



1. Connect to database

- Load JDBC driver

- `Class.forName("com.mysql.jdbc.Driver").newInstance();`

- Make connection

- `Connection conn = DriverManager.getConnection(url);`

- URL

- **Format: “jdbc:<subprotocol>:<subname>”**

- `jdbc:mysql://128.100.53.33/GROUPNUMBER?user=USER&password=PASSWORD`



2. Query database

a. Create statement

- `Statement stmt = conn.createStatement();`
- `stmt` object sends SQL commands to database
- Methods
 - `executeQuery()` for SELECT statements
 - `executeUpdate()` for INSERT, UPDATE, DELETE, statements

b. Send SQL statements

- `stmt.executeQuery("SELECT ...");`
- `stmt.executeUpdate("INSERT ...");`



3. Process results

- Result of a SELECT statement (rows/columns) returned as a **ResultSet** object
 - ```
ResultSet rs =
 stmt.executeQuery("SELECT * FROM users");
```
- Step through each row in the result
  - ```
rs.next();
```
- Get column values in a row
 - ```
String userid = rs.getString("userid");
```
  - ```
int type = rs.getInt("type");
```

users table				
<u>userid</u>	firstname	lastname	password	type
Bob	Bob	King	cat	0
John	John	Smith	pass	1



Print the users table

```
ResultSet rs = stmt.executeQuery("SELECT * FROM users");

while (rs.next()) {
    String userid = rs.getString(1);
    String firstname = rs.getString("firstname");
    String lastname = rs.getString("lastname");
    String password = rs.getString(4);
    int type = rs.getInt("type");
    System.out.println(userid + " " + firstname + " " +
        lastname + " " + password + " " + type);
}
```

users table				
<u>userid</u>	firstname	lastname	password	type
Bob	Bob	King	cat	0
John	John	Smith	pass	1



Add a row to the users table

```
String str =  
    "INSERT INTO users  
    VALUES ('Bob', 'Bob', 'King',  
            'cat', 0)";  
  
// Returns number of rows in table  
int rows = stmt.executeUpdate(str);
```

users table				
<u>userid</u>	firstname	lastname	password	type
Bob	Bob	King	cat	0

4. Close connection to database



- Close the ResultSet object
 - `rs.close();`
- Close the Statement object
 - `stmt.close();`
- Close the connection
 - `conn.close();`

```
import java.sql.*;

public class Tester {
    public static void main(String[] args) {
        try {
            // Load JDBC driver
            Class.forName("com.mysql.jdbc.Driver").newInstance();

            // Make connection
            String url =
                "jdbc:mysql://128.100.53.33/GRP?user=USER&password=PASS"
            Connection conn = DriverManager.getConnection(url);

            // Create statement
            Statement stmt = conn.createStatement();

            // Print the users table
            ResultSet rs = stmt.executeQuery("SELECT * FROM users");
            while (rs.next()) {
                ...
            }

            // Cleanup
            rs.close(); stmt.close(); conn.close();

        } catch (Exception e) {
            System.out.println("exception " + e);
        }
    }
}
```

