Lab #7:

JDBC Programming

소프트웨어학부
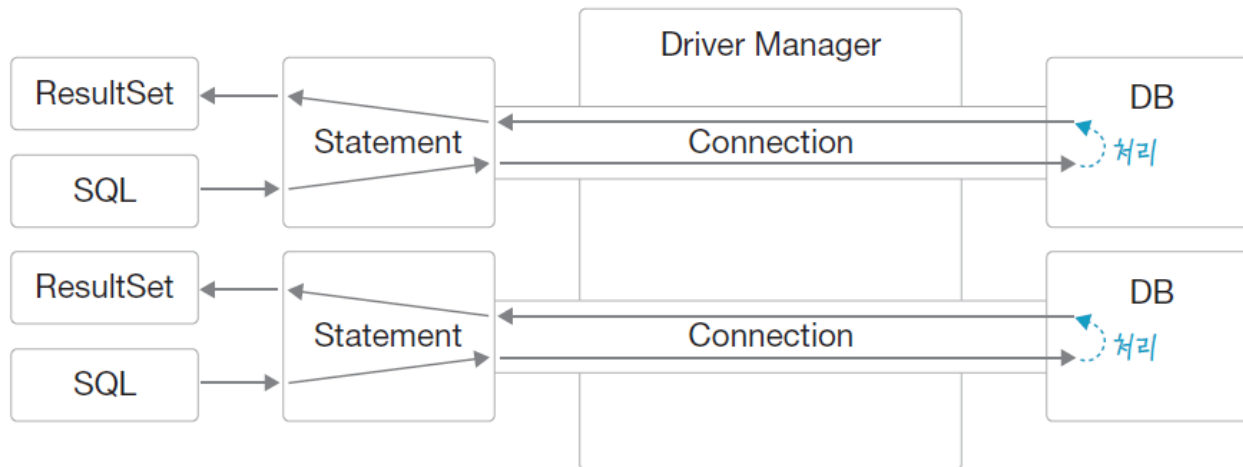
노 서 영

Overview

동작과정
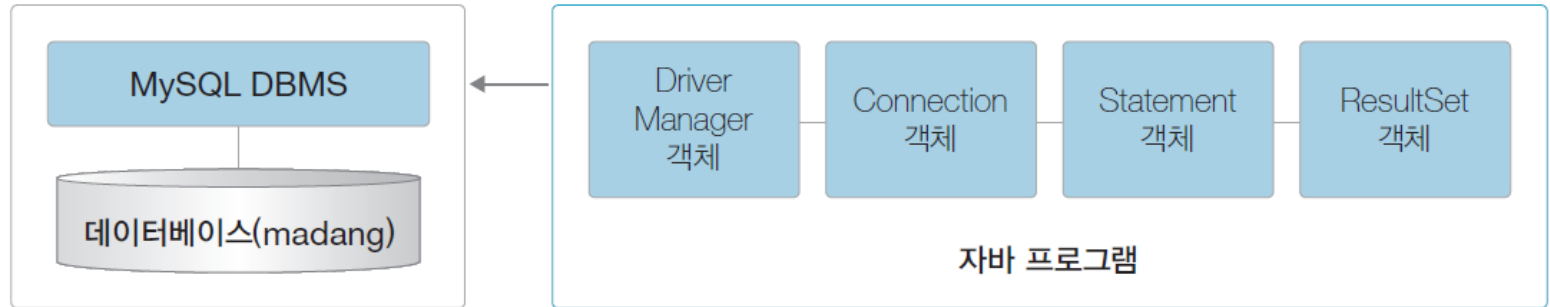
(a) 자바 프로그램의 데이터베이스 연동

(b) 객체 간의 호출 순서

프로그램 실습

3308로 변경
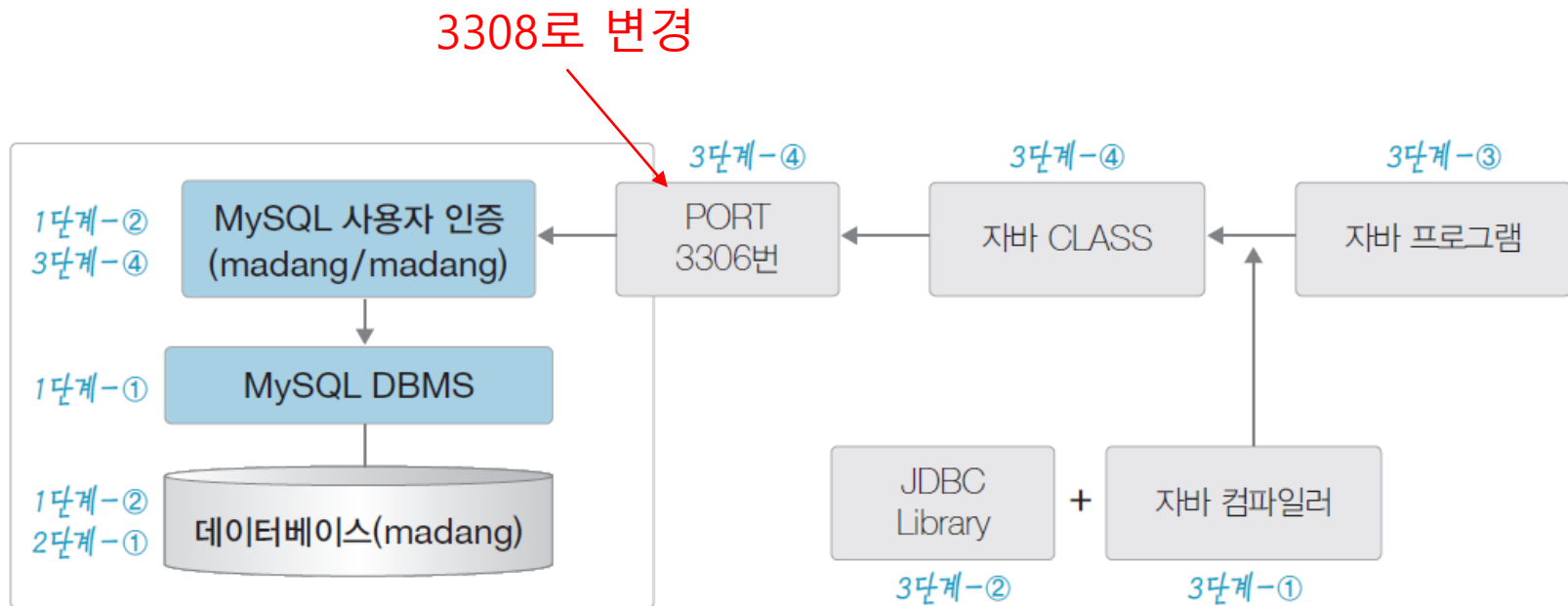
데이터베이스 연동 자바 프로그램의 실행 흐름도

Firewall Setting

방화벽(firewall setting)

- **iptables 설치**

```
rsyoung@diogenes:~$ ssh 192.168.56.201
rsyoung@192.168.56.201's password:
Last login: Sun Oct 27 03:43:04 2019
[rsyoung@mysql ~]$
[rsyoung@mysql ~]$ su -
Password:
Last login: Fri Oct 18 20:47:08 EDT 2019 on pts/0
[root@mysql ~]#
[root@mysql ~]# yum install iptable-services

Installed:
  iptables-services.x86_64 0:1.4.21-33.el7

Dependency Updated:
  iptables.x86_64 0:1.4.21-33.el7

Complete!
[root@mysql ~]#
```

방화벽(firewall setting)

- **MySQL과 통신 할 TCP port 3308번 Open**

```
[root@mysql ~]# cat /etc/sysconfig/iptables
# sample configuration for iptables service
# you can edit this manually or use system-config-firewall
# please do not ask us to add additional ports/services to this
default configuration
*filter
:INPUT ACCEPT [0:0]
:FORWARD ACCEPT [0:0]
:OUTPUT ACCEPT [0:0]
-A INPUT -m state --state RELATED,ESTABLISHED -j ACCEPT
-A INPUT -p icmp -j ACCEPT
-A INPUT -i lo -j ACCEPT
-A INPUT -p tcp -m state --state NEW -m tcp --dport 22 -j ACCEPT
-A INPUT -p tcp -m state --state NEW -m tcp --dport 3308 -j ACCEPT
-A INPUT -j REJECT --reject-with icmp-host-prohibited
-A FORWARD -j REJECT --reject-with icmp-host-prohibited
COMMIT
[root@mysql ~]#
```

방화벽(firewall setting)

- **iptables enabling**

```
[root@mysql ~]# systemctl start iptables
[root@mysql ~]#
[root@mysql ~]# systemctl status iptables
● iptables.service - IPv4 firewall with iptables
   Loaded: loaded (/usr/lib/systemd/system/iptables.service; disabled;
vendor preset: disabled)
   Active: active (exited) since Sun 2019-10-27 03:53:59 EDT; 5s ago
  Process: 4216 ExecStart=/usr/libexec/iptables/iptables.init start
(code=exited, status=0/SUCCESS)
 Main PID: 4216 (code=exited, status=0/SUCCESS)

[root@mysql ~]#
```

MySQL Configuration

MySQL 환경설정

- **Password Policy**

```
[root@mysql ~]# mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
mysql>
mysql> set global validate_password_length=0;
Query OK, 0 rows affected (0.00 sec)

mysql>
mysql> SET GLOBAL validate_password_policy=0;
Query OK, 0 rows affected (0.00 sec)

mysql>
```

MySQL 환경설정

```
mysql> show variables LIKE 'validate_%';
+--------------------------------------+-------+
| Variable_name                        | Value |
+--------------------------------------+-------+
| validate_password_check_user_name    | OFF   |
| validate_password_dictionary_file    |       |
| validate_password_length             | 4     |
| validate_password_mixed_case_count   | 1     |
| validate_password_number_count       | 1     |
| validate_password_policy             | LOW   |
| validate_password_special_char_count | 1     |
+--------------------------------------+-------+
7 rows in set (0.00 sec)

mysql> GRANT ALL PRIVILEGES ON *.* to <your id>@"%" IDENTIFIED BY
'your password' with GRANT OPTION;
Query OK, 0 rows affected, 1 warning (0.01 sec)

mysql>
mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.00 sec)
```

MySQL 환경설정

- ## MySQL port 설정

```
[root@mysql ~]# cat /etc/my.cnf
# For advice on how to change settings please see
# http://dev.mysql.com/doc/refman/5.7/en/server-configuration-
defaults.html

[mysqld]
#
# Remove leading # to set options mainly useful for reporting servers.
# The server defaults are faster for transactions and fast SELECTs.
# Adjust sizes as needed, experiment to find the optimal values.
# join_buffer_size = 128M
# sort_buffer_size = 2M
# read_rnd_buffer_size = 2M

port=3308
default-time-zone = '+09:00'

<생략>
root@mysql ~]#
```

MySQL 환경설정

- **Disabling SELinux**

```
[root@mysql ~]# getenforce
Enforcing
[root@mysql ~]#
[root@mysql ~]# setenforce 0
[root@mysql ~]# getenforce
Permissive
[root@mysql ~]# cat /etc/selinux/config

# This file controls the state of SELinux on the system.
# SELINUX= can take one of these three values:
#     enforcing - SELinux security policy is enforced.
#     permissive - SELinux prints warnings instead of enforcing.
#     disabled - No SELinux policy is loaded.
SELINUX=disabled
# SELINUXTYPE= can take one of three values:
#     targeted - Targeted processes are protected,
#     minimum - Modification of targeted policy. Only selected processes are
protected.
#     mls - Multi Level Security protection.
SELINUXTYPE=targeted

[root@mysql ~]#
```

MySQL 환경설정

- **Enabling and Restarting MySQL**

```
[root@mysql ~]# systemctl enable mysqld
[root@mysql ~]#
[root@mysql ~]# systemctl is-enabled mysqld
enabled
[root@mysql ~]#
[root@mysql ~]# systemctl restart mysqld
[root@mysql ~]#
[root@mysql ~]# systemctl status mysqld
● mysqld.service - MySQL Server
   Loaded: loaded (/usr/lib/systemd/system/mysqld.service; enabled;
vendor preset: disabled)
   Active: active (running) ...

[root@mysql ~]#
```

MySQL JDBC Installation

MySQL JDBC Library Download

https://dev.mysql.com/downloads/connector/j/

MySQL JDBC Library Download

MySQL JDBC Library Installation

```
rsyoung@diogenes:~/Downloads$ ls
eclipse-installer              mysql-connector-java-8.0.18.tar.gz
eclipse-inst-linux64.tar.gz
rsyoung@diogenes:~/Downloads$
rsyoung@diogenes:~/Downloads$ tar -xvzf mysql-connector-java-8.0.18.tar.gz
mysql-connector-java-8.0.18/
mysql-connector-java-8.0.18/src/

mysql-connector-java-8.0.18/src/test/java/testsuite/x/internal/package-
info.java
rsyoung@diogenes:~/Downloads$ ls
eclipse-installer              mysql-connector-java-8.0.18
eclipse-inst-linux64.tar.gz  mysql-connector-java-8.0.18.tar.gz
rsyoung@diogenes:~/Downloads$ cd mysql-connector-java-8.0.18/
rsyoung@diogenes:~/Downloads/mysql-connector-java-8.0.18$ ls
build.xml  INFO_BIN  LICENSE                        README
CHANGES     INFO_SRC  mysql-connector-java-8.0.18.jar  src
rsyoung@diogenes:~/Downloads/mysql-connector-java-8.0.18$
```

(예시)Eclipse :
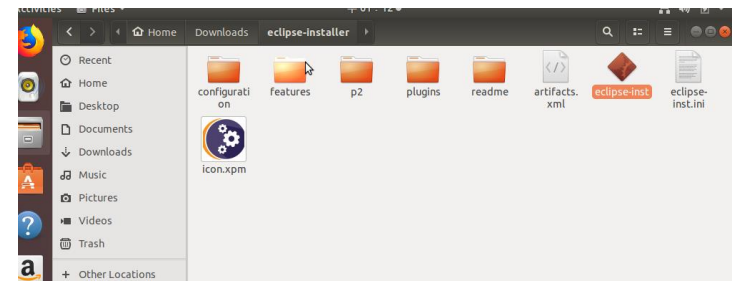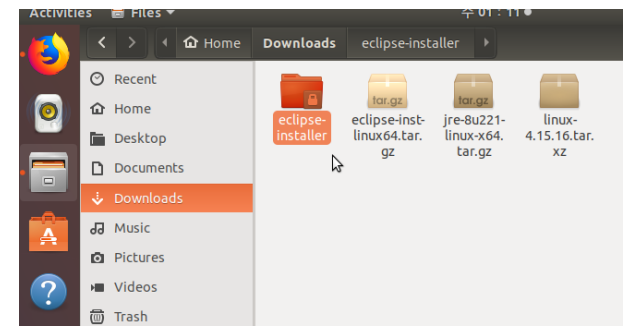# JDBC Sample Programming

주로 사용하는 Editor를 활용 할 것

Download

https://www.eclipse.org/downloads/

Installation


```
rsyoung@diogenes:~$ cd Downloads/
rsyoung@diogenes:~/Downloads$ ls
eclipse-inst-linux64.tar.gz
rsyoung@diogenes:~/Downloads$ tar -xvzf eclipse-inst-linux64.tar.gz
eclipse-installer/

rsyoung@diogenes:~/Downloads$ ls
eclipse-installer  eclipse-inst-linux64.tar.gz
rsyoung@diogenes:~/Downloads$ cd eclipse-installer/
rsyoung@diogenes:~/Downloads/eclipse-installer$ ls
artifacts.xml  eclipse-inst      features  p2       readme
configuration  eclipse-inst.ini  icon.xpm  plugins
rsyoung@diogenes:~/Downloads/eclipse-installer$ ./eclipse-inst
Eclipse Installer:
The Eclipse Installer executable launcher no longer supports running with GTK
+ 2.x. Continuing using GTK+ 3.x.

rsyoung@diogenes:~/Downloads/eclipse-installer$
```

JDBC 설치

이클립스 프로젝트 생성
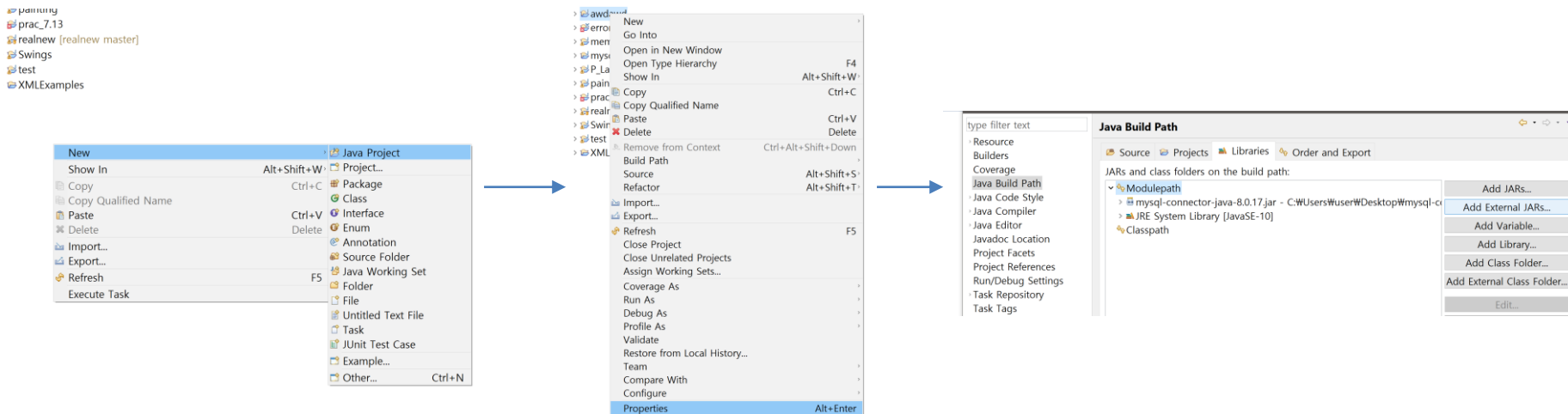
java build path -> add External JARS 클릭

설치한 JDBC 경로에서 mysql-connector-java 클릭

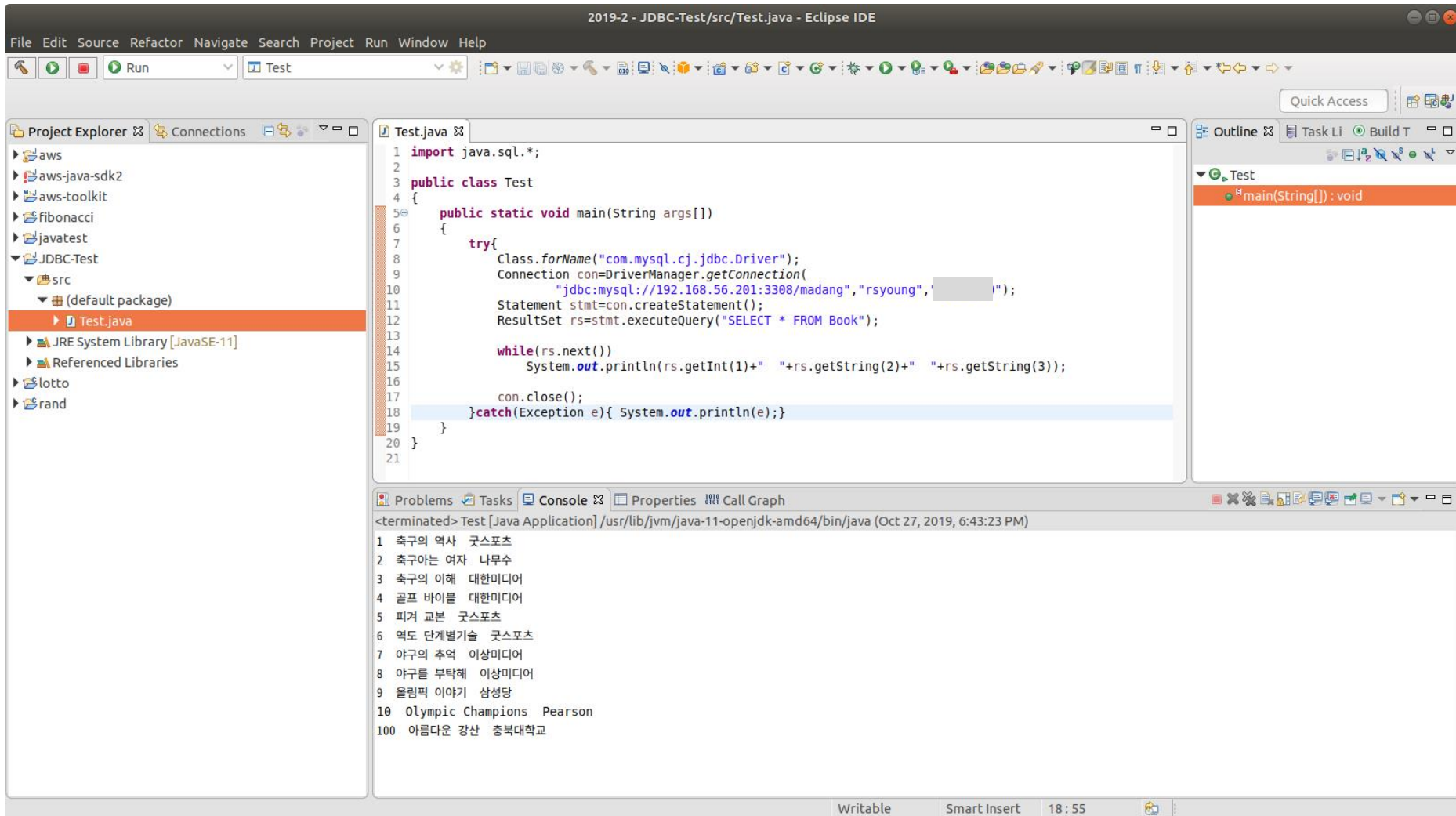# Sample Program

```java
import java.sql.*;

public class Test
{
    public static void main(String args[])
    {
        try{
            Class.forName("com.mysql.cj.jdbc.Driver");
            Connection con=DriverManager.getConnection(
                        "jdbc:mysql://192.168.56.201:3308/madang",
                        "your id","your password");
            Statement stmt=con.createStatement();
            ResultSet rs=stmt.executeQuery("SELECT * FROM Book");

            while(rs.next())
                System.out.println(rs.getInt(1)+"  "+rs.getString(2)+
                                            "  "+rs.getString(3));

            con.close();
        }catch(Exception e){ System.out.println(e);}
    }
}
```

Sample Program

Sample Program

클래스 구분	클래스 혹은 인터페이스	주요 메소드 이름	메소드 설명
java.lang	Class	Class. forName(《클래스이름》)	《클래스이름》의 JDBC 드라이버를 로딩
java.sql	DriverManager	Connection getConnection (url, user, password)	데이터베이스 Connection 객체를 생성
	Connection	Statement createStatement()	SQL 문을 실행하는 Statement 객체를 생성
		void close()	Connection 객체 연결을 종료
	Statement	ResultSet executeQuery (String sql)	SQL 문을 실행해서 ResultSet 객체를 생성
		ResultSet executeUpdate (String sql)	INSERT/DELETE/UPDATE 문을 실행해서 ResultSet 객체를 생성
	ResultSet	boolean first()	결과 테이블에서 커서가 처음 투플을 가리킴
		boolean next()	결과 테이블에서 커서가 다음 투플을 가리킴
		int getInt(《int》)	《int》가 가리키는 열 값을 정수로 반환
		String getString(《int》)	《int》가 가리키는 열 값을 문자열로 반환