**Practical No:4**

**Remote Object Communication**

**a) Using MySQL create Library database. Create table Book (Book\_id, Book\_name, Book\_author) and retrieve the Book information from Library database using Remote Object Communication concept.**

**Code:-**

**LibraryDbInf.java:-**package libraryManagement;

import java.rmi.Remote;

import java.rmi.RemoteException;

public interface LibraryDbInf extends Remote {

public String getData(String StrQuery) throws RemoteException;}

**LibraryOperations.java:**

package libraryManagement;

import java.rmi.RemoteException;  
import java.rmi.server.UnicastRemoteObject;  
import java.sql.Connection;  
import java.sql.DriverManager;  
import java.sql.ResultSet;  
import java.sql.ResultSetMetaData;  
import java.sql.Statement;  
public class LibraryOperations extends UnicastRemoteObject implements LibraryDbInf {

Connection con;

Statement stmt;

ResultSet rs;

ResultSetMetaData rsmd;

String colStr,resultStr;

private static final long serialVersionUID = 1L;

protected LibraryOperations() throws RemoteException {

super();

colStr="";

resultStr="";

con=null;

stmt=null;

rs=null;  
 rsmd=null;

}

//set Database connection

public void setDbConn()

{

try

{

//protocol //server //portNo //Database

String url="jdbc:mysql://localhost:3306/library";

//loading of driver

Class.forName("com.mysql.cj.jdbc.Driver");

//get connection

con=DriverManager.getConnection(url,"root","");

}catch(Exception e) {

System.out.println(e.getMessage());

}

}

@Override

public String getData(String StrQuery) {

try

{setDbConn();

System.out.println("Database Connected");

//create Statement

stmt=con.createStatement();

rs=stmt.executeQuery(StrQuery);

//getting metadata info about result set;

rsmd=rs.getMetaData();

//getting the columns of table which is stored in rsmd

for(int i=1;i<=rsmd.getColumnCount();i++)

{

System.out.println(i);

colStr=colStr + rsmd.getColumnName(i)+"\t\t\t";

}

//getting all records from result set

while(rs.next())

{

for(int i=1;i<=rsmd.getColumnCount();i++)

{

resultStr=resultStr + rs.getString(i)+ "\t\t";

}

resultStr=resultStr + "\n";

}}

catch(Exception e) {

System.out.println(e.getMessage());

}

return colStr + "\n" +resultStr;

}}

**Library\_Server.java:-**

package libraryManagement;  
import java.rmi.Naming;  
import java.rmi.registry.LocateRegistry;  
public class Library\_Server {

public static void main(String[] args) {

try

{

LibraryDbInf skeleton=new LibraryOperations();

//create registry

LocateRegistry.createRegistry(1902);

Naming.rebind("rmi://localhost:1902/libraryServices", skeleton);

System.out.println("Server Started......");

}catch(Exception e)

{

System.out.println("error from 1st catch"+e.getMessage());

}}}

**Library\_Client.java:-**

**package** libraryManagement;

**import** java.rmi.Naming;

**public** **class** Library\_Client {

**public** **static** **void** main(String[] args) {

String sql="";

**try**

{

LibraryDbInf stub=(LibraryDbInf) Naming.*lookup*("rmi://localhost:1902/libraryServices");

sql="select \* from book";

sql=stub.getData(sql);

System.***out***.println(sql);

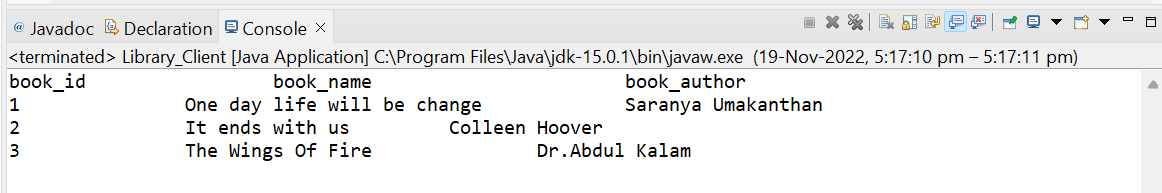
}

**catch** (Exception e) {

System.***out***.println(e.getMessage());

}}}

**Output:-**

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**b) Using MySQL create Electric\_Bill database. Create table Bill (consumer\_name, bill\_due\_date, bill\_amount) and retrieve the bill information from the Electric\_Bill database using Remote Object Communication concept.**

**Code:-**

**ElectricityDbInf.java:-**

package Electricity\_Bill\_Management;

import java.rmi.Remote;

import java.rmi.RemoteException;

public interface ElectricityDbInf extends Remote {

public String getData(String StrQuery) throws RemoteException;

}

**ElectricityDbOperations.java:-**

package Electricity\_Bill\_Management;

import java.rmi.RemoteException;

import java.rmi.server.UnicastRemoteObject;

import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.ResultSet;

import java.sql.ResultSetMetaData;

import java.sql.Statement;

public class ElectrictyDbOperations extends UnicastRemoteObject implements ElectricityDbInf {

Connection con;

Statement stmt;

ResultSet rs;

ResultSetMetaData rsmd;

String colStr,resultStr;

private static final long serialVersionUID = 1L;

protected ElectrictyDbOperations() throws RemoteException {

super();

colStr="";

resultStr="";

con=null;

stmt=null;

rs=null;

rsmd=null;

}

public void setDbConn()

{

try

{

//protocol //server //portNo //Database

String url="jdbc:mysql://localhost:3306/electric\_bill";

//loading of driver

Class.forName("com.mysql.cj.jdbc.Driver")

//get connection

con=DriverManager.getConnection(url,"root","");

}catch(Exception e) {

System.out.println(e.getMessage());

}

}

@Override

public String getData(String StrQuery) throws RemoteException {

try

{

setDbConn();

System.out.println("Database Connected");

//create Statement

stmt=con.createStatement();

rs=stmt.executeQuery(StrQuery);

//getting metadata info about result set;

rsmd=rs.getMetaData();

//getting the columns of table which is stored in rsmd

for(int i=1;i<=rsmd.getColumnCount();i++)

{

System.out.println(i);

colStr=colStr + rsmd.getColumnName(i)+"\t";

}

//getting all records from result set

while(rs.next())

{

for(int i=1;i<=rsmd.getColumnCount();i++)

{

resultStr=resultStr + rs.getString(i)+ "\t\t";

}

resultStr=resultStr + "\n";

}

}

catch(Exception e) {

System.out.println(e.getMessage());

}

return colStr + "\n" +resultStr;

}

}

**Electricity\_Server.java:-**

package Electricity\_Bill\_Management;

import java.rmi.Naming;

import java.rmi.registry.LocateRegistry;

public class Electricity\_Server {

public static void main(String[] args) {

try

{

ElectricityDbInf skeleton=new ElectrictyDbOperations()

//create registry

LocateRegistry.createRegistry(1904);

Naming.rebind("rmi://localhost:1904/electricityServices", skeleton);

System.out.println("Server Started......");

}

catch(Exception e)

{

System.out.println("error from 1st catch"+e.getMessage());

}

}

}

**Electricity\_Client.java:-**

package Electricity\_Bill\_Management;

import java.rmi.Naming;

public class Electricity\_Client {

public static void main(String[] args) {

String sql="";

try

{

ElectricityDbInf stub=(ElectricityDbInf) Naming.lookup("rmi://localhost:1904/electricityServices");

sql="select \* from bill";

sql=stub.getData(sql);

System.out.println(sql);

}

catch (Exception e) {

System.out.println(e.getMessage());

}

}

}

**Output:-**

