	4	2021-08-18	2021-08-22
<input type="checkbox"/>	 Edit	 Copy	 Delete	190030030	6	2021-08-14	NULL

3

The Project I created is named LibraryManagement, it's file structure is shown below.



a



StudentServlet.java AddServlet.java IssueServlet.java Add.jsp Input.jsp Issue.jsp Result.jsp Add/Issue Book

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

Add Book

[Add Book](#)

Issue a book

[Issue Book](#)

http://localhost:8080/LibraryManagement/Add.jsp

Book Details

Book Id	<input type="text"/>
Title	<input type="text"/>
Category	<input type="text"/>
Author	<input type="text"/>
<input type="submit" value="Submit"/>	

Book & Student Details

Student ID

Book ID

Issue Date (Enter date in the format YYYY-MM-DD)

b

StudentServlet.java AddServlet.java IssueServlet.java Add.jsp Input.jsp Issue.jsp Result.jsp Add a new book

http://localhost:8080/LibraryManagement/Add.jsp

Book Details

Book Id	<input type="text" value="12"/>
Title	<input type="text" value="abc"/>
Category	<input type="text" value="def"/>
Author	<input type="text" value="Karthik"/>
<input type="button" value="Submit"/>	

StudentServlet.java AddServlet.java IssueServlet.java Add.jsp Input.jsp Issue.jsp Result.jsp Book Addition Successful

http://localhost:8080/LibraryManagement/AddServlet

Book is added Successfully!!!!

✓ Showing rows 0 - 11 (12 total, Query took 0.0003 seconds.)

SELECT * FROM `book`

☐ Show all | Number of rows: 25 | Filter rows: Search this table | Sort by k

+ Options

	book_id	title	category	author
<input type="checkbox"/> Edit Copy Delete	1	Harry Potter 1	Fantasy	J.K.Rowling
<input type="checkbox"/> Edit Copy Delete	2	Intro. to Electrodynamics	Education	Griffiths
<input type="checkbox"/> Edit Copy Delete	3	Engineering Drawing	Education	N.D.Bhatt
<input type="checkbox"/> Edit Copy Delete	4	Attack on Titan 1	Manga	Hajime Isayama
<input type="checkbox"/> Edit Copy Delete	5	Physical Chemistry	Education	Peter Atkins
<input type="checkbox"/> Edit Copy Delete	6	Concise Inorganic Chemistry	Education	J.D.Lee
<input type="checkbox"/> Edit Copy Delete	7	a	b	c
<input type="checkbox"/> Edit Copy Delete	8	a	b	c
<input type="checkbox"/> Edit Copy Delete	9	b	c	d
<input type="checkbox"/> Edit Copy Delete	10	b	c	d
<input type="checkbox"/> Edit Copy Delete	11	a	b	c
<input type="checkbox"/> Edit Copy Delete	12	abc	def	Karthik

↑ ☐ Check all With selected: Edit Copy Delete Export

If the book already exists, then the book won't be inserted and the below message is displayed.

```

Markers Properties Servers Data Source Explorer Snippets Console
Tomcat v9.0 Server at localhost [Apache Tomcat] /usr/lib/jvm/java-11-openjdk-amd64/bin/java (11-Oct-2021, 11:35:31 AM)
Oct 11, 2021 11:35:38 AM org.apache.coyote.AbstractProtocol start
INFO: Starting ProtocolHandler ["http-nio-8080"]
Oct 11, 2021 11:35:38 AM org.apache.catalina.startup.Catalina start
INFO: Server startup in [2999] milliseconds
Loading class `com.mysql.jdbc.Driver'. This is deprecated. The new driver class is `com.mysql.cj.jdbc.Driver'. The driver is
Printing connection object com.mysql.cj.jdbc.ConnectionImpl@7443249e
Book is already present

```

C

The image shows two screenshots of a web browser. The top screenshot displays a form titled "Book & Student Details" with input fields for "Student ID" (190020020), "Book ID" (5), and "Issue Date" (2021-10-10). A button labeled "Issue Book" is visible. The bottom screenshot shows the same browser window after the form is submitted, displaying the message "Book issued Successfully!!!!".

Student ID

Book ID

Issue Date (Enter date in the format YYYY-MM-DD)

Book issued Successfully!!!!

✓ Showing rows 0 - 9 (10 total, Query took 0.0006 seconds.)

SELECT * FROM `issue`

☐ Show all | Number of rows: 25 | Filter rows: Search this table

+ Options

		student_id	book_id	issue_date	return_date
<input type="checkbox"/>	Edit Copy Delete	190010009	5	2019-08-04	2020-10-04
<input type="checkbox"/>	Edit Copy Delete	190010010	3	2021-07-11	2021-07-26
<input type="checkbox"/>	Edit Copy Delete	190010026	2	2020-09-04	2020-09-06
<input type="checkbox"/>	Edit Copy Delete	190010026	4	2021-10-02	NULL
<input type="checkbox"/>	Edit Copy Delete	190020018	1	2021-09-16	2021-10-01
<input type="checkbox"/>	Edit Copy Delete	190020018	5	2021-09-04	2021-09-15
<input type="checkbox"/>	Edit Copy Delete	190020020	1	2021-09-04	2021-09-09
<input type="checkbox"/>	Edit Copy Delete	190020020	4	2021-08-18	2021-08-22
<input type="checkbox"/>	Edit Copy Delete	190020020	5	2021-10-10	NULL
<input type="checkbox"/>	Edit Copy Delete	190030030	6	2021-08-14	NULL

↑ ☐ Check all With selected: Edit Copy Delete Export

If the student doesn't exist, the below message is displayed.

```

Markers Properties Servers Data Source Explorer Snippets Console
Tomcat v9.0 Server at localhost [Apache Tomcat] /usr/lib/jvm/java-11-openjdk-amd64/bin/java (11-Oct-2021, 11:35:31 AM)
    at java.base/java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1128)
    at java.base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628)
    at java.base/java.lang.Thread.run(Thread.java:829)

Loading class `com.mysql.jdbc.Driver'. This is deprecated. The new driver class is `com.mysql.cj.jdbc.Driver'. The driver is e
Printing connection object com.mysql.cj.jdbc.ConnectionImpl@7278520a
Student does not exist

```

Project Implementation:

Overall Idea:

For Part B of the project, we first create a J2EE project named LibraryManagement. Then, we create database named library with 3 tables in it namely book, issue and student.

We add some data into those tables. Finally, we have a home page which has 2 options, to add a book, or issue a book.

On clicking on add a book, you will be redirected to add.jsp file which asks for some info about the book. If the book is not already present, we insert it into the database and show the message Book is added successfully.

On clicking on Issue a book, you will be redirected to issue.jsp file which asks for some info about the book and student. If the student_id is valid, we insert it into the database and display the message Book issued successfully.

Implementation:

We have 2 servlet files, AddServlet.java and IssueServlet.java.

Both of these make connection to the Library database and take the data entered in the form present in Add.jsp or Issue.jsp and based on the condition like book shouldn't be already present or student doesn't exist(This condition is checked by executing sql query in the respective files), it will insert the data present in the form in jsp into the database. After successful insertion, we redirect to the AddResult.jsp or IssueResult.jsp correspondingly and show the success message or we display the error message in the terminal respectively. We have used SQL database for the implementation of the databases. Also, I have set the web.xml file with Home.jsp to load the Home.jsp whenever the server is started.