Replicated Databases

Source Code:

```
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.SQLException;
import java.sql.Statement;
import java.sql.ResultSet;
import java.util.Properties;
import java.util.ArrayList;
import java.util.concurrent.Semaphore;


public class JdbcMTSample extends Thread
{
   // Set default number of threads to 10
   private static int NUM_OF_THREADS = 10;

   int m_myId;

   static     int c_nextId = 1;
   static  Connection s_conn = null;
   static Semaphore semaphore = new Semaphore(1);

   synchronized static int getNextId()
   {
      return c_nextId++;
   }

   public static void main (String args [])
   {
      try
      {
         // Load the JDBC driver //
         DriverManager.registerDriver
                 (new oracle.jdbc.driver.OracleDriver());
          Class.forName("oracle.jdbc.OracleDriver");
         // If NoOfThreads is specified, then read it
         if (args.length > 1) {
            System.out.println("Error: Invalid Syntax. ");
```

```
            System.out.println("java JdbcMTSample [NoOfThreads]");
            System.exit(0);
        }
        else if (args.length == 1)

            NUM_OF_THREADS = Integer.parseInt (args[0]);

        // Create the threads
        Thread[] threadList = new Thread[NUM_OF_THREADS];

        // spawn threads
        for (int i = 0; i < NUM_OF_THREADS; i++)
        {
            threadList[i] = new JdbcMTSample();
            threadList[i].start();
        }

        // wait for all threads to end
        for (int i = 0; i < NUM_OF_THREADS; i++)
        {
                threadList[i].join();
        }

     }
     catch (Exception e)
     {
        e.printStackTrace();
     }
  }

  public JdbcMTSample()
  {
     super();
     // Assign an ID to the thread
     m_myId = getNextId();
  }

public void run()
{
    Connection conn1 = null;
    Connection conn2 = null;

    ResultSet     rs   = null;
```

```
    ResultSet     rs0   = null;

    Statement  stmt = null;
    Statement  stmt0 = null;

    ArrayList<String> lastitem = new ArrayList<String>();



    try
    {
       semaphore.acquire(); // providing mutual exclusion
         // Get the connection
    String dbURL1 = "jdbc:oracle:thin:system/oracle@192.168.56.101:1521:orclcdb";
    String dbURL2 = "jdbc:oracle:thin:fabedin/04118552@oracle.scs.ryerson.ca:1521:orcl";

                            conn1 = DriverManager.getConnection(dbURL1);
    conn2 = DriverManager.getConnection(dbURL2);

                            if (conn1 != null) {
                                    System.out.println("Connected with connection #1");
                                    conn1.setAutoCommit(false);
                            }
                            else{
                                    System.out.println("Connection Failed with connection #1");
                                    //transaction = false;
                            }

    if (conn2 != null) {
                                    System.out.println("Connected with connection #2");
                                    conn1.setAutoCommit(false);
                            }
                            else{
                                    System.out.println("Connection Failed with connection #2");
                                    //transaction = false;
                            }

         //String nameToInsert = "test" + m_myId % 5 ; // generates not unique names
        String nameToInsert = "test12";
        String nameToDelete = "test2";

         // You need to create a table called TESTJ with one string attributes call Name  by
SqlDeveloper in Site1
```

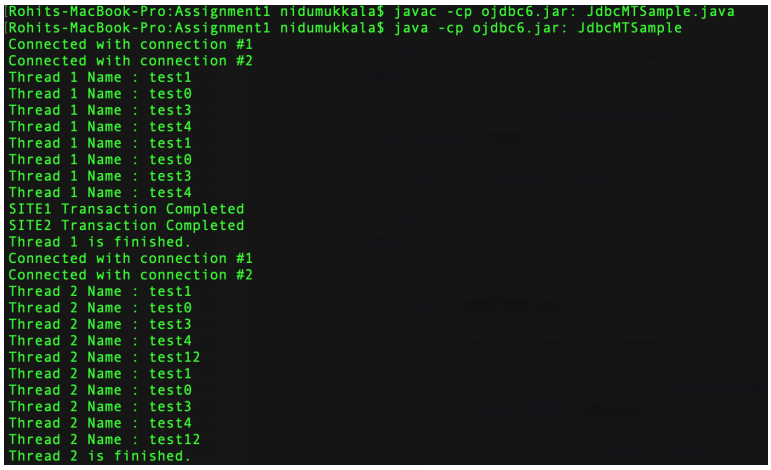
```
// check starts from here
            stmt = conn1.createStatement ();
    stmt0 = conn2.createStatement ();

         // Execute the Query
          rs = stmt.executeQuery ("SELECT * FROM TESTJ");
          rs0 = stmt0.executeQuery ("SELECT * FROM TESTJ");
         // Loop through the results
          while (rs.next()){
             System.out.println("Thread " + m_myId +
                          " Name : " + rs.getString("Name"));
                       lastitem.add(rs.getString("Name"));
                       }

          while (rs0.next()){
             System.out.println("Thread " + m_myId +
                          " Name : " + rs0.getString("Name"));
                        lastitem.add(rs0.getString("Name"));
                         }
          // Close all the resources
          rs.close();
          rs0.close();
          stmt.close();
          stmt0.close();
// check ends here

          // Create a Statement

                if (!lastitem.contains(nameToInsert))
             {
                          String insert = "INSERT into TESTJ VALUES('"+ nameToInsert +"')";

                                  try (Statement stmt1 = conn1.createStatement()) {
                                          stmt1.executeQuery(insert);
                                  } catch (SQLException e) {
                                          System.out.println(e.getErrorCode());
                                  }
                                  System.out.println("SITE1 Transaction Completed");
                                  conn1.commit();

       try (Statement stmt3 = conn2.createStatement()) {
         stmt3.executeQuery(insert);
```

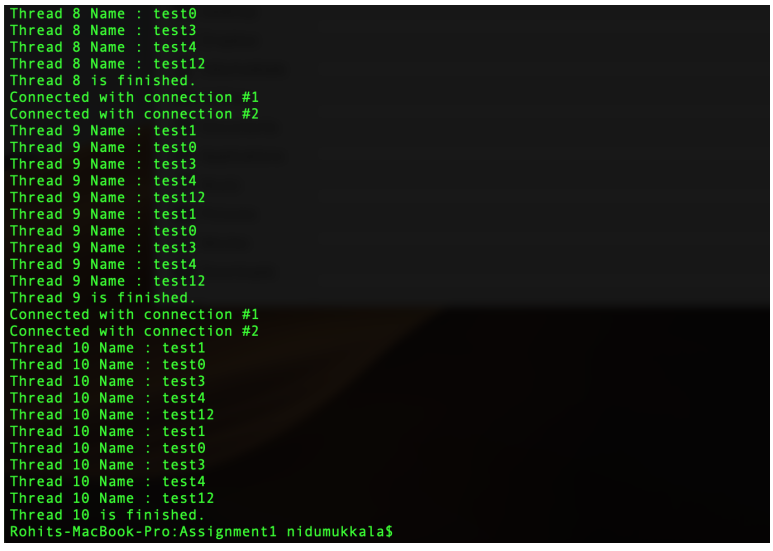
```
    } catch (SQLException e) {
      System.out.println(e.getErrorCode());
    }
    System.out.println("SITE2 Transaction Completed");
    conn2.commit();
          }

if (lastitem.contains(nameToDelete))
              {
      String delete = "DELETE FROM TESTJ WHERE Name = " + "'" + nameToDelete + "'";

                try (Statement stmt2 = conn1.createStatement()) {
                  stmt2.executeQuery(delete);
                } catch (SQLException e) {
                  System.out.println(e.getErrorCode());
                }
                System.out.println("SITE1 Transaction Completed");
                conn1.commit();

                try (Statement stmt4 = conn2.createStatement()) {
                  stmt4.executeQuery(delete);
                } catch (SQLException e) {
                  System.out.println(e.getErrorCode());
                }
                System.out.println("SITE2 Transaction Completed");
                conn2.commit();

                      }

       if (conn1 != null)
          conn1.close();

       if (conn2 != null)
          conn2.close();

       System.out.println("Thread " + m_myId +  " is finished. ");
  }

   catch (Exception e)
   {
      System.out.println("Thread " + m_myId + " got Exception: " + e);
      e.printStackTrace();
      return;
```

```
    }
    semaphore.release();
  }

}
```

Screenshots:

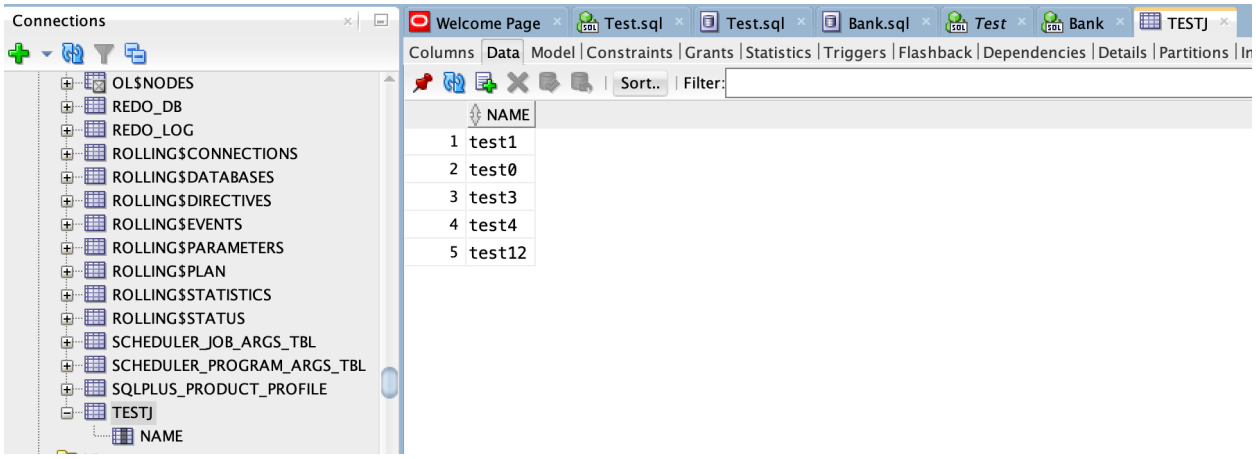
Terminal:





SQLDeveloper:

TESTJ table on Oracle VM



TESTJ table on Ryerson Database: