**[ 19 ] 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 다음의 두 파일을 복사한다.

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

mysql-connector-java-8.0.31.jar (C:\Program Files (x86)\MySQL\Connector J 8.0)

* MySQL버전에 따라 드라이버 파일은 다름 ex)mysql-connector-java-8.0.x.jar
  1. Java 8에서 방법 : 이클립스에서 Windows 메뉴 – preferences – Java – Installed JREs – edit – Add External JARs을 통해 두개의 jar를 등록 후 finish (취소: Restore Default 클릭)
  2. Java 8, 11이상에서 방법 : Project – 오른쪽 마우스 클릭 –Properties –Java Build Path –Classpath – Add External JARs – 두개의 jar를 등록 후 – Apply and Close
  3. JDBC프로그래밍 단계와 사용 클래스
     1. **JDBC 드라이버 로드** (JDBC 드라이버를 로드한다) : Class.forName()을 이용. 드라이버 클래스 로딩(드라이버 필요)
* 사용 API : Class.ForName()
  + 1. **데이터베이스 연결** (DB에 연결한다) : DriverManager.getConnection()을 이용해 Connection 객체 생성(접속 URL, id, passwd등 필요)
       - 사용 API : java.sql.Connection
    2. **Statement 생성** (SQL문을 수행할 객체 생성한다) : SQL을 이용해 DB를 조회하거나 다룸. Statement는 SQL 처리 기본 객체
       - 사용 API : java.sql.Statement java.sql.preparedStatement
    3. **SQL문 전송** (SQL문 수행전송하고 결과 받는다): 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** (수행한 결과를 읽어 원하는 로직을 수행한다 (필요할 때까지 반복)
    6. **연결 해제** ( DB 연결을 끊는다) : 사용한 자원을 반납함
       - 사용 API : java.sql.Connection.close()

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

**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

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

String driver = "com.mysql.cj.jdbc.Driver"; // 8.0

//String driver = "com.mysql.jdbc.Driver"; // 5.X버전 mysql일 경우

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

// String url = "jdbc:mysql://127.0.0.1:3306/kimdb?useUnicode=true&characterEncoding=utf8";

//String url = "jdbc:mysql://127.0.0.1:3306/kimdb"; // 5.X버전 mysql일 경우

Connection conn = **null**;

**try** {

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

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

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

System.***out***.println("MySQL 연결 성공");

} **catch** (ClassNotFoundException e) {

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

} **catch** (SQLException e) {

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

} **finally** {

**try** {

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

} **catch** (SQLException e) {System.***out***.println(e.getMessage());}

}

}

* 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");

//Timestamp hiredate = rs.getTimestamp("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) {

// mysql verson마다 달라

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

// mysql verson마다 달라

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

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) {

// mysql verson마다 달라

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

// mysql verson마다 달라

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

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) {

// mysql verson마다 달라

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

// mysql verson마다 달라

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

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) {

// mysql verson마다 달라

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

// mysql verson마다 달라

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

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) {

// mysql verson마다 달라

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

// mysql verson마다 달라

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

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) {

// mysql verson마다 달라

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

// mysql verson마다 달라

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

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) {

// mysql verson마다 달라

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

// mysql verson마다 달라

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

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) {

// mysql verson마다 달라

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

// mysql verson마다 달라

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

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) {

// mysql verson마다 달라

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

// mysql verson마다 달라

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

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

**- 과정평가형처럼 시간이 없는 단기과정에서는 이후는 생략 -**

1. BLOB 데이터의 입력 및 조회

CREATE TABLE PHOTOINFO (

ID VARCHAR2(15) PRIMARY KEY,

PHOTO BLOB);

BLOB 데이터 입력

**import** java.io.File;

**import** java.io.FileInputStream;

**import** java.io.FileNotFoundException;

**import** java.io.InputStream;

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

**public** **class** BLOBInsert {

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

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

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

String sql = "INSERT INTO PHOTOINFO VALUES ('testid',?)";

File file = **new** File("c:/aca/test.jpg");

Connection conn = **null**;

PreparedStatement pstmt = **null**;

InputStream is = **null**;

**try**{

Class.*forName*(driver);

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

is = **new** FileInputStream(file);

**long** fileSize = file.length();

pstmt = conn.prepareStatement(sql);

pstmt.setBinaryStream(1, is, fileSize);

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

System.***out***.println("성공여부 : " + ((result>0)? "true":"false"));

}**catch** (ClassNotFoundException e) {

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

}**catch** (SQLException e) {

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

}**catch** (FileNotFoundException e) {

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

}**finally** {

**try**{

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

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

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

}**catch** (Exception e) {

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

}

}

}

}

BLOB 데이터 조회

**import** java.io.File;

**import** java.io.FileOutputStream;

**import** java.io.InputStream;

**import** java.sql.Blob;

**import** java.sql.Connection;

**import** java.sql.DriverManager;

**import** java.sql.PreparedStatement;

**import** java.sql.ResultSet;

**public** **class** BLOBRead {

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

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

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

String sql = "SELECT \* FROM PHOTOINFO WHERE ID='testid'";

File file = **new** File("c:/aca/copied.jpg");

Connection conn = **null**;

PreparedStatement pstmt = **null**;

ResultSet rs = **null**;

InputStream is = **null**;

FileOutputStream fos = **null**;

**try**{

Class.*forName*(driver);

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

pstmt = conn.prepareStatement(sql);

rs = pstmt.executeQuery();

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

System.***out***.println("해당 ID의 사진은 다음과 같습니다");

Blob photo = rs.getBlob("photo");

is = photo.getBinaryStream();

fos = **new** FileOutputStream(file);

**byte**[] temp = **new** **byte**[5\*1024];

**int** cnt;

**while**(**true**){

cnt = is.read(temp);

**if**(cnt==-1) **break**;

fos.write(temp, 0, cnt);

}

System.***out***.println("출력화일명 : " + file.getName());

}**else**{

System.***out***.println("해당 ID가 없습니다");

}

} **catch** (Exception e) {

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

} **finally** {

**try**{

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

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

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

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

}**catch** (Exception e) {

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

}

}

}

}