# JDBC:

1. JDBC stands for Java Database Connectivity.
2. It is used for connecting a Java program to some database.
3. JDBC is a Java API to connect and execute the query with the database.
4. It is a part of Java SE (Java Standard Edition).
5. The PreparedStatement interface is a sub-interface of Statement.
6. It is used to execute parameterized query.

Q1. **Why use PreparedStatement?**

Ans : **Improves performance:** The performance of the application will be

faster if you use PreparedStatement interface

because query is compiled only once.

# Java Database Connectivity with 5 Steps

There are 5 steps to connect any java application with the database using JDBC.

These steps are as follows:

Step – 1: Register the Driver class

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

Step – 2: Create connection

        String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

Step – 3: PreparedStatementInterface Object

        String s1 **=** ""**;**

        PreparedStatement pr **=** con**.**prepareStatement**(**s1**);**

Step – 4: Execute queries

        pr**.**executeUpdate**();**

Step – 5: Close connection

        con**.**close**();**

1. Create Database JDBC\_Demo;

2. Use JDBC\_Demo;

**import** java**.**sql**.\*;**

class Q01\_Prepared\_Statement\_All\_Steps

**{**

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

**{**

        // 01

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

        // 02

        String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

        // 03

        String s1 **=** "CREATE TABLE Statement\_Table\_1( id int(10), Name varchar(20), Contact int(15), Address varchar(20) );"**;**

        PreparedStatement pr **=** con**.**prepareStatement**(**"CREATE TABLE Statement\_Table\_1( id int(10), Name varchar(20), Contact int(15), Address varchar(20) );"**);**

        // 04

        pr**.**executeUpdate**();**

        // 05

        con**.**close**();**

**}**

**}**

error: unreported exception ClassNotFoundException; must be caught or declared to be thrown

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

                 ^

error: unreported exception SQLException; must be caught or declared to be thrown

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

                                                ^

error: unreported exception SQLException; must be caught or declared to be thrown

    PreparedStatement pr = con.prepareStatement("CREATE TABLE Statement\_Table\_1( id int(10), Name varchar(20), Contact int(15), Address varchar(20) );");

                                                ^

error: unreported exception SQLException; must be caught or declared to be thrown

    pr.executeUpdate();

                    ^

error: unreported exception SQLException; must be caught or declared to be thrown

    con.close();

             ^

**import** java**.**sql**.\*;**

class Q02\_Prepared\_Statement\_ClassPath\_And\_Create\_Table

**{**

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

**{**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String create\_Table **=** "CREATE TABLE Prepared\_Table( id int(10), Name varchar(20), Contact int(15), Address varchar(20) );"**;**

            PreparedStatement pr **=** con**.**prepareStatement**(**create\_Table**);**

            // 04

            pr**.**executeUpdate**();**

            // 05

            con**.**close**();**

            System**.**out**.**println**(**"Table Created Succesfully"**);**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

Before Class Path :

    java.lang.ClassNotFoundException: com.mysql.cj.jdbc.Driver

Because there no Class Path Added.

Set Class Path  :  D:\2\_All\_Code\17\_JDBC\mysql-connector-java-8.0.29.jar;.;%classpath%

After Set Class Path :

Table Created Succesfully

**import** java**.**sql**.\*;**

class Q03\_Prepared\_Statement\_Insert\_Data\_Manaully

**{**

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

**{**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String insert **=** "Insert into Prepared\_Table Values (1, 'Aman', 9876543, 'Harda');"**;**

            PreparedStatement pr **=** con**.**prepareStatement**(**insert**);**

            // 04

            int rows **=** pr**.**executeUpdate**();**

            // 05

            con**.**close**();**

            System**.**out**.**println**(**"Query OK, " **+** rows **+** " rows affected."**);**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

Query OK, 1 rows affected.

**import** java**.**sql**.\*;**

class Q04\_Prepared\_Statement\_Insert\_Data\_Multiple\_Data

**{**

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

**{**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String insert1 **=** "Insert into Prepared\_Table values (2, 'Bhanu', 7894563, 'Harda');"**;**

            String insert2 **=** "Insert into Prepared\_Table values (3, 'Chandu', 4569871, 'Harda');"**;**

            String insert3 **=** "Insert into Prepared\_Table values (4, 'Deepak', 1234568, 'Harda');"**;**

            String insert4 **=** "Insert into Prepared\_Table values (5, 'Eshan', 1478523, 'Harda');"**;**

            PreparedStatement pr1 **=** con**.**prepareStatement**(**insert1**);**

            PreparedStatement pr2 **=** con**.**prepareStatement**(**insert2**);**

            PreparedStatement pr3 **=** con**.**prepareStatement**(**insert3**);**

            PreparedStatement pr4 **=** con**.**prepareStatement**(**insert4**);**

            // 04

            int rows **=** pr1**.**executeUpdate**();**

            rows **+=** pr2**.**executeUpdate**();**

            rows **+=** pr3**.**executeUpdate**();**

            rows **+=** pr4**.**executeUpdate**();**

            // 05

            con**.**close**();**

            System**.**out**.**println**(**"Query OK, " **+** rows **+** " rows affected."**);**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

Query OK, 4 rows affected.

mysql> select \* from prepared\_Table;

+------+--------+---------+---------+

| id   | Name   | Contact | Address |

+------+--------+---------+---------+

|    1 | Aman   | 9876543 | Harda   |

|    2 | Bhanu  | 7894563 | Harda   |

|    3 | Chandu | 4569871 | Harda   |

|    4 | Deepak | 1234568 | Harda   |

|    5 | Eshan  | 1478523 | Harda   |

+------+--------+---------+---------+

**import** java**.**sql**.\*;**

**import** java**.**util**.\*;**

class Q05\_Prepared\_Statement\_Insert\_Parameter

**{**

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

**{**

        Scanner sc **=** **new** Scanner**(**System**.**in**);**

        System**.**out**.**print**(**"Enter Id : "**);**

        int id **=** sc**.**nextInt**();**

        System**.**out**.**print**(**"Enter Name : "**);**

        String name **=** sc**.**next**();**

        System**.**out**.**print**(**"Enter Contact : "**);**

        int contact **=** sc**.**nextInt**();**

        System**.**out**.**print**(**"Enter Address : "**);**

        String address **=** sc**.**next**();**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String insert1 **=** "Insert into Prepared\_Table values(?, ?, ?, ?); "**;**

            PreparedStatement pr1 **=** con**.**prepareStatement**(**insert1**);**

            // 04

            pr1**.**setInt**(**1**,** id**);**

            pr1**.**setString**(**2**,** name**);**

            pr1**.**setInt**(**3**,** contact**);**

            pr1**.**setString**(**4**,** address**);**

            int rows **=** pr1**.**executeUpdate**();**

            System**.**out**.**println**(**"Query OK, " **+** rows **+** " rows affected."**);**

            // 05

            con**.**close**();**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

Enter Id : 6

Enter Name : Faruk

Enter Contact : 798782

Enter Address : Harda

Query OK, 1 rows affected.

mysql> select \* from prepared\_Table;

+------+--------+---------+---------+

| id   | Name   | Contact | Address |

+------+--------+---------+---------+

|    1 | Aman   | 9876543 | Harda   |

|    1 | Aman   | 9876543 | Harda   |

|    2 | Bhanu  | 7894563 | Harda   |

|    3 | Chandu | 4569871 | Harda   |

|    4 | Deepak | 1234568 | Harda   |

|    5 | Eshan  | 1478523 | Harda   |

|    6 | Faruk  |  798782 | Harda   |

+------+--------+---------+---------+

**import** java**.**sql**.\*;**

**import** java**.**util**.\*;**

class Q06\_Prepared\_Statement\_Update\_Data\_Parameter

**{**

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

**{**

        Scanner sc **=** **new** Scanner**(**System**.**in**);**

        System**.**out**.**print**(**"Enter Id Which Do you want to Update : "**);**

        int update\_Row **=** sc**.**nextInt**();**

        System**.**out**.**print**(**"Enter Id : "**);**

        int id **=** sc**.**nextInt**();**

        System**.**out**.**print**(**"Enter Name : "**);**

        String name **=** sc**.**next**();**

        System**.**out**.**print**(**"Enter Contact : "**);**

        int contact **=** sc**.**nextInt**();**

        System**.**out**.**print**(**"Enter Address : "**);**

        String address **=** sc**.**next**();**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String update1 **=** "Update Prepared\_Table Set id=?, name=?, contact=?, Address=?  WHERE id = ?"**;**

            PreparedStatement pr1 **=** con**.**prepareStatement**(** update1 **);**

            // 04

            pr1**.**setInt**(**1**,** id**);**

            pr1**.**setString**(**2**,** name**);**

            pr1**.**setInt**(**3**,** contact**);**

            pr1**.**setString**(**4**,** address**);**

            pr1**.**setInt**(**5**,** update\_Row**);**

            int rows **=** pr1**.**executeUpdate**();**

            System**.**out**.**println**(**"Query OK, " **+** rows **+** " rows affected."**);**

            // 05

            con**.**close**();**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

Enter Id Which Do you want to Update : 6

Enter Id : 100

Enter Name : ABCD

Enter Contact : 8521478

Enter Address : Harda

Query OK, 1 rows affected.

Before mysql> select \* from prepared\_Table;

+------+--------+---------+---------+

| id   | Name   | Contact | Address |

+------+--------+---------+---------+

|    1 | Aman   | 9876543 | Harda   |

|    1 | Aman   | 9876543 | Harda   |

|    2 | Bhanu  | 7894563 | Harda   |

|    3 | Chandu | 4569871 | Harda   |

|    4 | Deepak | 1234568 | Harda   |

|    5 | Eshan  | 1478523 | Harda   |

|    6 | Faruk  |  798782 | Harda   |

+------+--------+---------+---------+

After mysql> select \* from prepared\_Table;

+------+--------+---------+---------+

| id   | Name   | Contact | Address |

+------+--------+---------+---------+

|    1 | Aman   | 9876543 | Harda   |

|    1 | Aman   | 9876543 | Harda   |

|    2 | Bhanu  | 7894563 | Harda   |

|    3 | Chandu | 4569871 | Harda   |

|    4 | Deepak | 1234568 | Harda   |

|    5 | Eshan  | 1478523 | Harda   |

|  100 | ABCD   | 8521478 | Harda   |

+------+--------+---------+---------+

**import** java**.**sql**.\*;**

**import** java**.**util**.\*;**

class Q07\_Prepared\_Statement\_Delete\_With\_Parameter

**{**

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

**{**

        Scanner sc **=** **new** Scanner**(**System**.**in**);**

        System**.**out**.**print**(**"Enter Id Which Do you want to Delete : "**);**

        int delete\_Row **=** sc**.**nextInt**();**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String delete **=** "Delete from Prepared\_Table WHERE id = ?"**;**

            PreparedStatement pr1 **=** con**.**prepareStatement**(** delete **);**

            // 04

            pr1**.**setInt**(**1**,** delete\_Row**);**

            int rows **=** pr1**.**executeUpdate**();**

            System**.**out**.**println**(**"Query OK, " **+** rows **+** " rows affected."**);**

            // 05

            con**.**close**();**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

Enter Id Which Do you want to Delete : 100

Query OK, 1 rows affected.

Before

mysql> select \* from prepared\_Table;

+------+--------+---------+---------+

| id   | Name   | Contact | Address |

+------+--------+---------+---------+

|    1 | Aman   | 9876543 | Harda   |

|    1 | Aman   | 9876543 | Harda   |

|    2 | Bhanu  | 7894563 | Harda   |

|    3 | Chandu | 4569871 | Harda   |

|    4 | Deepak | 1234568 | Harda   |

|    5 | Eshan  | 1478523 | Harda   |

|  100 | ABCD   | 8521478 | Harda   |

+------+--------+---------+---------+

After

mysql> select \* from prepared\_Table;

+------+--------+---------+---------+

| id   | Name   | Contact | Address |

+------+--------+---------+---------+

|    1 | Aman   | 9876543 | Harda   |

|    1 | Aman   | 9876543 | Harda   |

|    2 | Bhanu  | 7894563 | Harda   |

|    3 | Chandu | 4569871 | Harda   |

|    4 | Deepak | 1234568 | Harda   |

|    5 | Eshan  | 1478523 | Harda   |

+------+--------+---------+---------+

**import** java**.**sql**.\*;**

**import** java**.**util**.\*;**

class Q08\_Prepared\_Statement\_Delete\_All\_With\_Parameter

**{**

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

**{**

        Scanner sc **=** **new** Scanner**(**System**.**in**);**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String delete **=** "Delete from Prepared\_Table"**;**

            PreparedStatement pr1 **=** con**.**prepareStatement**(** delete **);**

            // 04

            int rows **=** pr1**.**executeUpdate**();**

            System**.**out**.**println**(**"Query OK, " **+** rows **+** " rows affected."**);**

            // 05

            con**.**close**();**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

Query OK, 6 rows affected.

Before

mysql> select \* from prepared\_Table;

+------+--------+---------+---------+

| id   | Name   | Contact | Address |

+------+--------+---------+---------+

|    1 | Aman   | 9876543 | Harda   |

|    1 | Aman   | 9876543 | Harda   |

|    2 | Bhanu  | 7894563 | Harda   |

|    3 | Chandu | 4569871 | Harda   |

|    4 | Deepak | 1234568 | Harda   |

|    5 | Eshan  | 1478523 | Harda   |

+------+--------+---------+---------+

After

mysql> select \* from prepared\_Table;

Empty set (0.00 sec)

**import** java**.**sql**.\*;**

**import** java**.**util**.\*;**

class Q09\_Prepared\_Statement\_ResultSet

**{**

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

**{**

        Scanner sc **=** **new** Scanner**(**System**.**in**);**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String display\_All **=** "SELECT \* FROM Prepared\_Table"**;**

            PreparedStatement pr **=** con**.**prepareStatement**(** display\_All **);**

            // 04

            ResultSet rs **=** pr**.**executeQuery**();**

            // rs.next();

            System**.**out**.**println**(**rs**.**getString**(**"id"**)** **+** " , " **+** rs**.**getString**(**"Name"**)** **+** " , " **+** rs**.**getString**(**3**)** **+**" , " **+** rs**.**getString**(**4**)** **);**

            // 05

            con**.**close**();**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

With  :  rs.next();

1 , Aman , 9876543 , Harda

Without  :  rs.next();

java.sql.SQLException: Before start of result set

**import** java**.**sql**.\*;**

**import** java**.**util**.\*;**

class Q10\_Prepared\_Statement\_getInt\_getString

**{**

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

**{**

        Scanner sc **=** **new** Scanner**(**System**.**in**);**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String display\_All **=** "SELECT \* FROM Prepared\_Table"**;**

            PreparedStatement pr **=** con**.**prepareStatement**(** display\_All **);**

            // 04

            ResultSet rs **=** pr**.**executeQuery**();**

            rs**.**next**();**

            System**.**out**.**println**(**rs**.**getString**(**"id"**)** **+** " , " **+** rs**.**getString**(**"Name"**)** **+** " , " **+** rs**.**getString**(**3**)** **+**" , " **+** rs**.**getString**(**4**)** **);**

            rs**.**next**();**

            System**.**out**.**println**(**rs**.**getString**(**"id"**)** **+** " , " **+** rs**.**getString**(**"Name"**)** **+** " , " **+** rs**.**getString**(**3**)** **+**" , " **+** rs**.**getString**(**4**)** **);**

            rs**.**next**();**

            System**.**out**.**println**(**rs**.**getString**(**"id"**)** **+** " , " **+** rs**.**getString**(**"Name"**)** **+** " , " **+** rs**.**getString**(**3**)** **+**" , " **+** rs**.**getString**(**4**)** **);**

            rs**.**next**();**

            System**.**out**.**println**(**rs**.**getString**(**"id"**)** **+** " , " **+** rs**.**getString**(**"Name"**)** **+** " , " **+** rs**.**getString**(**3**)** **+**" , " **+** rs**.**getString**(**4**)** **);**

            // 05

            con**.**close**();**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

With  :  rs.next();

1 , Aman , 9876543 , Harda

2 , Bhanu , 7894563 , Harda

3 , Chandu , 4569871 , Harda

4 , Deepak , 1234568 , Harda

Without  :  rs.next();

java.sql.SQLException: Before start of result set

**import** java**.**sql**.\*;**

**import** java**.**util**.\*;**

class Q11\_Prepared\_Statement\_next

**{**

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

**{**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String display\_All **=** "SELECT \* FROM Prepared\_Table"**;**

            PreparedStatement pr **=** con**.**prepareStatement**(** display\_All **);**

            // 04

            ResultSet rs **=** pr**.**executeQuery**();**

**while(** rs**.**next**()** **)**

**{**

                System**.**out**.**println**(**rs**.**getString**(**"id"**)** **+** " , " **+** rs**.**getString**(**"Name"**)** **+** " , " **+** rs**.**getString**(**3**)** **+**" , " **+** rs**.**getString**(**4**)** **);**

**}**

            // 05

            con**.**close**();**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

With  :  rs.next();

1 , Aman , 9876543 , Harda

2 , Bhanu , 7894563 , Harda

3 , Chandu , 4569871 , Harda

4 , Deepak , 1234568 , Harda

5 , Eshan , 1478523 , Harda

Previous  And TYPE\_FORWARD\_ONLY

**import** java**.**sql**.\*;**

**import** java**.**util**.\*;**

class Q12\_Prepared\_Statement\_previous\_TYPE\_FORWARD\_ONLY

**{**

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

**{**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String display\_All **=** "SELECT \* FROM Prepared\_Table"**;**

            // PreparedStatement pr = con.prepareStatement( display\_All );

            PreparedStatement pr **=** con**.**prepareStatement**(** display\_All **,**  ResultSet**.**TYPE\_SCROLL\_SENSITIVE**,** ResultSet**.**CONCUR\_READ\_ONLY**);**

            // 04

            ResultSet rs **=** pr**.**executeQuery**();**

**while(** rs**.**next**()** **){}**

**while(** rs**.**previous**()** **)**

                System**.**out**.**println**(**rs**.**getString**(**"id"**)** **+** " , " **+** rs**.**getString**(**"Name"**)** **+** " , " **+** rs**.**getString**(**3**)** **+**" , " **+** rs**.**getString**(**4**)** **);**

            // 05

            con**.**close**();**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

PreparedStatement pr = con.prepareStatement( display\_All );

java.sql.SQLException: Operation not allowed for a result set of type ResultSet.TYPE\_FORWARD\_ONLY.

PreparedStatement pr = con.prepareStatement( display\_All ,  ResultSet.TYPE\_SCROLL\_SENSITIVE, ResultSet.CONCUR\_READ\_ONLY);

5 , Eshan , 1478523 , Harda

4 , Deepak , 1234568 , Harda

3 , Chandu , 4569871 , Harda

2 , Bhanu , 7894563 , Harda

1 , Aman , 9876543 , Harda

ResultSet Categories :-

1. TYPE\_FORWARD\_ONLY     :- Cursor can Moved Only Forward Direction.

2. TYPE\_SCROLL\_SENSITIVE :- Cursor can Moved Only Forward and Backward Direction. (Both)

3. CONCUR\_READ\_ONLY      :- Only Read the Data From ResultSet ( Getter Method).

4. CONCUR\_UPDATEABEL     :- it can insert, update, delete, create (All) Using ResultSet.

**import** java**.**sql**.\*;**

**import** java**.**util**.\*;**

class Q13\_Prepared\_Statement\_first

**{**

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

**{**

        Scanner sc **=** **new** Scanner**(**System**.**in**);**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String display\_All **=** "SELECT \* FROM Prepared\_Table"**;**

            // PreparedStatement pr = con.prepareStatement( delete );

            PreparedStatement pr **=** con**.**prepareStatement**(** display\_All **,**  ResultSet**.**TYPE\_SCROLL\_SENSITIVE**,** ResultSet**.**CONCUR\_READ\_ONLY**);**

            // 04

            ResultSet rs **=** pr**.**executeQuery**();**

**while(** rs**.**next**()** **){}**   // Reach To Last

            rs**.**first**();**      // Reach To First

**while(** rs**.**next**()** **)**

**{**

                System**.**out**.**println**(**rs**.**getString**(**"id"**)** **+** " , " **+** rs**.**getString**(**"Name"**)** **+** " , " **+** rs**.**getString**(**3**)** **+**" , " **+** rs**.**getString**(**4**)** **);**

**}**

            // 05

            con**.**close**();**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

PreparedStatement pr = con.prepareStatement( delete );

java.sql.SQLException: Operation not allowed for a result set of type ResultSet.TYPE\_FORWARD\_ONLY.

PreparedStatement pr = con.prepareStatement( delete ,  ResultSet.TYPE\_SCROLL\_SENSITIVE, ResultSet.CONCUR\_READ\_ONLY);

2 , Bhanu , 7894563 , Harda

3 , Chandu , 4569871 , Harda

4 , Deepak , 1234568 , Harda

5 , Eshan , 1478523 , Harda

**import** java**.**sql**.\*;**

**import** java**.**util**.\*;**

class Q14\_Prepared\_Statement\_beforeFirst

**{**

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

**{**

        Scanner sc **=** **new** Scanner**(**System**.**in**);**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String display\_All **=** "SELECT \* FROM Prepared\_Table"**;**

            PreparedStatement pr **=** con**.**prepareStatement**(** display\_All **);**

            // PreparedStatement pr = con.prepareStatement( display\_All ,  ResultSet.TYPE\_SCROLL\_SENSITIVE, ResultSet.CONCUR\_READ\_ONLY);

            // 04

            ResultSet rs **=** pr**.**executeQuery**();**

**while(** rs**.**next**()** **){}**   // Reach To Last

            rs**.**beforeFirst**();**    // Reach To First

**while(** rs**.**next**()** **)**

**{**

                System**.**out**.**println**(**rs**.**getString**(**"id"**)** **+** " , " **+** rs**.**getString**(**"Name"**)** **+** " , " **+** rs**.**getString**(**3**)** **+**" , " **+** rs**.**getString**(**4**)** **);**

**}**

            // 05

            con**.**close**();**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

PreparedStatement pr = con.prepareStatement( display\_All );

java.sql.SQLException: Operation not allowed for a result set of type ResultSet.TYPE\_FORWARD\_ONLY.

PreparedStatement pr = con.prepareStatement( display\_All ,  ResultSet.TYPE\_SCROLL\_SENSITIVE, ResultSet.CONCUR\_READ\_ONLY);

1 , Aman , 9876543 , Harda

2 , Bhanu , 7894563 , Harda

3 , Chandu , 4569871 , Harda

4 , Deepak , 1234568 , Harda

5 , Eshan , 1478523 , Harda

**import** java**.**sql**.\*;**

**import** java**.**util**.\*;**

class Q15\_Prepared\_Statement\_last

**{**

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

**{**

        Scanner sc **=** **new** Scanner**(**System**.**in**);**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String display\_All **=** "SELECT \* FROM Prepared\_Table"**;**

            // PreparedStatement pr = con.prepareStatement( display\_All );

            PreparedStatement pr **=** con**.**prepareStatement**(** display\_All **,**  ResultSet**.**TYPE\_SCROLL\_SENSITIVE**,** ResultSet**.**CONCUR\_READ\_ONLY**);**

            // 04

            ResultSet rs **=** pr**.**executeQuery**();**

            rs**.**last**();** // Reach To Last

**while(** rs**.**previous**()** **)**

**{**

                System**.**out**.**println**(**rs**.**getString**(**"id"**)** **+** " , " **+** rs**.**getString**(**"Name"**)** **+** " , " **+** rs**.**getString**(**3**)** **+**" , " **+** rs**.**getString**(**4**)** **);**

**}**

            // 05

            con**.**close**();**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

PreparedStatement pr = con.prepareStatement( display\_All );

java.sql.SQLException: Operation not allowed for a result set of type ResultSet.TYPE\_FORWARD\_ONLY.

PreparedStatement pr = con.prepareStatement( display\_All ,  ResultSet.TYPE\_SCROLL\_SENSITIVE, ResultSet.CONCUR\_READ\_ONLY);

4 , Deepak , 1234568 , Harda

3 , Chandu , 4569871 , Harda

2 , Bhanu , 7894563 , Harda

1 , Aman , 9876543 , Harda

**import** java**.**sql**.\*;**

**import** java**.**util**.\*;**

class Q17\_Prepared\_Statement\_absolute

**{**

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

**{**

        Scanner sc **=** **new** Scanner**(**System**.**in**);**

        System**.**out**.**print**(**"Enter Which row Do you want to Print : "**);**

        int absolute\_Row **=** sc**.**nextInt**();**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String absolute1     **=** "SELECT \* FROM Prepared\_Table"**;**

            // PreparedStatement pr = con.prepareStatement( absolute1 );

            PreparedStatement pr **=** con**.**prepareStatement**(** absolute1 **,**  ResultSet**.**TYPE\_SCROLL\_SENSITIVE**,** ResultSet**.**CONCUR\_READ\_ONLY**);**

            // 04

            ResultSet rs **=** pr**.**executeQuery**();**

            rs**.**absolute**(**absolute\_Row**);** // Reach To Last

            System**.**out**.**println**(**rs**.**getString**(**"id"**)** **+** " , " **+** rs**.**getString**(**"Name"**)** **+** " , " **+** rs**.**getString**(**3**)** **+**" , " **+** rs**.**getString**(**4**)** **);**

            // 05

            con**.**close**();**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

PreparedStatement pr = con.prepareStatement( absolute1 );

java.sql.SQLException: Operation not allowed for a result set of type ResultSet.TYPE\_FORWARD\_ONLY.

PreparedStatement pr = con.prepareStatement( absolute1 ,  ResultSet.TYPE\_SCROLL\_SENSITIVE, ResultSet.CONCUR\_READ\_ONLY);

// 01

Enter Which row Do you want to Print : 1

1 , Aman , 9876543 , Harda

// 02

Enter Which row Do you want to Print : 5

5 , Eshan , 1478523 , Harda

**import** java**.**sql**.\*;**

**import** java**.**util**.\*;**

class Q18\_Insertion\_Using\_ResultSet

**{**

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

**{**

        Scanner sc **=** **new** Scanner**(**System**.**in**);**

        System**.**out**.**print**(**"Enter Id : "**);**

        int id **=** sc**.**nextInt**();**

        System**.**out**.**print**(**"Enter Name : "**);**

        String name **=** sc**.**next**();**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String insert1 **=** "SELECT \* FROM ResultSet\_Table"**;**

            PreparedStatement pr **=** con**.**prepareStatement**(** insert1**,** ResultSet**.**TYPE\_SCROLL\_SENSITIVE**,** ResultSet**.**CONCUR\_UPDATABLE**);**

            // PreparedStatement pr = con.prepareStatement( insert1);

            // 04

            ResultSet rs **=** pr**.**executeQuery**();**

            // 01 Reach To Last ( Create a blank row in ResultSet)

            rs**.**moveToInsertRow**();**

            // 02 Update Data in newly Inserted Row

            rs**.**updateInt**(**1**,** id**);**

            rs**.**updateString**(**2**,** name**);**

            // 03 To save the newly inserted Row in Database.

            rs**.**insertRow**();**

            System**.**out**.**println**(**"Query OK, 1  rows affected."**);**

            // 05

            con**.**close**();**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

without ResultSet Categerious

PreparedStatement pr = con.prepareStatement( insert1);

com.mysql.cj.jdbc.exceptions.NotUpdatable: Result Set not updatable.

With ResultSet Categerious

PreparedStatement pr = con.prepareStatement( insert1, ResultSet.TYPE\_ SCROLL\_SENSITIVE, ResultSet.CONCUR\_UPDATABLE);

Enter Id : 6

Enter Name : Vishal

Query OK, 1  rows affected.

Some Cases when a resultSet can't be updatable

1. If it don't have primary key.

2. if it contains Data From more then one table.

3. if Select Command contains some aggregation function (sum, max, avg, etc... ).

Create table ResultSet\_Table

(

    Id int(10) Primary Key,

    Name varchar(20)

);

Insert into ResultSet\_Table values

(1, 'AAA'),

(2, 'BBB'),

(3, 'CCC'),

(4, 'DDD'),

(5, 'EEE'),

(6, 'FFF'),

(7, 'GGG');

**import** java**.**sql**.\*;**

**import** java**.**util**.\*;**

class Q19\_Update\_Using\_ResultSet

**{**

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

**{**

        Scanner sc **=** **new** Scanner**(**System**.**in**);**

        System**.**out**.**print**(**"Enter Update Row : "**);**

        int update\_Row **=** sc**.**nextInt**();**

        System**.**out**.**print**(**"Enter Id : "**);**

        int id **=** sc**.**nextInt**();**

        System**.**out**.**print**(**"Enter Name : "**);**

        String name **=** sc**.**next**();**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String update1 **=** "SELECT \* FROM ResultSet\_Table"**;**

            PreparedStatement pr **=** con**.**prepareStatement**(** update1**,** ResultSet**.**TYPE\_SCROLL\_SENSITIVE**,** ResultSet**.**CONCUR\_UPDATABLE**);**

            // PreparedStatement pr = con.prepareStatement( update1);

            // 04

            ResultSet rs **=** pr**.**executeQuery**();**

            // 01 Move to Update Row

            rs**.**absolute**(** update\_Row **);**

            // 02 Update Data in Row

            rs**.**updateInt**(**1**,** id**);**

            rs**.**updateString**(**2**,** name**);**

            // 03 To save the newly inserted Row in Database.

            rs**.**updateRow**();**

            System**.**out**.**println**(**"Query OK, 1  rows affected."**);**

            // 05

            con**.**close**();**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

without ResultSet Categerious

PreparedStatement pr = con.prepareStatement( update1);

com.mysql.cj.jdbc.exceptions.NotUpdatable: Result Set not updatable.

With ResultSet Categerious

PreparedStatement pr = con.prepareStatement( update1, ResultSet.TYPE\_SCROLL\_SENSITIVE, ResultSet.CONCUR\_UPDATABLE);

Enter Update Row : 3

Enter Id : 12

Enter Name : 12

Query OK, 1  rows affected.

**import** java**.**sql**.\*;**

**import** java**.**util**.\*;**

class Q20\_Delete\_Using\_ResultSet

**{**

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

**{**

        Scanner sc **=** **new** Scanner**(**System**.**in**);**

        System**.**out**.**print**(**"Enter Delete Row : "**);**

        int delete\_Row **=** sc**.**nextInt**();**

**try**

**{**

            // 01

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

            // 02

            String url **=** "jdbc:mysql://localhost:3306/JDBC\_Demo"**;**

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

            // 03

            String delete1 **=** "SELECT \* FROM ResultSet\_Table"**;**

            PreparedStatement pr **=** con**.**prepareStatement**(** delete1**,** ResultSet**.**TYPE\_SCROLL\_SENSITIVE**,** ResultSet**.**CONCUR\_UPDATABLE**);**

            // PreparedStatement pr = con.prepareStatement( delete1);

            // 04

            ResultSet rs **=** pr**.**executeQuery**();**

            // 01 Reach To Last ( Create a blank row in ResultSet)

            // rs.moveToInsertRow();

            rs**.**absolute**(** delete\_Row **);**

            rs**.**deleteRow**();**

            System**.**out**.**println**(**"Query OK, 1  rows affected."**);**

            // 05

            con**.**close**();**

**}**

**catch(** Exception e**)**

**{**

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

**}**

**}**

**}**

without ResultSet Categerious

PreparedStatement pr = con.prepareStatement( delete1);

com.mysql.cj.jdbc.exceptions.NotUpdatable: Result Set not updatable.

With ResultSet Categerious

PreparedStatement pr = con.prepareStatement( delete1, ResultSet.TYPE\_SCROLL\_SENSITIVE, ResultSet.CONCUR\_UPDATABLE);

Enter Delete Row : 6

Query OK, 1  rows affected.