

Lab #7:

JDBC Programming

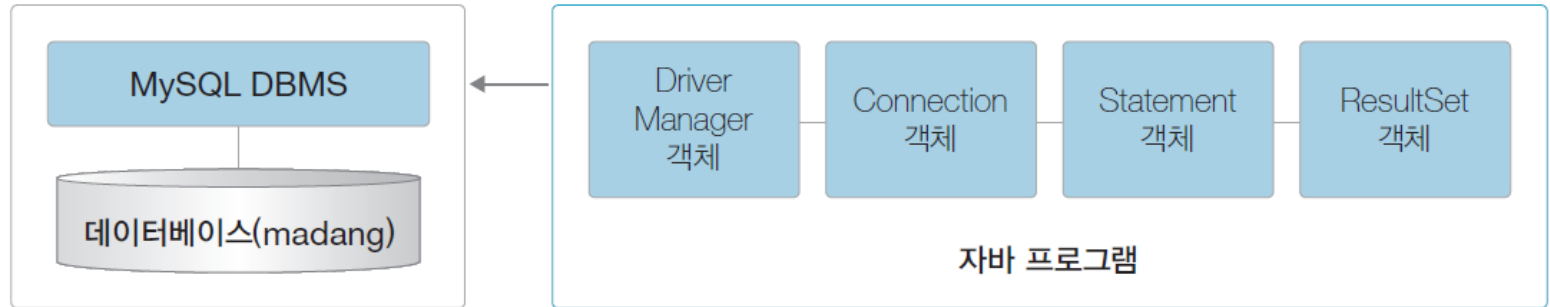
소프트웨어학부
노서영



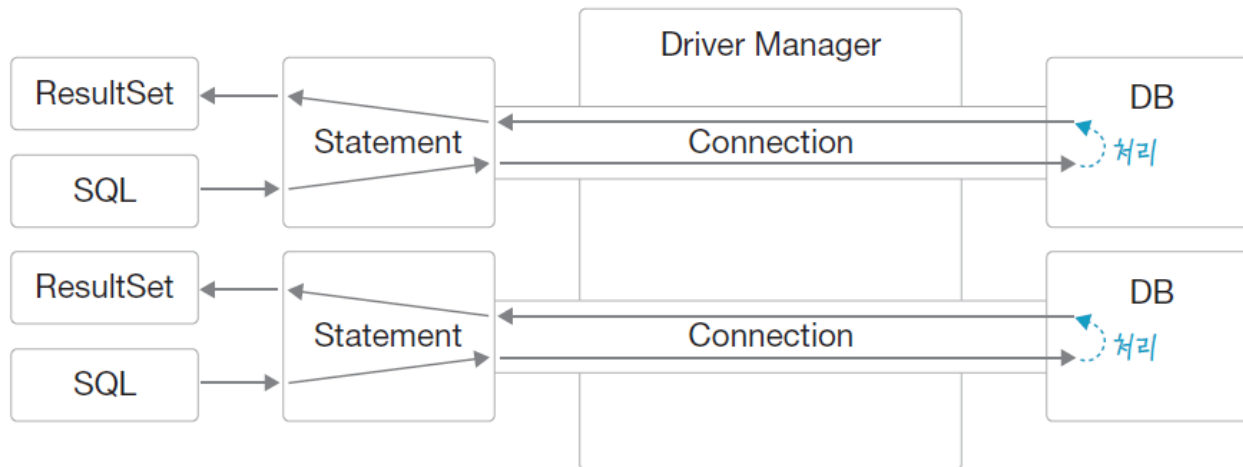
Overview

동작과정

Source from
MySQL로 배우는 데이터베이스 개론과 실습
한빛아카데미

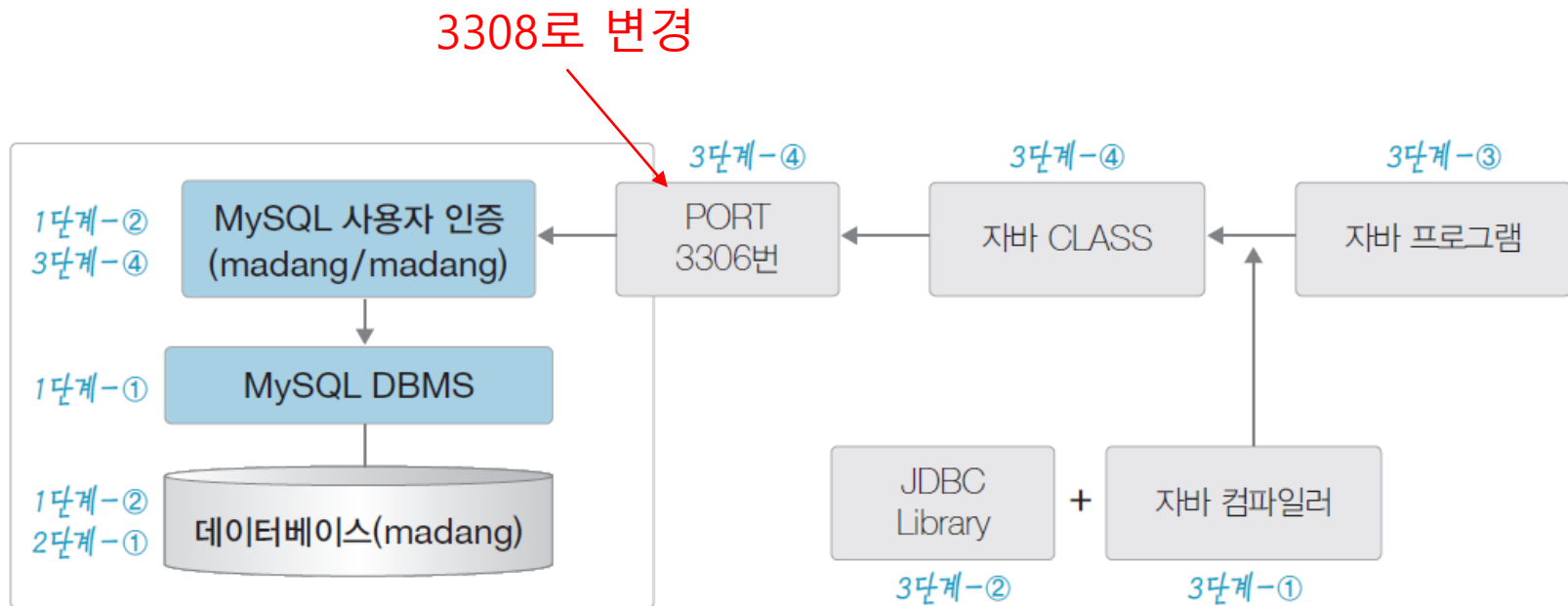


(a) 자바 프로그램의 데이터베이스 연동



(b) 객체 간의 호출 순서

프로그램 실습



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 :: Download Connector/J - Mozilla Firefox

MySQL :: Download Connector/J

MySQL Community Downloads

Connector/J

General Availability (GA) Releases

Connector/J 8.0.18

Select Operating System:

Platform Independent

Looking for previous GA versions?

Platform Independent (Architecture Independent), Compressed TAR Archive (mysql-connector-java-8.0.18.tar.gz)	8.0.18	3.7M	Download
Platform Independent (Architecture Independent), ZIP Archive (mysql-connector-java-8.0.18.zip)	8.0.18	4.4M	Download

We suggest that you use the MD5 checksums and GnuPG signatures to verify the integrity of the packages you download.

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MySQL JDBC Library Download

MySQL :: Begin Your Download - Mozilla Firefox

MySQL :: Begin Your Download X

https://dev.mysql.com/downloads/file/?id=490494

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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/>

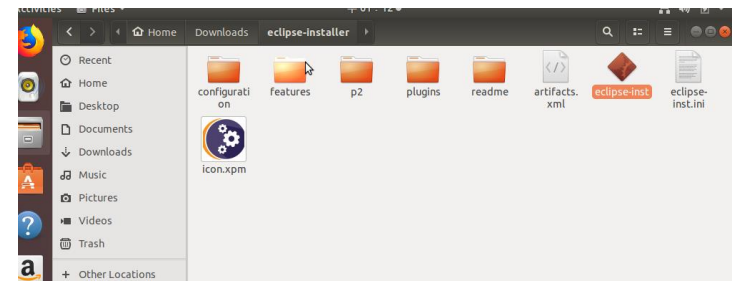
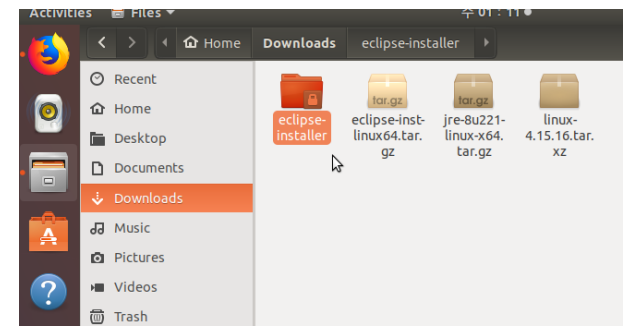
The screenshot shows the Eclipse Downloads page in a Mozilla Firefox browser. The address bar displays <https://www.eclipse.org/downloads/>. The page header features the Eclipse Foundation logo and navigation links: Members, Working Groups, Projects, and More. A main banner area contains the text "Download Eclipse Technology that is right for you" and a sponsored advertisement for "Squish" showing a green frog. Below the banner, the "Tool Platforms" section is visible, featuring four cards: "Get Eclipse IDE 2019-09" with a "Download 64 bit" button, "Eclipse Che" described as a developer workspace server and cloud IDE, "ORION" described as a modern open source software development environment, and a card for installing, launching, and sharing Eclipse IDE. At the bottom, the "Runtime Platforms" section is partially visible. A footer notice states: "Some Eclipse Foundation pages use cookies to better serve you when you return to the site. You can set your browser to notify you before you receive a cookie or turn off cookies. If you do so, however, some areas of some sites may not function properly. To read Eclipse Foundation Privacy Policy [click here.](#)" with "Decline" and "Allow cookies" buttons.

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/
```

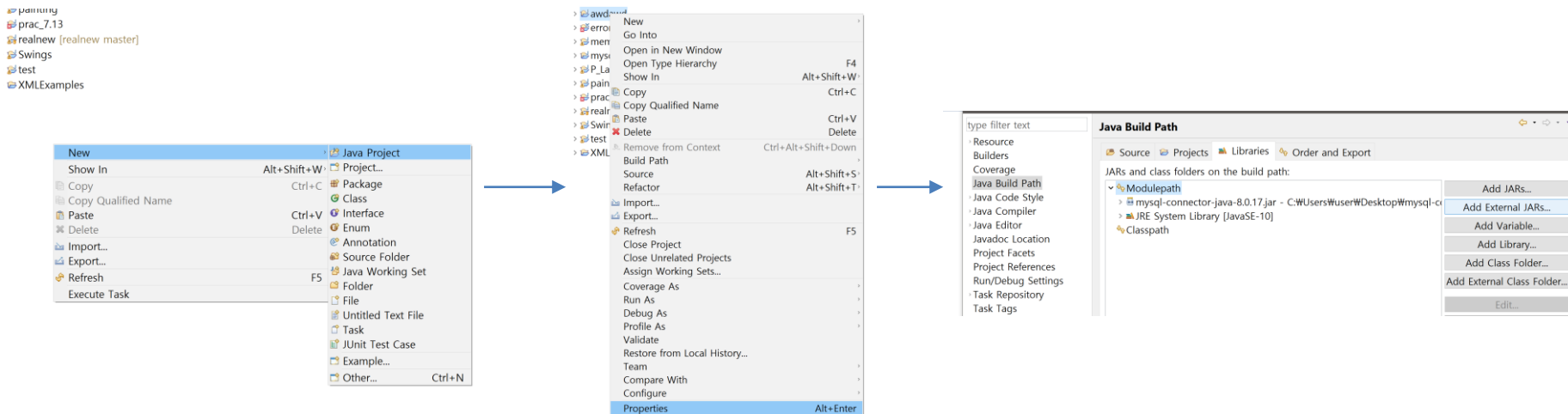
```
rsyoung@diogenes:~/Downloads$ ls  
eclipse-installer  eclipse-inst-linux64.tar.gz  
rsyoung@diogenes:~/Downloads$ cd eclipse-installer/  
rsyoung@diogenes:~/Downloads/eclipse-installer$ ls  
artifacts.xml  eclipse-inst  features  p2  readme  
configuration  eclipse-inst.ini  icon.xpm  plugins  
rsyoung@diogenes:~/Downloads/eclipse-installer$ ./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

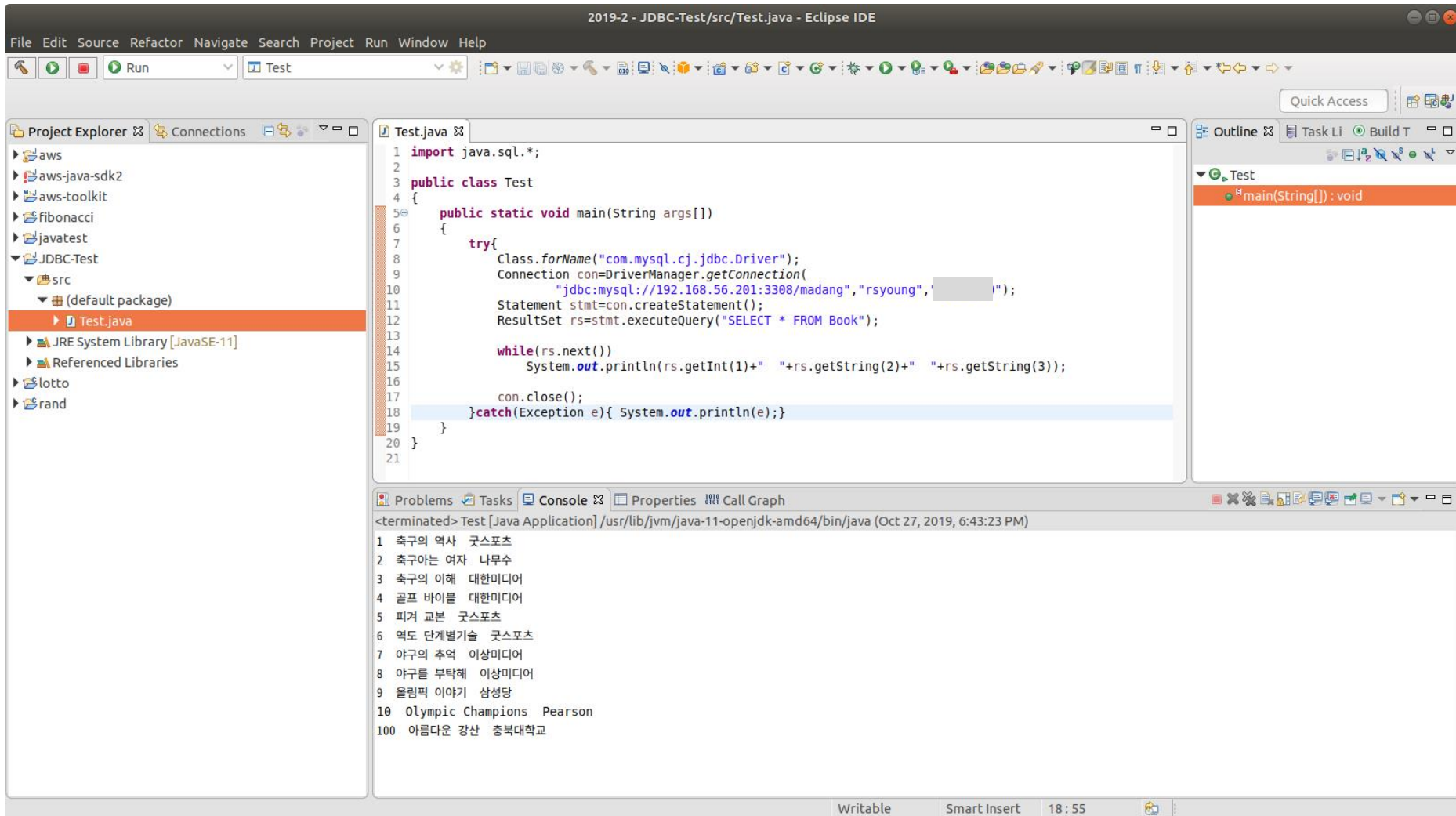
```
import java.sql.*;

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 실행 해서 ResultSet 객체를 생성
	ResultSet	boolean first()	결과 테이블에서 커서가 처음 튜플을 가리킴
		boolean next()	결과 테이블에서 커서가 다음 튜플을 가리킴
		int getInt(<int>)	<int>가 가리키는 열 값을 정수로 반환
		String getString(<int>)	<int>가 가리키는 열 값을 문자열로 반환