Page No.
Date

Assignment - III

Title :- Application developement using JDBC & concurrency.

Problem statement :-
Develope an application by using JDBC, multithreading, concurrency, synchrono-us & asynchronous callback, Thread pools using Executor service.

Objective :- 1) To learn database connectiveity.
2) To learn concurrency.

Outcome :- Student should be able to implement
1) All types of JDBC drivers
2) concurrency in their application

S/W & H/W :- Fedora linux, JDK 13/15

Theory :-
Java JDBC is a Java API to connect & execute query with the database. JDBC API uses JDBC drivers to connect with the database.

Steps in JDBC application.

1) Import the package. eg. import java.sql.*

2) Load & register the driver :-

Load - The jdbc driver used for connection should be available in your system.

Register - In jdbc code, we need to register a driver for use. A method forName() is provided for same purpose.

3) Establish a connection to the database:
Create a connection object provide URL username & password.

4) Create statement object from connection:
statement object is used for executing queries on database.

5) Use statement object to execute query :-
If we are fetching data from database then we need to define Resultset object we can also perform other operations like insert, update, delete on database table.

6) Process Result :-
If we are fetching data from database, we can get it from Resultset object we can process this

data as per requirement.

close & terminate the object
eg. rs.close
st.close
con.close

Multi-threading In Java :-

Different phases in Thread lifecycle.
Newborn - New thread is created.
Running - Thread is running on processor core.
Runnable - Thread is waiting for the access of processor core.
Blocked - Thread is suspended
Dead - Execution of thread is stopped

In Java there are two ways of creating threads are two ways of creating threads
i) By Implementing interface runnable.
ii) By extending class thread.

Thread Pool in Java :

Thread pool is a concept in java. It refers to the collection of threads ie. a group of fixed size of threads. A thread is taken from thread pool & task is allocated to it. similarly other threads are taken from thread pool & task are allocated to them. when task is completed thread

is returned to the thread pool. A returned thread in thread pool can be pulled back again & can be allocated a new task.

Suppose there are three threads in a thread pool & five tasks. First thread will be allocated first task. Second thread will be allocated to second task. Third thread will be allocated to third task.

Once the first or second or third thread will be free, ie. completed task. It will return to thread pool & it will be allocated to fourth task.

Again whenever thread gets free will return back to thread pool & will be allocated fifth task.

Advantages of thread pool :-

Threadpool reuses the threads. Thats why it reduces the time for creating new threads. Java thread pool can be used with servelet or JSP.

Algorithm :-

1) Connecting to Database.

```
Connection con = DriverManager.getConnection
                 (path, "uname", "pwd");
Statement st = con.createStatement();
```

2) Fetch data from database

```
Query = " select * from employee where name = ' "
        + name + " ' ";
ResultSet rs = st.executeQuery(Query);
rs.next();
```

3) SignUp user :-

```
Query = " INSERT INTO employe (name, exp, desig,
        email, salary) VALUES ( ' "+name+" ' , " + ex +
        " , ' " + des + " ' , ' " + email + " ' , " + sal + " )";
st.executeUpdate(Query);
```

4) Delete User :-

```
Query = " DELETE FROM employee WHERE name = ' "
        + name + " ' ";
st.execute Update (Query);
s.o.p(" Employee : " + name + " Removed ! ");
```

Test cases :-

	I/P	O/P	Expected O/P	Result
1]	SignUp User			
	name = "Rajat"	User signUp Successful!	—11—	Success
	desig = " Software engg. "			
	exp = 2;			
	email = " rajat@gmail.com "			

2] Create Project

name = "Rajat"

prj-name = "WebApp"

Prj-detail = "develope a webapp"

d = 10

m = 12

y = 2020

project :
WebApp
Created
Successfully!

—||— Success

3] Employee Removed

name = "Rajat"

Employee :
Rajat
Removed

—||— Success.

Conclusion :-

Students should implement JDBC drivers successfully. Also implement use of Multithreading application.