**[ 27 ] JDBC 프로그래밍**

1. 데이터베이스개요
   1. 테이블은 컬럼(속성, 필드)과 로우(엔티티)로 이루어져있고 서로 연관된 데이터들이 표처럼 구성되어 있다.
2. JDBC(Java Database Connectivity) 프로그래밍 개념
   1. JDBC(Java Database Connectivity) : 자바 패키지의 일부로 자바 프로그램이 데이터 베이스와 연결되어 데이터를 주고 받을 수 있게 해 주는 프로그래밍 인터페이스이다. 자바 데이터베이스 프로그래밍 API라고 할 수 있다.
   2. JDBC 드라이버 : 오라클 드라이버또는 MySQL 드라이버를 자바가 설치되어 있는 C:\Program Files\Java\jre1.8.0\_XXX\lib\ext 폴더(%JAVA\_HOME%/JRE/LIB/EXT 폴더)에 복사한다.

ojdbc6.JAR (C:\oraclexe\app\oracle\product\11.2.0\server\jdbc\lib)

mysql-connector-java-5.1.37-bin.jar (C:\Program Files (x86)\MySQL\Connector.J 5.1)

* 1. 이클립스에서 Windows 메뉴 – preferences – Java – Installed JREs – edit – Add External JARs을 통해 두개의 jar를 등록 후 Restore Default 클릭 후 finish
  2. JDBC프로그래밍 단계와 사용 클래스
     1. JDBC 드라이버 로드 : Class.froName()을 이용. 드라이버 클래스 로딩(드라이버 필요)
* 사용 API : System.setProperty() Class.ForName()
  + 1. 데이터베이스 연결 : DriverManager.getConnection()을 이용해 Connetion 객체 생성(접속 URL, id, passwd등 필요)
       - 사용 API : java.sql.Connection
    2. Statement 생성 : SQL을 이용해 DB를 조회하거나 다룸. Statement는 SQL 처리 기본 객체
       - 사용 API : java.sql.Statement java.sql.preparedStatement
    3. SQL문 전송 : SQL 문 Statement 객체의 executeQuery(), executeUpdate() 메소드를 이용, 데이텁이스로 전달해 처리
       - 사용 API : java.sql.Statement.executeQuery() java.sql.Statement.executeUpdate()
    4. 결과 받기 : SQL 실행 결과를 반환 받아야 하는 값이 있따면 ResultSet객체로 받음
       - 사용 API : java.sql.ResultSet
    5. 결과 받아 원하는 로직 수행
    6. 연결 해제 : 사용한 자원을 반납함
       - 사용 API : java.sql.Connection.close()
  1. JDBC를 이용한 프로그램의 작성 방법
     1. JDBC 드라이버를 로드한다
     2. DB에 연결한다
     3. SQL문을 수행할 객체 생성한다
     4. SQL문 수행전송하고 결과 받는다.
     5. 수행한 결과를 읽어 원하는 로직을 수행한다 (필요할 때까지 반복)
     6. DB 연결을 끊는다

1. JDBC 소스
   1. 단순 연결
      * + Class.forName(“oracle.jdbc.driver.OracleDriver”);
          - Class.forName(“com.mysql.jdbc.Driver”);
        + Connection conn = DriverManager.getConnection(url, uid,pwd); //관계형 데이터베이스 엔진에서 위치을 연결
          - url : 사용자 계정

String url = “jdbc:oracle:thin:@127.0.0.1:1521:orcl”;

String url =” jdbc:oracle:thin:@127.0.0.1:1521:xe”;

프로토콜:서브프로토콜:서브네임(ip주소:포트:DB이름

* + - * + uid : user id
        + pwd : user password
      * conn.close()

1. Oracle

**import** java.sql.Connection;

**import** java.sql.DriverManager;

**import** java.sql.SQLException;

**public** **class** ConnOracle {

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

String driver = "oracle.jdbc.driver.OracleDriver";

String url = "jdbc:oracle:thin:@127.0.0.1:1521:xe";

Connection conn = **null** ;

**try** {

Class.*forName*(driver);// ① 드라이버연결

System.***out***.println("드라이버 검색 성공");

//② 데이터베이스 연결

conn =

DriverManager.*getConnection*(url,"scott","tiger");

System.***out***.println("DB 연결 성공");

//③SQL실행할 객체생성해서 SQL날리고 결과 받고 쓰기

} **catch** (ClassNotFoundException e) {

System.***out***.println(e.getMessage()+"드라이버오류");

}**catch** (SQLException e) {

System.***out***.println(e.getMessage()+"DB연결실패");

} **finally** {

**try** {**if**(conn!=**null**) conn.close(); // 연결 끊기

} **catch** (SQLException e) {

System.***out***.println(e.getMessage()+"닫기오류");

}

}

}

}

1. Mysql

**import** java.sql.Connection;

**import** java.sql.DriverManager;

**import** java.sql.SQLException;

**public** **class** ConnMysql {

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

String driver = "com.mysql.jdbc.Driver";

String url = "jdbc:mysql://127.0.0.1:3306/kimdb";

Connection conn = **null**;

**try** {

Class.*forName*(driver);//1.드라이버 로드하기

System.***out***.println("드라이버 검색 성공");

//2. DB연결

conn =

DriverManager.*getConnection*(url,"root","mysql");

System.***out***.println("데이터 베이스 연결 성공");

} **catch** (ClassNotFoundException e) {

System.***out***.println(e.getMessage()+"드라이버오류");

} **catch** (SQLException e) {

System.***out***.println(e.getMessage()+"DB오류");

} **finally** {

**try**{ **if**(conn!=**null**) conn.close();}**catch**(SQLException e){

System.***out***.println(e.getMessage()+"닫기오류");

}

}

}

}

* 1. 조회
     + - Statement객체 : 이전 단계에서 생성한 Connection 객체(conn)로 접근해서 createStatement()메소드를 호출하여 생성한다.
         * Statement stmt = conn.createStatement();
       - Statement객체로 질의문 수행
         * String str = “SELECT \* FROM EMP;
         * ResultSet rs= stmt.excuteQuery(str);
       - rs.next() : 현재행에서 한행 앞으로 이동

rs.previouse() : 현재행에서 한행 뒤로 이동

rs.first() : 현재 행에서 첫번재 행의 위치로 이동

rs.last() : 현재 행에서 마지막 행의 위치로 이동

* + - * rs.cloase() stmt.close() conn.close()

1. oracle

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

**public** **class** SelectAllOracle {

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

String driver = "oracle.jdbc.driver.OracleDriver";

String url = "jdbc:oracle:thin:@localhost:1521:xe";

String query = "SELECT \* FROM EMP";

Connection conn = **null**;

Statement stmt = **null**;

ResultSet rs = **null**;

**try**{

Class.*forName*(driver); // ① 드라이버로드

//②데이터 베이스 연결

conn = DriverManager.*getConnection*(url, "scott", "tiger");

// ③ SQL문을 처리할 객체 생성

stmt = conn.createStatement();

// ④ SQL문 전송 + 결과 받기

rs = stmt.executeQuery(query);

// ⑤ 결과 받아 로직수행하기

System.***out***.println( " 사 원 명 단");

System.***out***.println("사번\t이름\t작업\t\t급여\t입사일\t부서번호");

System.***out***.println("~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~");

**if**(rs.next()){

**do**{

**int** empno = rs.getInt("empno");

String ename = rs.getString("ename");

String job = rs.getString("job");

**int** sal = rs.getInt("sal");

Date hiredate = rs.getDate("hiredate");

**int** deptno = rs.getInt("deptno");

**if**(job.length()<7)

System.***out***.printf("%d\t %s\t %s\t\t %d\t %TF\t %d\n",

empno, ename, job, sal, hiredate, deptno);

**else**

System.***out***.printf("%d\t %s\t %s\t %d\t %TF\t %d\n",

empno, ename, job, sal, hiredate, deptno);

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

}**else**{

System.***out***.println("데이터가 없습니다");

}

}**catch**(Exception e){

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

}**finally** {

**try**{

**if**(rs!=**null**) rs.close();

**if**(stmt!=**null**)stmt.close();//⑥연결 해제

**if**(conn!=**null**)conn.close();

}**catch** (Exception e) {

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

}

}

}

}

1. mysql

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

**public** **class** selectMySql {

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

String driver = "com.mysql.jdbc.Driver";

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

String query = "SELECT \* FROM PERSONAL";

Connection conn = **null**;

Statement stmt = **null**;

ResultSet rs = **null**;

**try**{

Class.*forName*(driver); // ① 드라이버로드

//②데이터 베이스 연결

conn = DriverManager.*getConnection*(url, "root", "mysql");

// ③ SQL문을 처리할 객체 생성

stmt = conn.createStatement();

// ④ SQL문 전송 + ⑤ 결과 받기

rs = stmt.executeQuery(query);

// 결과 받아 로직수행하기

System.***out***.println( " 사 원 명 단");

System.***out***.println("사번\t이름\t\t직책\t\t급여\t\t입사일\t부서번호");

System.***out***.println("~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~");

**if**(rs.next()){

**do**{

**int** pno = rs.getInt("pno");

String pname = rs.getString("pname");

String job = rs.getString("job");

**int** pay = rs.getInt("pay");

Date startdate = rs.getDate("startdate");

**int** dno = rs.getInt("dno");

**if**(pname.length()>=7)

System.***out***.printf("%d\t %s\t %s\t %d\t %TF\t %d\n", pno, pname, job, pay, startdate, dno);

**else** **if** (job.length()>=7)

System.***out***.printf("%d\t %s\t\t %s\t %d\t %TF\t %d\n", pno, pname, job, pay, startdate, dno);

**else**

System.***out***.printf("%d\t %s\t\t %s\t\t %d\t %TF\t %d\n", pno, pname, job, pay, startdate, dno);

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

}**else**{

System.***out***.println("데이터가 없습니다");

}

}**catch**(Exception e){

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

}**finally** {

**try**{

**if**(rs!=**null**) rs.close();

**if**(stmt!=**null**)stmt.close();//⑥연결 해제

**if**(conn!=**null**)conn.close();

}**catch** (Exception e) {

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

}

}

}

}

* 1. 조건에 맞는 조회
     1. Oracle

**package** com.ch.ex2selectOne;

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

**import** java.util.Scanner;

**public** **class** SelectNoOracle {

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

String driver = "oracle.jdbc.driver.OracleDriver";

String url = "jdbc:oracle:thin:@127.0.0.1:1521:xe";

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

System.***out***.print("보고 싶은 부서번호는? ");

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

//String query = "SELECT \* FROM DEPT WHERE DEPTNO = "+deptno;

String query = String.*format*(

"SELECT \* FROM DEPT WHERE DEPTNO = %d", deptno);

Connection conn = **null**;

Statement stmt = **null**;

ResultSet rs = **null**;

**try** {

Class.*forName*(driver); //①드라이버 로드

conn = DriverManager.*getConnection*(url, "scott", "tiger");//②DB연결

stmt = conn.createStatement(); // ③SQL문 수행관련 객체 생성

rs = stmt.executeQuery(query);// ④SQL문전송 + ⑤결과받기

**if**(rs.next()){

System.***out***.println("부서코드 : "+rs.getInt(1));

System.***out***.println("부서이름 : "+rs.getString(2));

System.***out***.println("부서위치 : "+rs.getString(3));

}**else**{

System.***out***.println("없는 부서번호입니다");

}

} **catch** (ClassNotFoundException e) {

System.***out***.println(e.getMessage()+"드라이버오류");

} **catch** (SQLException e) {

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

} **finally** {

**try**{

**if**(rs!=**null**) rs.close(); //⑥ 연결해제

**if**(stmt!=**null**) stmt.close();

**if**(conn!=**null**) conn.close();

}**catch**(SQLException e){

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

}

}

}

}

※ 위의 예제를 활용하여 해당 부서의 사원들 리스트도 출력하는 프로그램 구현을 완성하시오

**public** **class** SelectOneOracle {

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

String driver = "oracle.jdbc.driver.OracleDriver";

String url = "jdbc:oracle:thin:@127.0.0.1:1521:xe";

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

System.***out***.print("검색하고 싶은 부서번호는 ?");

**int** deptno = scanner.nextInt();

//String query = "SELECT \* FROM DEPT WHERE DEPTNO = "+deptno;

String query1 = String.*format*(

"SELECT \* FROM DEPT WHERE DEPTNO = %d", deptno);

String query2 = String.*format*("SELECT \* FROM EMP WHERE DEPTNO=%d", deptno);

Connection conn = **null**;

Statement stmt = **null**;

ResultSet rs = **null**;

**try** {

Class.*forName*(driver); // 1. 드라이버 연결

conn = DriverManager.*getConnection*(url, "scott","tiger"); //2. DB연결

stmt = conn.createStatement();

rs = stmt.executeQuery(query1);

**if**(rs.next()) {

System.***out***.println("부서코드 : "+rs.getInt("deptno"));

System.***out***.println("부서이름 : "+rs.getString(2));

System.***out***.println("부서위치 : "+rs.getString(3));

}**else** {

System.***out***.println("데이터가 없습니다");

}

rs.close();

rs = stmt.executeQuery(query2);

System.***out***.println("사번\t이름\t업무\t\t급여\t입사일\t\t부서번호");

**if**(rs.next()) {

**do** {

**int** empno = rs.getInt("empno");

String ename = rs.getString("ename");

String job = rs.getString("job");

**int** sal = rs.getInt("sal");

Date hiredate = rs.getDate("hiredate");

**if**(job.length()<7)

System.***out***.printf("%d\t %s\t %s\t\t %d\t %TF\t %d\n",

empno, ename, job, sal, hiredate, deptno);

**else**

System.***out***.printf("%d\t %s\t %s\t %d\t %TF\t %d\n",

empno, ename, job, sal, hiredate, deptno);

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

}**else** {

System.***out***.println("해당부서 데이터가 없습니다");

}

} **catch** (ClassNotFoundException e) {

System.***out***.println("드라이버 연결 예외"+e.getMessage());

} **catch** (SQLException e) {

System.***out***.println("DBMS 연결 예외"+e.getMessage());

} **finally** {

**try** {

**if**(rs!=**null**) rs.close();

**if**(stmt!=**null**)stmt.close();

**if**(conn!=**null**)conn.close();

} **catch** (SQLException e) {

System.***out***.println("close 예외"+e.getMessage());

}

}

}

}

* + 1. Mysql

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

**import** java.util.Scanner;

**public** **class** SelectNoMysql {

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

String driver = "com.mysql.jdbc.Driver";

String url = "jdbc:mysql://127.0.0.1:3306/kimdb";

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

System.***out***.print("보고 싶은 부서번호는? ");

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

//String query = "SELECT \* FROM DIVISION WHERE DNO = "+dno;

String query = String.*format*(

"SELECT \* FROM DIVISION WHERE DNO = %d", dno);

Connection conn = **null**;

Statement stmt = **null**;

ResultSet rs = **null**;

**try** {

Class.*forName*(driver); //①드라이버 로드

conn = DriverManager.*getConnection*(url, "root", "mysql");//②DB연결

stmt = conn.createStatement(); // ③SQL문 수행관련 객체 생성

rs = stmt.executeQuery(query);// ④SQL문전송 + ⑤결과받기

**if**(rs.next()){

System.***out***.println("부서코드 : "+rs.getInt(1));

System.***out***.println("부서이름 : "+rs.getString(2));

System.***out***.println("부서전화 : "+rs.getString(3));

System.***out***.println("부서위치 : "+rs.getString(4));

}**else**{

System.***out***.println("없는 부서번호입니다");

}

} **catch** (ClassNotFoundException e) {

System.***out***.println(e.getMessage()+"드라이버오류");

} **catch** (SQLException e) {

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

} **finally** {

**try**{

**if**(rs!=**null**) rs.close(); //⑥ 연결해제

**if**(stmt!=**null**) stmt.close();

**if**(conn!=**null**) conn.close();

}**catch**(SQLException e){

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

}

}

}

}

※ 위의 예제를 활용하여 해당 부서의 사원들 리스트도 출력하는 프로그램 구현을 완성하시오

**public** **class** SelectOneMysql {

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

String driver = "com.mysql.jdbc.Driver";

String url = "jdbc:mysql://127.0.0.1:3306/kimdb";

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

System.***out***.print("원하는 부서번호는 ?");

**int** dno = scanner.nextInt();

String query1 = String.*format*("SELECT \* FROM DIVISION WHERE DNO = %d",dno);

String query2 = String.*format*("SELECT \* FROM PERSONAL WHERE DNO = %d",dno);

Connection conn = **null**;

Statement stmt = **null**;

ResultSet rs = **null**;

**try** {

Class.*forName*(driver);

conn = DriverManager.*getConnection*(url, "root", "mysql");

stmt = conn.createStatement();

rs = stmt.executeQuery(query1);

**if**(rs.next()) {

System.***out***.println("부서코드 : "+rs.getInt("dno"));

System.***out***.println("부서이름 : "+rs.getString("dname"));

System.***out***.println("부서전화 : "+rs.getString("phone"));

System.***out***.println("부서위치 : "+rs.getString("position"));

}**else** {

System.***out***.println("존재하지 않는 부서입니다");

}

rs.close();

rs = stmt.executeQuery(query2);

**if**(rs.next()) {

**do** {

**int** pno = rs.getInt("pno");

String pname = rs.getString("pname");

String job = rs.getString("job");

**int** pay = rs.getInt("pay");

Date startdate = rs.getDate("startdate");

**if**(pname.length()>=7)

System.***out***.printf("%d\t %s\t %s\t %d\t %TF\t %d\n",

pno, pname, job, pay, startdate, dno);

**else** **if** (job.length()>6)

System.***out***.printf("%d\t %s\t\t %s\t %d\t %TF\t %d\n",

pno, pname, job, pay, startdate, dno);

**else**

System.***out***.printf("%d\t %s\t\t %s\t\t %d\t %TF\t %d\n",

pno, pname, job, pay, startdate, dno);

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

}**else** {

System.***out***.println("데이터가 없습니다");

}

} **catch** (ClassNotFoundException e) {

System.***out***.println("드라이어 연결 오류"+e.getMessage());

} **catch** (SQLException e) {

System.***out***.println("db 연결 오류"+e.getMessage());

}**finally** {

**try** {

**if**(rs!=**null**) rs.close();

**if**(stmt!=**null**) stmt.close();

**if**(conn!=**null**) conn.close();

}**catch** (Exception e) {

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

}

}

}

}

※ **varchar형 필드 검색시**

**public** **class** SelectOneOracle {

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

String driver = "oracle.jdbc.driver.OracleDriver";

String url = "jdbc:oracle:thin:@127.0.0.1:1521:xe";

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

System.***out***.print("검색하고 싶은 부서번호는 ?");

String dname = scanner.next();

//String query1 = "SELECT \* FROM DEPT WHERE DEPTNO = '"+dname+"'";

String query1 = String.*format*(

"SELECT \* FROM DEPT WHERE DNAME = '%S'", dname);

String query2 = String.*format*("SELECT \* FROM EMP E, DEPT D WHERE E.DEPTNO=D.DEPTNO AND DNAME='%S'", dname);

Connection conn = **null**;

Statement stmt = **null**;

ResultSet rs = **null**;

**try** {

Class.*forName*(driver); // 1. 드라이버 연결

conn = DriverManager.*getConnection*(url, "scott","tiger"); //2. DB연결

stmt = conn.createStatement(); //3. SQL 전송객체(stmt)

rs = stmt.executeQuery(query1); //4.전송+결과받기

**if**(rs.next()) {

System.***out***.println("부서코드 : "+rs.getInt("deptno"));

System.***out***.println("부서이름 : "+rs.getString("dname"));

System.***out***.println("부서위치 : "+rs.getString("loc"));

}**else** {

System.***out***.println("해당 이름의 부서가 없습니다");

}

rs.close();

rs = stmt.executeQuery(query2);

System.***out***.println("사번\t이름\t업무\t\t급여\t입사일\t\t부서번호");

**if**(rs.next()) {

**do** {

**int** empno = rs.getInt("empno");

String ename = rs.getString("ename");

String job = rs.getString("job");

**int** sal = rs.getInt("sal");

Date hiredate = rs.getDate("hiredate");

**int** deptno = rs.getInt("deptno");

**if**(job.length()<7)

System.***out***.printf("%d\t %s\t %s\t\t %d\t %TF\t %d\n",

empno, ename, job, sal, hiredate, deptno);

**else**

System.***out***.printf("%d\t %s\t %s\t %d\t %TF\t %d\n",

empno, ename, job, sal, hiredate, deptno);

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

}**else** {

System.***out***.println("해당부서 데이터가 없습니다");

}

} **catch** (ClassNotFoundException e) {

System.***out***.println("드라이버 연결 예외"+e.getMessage());

} **catch** (SQLException e) {

System.***out***.println("DBMS 연결 예외"+e.getMessage());

} **finally** {

**try** {

**if**(rs!=**null**) rs.close();

**if**(stmt!=**null**)stmt.close();

**if**(conn!=**null**)conn.close();

} **catch** (SQLException e) {

System.***out***.println("close 예외"+e.getMessage());

}

}

}

}

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

**import** java.util.Scanner;

**public** **class** SelectNoMysql2 {

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

String driver = "com.mysql.jdbc.Driver";

String url = "jdbc:mysql://127.0.0.1:3306/kimdb";

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

System.***out***.print("보고 싶은 부서이름는? ");

String dname = sc.next();

String query =

"SELECT \* FROM DIVISION WHERE DNAME = '"+dname+"'";

//String query = String.format(

// "SELECT \* FROM DIVISION WHERE DNAME = '%s'", dname);

Connection conn = **null**;

Statement stmt = **null**;

ResultSet rs = **null**;

**try** {

Class.*forName*(driver); //①드라이버 로드

conn = DriverManager.*getConnection*(url, "root", "mysql");//②DB연결

stmt = conn.createStatement(); // ③SQL문 수행관련 객체 생성

rs = stmt.executeQuery(query);// ④SQL문전송 + ⑤결과받기

**if**(rs.next()){

System.***out***.println("부서코드 : "+rs.getInt(1));

System.***out***.println("부서이름 : "+rs.getString(2));

System.***out***.println("부서전화 : "+rs.getString(3));

System.***out***.println("부서위치 : "+rs.getString(4));

}**else**{

System.***out***.println("없는 부서번호입니다");

}

} **catch** (ClassNotFoundException e) {

System.***out***.println(e.getMessage()+"드라이버오류");

} **catch** (SQLException e) {

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

} **finally** {

**try**{

**if**(rs!=**null**) rs.close(); //⑥ 연결해제

**if**(stmt!=**null**) stmt.close();

**if**(conn!=**null**) conn.close();

}**catch**(SQLException e){

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

}

}

}

}

* 1. Insert
     + - **Stmt.excuteQuery(sql)**
         * **검색(Select)시 사용 반환값이 ResultSet**
       - **Stmt.excuteUpdate(sql)**
         * **입력, 수정, 삭제(insert, update, delete)시 사용. 반환값이 정수형을 반환. 작업에 성공한 횟수 리턴하여 DML명령어(insert, update, delete)가 제대로 수행되었는지 체크할 수 있다**

1. Oracle

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

**import** java.util.Scanner;

**public** **class** InsertOracle {

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

String driver = "oracle.jdbc.driver.OracleDriver";

String url = "jdbc:oracle:thin:@127.0.0.1:1521:xe";

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

System.***out***.print("추가할 부서코드 : ");

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

System.***out***.print("추가할 부서이름 : ");

sc.nextLine(); //부서이름에 " " 대비

String dname = sc.nextLine();

System.***out***.print("추가할 부서위치 : ");

String loc = sc.nextLine();

//String sql =

// String.format("INSERT INTO DEPT VALUES (%d,'%s','%s')",

// deptno, dname, loc);

String sql = "INSERT INTO DEPT VALUES ("+deptno+", '"+

dname+"', '"+loc+"')";

Connection conn = **null**;

Statement stmt = **null**;

**try** {

Class.*forName*(driver);//1

conn = DriverManager.*getConnection*(url,"scott","tiger");//2

stmt = conn.createStatement(); //3

**int** result = stmt.executeUpdate(sql);

**if**(result>0){

System.***out***.print(deptno+"\t"+dname+"\t"+loc);

System.***out***.println("\t입력성공");

}**else**{

System.***out***.println("입력실패");

}

} **catch** (ClassNotFoundException e) {

System.***out***.println(e.getMessage()+"드라이버오류");

} **catch** (SQLException e){

System.***out***.println(e.getMessage()+"SQL오류");

} **finally** {

**try** {

**if**(stmt!=**null**) stmt.close();

**if**(conn!=**null**) conn.close();

}**catch** (SQLException e){

System.***out***.println(e.getMessage()+"닫기오류");

}

}

sc.close();

}

}

1. Mysql

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

**import** java.util.Scanner;

**public** **class** InsertMySQL {

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

String driver = "com.mysql.jdbc.Driver";

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

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

System.***out***.print("추가할 부서코드 : ");

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

System.***out***.print("추가할 부서이름 : ");

sc.nextLine(); //부서이름에 " " 대비

String dname = sc.nextLine();

System.***out***.print("추가할 부서전화 : ");

String phone = sc.nextLine();

System.***out***.print("부서위치 : ");

String position = sc.nextLine();

String sql =

String.*format*("INSERT INTO DIVISION "

+ "VALUES (%d,'%s','%s','%s')",

dno, dname, phone, position);

Connection conn = **null**;

Statement stmt = **null**;

**try** {

Class.*forName*(driver);//1

conn = DriverManager.*getConnection*(url,"root","mysql");//2

stmt = conn.createStatement(); //3

**int** result = stmt.executeUpdate(sql);

**if**(result>0){

System.***out***.print(dno+"\t"+dname+"\t"+phone);

System.***out***.println("\t입력성공");

}**else**{

System.***out***.println("입력실패");

}

} **catch** (ClassNotFoundException e) {

System.***out***.println(e.getMessage()+"드라이버오류");

} **catch** (SQLException e){

System.***out***.println(e.getMessage()+"SQL오류");

} **finally** {

**try** {

**if**(stmt!=**null**) stmt.close();

**if**(conn!=**null**) conn.close();

}**catch** (SQLException e){

System.***out***.println(e.getMessage()+"닫기오류");

}

}

}

}

* 1. Update
     1. Oracle

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

**import** java.util.Scanner;

**public** **class** UpdateOracle {

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

String driver = "oracle.jdbc.driver.OracleDriver";

String url = "jdbc:oracle:thin:@localhost:1521:xe";

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

System.***out***.print("수정할 부서번호는 ");

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

System.***out***.print("부서이름을 뭐라할건됴? ");

sc.nextLine();

String dname = sc.nextLine();

System.***out***.print("부서위치 뭐라 바꿀건디요?");

String loc = sc.nextLine();

String sql = String.*format*(

"UPDATE DEPT SET dname='%s', loc='%s' WHERE deptno=%d",

dname, loc, deptno);

Connection conn = **null**;

Statement stmt = **null**;

**try** {

Class.*forName*(driver);//1

conn = DriverManager.*getConnection*(url, "scott", "tiger");//2

stmt = conn.createStatement(); //3

**int** result = stmt.executeUpdate(sql);

**if**(result>0){

System.***out***.println(deptno+"가 "+dname+"로 수정 성공");

}**else**{

System.***out***.println("수정 실패");

}

} **catch** (Exception e) {

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

} **finally** {

**try**{

**if**(stmt!=**null**) stmt.close();

**if**(conn!=**null**) conn.close();

}**catch**(Exception e){ }

}//try

sc.close();

}//main

}//class

**부서 번호가 없을 경우 처리 추가**

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

**import** java.util.Scanner;

**public** **class** UpdateOracle2 {

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

String driver = "oracle.jdbc.driver.OracleDriver";

String url = "jdbc:oracle:thin:@localhost:1521:xe";

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

System.***out***.print("수정할 부서번호는 ");

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

String sql1 = "SELECT \* FROM DEPT WHERE DEPTNO = "+deptno;

Connection conn = **null**;

Statement stmt1 = **null**; // sql1(select)을 담당

Statement stmt2 = **null**; // sql2(update)을 담당

ResultSet rs = **null**;

**try** {

Class.*forName*(driver);//1

conn = DriverManager.*getConnection*(url, "scott", "tiger");//2

stmt1 = conn.createStatement(); //3

rs = stmt1.executeQuery(sql1);

**if**(rs.next()){

// 수정시작할 차례

System.***out***.print("부서이름을 뭐라할건됴? ");

sc.nextLine();

String dname = sc.nextLine();

System.***out***.print("부서위치 뭐라 바꿀건디요?");

String loc = sc.nextLine();

String sql2 = String.*format*(

"UPDATE DEPT SET dname='%s', loc='%s' WHERE deptno=%d",

dname, loc, deptno);

stmt2 = conn.createStatement(); // 3

**int** result = stmt2.executeUpdate(sql2);

**if**(result>0){

System.***out***.println(deptno+"가 "+dname+"로 수정성공");

}**else**{

System.***out***.println("수정실패");

}//if-result

}**else**{

System.***out***.println("없는 부서번호라 수정 못해");

}//if-rs.next()

} **catch** (Exception e) {

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

} **finally** {

**try**{

**if**(stmt2!=**null**) stmt2.close();

**if**(rs!=**null**) rs.close();

**if**(stmt1!=**null**) stmt1.close();

**if**(conn!=**null**) conn.close();

}**catch**(Exception e){ }

}//try

sc.close();

}//main

}//class

* + 1. Mysql

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

**import** java.util.Scanner;

**public** **class** UpdateMysql2 {

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

String driver = "com.mysql.jdbc.Driver";

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

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

System.***out***.print("수정할 부서번호는 ");

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

String sql1 = "SELECT \* FROM DIVISION WHERE DNO = "

+dno;

Connection conn = **null**;

Statement stmt1 = **null**; // sql1(select)을 담당

Statement stmt2 = **null**; // sql2(update)을 담당

ResultSet rs = **null**;

**try** {

Class.*forName*(driver);//1

conn = DriverManager.*getConnection*(url, "root", "mysql");//2

stmt1 = conn.createStatement(); //3

rs = stmt1.executeQuery(sql1);

**if**(rs.next()){

// 수정 시작

System.***out***.print("부서이름을 뭐라할건됴? ");

sc.nextLine();

String dname = sc.nextLine();

System.***out***.print("부서전화 뭐라 바꿀건디요?");

String phone = sc.nextLine();

System.***out***.print("부서위치 뭐라 바꿀건디요?");

String position = sc.nextLine();

String sql2 = String.*format*(

"UPDATE DIVISION SET dname='%s', PHONE='%s',"+

"POSITION='%s' WHERE dno=%d",

dname, phone, position, dno);

stmt2 = conn.createStatement(); // 3

**int** result = stmt2.executeUpdate(sql2);

**if**(result>0){

System.***out***.println(dno+"가 "+dname+"로 수정성공");

}**else**{

System.***out***.println("수정실패");

}//if-result

}**else**{

System.***out***.println("없는 부서번호라 수정 못해");

}//if-rs.next()

} **catch** (Exception e) {

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

} **finally** {

**try**{

**if**(stmt2!=**null**) stmt2.close();

**if**(rs!=**null**) rs.close();

**if**(stmt1!=**null**) stmt1.close();

**if**(conn!=**null**) conn.close();

}**catch**(Exception e){ }

}//try

sc.close();

}//main

}//class

* 1. delete
     1. Oracle

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

**import** java.util.Scanner;

**public** **class** DeleteOracle {

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

String driver = "oracle.jdbc.driver.OracleDriver";

String url = "jdbc:oracle:thin:@localhost:1521:xe";

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

System.***out***.print("삭제하고 픈 부서번호는? ");

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

/\*String deleteQuery = "DELETE FROM DEPT WHERE DEPTNO="+deptno;\*/

String selectQuery = String.*format*("SELECT \* FROM DEPT WHERE DEPTNO = %d",deptno);

String deleteQuery = String.*format*("DELETE FROM DEPT WHERE DEPTNO = %d",deptno);

Connection conn = **null**;

Statement stmt = **null**;

ResultSet rs = **null**;

**try** {

Class.*forName*(driver);

conn = DriverManager.*getConnection*(url, "scott", "tiger");

stmt = conn.createStatement();

rs = stmt.executeQuery(selectQuery);

**if**(rs.next()){

// rs.close();

// stmt.close();

// stmt = conn.createStatement();

**int** result = stmt.executeUpdate(deleteQuery);

**if**(result>0){

System.***out***.println(deptno +"번 부서 삭제 성공");

}**else**{

System.***out***.println("삭제 실패");

}

}**else**{

System.***out***.println("없는 부서번호라 삭제 불가");

}

} **catch** (ClassNotFoundException e) {

System.***out***.println(e.getMessage()+"드라이버오류");

} **catch** (SQLException e) {

System.***out***.println(e.getMessage()+"SQL오류");

} **finally** {

**try**{

**if**(rs!=**null**) rs.close();

**if**(stmt!=**null**) stmt.close();

**if**(conn!=**null**) conn.close();

} **catch** (SQLException e) { }

}//try

sc.close();

}//main

}//class

**부서번호를 문자열로 받아도 가능하다**

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

**import** java.util.Scanner;

**public** **class** DeleteOracle2 {

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

String driver = "oracle.jdbc.driver.OracleDriver";

String url = "jdbc:oracle:thin:@localhost:1521:xe";

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

System.***out***.print("삭제하고 픈 부서번호는? ");

String deptno = sc.nextLine();

/\*String deleteQuery = "DELETE FROM DEPT WHERE DEPTNO="+deptno;\*/

String selectQuery = String.*format*("SELECT \* FROM DEPT WHERE DEPTNO = %s",deptno);

String deleteQuery = String.*format*("DELETE FROM DEPT WHERE DEPTNO = %s",deptno);

Connection conn = **null**;

Statement stmt = **null**;

ResultSet rs = **null**;

**try** {

Class.*forName*(driver);

conn = DriverManager.*getConnection*(url, "scott", "tiger");

stmt = conn.createStatement();

rs = stmt.executeQuery(selectQuery);

**if**(rs.next()){

// rs.close();

// stmt.close();

// stmt = conn.createStatement();

**int** result = stmt.executeUpdate(deleteQuery);

**if**(result>0){

System.***out***.println(deptno +"번 부서 삭제 성공");

}**else**{

System.***out***.println("삭제 실패");

}

}**else**{

System.***out***.println("없는 부서번호라 삭제 불가");

}

} **catch** (ClassNotFoundException e) {

System.***out***.println(e.getMessage()+"드라이버오류");

} **catch** (SQLException e) {

System.***out***.println(e.getMessage()+"SQL오류");

} **finally** {

**try**{

**if**(rs!=**null**) rs.close();

**if**(stmt!=**null**) stmt.close();

**if**(conn!=**null**) conn.close();

} **catch** (SQLException e) { }

}//try

sc.close();

}//main

}//class

* + 1. Mysql

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

**import** java.util.Scanner;

**public** **class** DeleteMySQL {

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

String driver = "com.mysql.jdbc.Driver";

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

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

System.***out***.print("삭제하고 픈 부서번호는? ");

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

/\*String deleteQuery = "DELETE FROM DIVISION WHERE DEPTNO="+deptno;\*/

String selectQuery = String.*format*("SELECT \* FROM DIVISION WHERE DNO = %d",dno);

String deleteQuery = String.*format*("DELETE FROM DIVISION WHERE DNO = %d",dno);

Connection conn = **null**;

Statement stmt = **null**;

ResultSet rs = **null**;

**try** {

Class.*forName*(driver);

conn = DriverManager.*getConnection*(url, "root", "mysql");

stmt = conn.createStatement();

rs = stmt.executeQuery(selectQuery);

**if**(rs.next()){

// rs.close();

// stmt.close();

// stmt = conn.createStatement();

**int** result = stmt.executeUpdate(deleteQuery);

**if**(result>0){

System.***out***.println(dno +"번 부서 삭제 성공");

}**else**{

System.***out***.println("삭제 실패");

}

}**else**{

System.***out***.println("없는 부서번호라 삭제 불가");

}

} **catch** (ClassNotFoundException e) {

System.***out***.println(e.getMessage()+"드라이버오류");

} **catch** (SQLException e) {

System.***out***.println(e.getMessage()+"SQL오류");

} **finally** {

**try**{

**if**(rs!=**null**) rs.close();

**if**(stmt!=**null**) stmt.close();

**if**(conn!=**null**) conn.close();

} **catch** (SQLException e) { }

}//try

sc.close();

}//main

}//class

**부서번호를 문자열로 받아도 가능하다**

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

**import** java.util.Scanner;

**public** **class** DeleteMySQL2 {

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

String driver = "com.mysql.jdbc.Driver";

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

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

System.***out***.print("삭제하고 픈 부서번호는? ");

String dno = sc.next();

/\*String deleteQuery = "DELETE FROM DIVISION WHERE DEPTNO="+deptno;\*/

String selectQuery = String.*format*("SELECT \* FROM DIVISION WHERE DNO = %s",dno);

String deleteQuery = String.*format*("DELETE FROM DIVISION WHERE DNO = %s",dno);

Connection conn = **null**;

Statement stmt = **null**;

ResultSet rs = **null**;

**try** {

Class.*forName*(driver);

conn = DriverManager.*getConnection*(url, "root", "mysql");

stmt = conn.createStatement();

rs = stmt.executeQuery(selectQuery);

**if**(rs.next()){

// rs.close();

// stmt.close();

// stmt = conn.createStatement();

**int** result = stmt.executeUpdate(deleteQuery);

**if**(result>0){

System.***out***.println(dno +"번 부서 삭제 성공");

}**else**{

System.***out***.println("삭제 실패");

}

}**else**{

System.***out***.println("없는 부서번호라 삭제 불가");

}

} **catch** (ClassNotFoundException e) {

System.***out***.println(e.getMessage()+"드라이버오류");

} **catch** (SQLException e) {

System.***out***.println(e.getMessage()+"SQL오류");

} **finally** {

**try**{

**if**(rs!=**null**) rs.close();

**if**(stmt!=**null**) stmt.close();

**if**(conn!=**null**) conn.close();

} **catch** (SQLException e) { }

}//try

sc.close();

}//main

}//class

* 1. PreparedStatement 인터페이스 이용
     + - String sql\_query = “insert into dept values (?,?,?);
       - PreparedStatement pstmt = conn.preparedStatement(sql\_query);
       - setXXX(int 순서, 실제 데이터나 변수);

1. Oracle

**import** java.sql.Connection;

**import** java.sql.DriverManager;

**import** java.sql.PreparedStatement;

**import** java.sql.SQLException;

**import** java.util.Scanner;

**public** **class** PreparedInsertOracle {

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

String driver = "oracle.jdbc.driver.OracleDriver";

String url = "jdbc:oracle:thin:@127.0.0.1:1521:xe";

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

System.***out***.print("입력할 부서번호는 ? ");

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

System.***out***.print("부서명은 ? ");

sc.nextLine();

String dname = sc.nextLine();

System.***out***.print("부서위치는 ? ");

String loc = sc.nextLine();

String query = "INSERT INTO DEPT VALUES (?, ?, ?)";

Connection conn = **null**;

PreparedStatement pstmt = **null**;

**try**{

Class.*forName*(driver);

conn = DriverManager.*getConnection*(url,"scott","tiger");

pstmt = conn.prepareStatement(query);

pstmt.setInt(1, deptno);

pstmt.setString(2, dname);

pstmt.setString(3, loc);

**int** result = pstmt.executeUpdate();

**if**(result>0)

System.***out***.println(deptno+" 입력 성공");

**else**

System.***out***.println("입력 실패");

}**catch**(ClassNotFoundException e){

System.***out***.println(e.getMessage()+"Driver 검색 오류");

}**catch** (SQLException e) {

System.***out***.println(e.getMessage()+"SQL 오류");

}**finally** {

**try**{

**if**(pstmt!=**null**) pstmt.close();

**if**(conn!=**null**) conn.close();

}**catch** (SQLException e) {

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

}

}

}

}

**public** **class** PreparedDelete {

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

String driver = "oracle.jdbc.driver.OracleDriver";

String url = "jdbc:oracle:thin:@127.0.0.1:1521:xe";

String deleteQuery = "delete from dept where deptno=?";

String seleteQuery = "select \* from dept where deptno=?";

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

System.***out***.print("삭제할 부서번호?");

**int** deptno = scanner.nextInt();

Connection conn = **null**;

PreparedStatement pstmt = **null**;

ResultSet rs = **null**;

**try** {

Class.*forName*(driver);

conn = DriverManager.*getConnection*(url, "scott", "tiger");

pstmt = conn.prepareStatement(seleteQuery);

pstmt.setInt(1, deptno);

rs = pstmt.executeQuery();

**if**(rs.next()) {

System.***out***.print(deptno +"번을 진짜 삭제하시겠습니까(Y/N)?");

String answer = scanner.next();

**if**(answer.equalsIgnoreCase("y")) {

rs.close();

pstmt.close();

pstmt = conn.prepareStatement(deleteQuery);

pstmt.setInt(1, deptno);

**int** result = pstmt.executeUpdate();

System.***out***.println(result>0 ? "삭제성공":"삭제실패");

}**else** {

System.***out***.println("알았어요. 삭제 안 해요.");

}

}**else** {

System.***out***.println("존재하지 않는 부서번호입니다");

}

} **catch** (ClassNotFoundException e) {

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

} **catch** (SQLException e) {

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

}

}

}

**public** **class** PreparedSelect {

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

String driver = "oracle.jdbc.driver.OracleDriver";

String url = "jdbc:oracle:thin:@localhost:1521:xe";

String query = "SELECT \* FROM EMP E, DEPT D" +

" WHERE E.DEPTNO=D.DEPTNO AND DNAME=?";

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

System.***out***.print("부서명은 ? ");

String dname = sc.nextLine();

Connection conn = **null**;

PreparedStatement pstmt = **null**;

ResultSet rs = **null**;

**try** {

Class.*forName*(driver);

conn = DriverManager.*getConnection*(url, "scott", "tiger");

pstmt = conn.prepareStatement(query);

pstmt.setString(1, dname);

rs = pstmt.executeQuery();

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

**int** empno = rs.getInt("empno");

String ename = rs.getString(2);

String job = rs.getString(3);

String sal = rs.getString("sal");

System.***out***.println(empno+"\t"+ename+"\t"+job+"\t"+sal);

}

} **catch** (ClassNotFoundException e) {

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

} **catch** (SQLException e) {

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

}

}

}

**public** **class** PreparedUpdate {

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

String driver = "oracle.jdbc.driver.OracleDriver";

String url = "jdbc:oracle:thin:@127.0.0.1:1521:xe";

String updateQuery = "UPDATE DEPT SET DNAME=?, LOC=? WHERE DEPTNO=?";

String seleteQuery = "SELECT \* FROM DEPT WHERE DEPTNO=?";

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

System.***out***.print("수정할 부서번호?");

**int** deptno = scanner.nextInt();

Connection conn = **null**;

PreparedStatement pstmt = **null**;

ResultSet rs = **null**;

**try** {

Class.*forName*(driver);

conn = DriverManager.*getConnection*(url, "scott", "tiger");

pstmt = conn.prepareStatement(seleteQuery);

pstmt.setInt(1, deptno);

rs = pstmt.executeQuery();

**if**(rs.next()) {

System.***out***.print(deptno +"번을 수정할 부서이름은?");

scanner.nextLine();

String dname = scanner.nextLine();

System.***out***.print(deptno +"번을 수정할 지역은?");

String loc = scanner.nextLine();

rs.close();

pstmt.close();

pstmt = conn.prepareStatement(updateQuery);

pstmt.setString(1, dname);

pstmt.setString(2, loc);

pstmt.setInt(3, deptno);

**int** result = pstmt.executeUpdate();

System.***out***.println(result>0? "수정성공":"수정실패");

}**else** {

System.***out***.println("존재하지 않는 부서번호입니다");

}

} **catch** (ClassNotFoundException e) {

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

} **catch** (SQLException e) {

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

}

}

}

1. Mysql

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

**import** java.util.Scanner;

**public** **class** PreparedInsertMySql {

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

String driver = "com.mysql.jdbc.Driver";

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

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

System.***out***.print("입력할 부서번호는 ? ");

String dno = sc.nextLine();

String selectQuery = "SELECT \* FROM DIVISION WHERE DNO = ?";

Connection conn = **null**;

PreparedStatement pstmt = **null**;

ResultSet rs = **null**;

**try**{

Class.*forName*(driver);

conn = DriverManager.*getConnection*(url,"root","mysql");

pstmt = conn.prepareStatement(selectQuery);

pstmt.setString(1, dno);

rs = pstmt.executeQuery();

**if**(rs.next()){

System.***out***.println("부서번호가 중복되어 입력이 불가합니다");

}**else**{

System.***out***.print("부서명은 ? ");

String dname = sc.nextLine();

System.***out***.print("부서전화는 ? ");

String phone = sc.nextLine();

System.***out***.print("부서위치는 ? ");

String position = sc.nextLine();

String query = "INSERT INTO DIVISION VALUES (?, ?, ?, ?)";

rs.close();

pstmt.close();

pstmt = conn.prepareStatement(query);

pstmt.setString(1, dno);

pstmt.setString(2, dname);

pstmt.setString(3, phone);

pstmt.setString(4, position);

**int** result = pstmt.executeUpdate();

**if**(result>0)

System.***out***.println(dno+" 입력 성공");

**else**

System.***out***.println("입력 실패");

}

}**catch**(ClassNotFoundException e){

System.***out***.println(e.getMessage()+"Driver 검색 오류");

}**catch** (SQLException e) {

System.***out***.println(e.getMessage()+"SQL 오류");

}**finally** {

**try**{

**if**(pstmt!=**null**) pstmt.close();

**if**(conn!=**null**) conn.close();

}**catch** (SQLException e) {

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

}//try-finally\_block

}//try

}//main

}//class