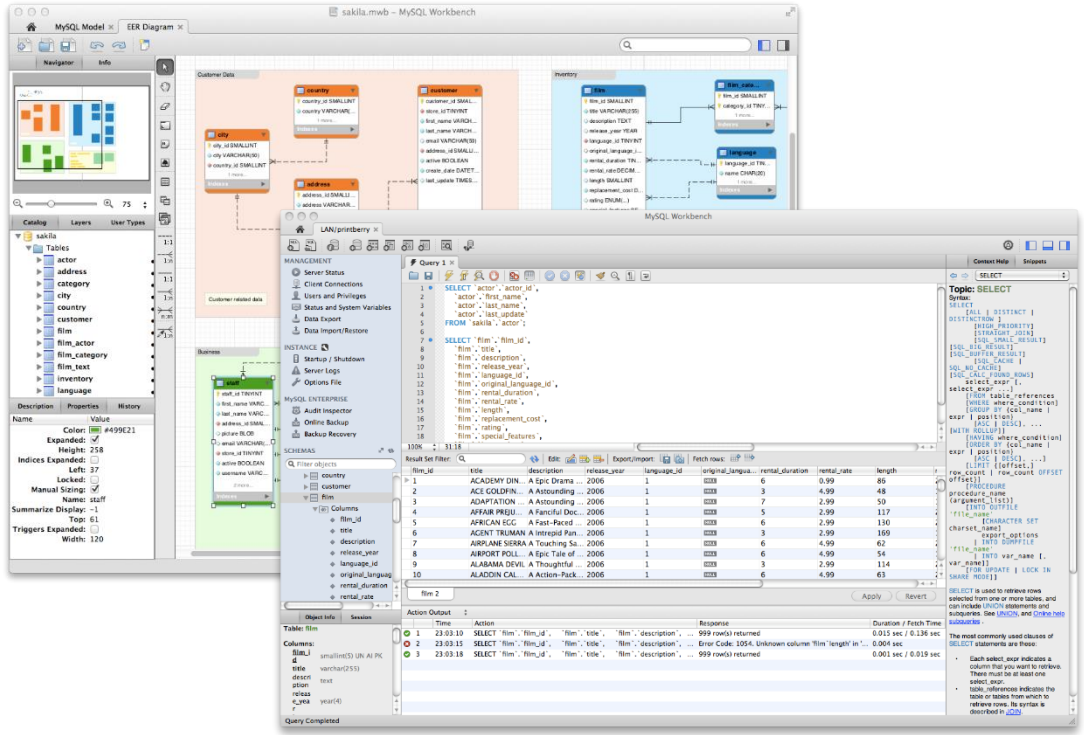

suanlab
이수안 컴퓨터 연구소
suan computer laboratory

MySQL 한번에 끝내기



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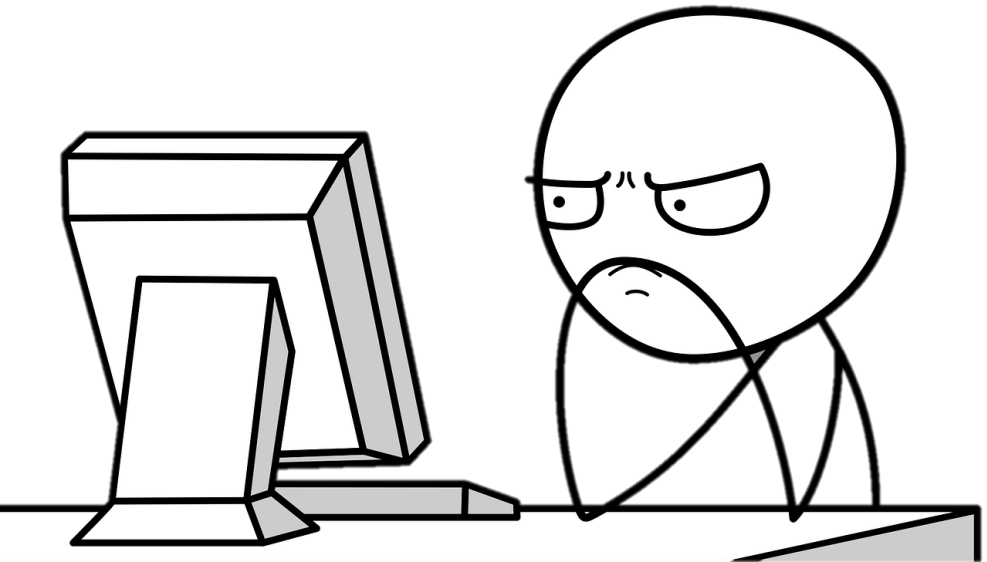
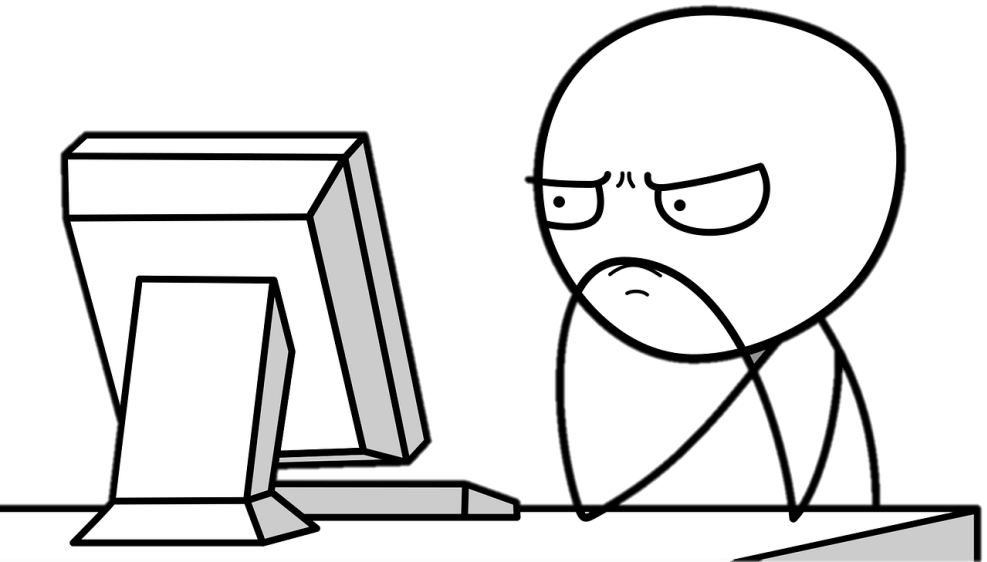
1. MySQL 소개



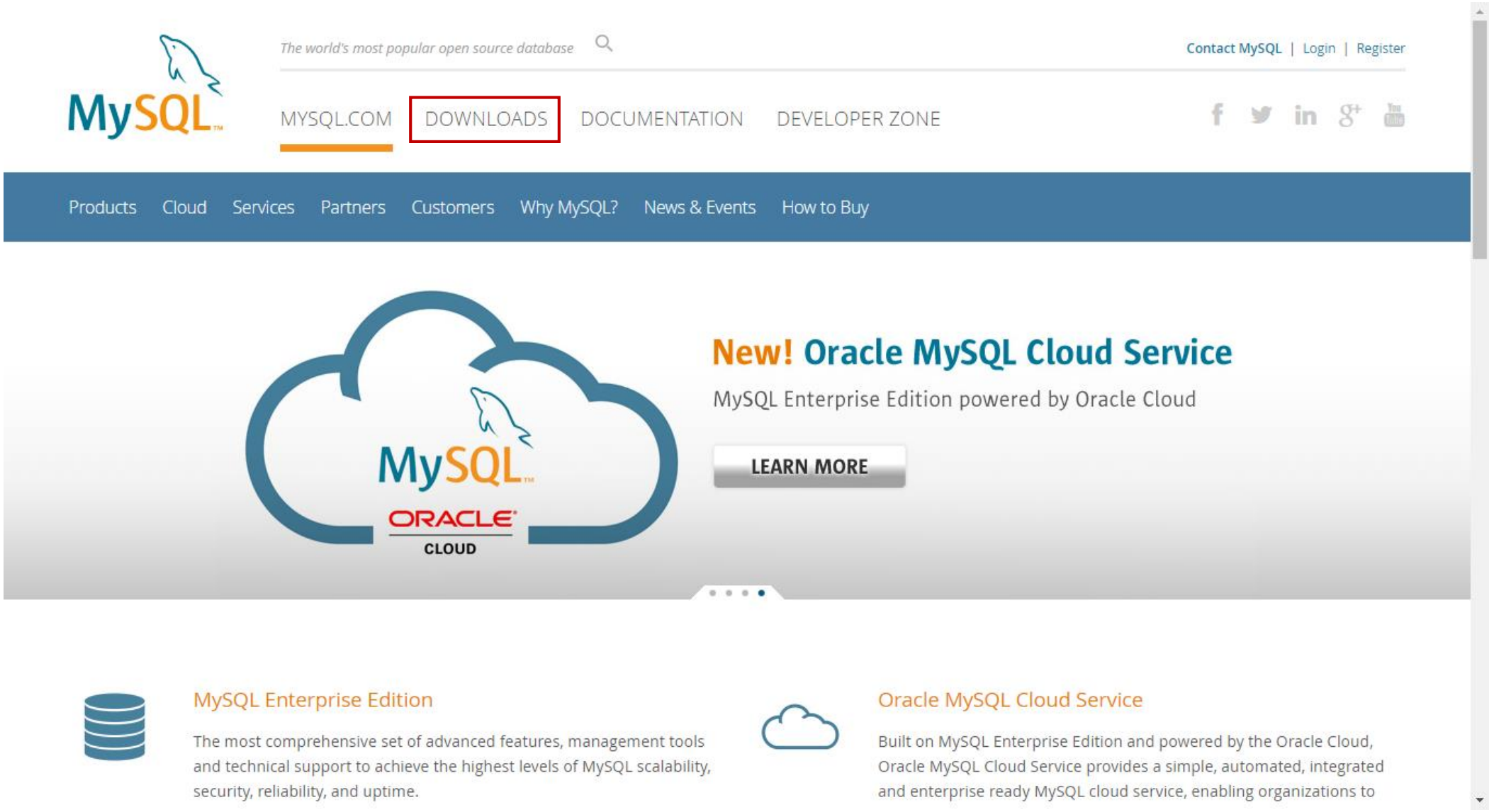
MySQL 소개

- MySQL은 가장 널리 사용되고 있는 관계형 데이터베이스 관리 시스템(RDBMS: Relational DBMS)
- MySQL은 오픈 소스이며, 다중 사용자와 다중 스레드를 지원
- C언어, C++, JAVA, PHP 등 여러 프로그래밍 언어를 위한 다양한 API를 제공
- MySQL은 유닉스, 리눅스, 윈도우 등 다양한 운영체제에서 사용할 수 있으며, 특히 PHP와 함께 웹 개발에 자주 사용
- MySQL은 오픈 소스 라이센스를 따르기는 하지만, 상업적으로 사용할 때는 상업용 라이센스 구입 필요

2. MySQL 설치



MySQL 다운로드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The most comprehensive set of advanced features, management tools and technical support to achieve the highest levels of MySQL scalability, security, reliability, and uptime.
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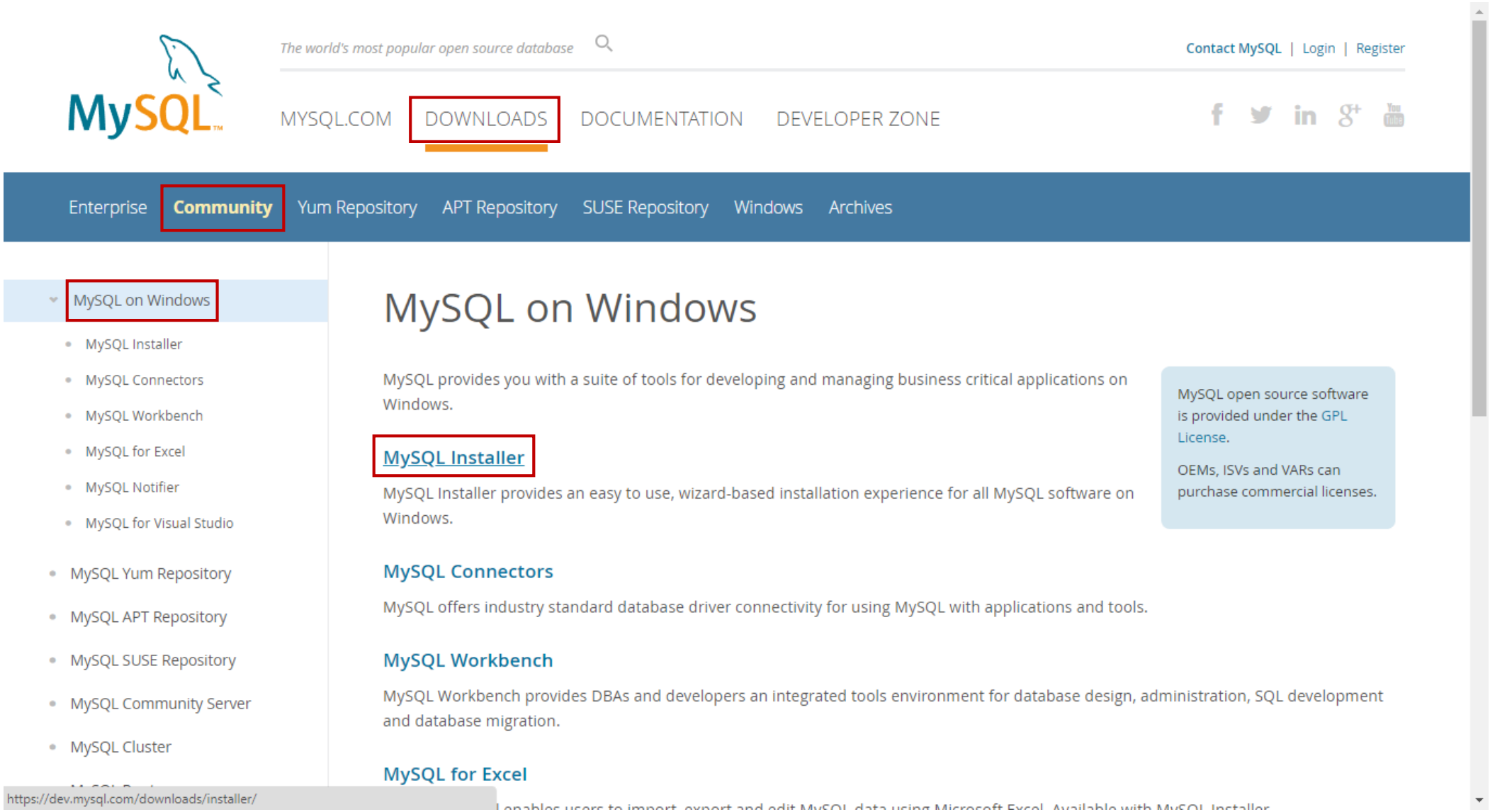
MySQL 다운로드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DOCUMENTATION
DEVELOPER ZONE
Enterprise
Community
Yum Repository
APT Repository
SUSE Repository
Windows
Archives
MySQL on Windows
MySQL Installer
MySQL Connectors
MySQL Workbench
MySQL for Excel
MySQL Notifier
MySQL for Visual Studio
MySQL Yum Repository
MySQL APT Repository
MySQL SUSE Repository
MySQL Community Server
MySQL Cluster
MySQL on Windows
MySQL provides you with a suite of tools for developing and managing business critical applications on Windows.
MySQL Installer
MySQL Installer provides an easy to use, wizard-based installation experience for all MySQL software on Windows.
MySQL open source software is provided under the GPL License.
OEMs, ISVs and VARs can purchase commercial licenses.
MySQL Connectors
MySQL offers industry standard database driver connectivity for using MySQL with applications and tools.
MySQL Workbench
MySQL Workbench provides DBAs and developers an integrated tools environment for database design, administration, SQL development and database migration.
MySQL for Excel
https://dev.mysql.com/downloads/installer/

MySQL 다운로드

- MySQL Shell
- MySQL Workbench
- MySQL Connectors
- Other Downloads

- If you have an online connection while running the MySQL Installer, choose the `mysql-installer-web-community` file.
- If you do NOT have an online connection while running the MySQL Installer, choose the `mysql-installer-community` file.

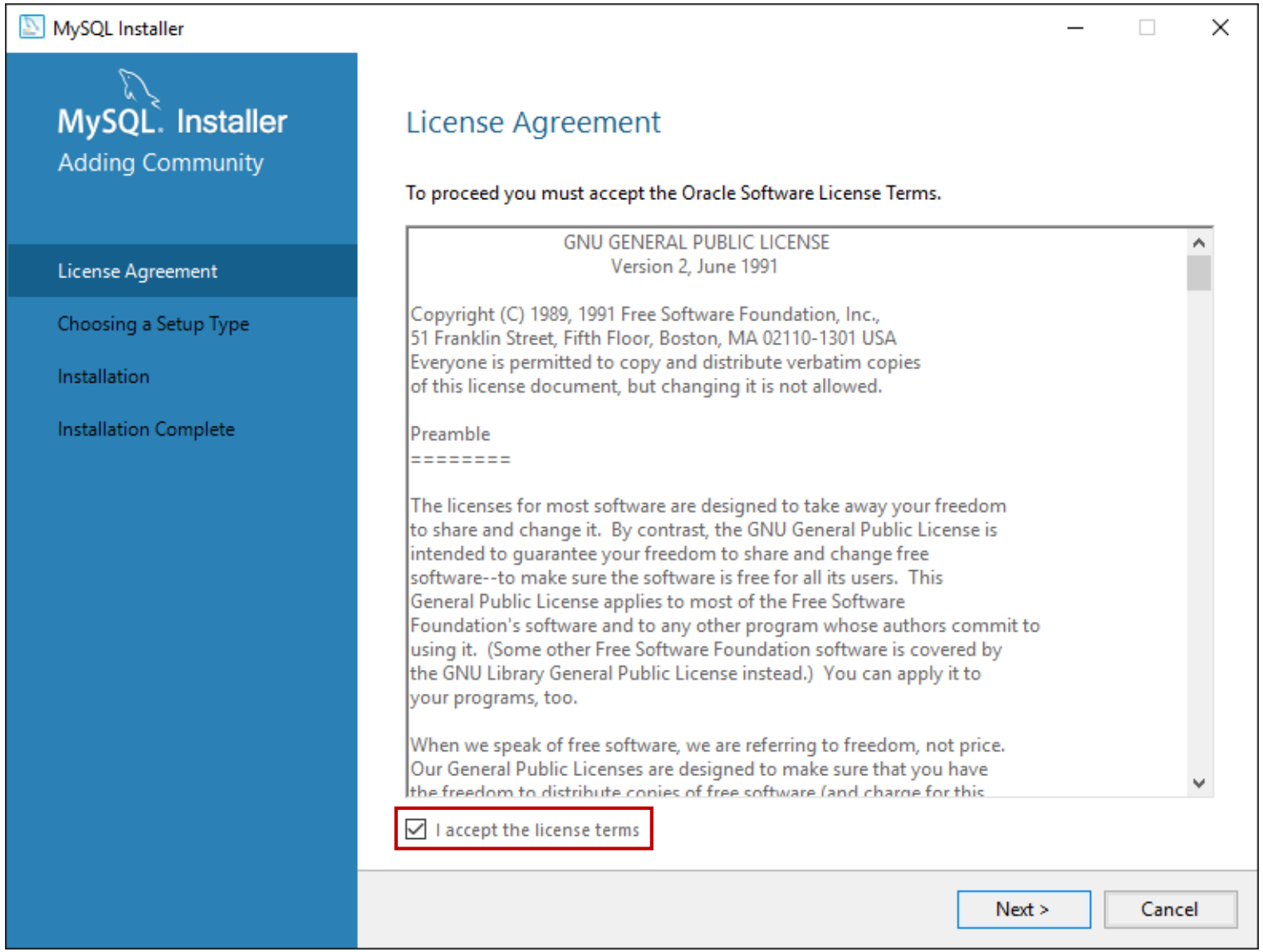
Note: MySQL Installer is 32 bit, but will install both 32 bit and 64 bit binaries.

Online Documentation

- MySQL Installer Documentation and Change History

Please report any bugs or inconsistencies you observe to our Bugs Database.
Thank you for your support!

MySQL 설치


MySQL Installer
MySQL. Installer
Adding Community
License Agreement
Choosing a Setup Type
Installation
Installation Complete
License Agreement
To proceed you must accept the Oracle Software License Terms.
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Preamble
========
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Next >
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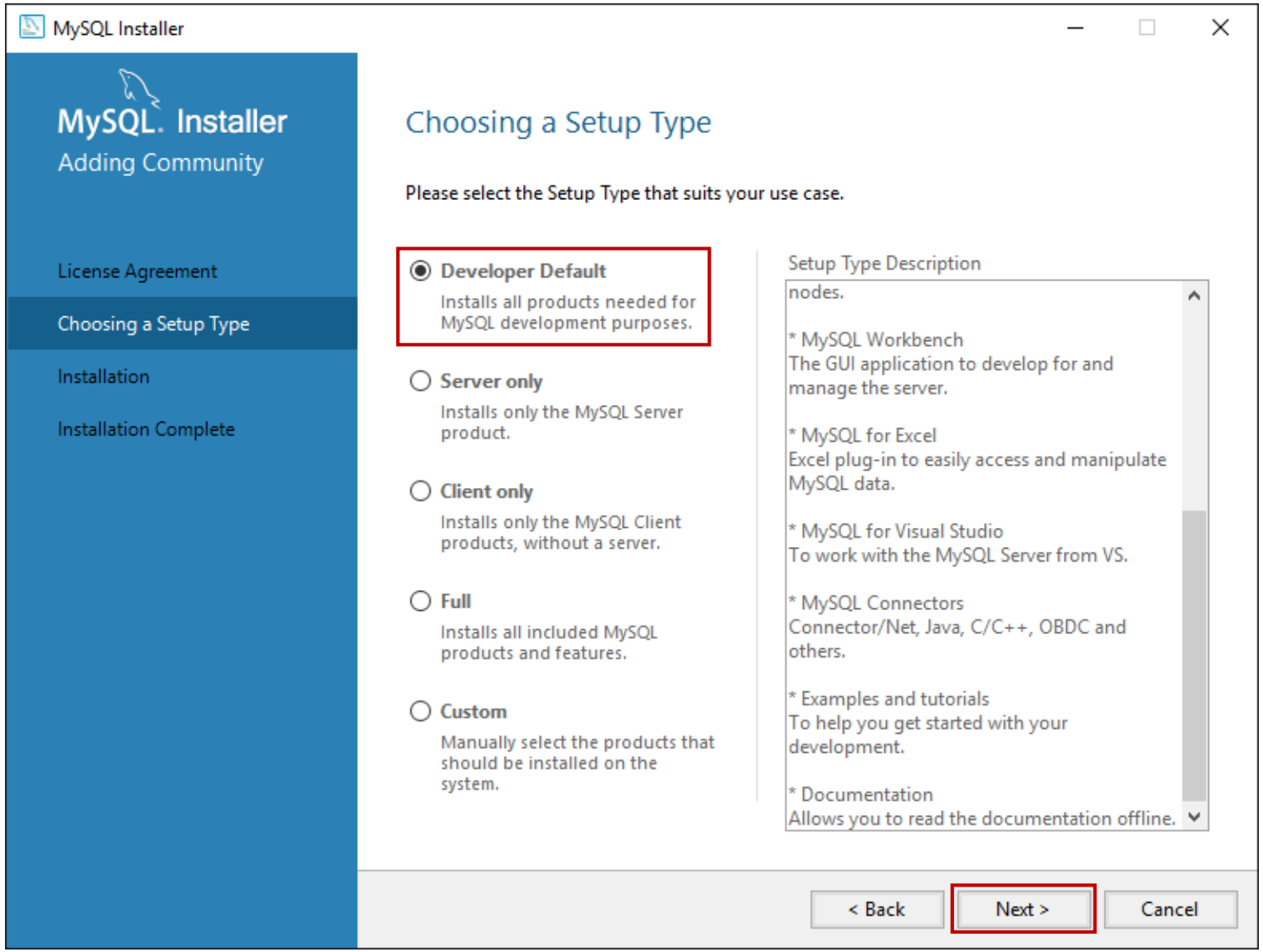
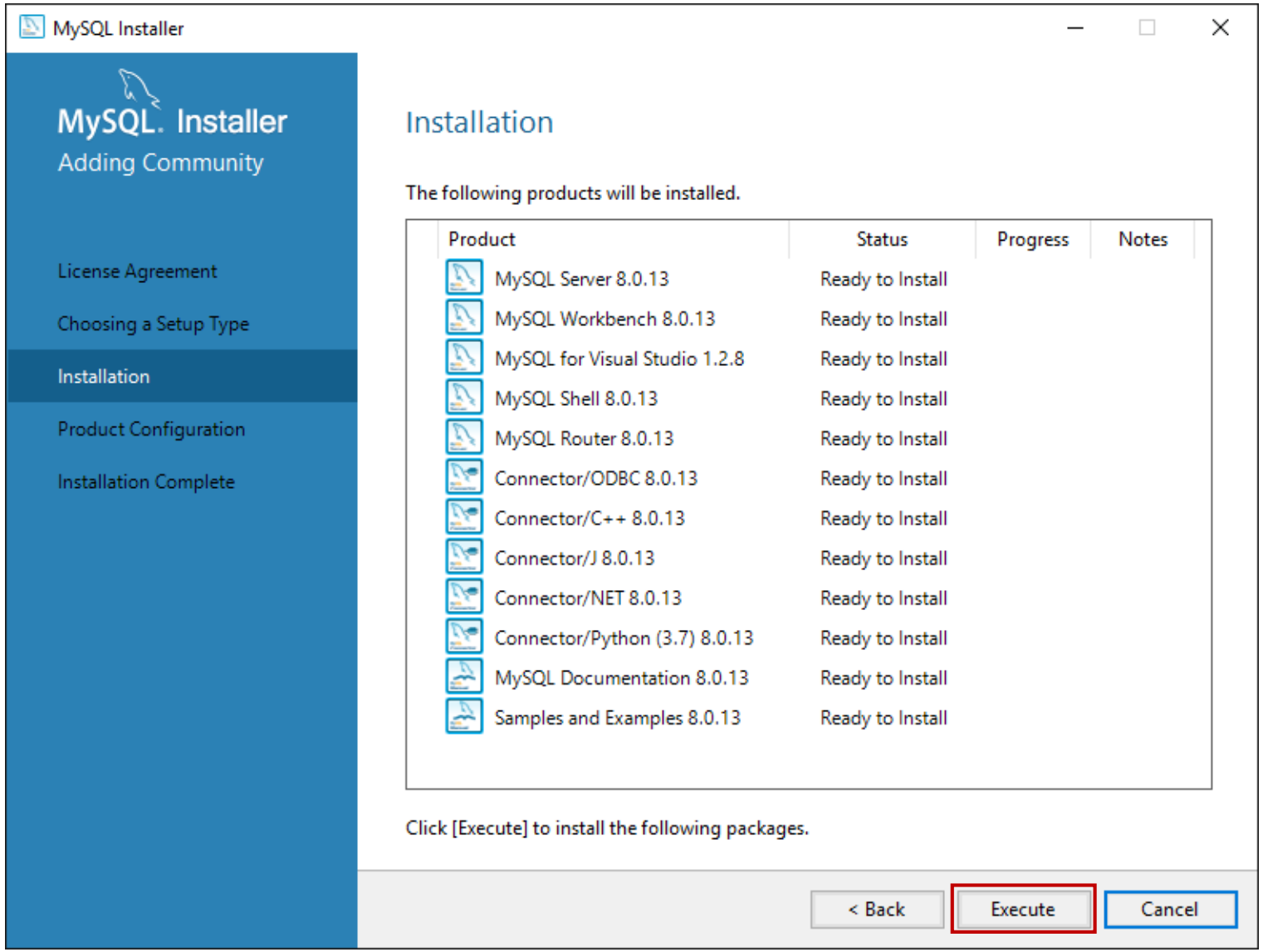
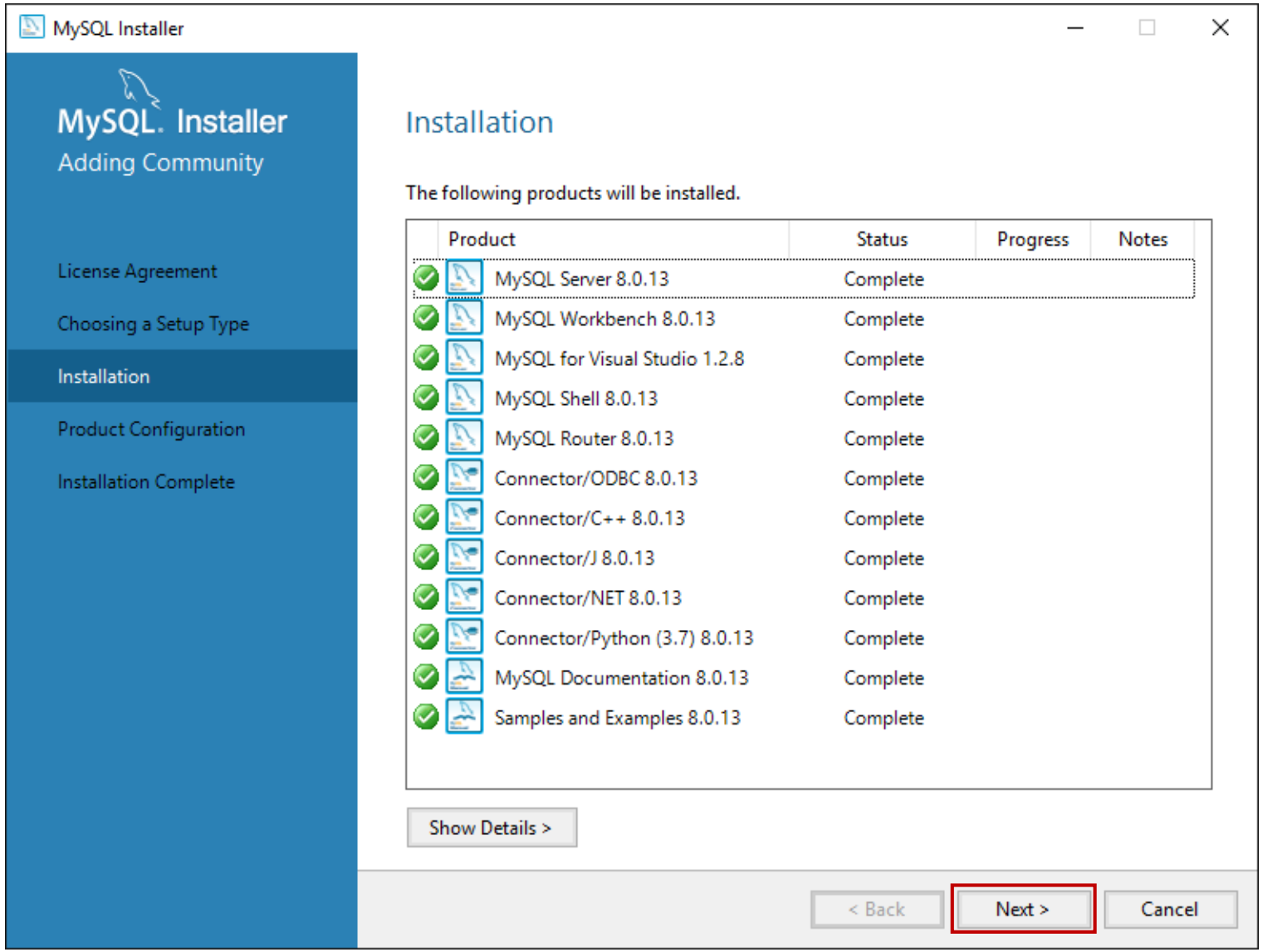
MySQL 설치


MySQL Installer
MySQL. Installer
Adding Community
License Agreement
Choosing a Setup Type
Installation
Installation Complete
Choosing a Setup Type
Please select the Setup Type that suits your use case.
Developer Default
Installs all products needed for MySQL development purposes.
Server only
Installs only the MySQL Server product.
Client only
Installs only the MySQL Client products, without a server.
Full
Installs all included MySQL products and features.
Custom
Manually select the products that should be installed on the system.
Setup Type Description
nodes.
* MySQL Workbench
The GUI application to develop for and manage the server.
* MySQL for Excel
Excel plug-in to easily access and manipulate MySQL data.
* MySQL for Visual Studio
To work with the MySQL Server from VS.
* MySQL Connectors
Connector/Net, Java, C/C++, OBDC and others.
* Examples and tutorials
To help you get started with your development.
* Documentation
Allows you to read the documentation offline.
< Back
Next >
Cancel

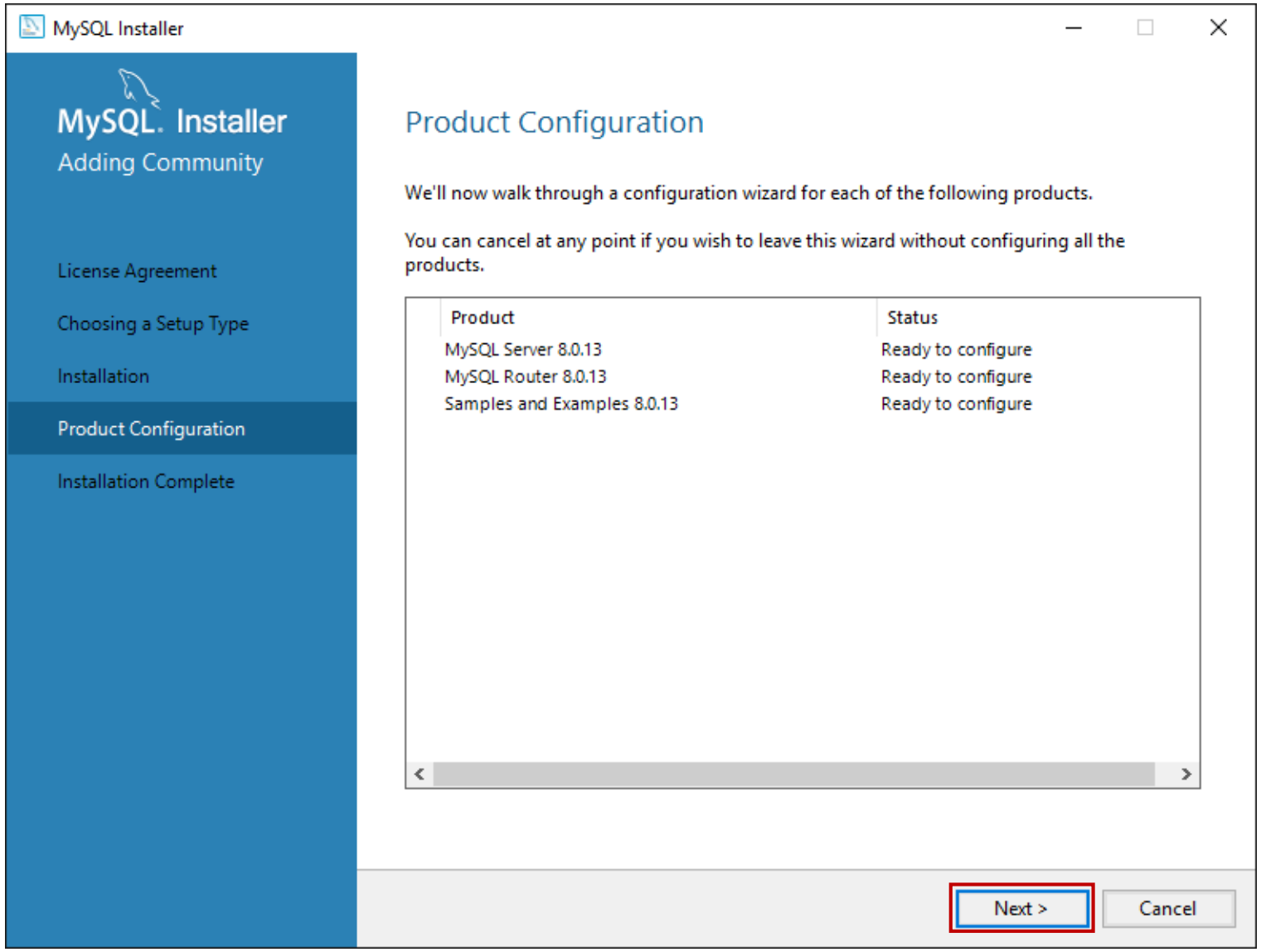
MySQL 설치


MySQL Installer
MySQL. Installer
Adding Community
License Agreement
Choosing a Setup Type
Installation
Product Configuration
Installation Complete
Installation
The following products will be installed.
Product
Status
Progress
Notes
MySQL Server 8.0.13
Ready to Install
MySQL Workbench 8.0.13
Ready to Install
MySQL for Visual Studio 1.2.8
Ready to Install
MySQL Shell 8.0.13
Ready to Install
MySQL Router 8.0.13
Ready to Install
Connector/ODBC 8.0.13
Ready to Install
Connector/C++ 8.0.13
Ready to Install
Connector/J 8.0.13
Ready to Install
Connector/NET 8.0.13
Ready to Install
Connector/Python (3.7) 8.0.13
Ready to Install
MySQL Documentation 8.0.13
Ready to Install
Samples and Examples 8.0.13
Ready to Install
Click [Execute] to install the following packages.
< Back
Execute
Cancel

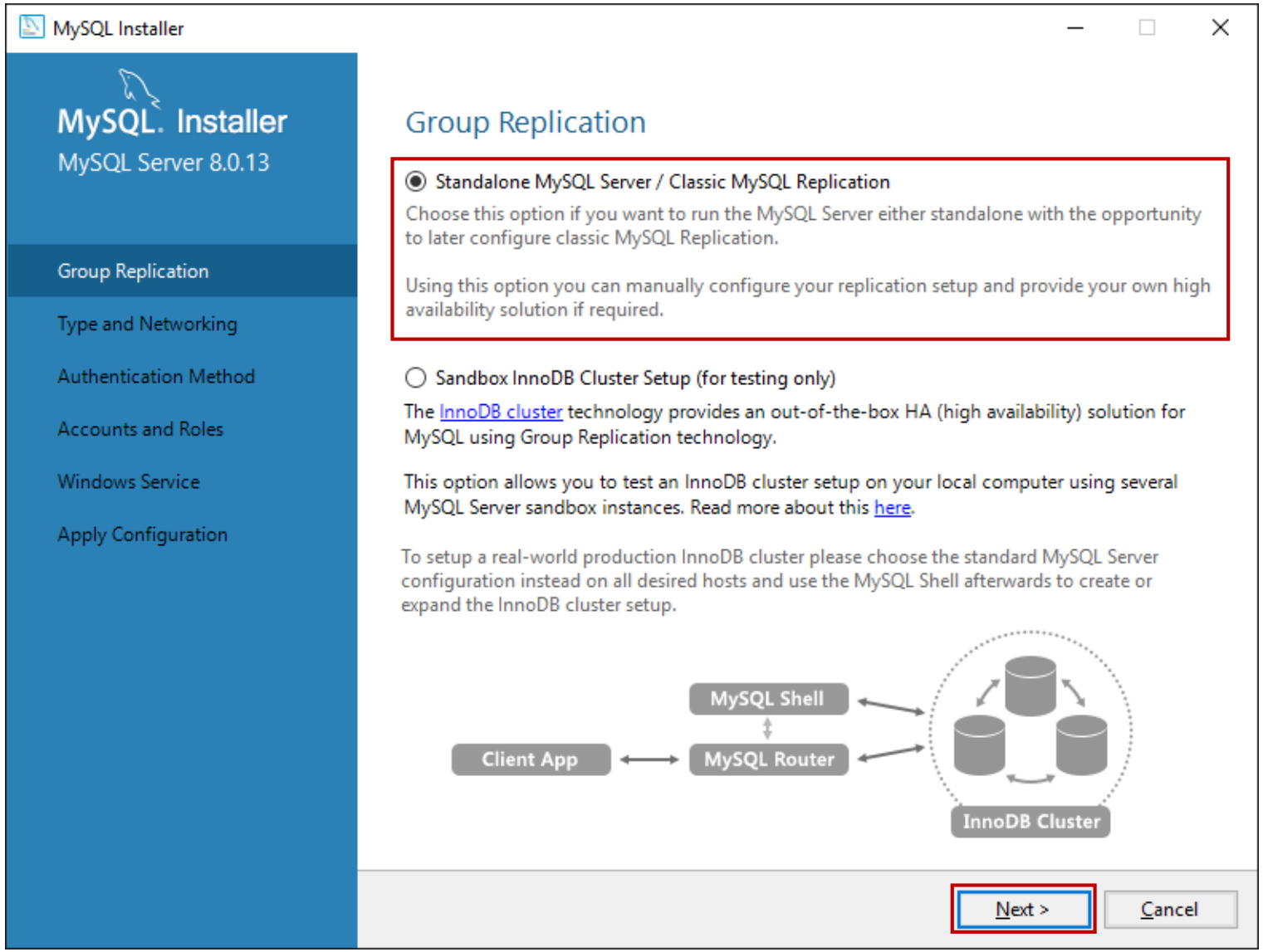
MySQL 설치


MySQL Installer
MySQL. Installer
Adding Community
License Agreement
Choosing a Setup Type
Installation
Product Configuration
Installation Complete
Installation
The following products will be installed.
Product
Status
Progress
Notes
MySQL Server 8.0.13
Complete
MySQL Workbench 8.0.13
Complete
MySQL for Visual Studio 1.2.8
Complete
MySQL Shell 8.0.13
Complete
MySQL Router 8.0.13
Complete
Connector/ODBC 8.0.13
Complete
Connector/C++ 8.0.13
Complete
Connector/J 8.0.13
Complete
Connector/NET 8.0.13
Complete
Connector/Python (3.7) 8.0.13
Complete
MySQL Documentation 8.0.13
Complete
Samples and Examples 8.0.13
Complete
Show Details >
< Back
Next >
Cancel

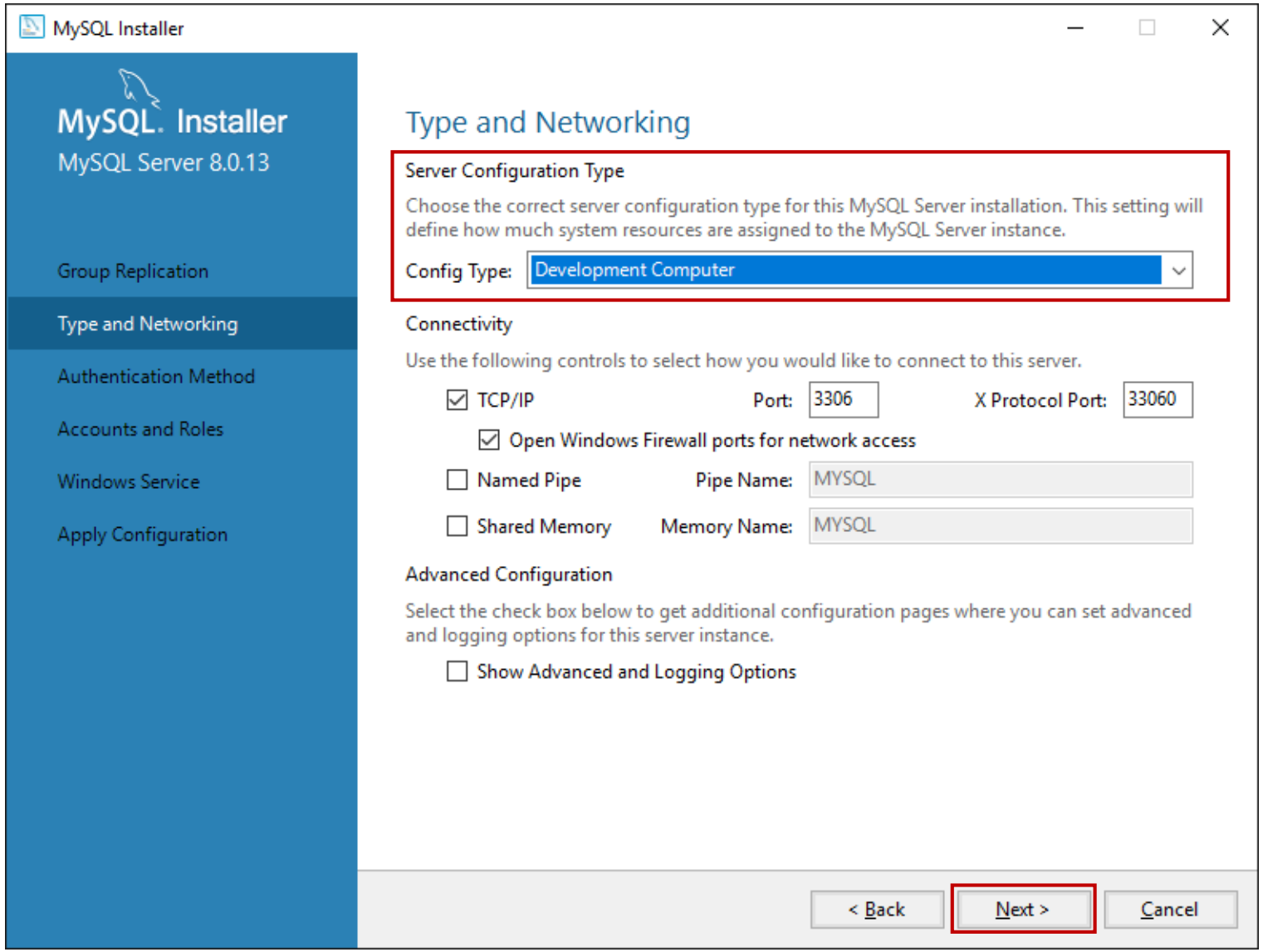
MySQL 설치


MySQL Installer
MySQL. Installer
Adding Community
License Agreement
Choosing a Setup Type
Installation
Product Configuration
Installation Complete
Product Configuration
We'll now walk through a configuration wizard for each of the following products.
You can cancel at any point if you wish to leave this wizard without configuring all the products.
Product
Status
MySQL Server 8.0.13
Ready to configure
MySQL Router 8.0.13
Ready to configure
Samples and Examples 8.0.13
Ready to configure
Next >
Cancel

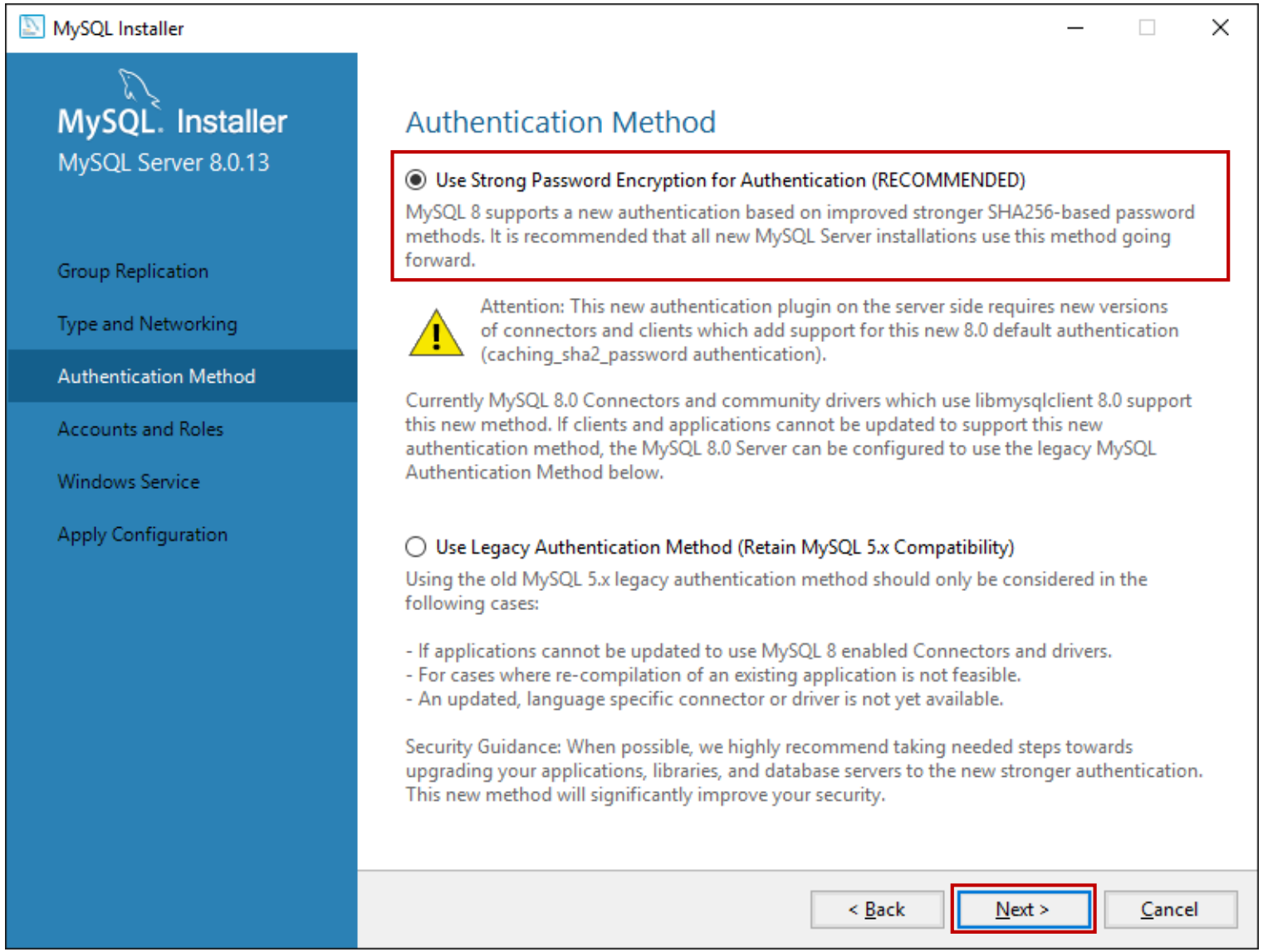
MySQL 설치


MySQL Installer
MySQL. Installer
MySQL Server 8.0.13
Group Replication
Type and Networking
Authentication Method
Accounts and Roles
Windows Service
Apply Configuration
Group Replication
Standalone MySQL Server / Classic MySQL Replication
Choose this option if you want to run the MySQL Server either standalone with the opportunity to later configure classic MySQL Replication.
Using this option you can manually configure your replication setup and provide your own high availability solution if required.
Sandbox InnoDB Cluster Setup (for testing only)
The InnoDB cluster technology provides an out-of-the-box HA (high availability) solution for MySQL using Group Replication technology.
This option allows you to test an InnoDB cluster setup on your local computer using several MySQL Server sandbox instances. Read more about this here.
To setup a real-world production InnoDB cluster please choose the standard MySQL Server configuration instead on all desired hosts and use the MySQL Shell afterwards to create or expand the InnoDB cluster setup.
MySQL Shell
Client App
MySQL Router
InnoDB Cluster
Next >
Cancel

MySQL 설치


MySQL Installer
MySQL. Installer
MySQL Server 8.0.13
Group Replication
Type and Networking
Authentication Method
Accounts and Roles
Windows Service
Apply Configuration
Type and Networking
Server Configuration Type
Choose the correct server configuration type for this MySQL Server installation. This setting will define how much system resources are assigned to the MySQL Server instance.
Config Type: Development Computer
Connectivity
Use the following controls to select how you would like to connect to this server.
TCP/IP
Port: 3306
X Protocol Port: 33060
Open Windows Firewall ports for network access
Named Pipe
Pipe Name: MYSQL
Shared Memory
Memory Name: MYSQL
Advanced Configuration
Select the check box below to get additional configuration pages where you can set advanced and logging options for this server instance.
Show Advanced and Logging Options
< Back
Next >
Cancel

MySQL 설치


MySQL Installer
MySQL. Installer
MySQL Server 8.0.13
Group Replication
Type and Networking
Authentication Method
Accounts and Roles
Windows Service
Apply Configuration
Authentication Method
Use Strong Password Encryption for Authentication (RECOMMENDED)
MySQL 8 supports a new authentication based on improved stronger SHA256-based password methods. It is recommended that all new MySQL Server installations use this method going forward.
Attention: This new authentication plugin on the server side requires new versions of connectors and clients which add support for this new 8.0 default authentication (caching_sha2_password authentication).
Currently MySQL 8.0 Connectors and community drivers which use libmysqlclient 8.0 support this new method. If clients and applications cannot be updated to support this new authentication method, the MySQL 8.0 Server can be configured to use the legacy MySQL Authentication Method below.
Use Legacy Authentication Method (Retain MySQL 5.x Compatibility)
Using the old MySQL 5.x legacy authentication method should only be considered in the following cases:
- If applications cannot be updated to use MySQL 8 enabled Connectors and drivers.
- For cases where re-compilation of an existing application is not feasible.
- An updated, language specific connector or driver is not yet available.
Security Guidance: When possible, we highly recommend taking needed steps towards upgrading your applications, libraries, and database servers to the new stronger authentication. This new method will significantly improve your security.
< Back
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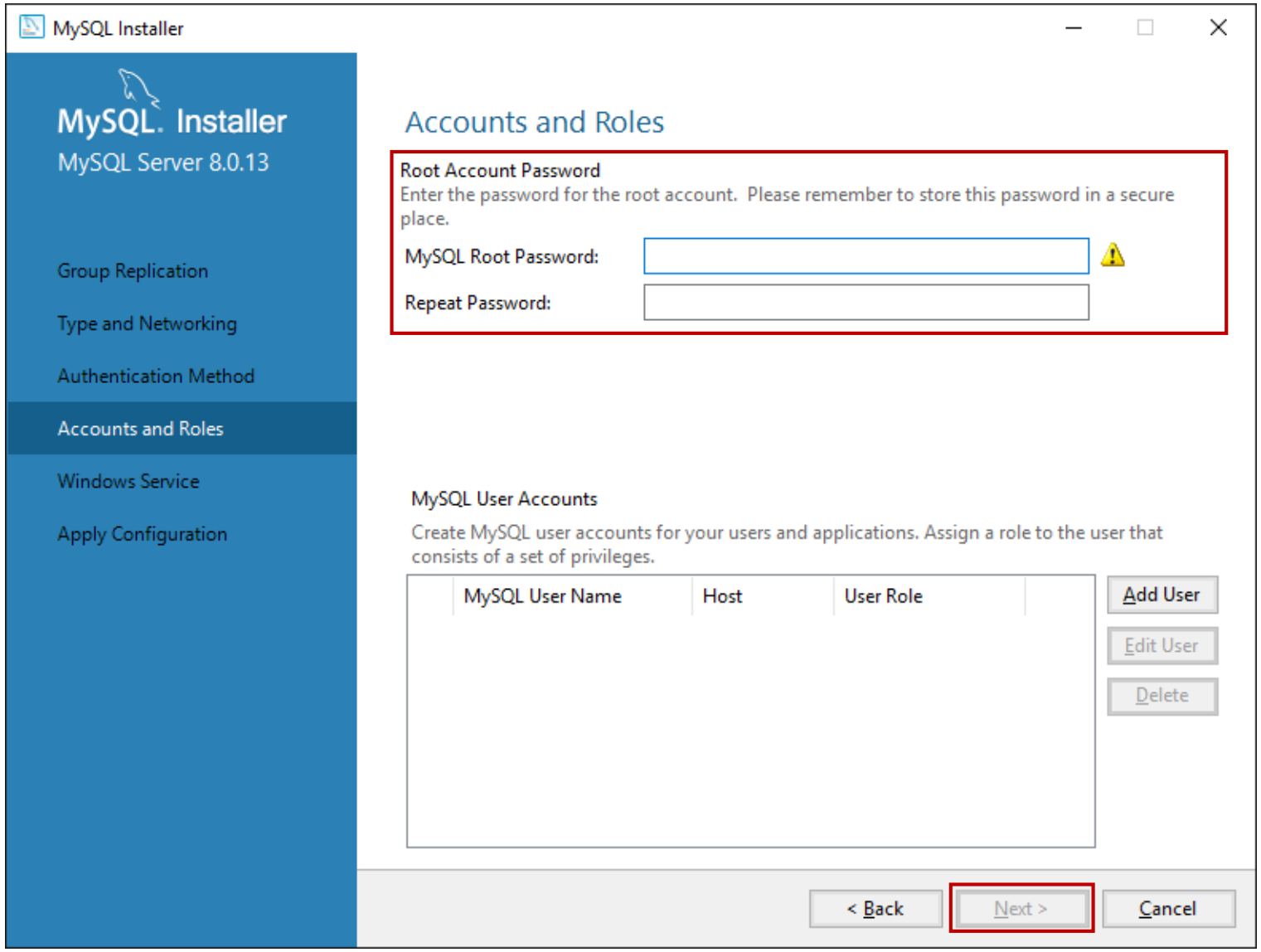
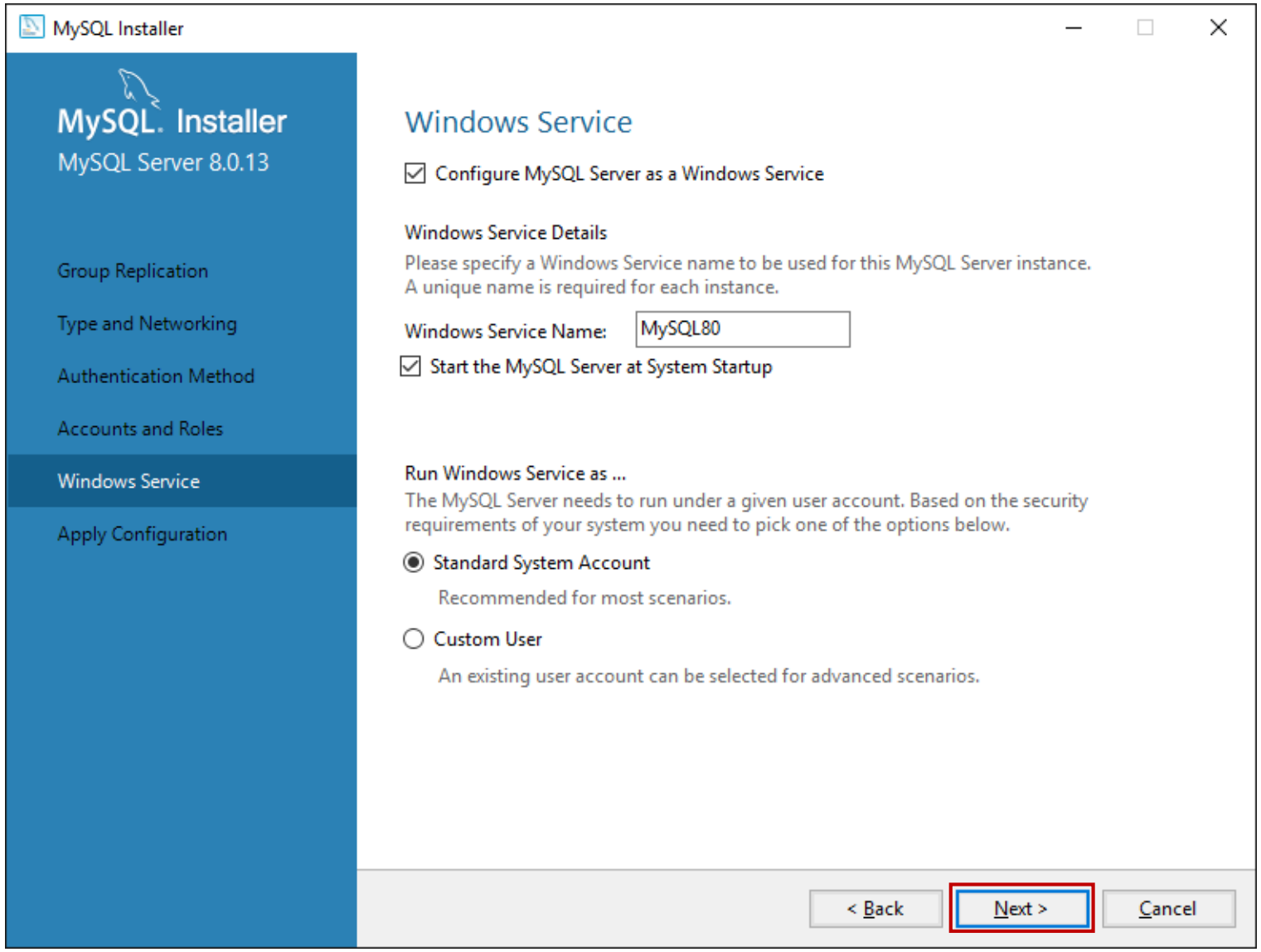
Cancel

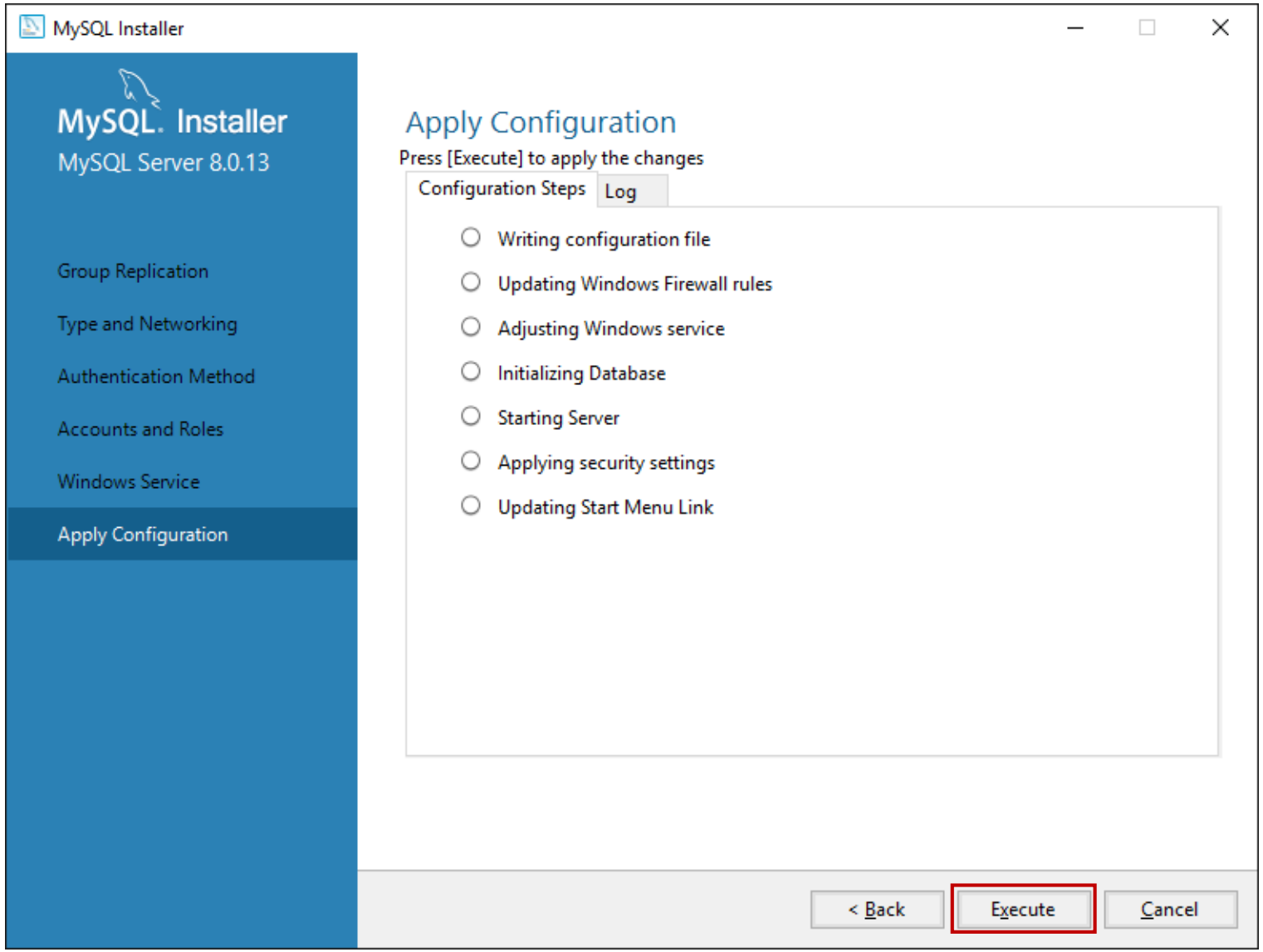
MySQL 설치


MySQL Installer
MySQL. Installer
MySQL Server 8.0.13
Group Replication
Type and Networking
Authentication Method
Accounts and Roles
Windows Service
Apply Configuration
Accounts and Roles
Root Account Password
Enter the password for the root account. Please remember to store this password in a secure place.
MySQL Root Password:
Repeat Password:
MySQL User Accounts
Create MySQL user accounts for your users and applications. Assign a role to the user that consists of a set of privileges.
MySQL User Name
Host
User Role
Add User
Edit User
Delete
< Back
Next >
Cancel

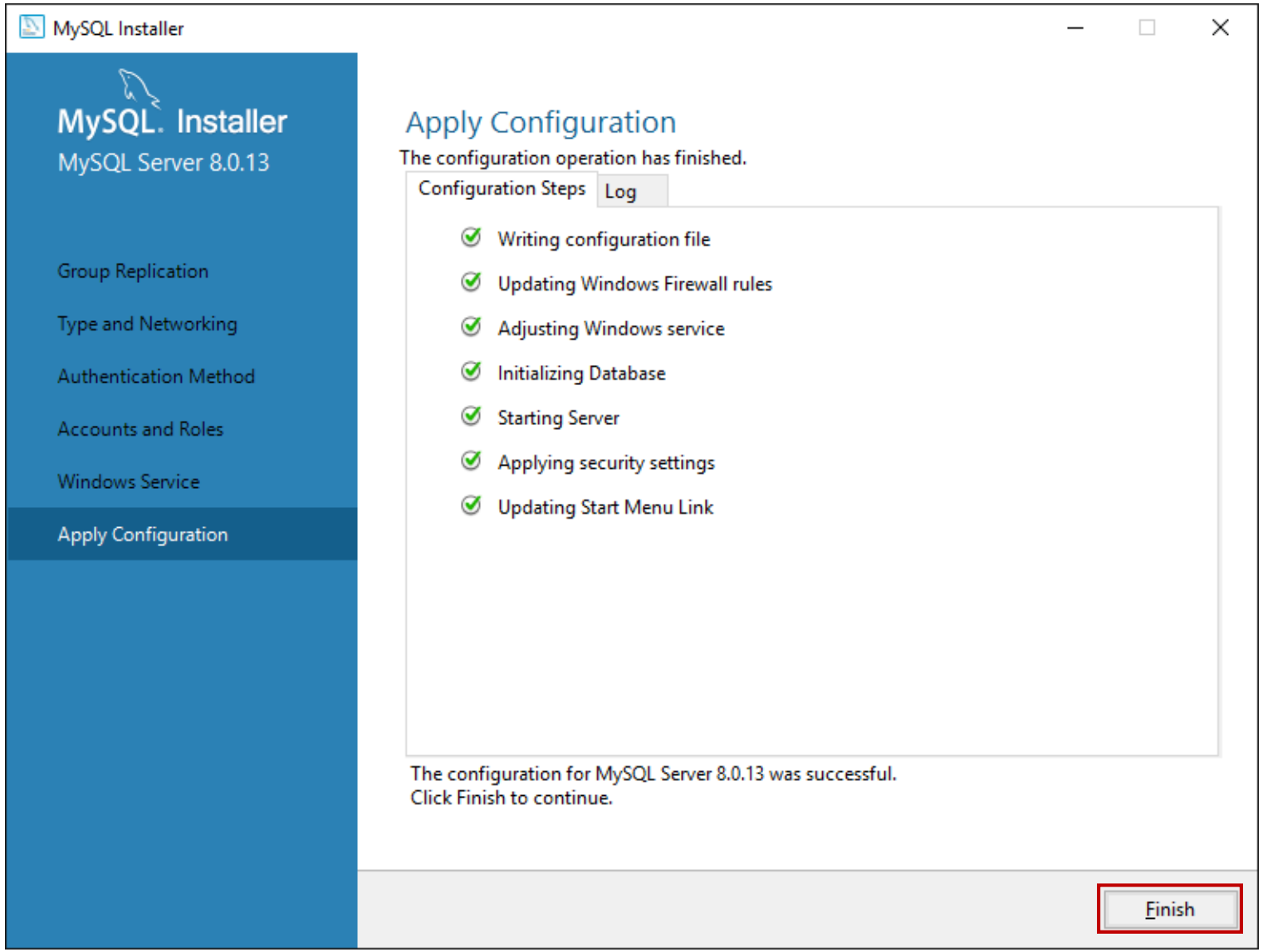
MySQL 설치


MySQL Installer
MySQL. Installer
MySQL Server 8.0.13
Group Replication
Type and Networking
Authentication Method
Accounts and Roles
Windows Service
Apply Configuration
Windows Service
Configure MySQL Server as a Windows Service
Windows Service Details
Please specify a Windows Service name to be used for this MySQL Server instance.
A unique name is required for each instance.
Windows Service Name:
MySQL80
Start the MySQL Server at System Startup
Run Windows Service as ...
The MySQL Server needs to run under a given user account. Based on the security requirements of your system you need to pick one of the options below.
Standard System Account
Recommended for most scenarios.
Custom User
An existing user account can be selected for advanced scenarios.
< Back
Next >
Cancel

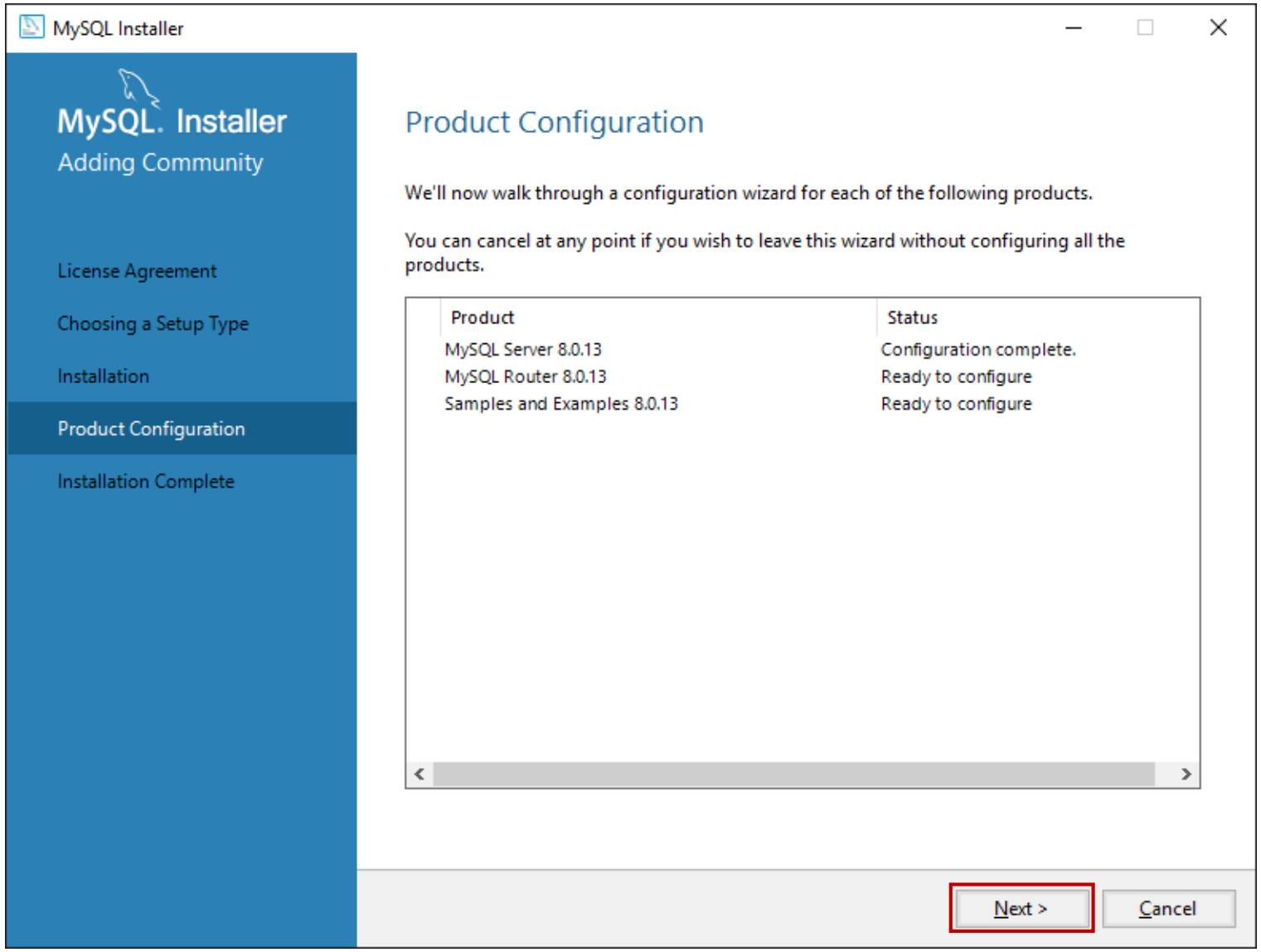
MySQL 설치


MySQL Installer
MySQL. Installer
MySQL Server 8.0.13
Group Replication
Type and Networking
Authentication Method
Accounts and Roles
Windows Service
Apply Configuration
Apply Configuration
Press [Execute] to apply the changes
Configuration Steps
Log
Writing configuration file
Updating Windows Firewall rules
Adjusting Windows service
Initializing Database
Starting Server
Applying security settings
Updating Start Menu Link
< Back
Execute
Cancel

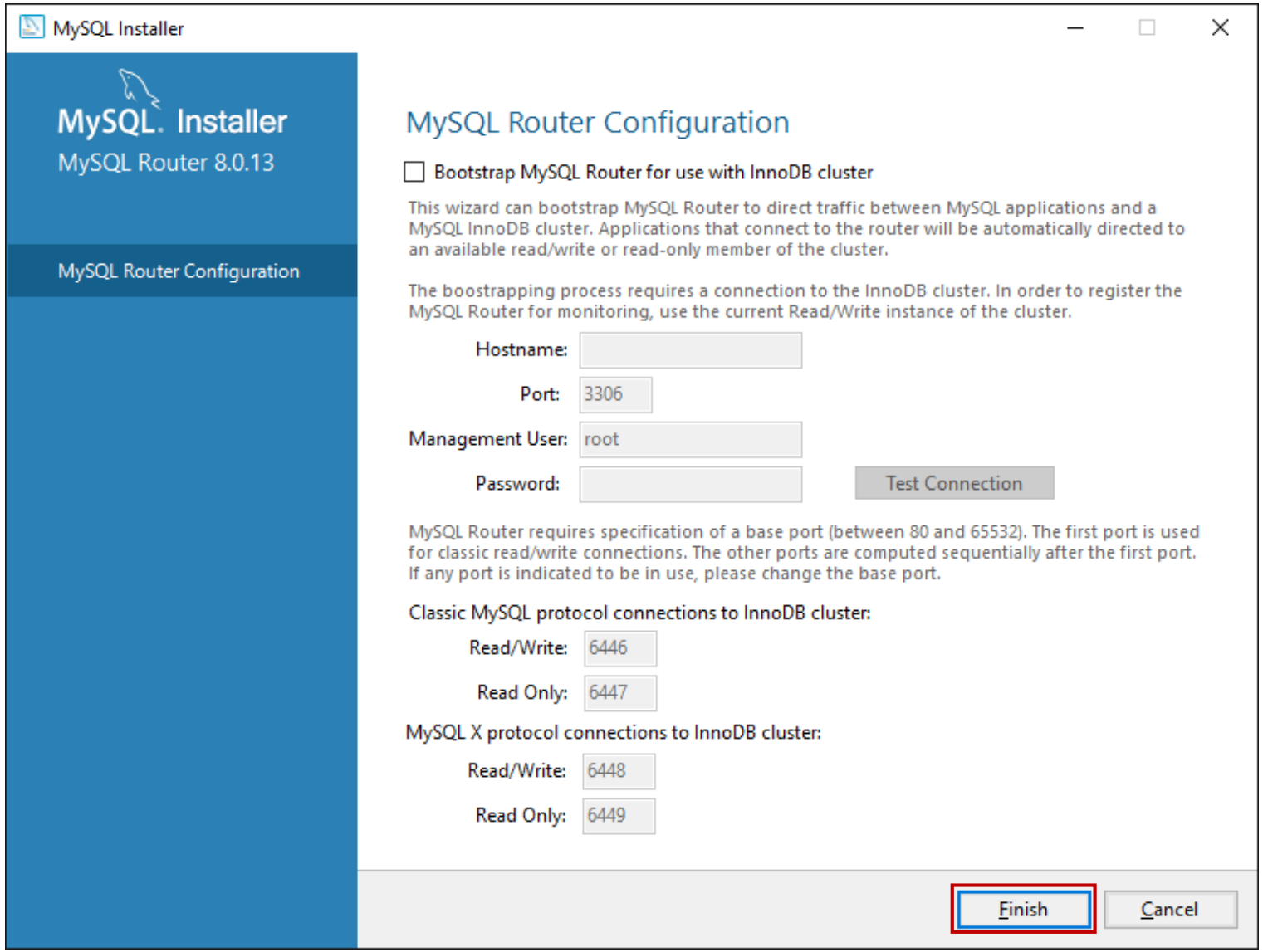
MySQL 설치


MySQL Installer
MySQL. Installer
MySQL Server 8.0.13
Group Replication
Type and Networking
Authentication Method
Accounts and Roles
Windows Service
Apply Configuration
Apply Configuration
The configuration operation has finished.
Configuration Steps
Log
Writing configuration file
Updating Windows Firewall rules
Adjusting Windows service
Initializing Database
Starting Server
Applying security settings
Updating Start Menu Link
The configuration for MySQL Server 8.0.13 was successful.
Click Finish to continue.
Finish

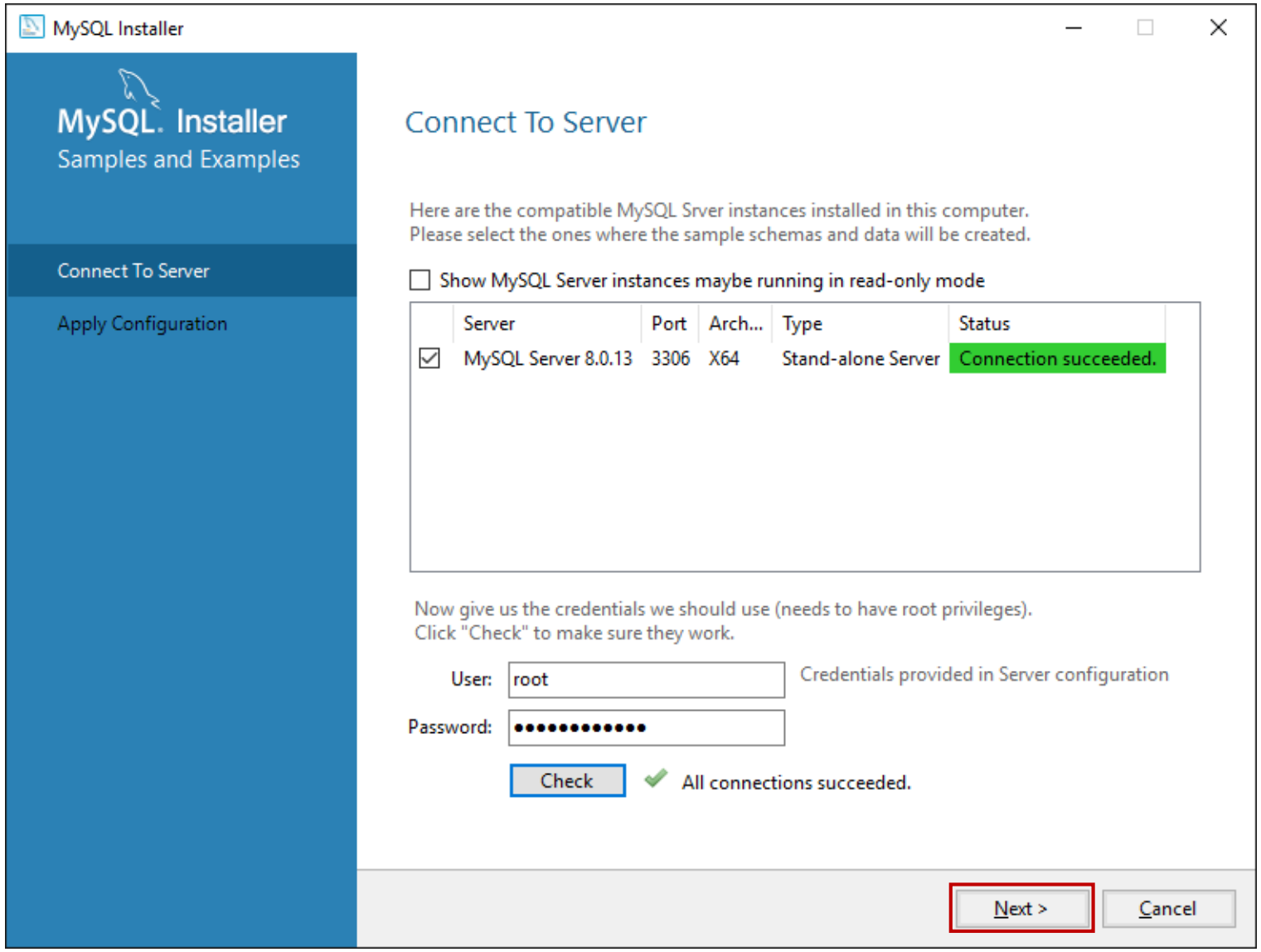
MySQL 설치


MySQL Installer
MySQL. Installer
Adding Community
License Agreement
Choosing a Setup Type
Installation
Product Configuration
Installation Complete
Product Configuration
We'll now walk through a configuration wizard for each of the following products.
You can cancel at any point if you wish to leave this wizard without configuring all the products.
Product
Status
MySQL Server 8.0.13
Configuration complete.
MySQL Router 8.0.13
Ready to configure
Samples and Examples 8.0.13
Ready to configure
Next >
Cancel

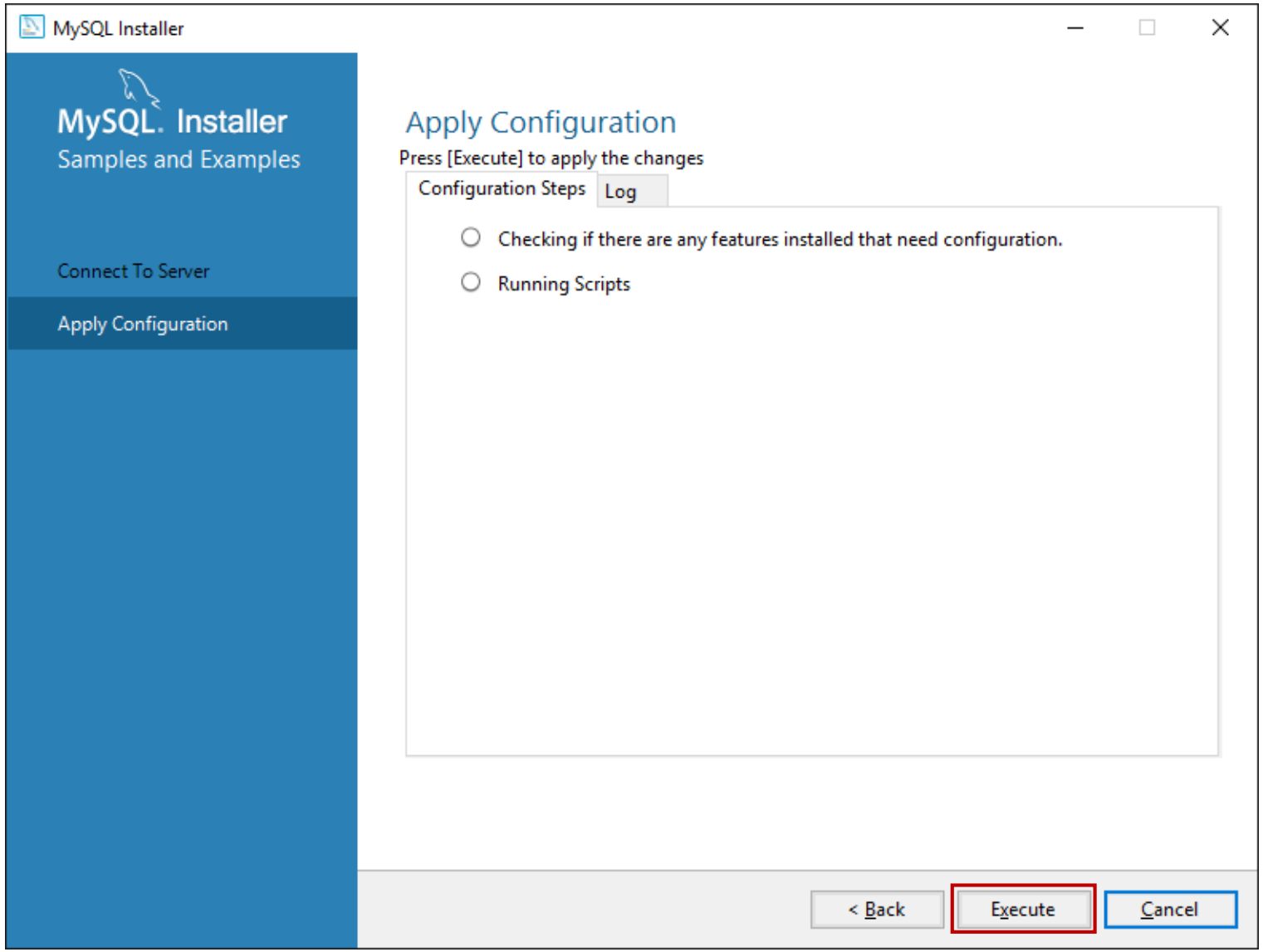
MySQL 설치


MySQL Installer
MySQL. Installer
MySQL Router 8.0.13
MySQL Router Configuration
MySQL Router Configuration
Bootstrap MySQL Router for use with InnoDB cluster
This wizard can bootstrap MySQL Router to direct traffic between MySQL applications and a MySQL InnoDB cluster. Applications that connect to the router will be automatically directed to an available read/write or read-only member of the cluster.
The boostrapping process requires a connection to the InnoDB cluster. In order to register the MySQL Router for monitoring, use the current Read/Write instance of the cluster.
Hostname:
Port: 3306
Management User: root
Password:
Test Connection
MySQL Router requires specification of a base port (between 80 and 65532). The first port is used for classic read/write connections. The other ports are computed sequentially after the first port. If any port is indicated to be in use, please change the base port.
Classic MySQL protocol connections to InnoDB cluster:
Read/Write: 6446
Read Only: 6447
MySQL X protocol connections to InnoDB cluster:
Read/Write: 6448
Read Only: 6449
Finish
Cancel

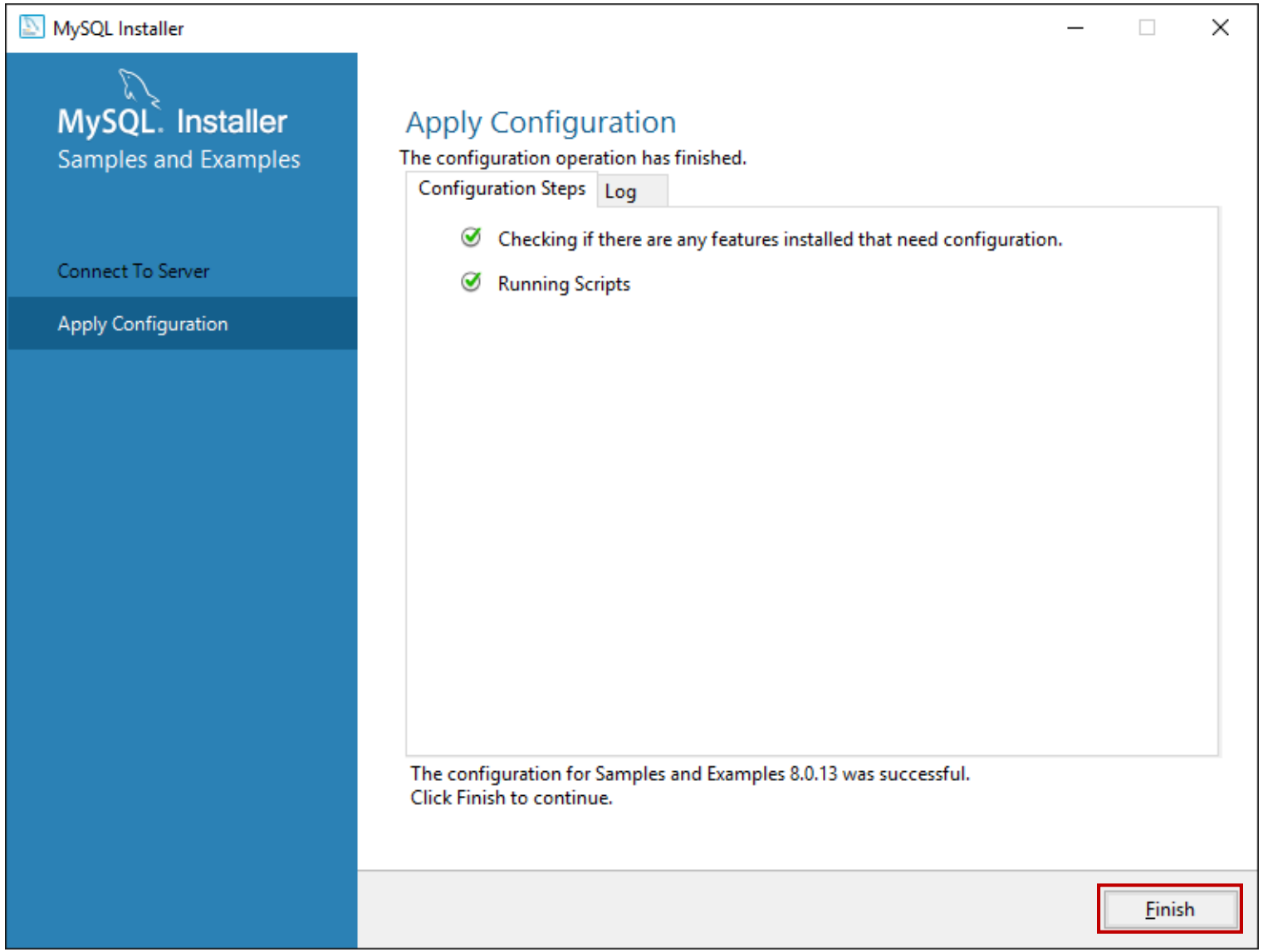
MySQL 설치


MySQL Installer
MySQL. Installer
Samples and Examples
Connect To Server
Apply Configuration
Connect To Server
Here are the compatible MySQL Srver instances installed in this computer.
Please select the ones where the sample schemas and data will be created.
Show MySQL Server instances maybe running in read-only mode
Server
Port
Arch...
Type
Status
MySQL Server 8.0.13
3306
X64
Stand-alone Server
Connection succeeded.
Now give us the credentials we should use (needs to have root privileges).
Click "Check" to make sure they work.
User:
root
Credentials provided in Server configuration
Password:
Check
All connections succeeded.
Next >
Cancel

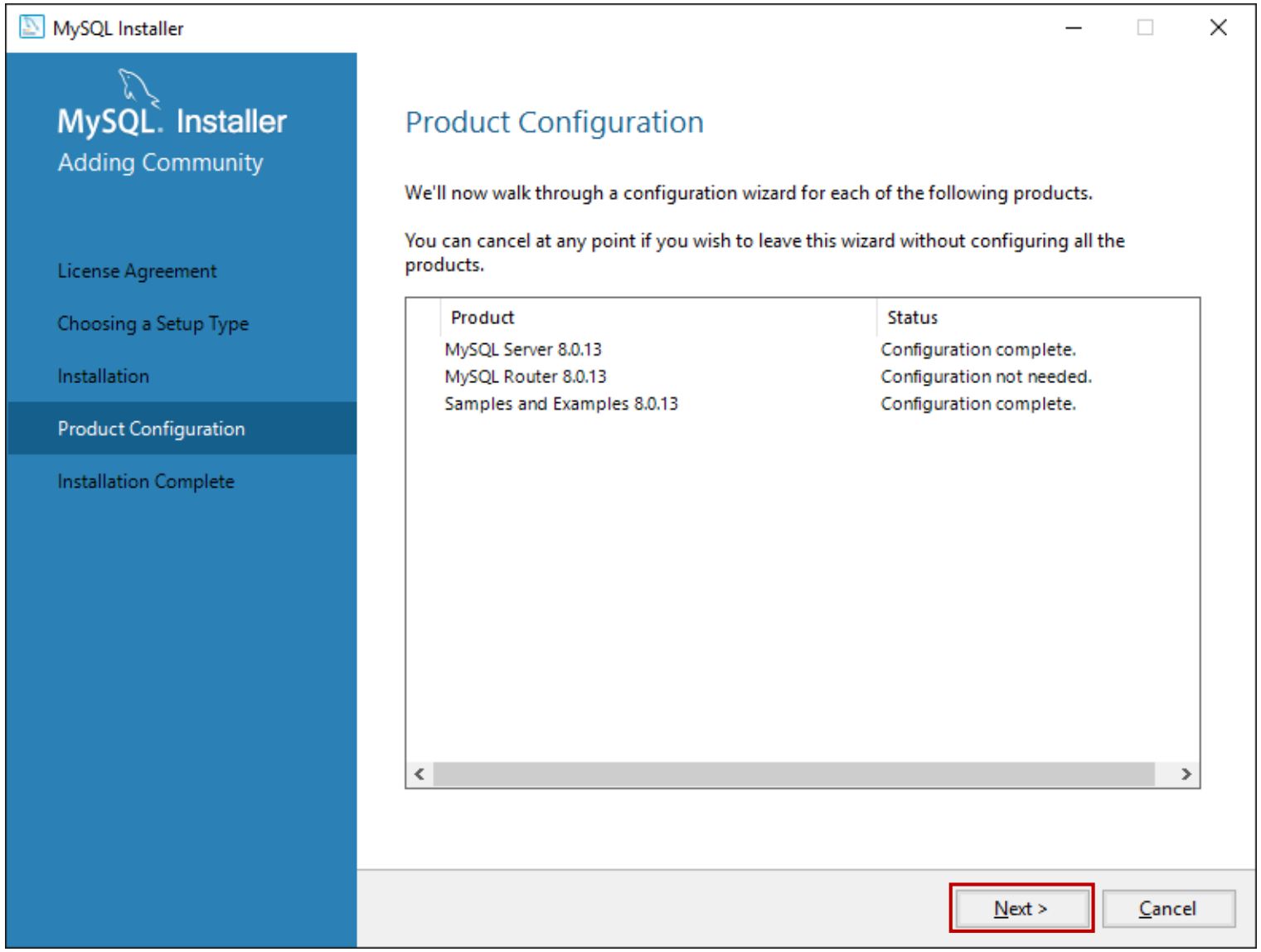
MySQL 설치


MySQL Installer
MySQL. Installer
Samples and Examples
Connect To Server
Apply Configuration
Apply Configuration
Press [Execute] to apply the changes
Configuration Steps
Log
Checking if there are any features installed that need configuration.
Running Scripts
< Back
Execute
Cancel

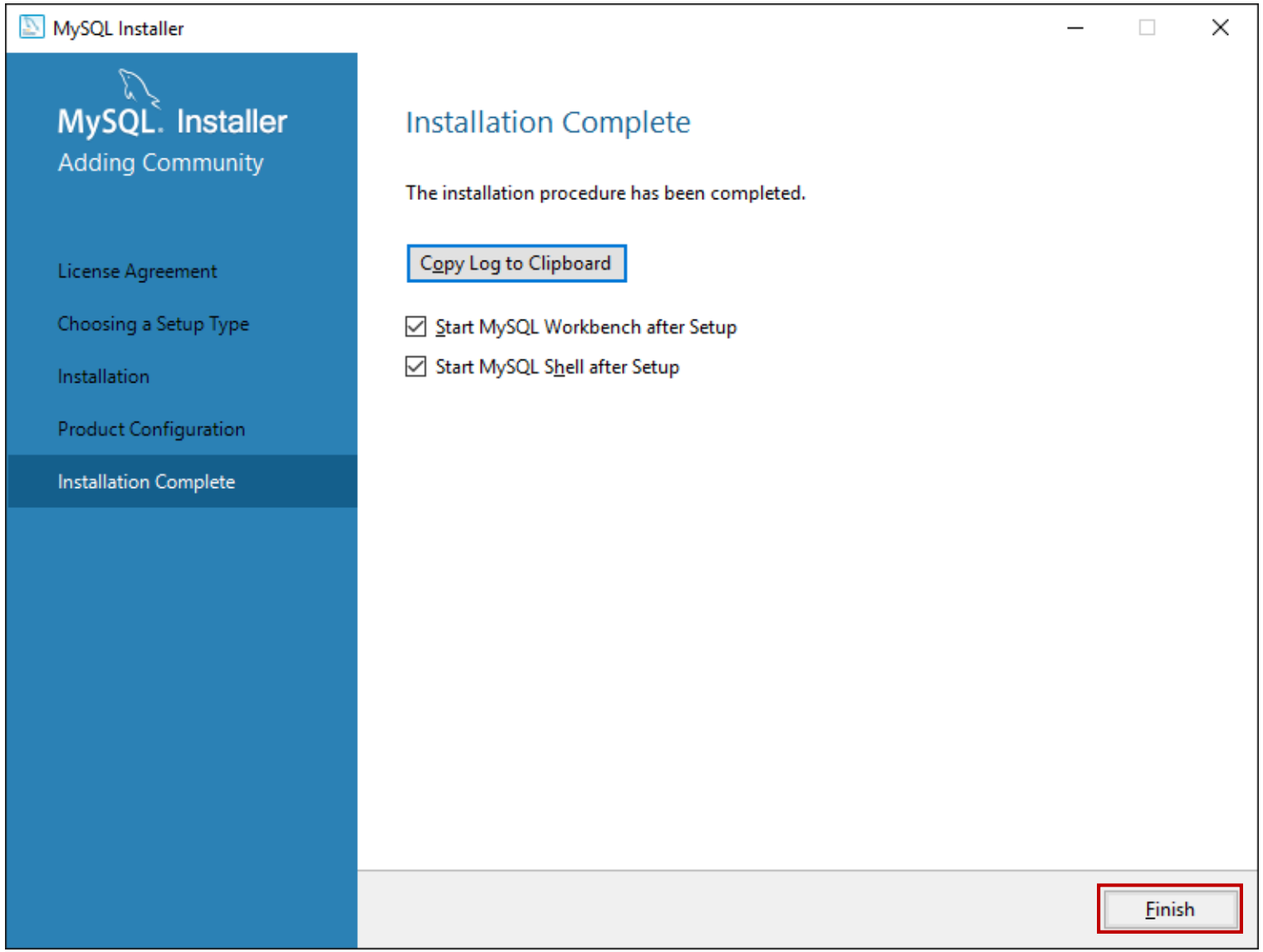
MySQL 설치


MySQL Installer
MySQL. Installer
Samples and Examples
Connect To Server
Apply Configuration
Apply Configuration
The configuration operation has finished.
Configuration Steps
Log
Checking if there are any features installed that need configuration.
Running Scripts
The configuration for Samples and Examples 8.0.13 was successful.
Click Finish to continue.
Finish

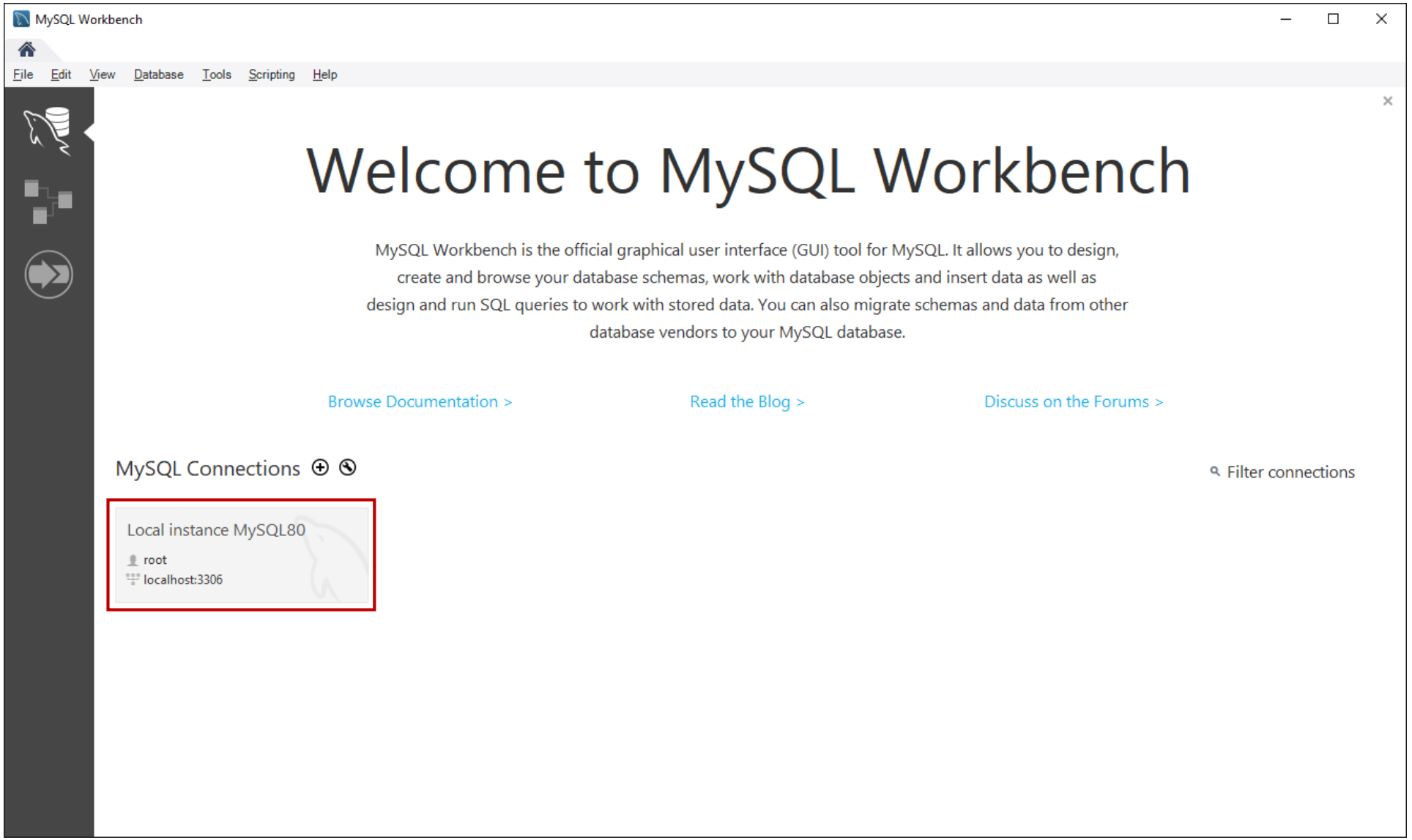
MySQL 설치


MySQL Installer
MySQL. Installer
Adding Community
License Agreement
Choosing a Setup Type
Installation
Product Configuration
Installation Complete
Product Configuration
We'll now walk through a configuration wizard for each of the following products.
You can cancel at any point if you wish to leave this wizard without configuring all the products.
Product
Status
MySQL Server 8.0.13
Configuration complete.
MySQL Router 8.0.13
Configuration not needed.
Samples and Examples 8.0.13
Configuration complete.
Next >
Cancel

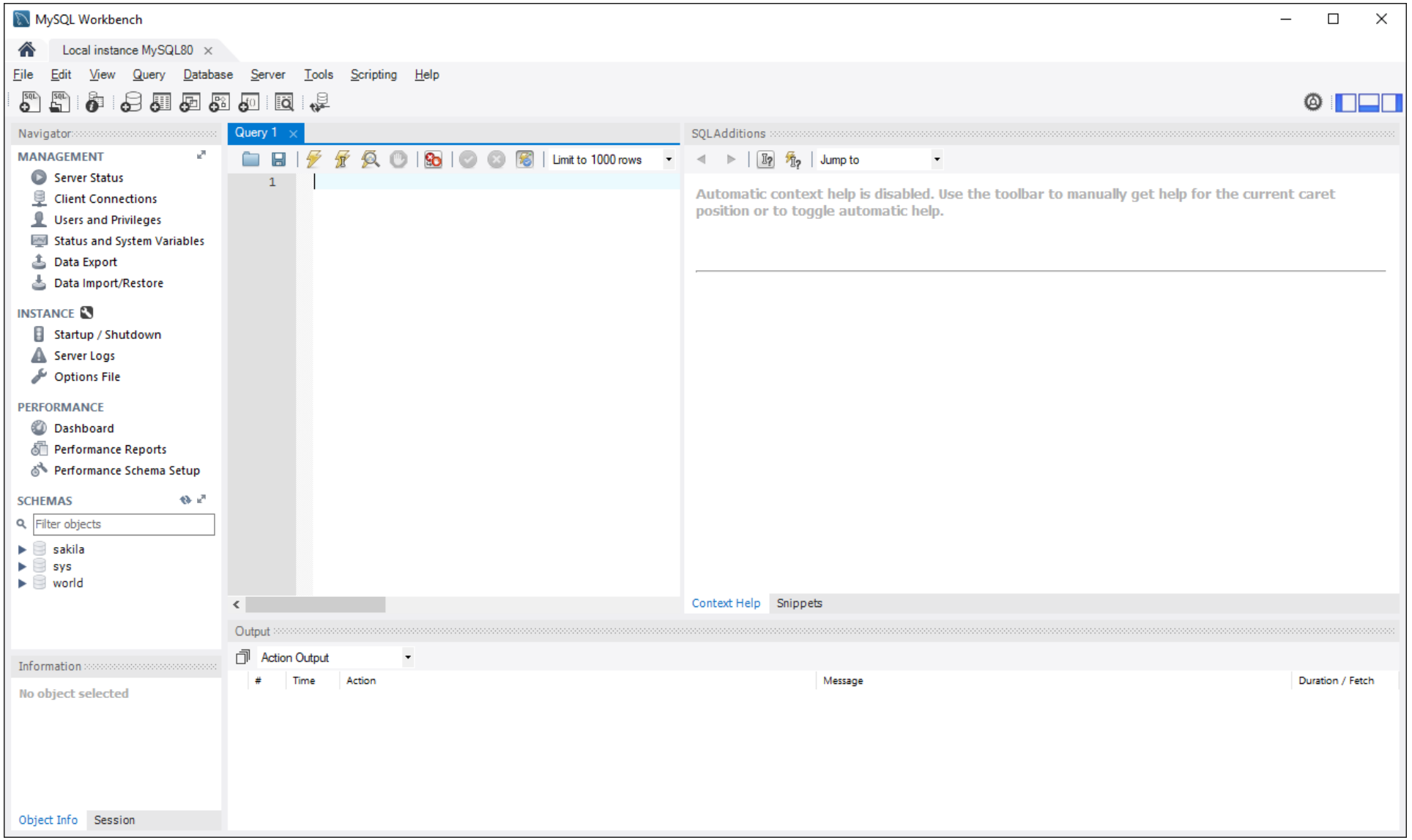
MySQL 설치


MySQL Installer
MySQL. Installer
Adding Community
License Agreement
Choosing a Setup Type
Installation
Product Configuration
Installation Complete
Installation Complete
The installation procedure has been completed.
Copy Log to Clipboard
Start MySQL Workbench after Setup
Start MySQL Shell after Setup
Finish

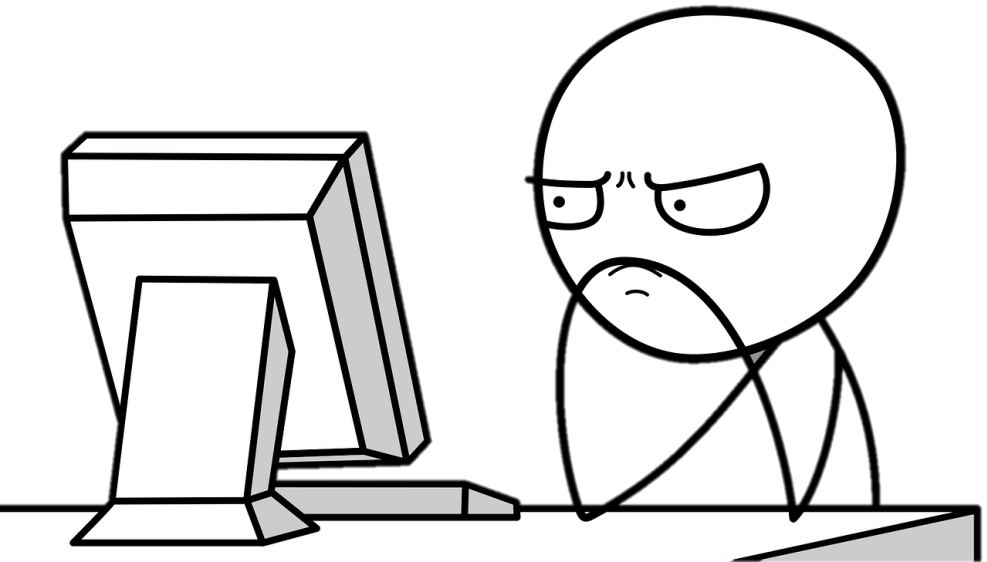
MySQL Workbench



MySQL Workbench



3. SQL 기본

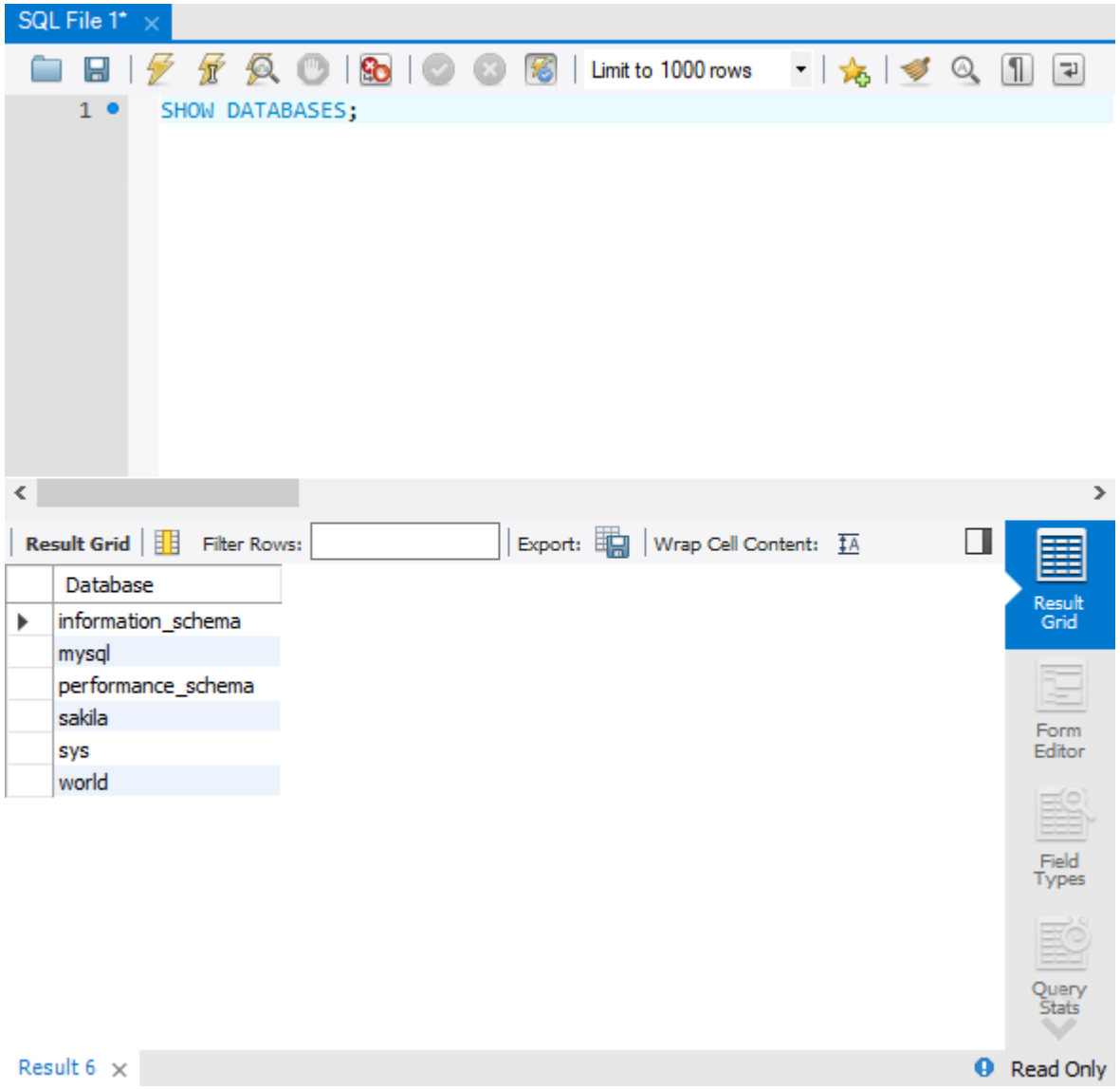


SQL의 분류

- DML Data Manipulation Language
  - 데이터 조작 언어
  - 데이터를 조작(선택, 삽입, 수정, 삭제)하는 데 사용되는 언어
  - DML 구문이 사용되는 대상은 테이블의 행
  - DML 사용하기 위해서는 꼭 그 이전에 테이블이 정의되어 있어야 함
  - SQL문 중 SELECT, INSERT, UPDATE, DELETE가 이 구문에 해당
  - 트랜잭션Transaction이 발생하는 SQL도 이 DML에 속함
    - 테이블의 데이터를 변경(입력/수정/삭제)할 때 실제 테이블에 완전히 적용하지 않고, 임시로 적용시키는 것
    - 취소 가능
- DDL Data Definition Language
  - 데이터 정의 언어
  - 데이터베이스, 테이블, 뷰, 인덱스 등의 데이터베이스 개체를 생성/삭제/변경하는 역할
  - CREATE, DROP, ALTER 구문
  - DDL은 트랜잭션 발생시키지 않음
  - ROLLBACK이나 COMMIT 사용 불가
  - DDL문은 실행 즉시 MySQL에 적용
- DCL Data Control Language
  - 데이터 제어 언어
  - 사용자에게 어떤 권한을 부여하거나 빼앗을 때 주로 사용하는 구문
  - GRANT/REVOKE/DENY 구문

SHOW DATABASES

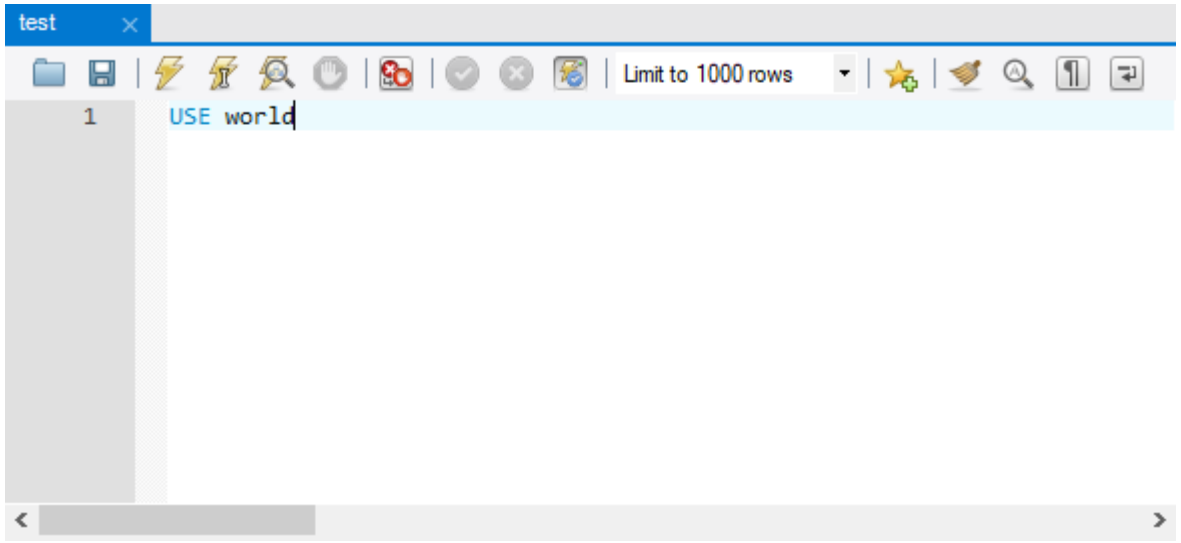
- 현재 서버에 어떤 DB가 있는지 보기



USE

- 사용할 데이터베이스 지정
- 지정해 놓은 후 특별히 다시 USE문 사용하거나 다른 DB를 사용하겠다고 명시하지 않는 이상 모든 SQL문은 지정 DB에서 수행

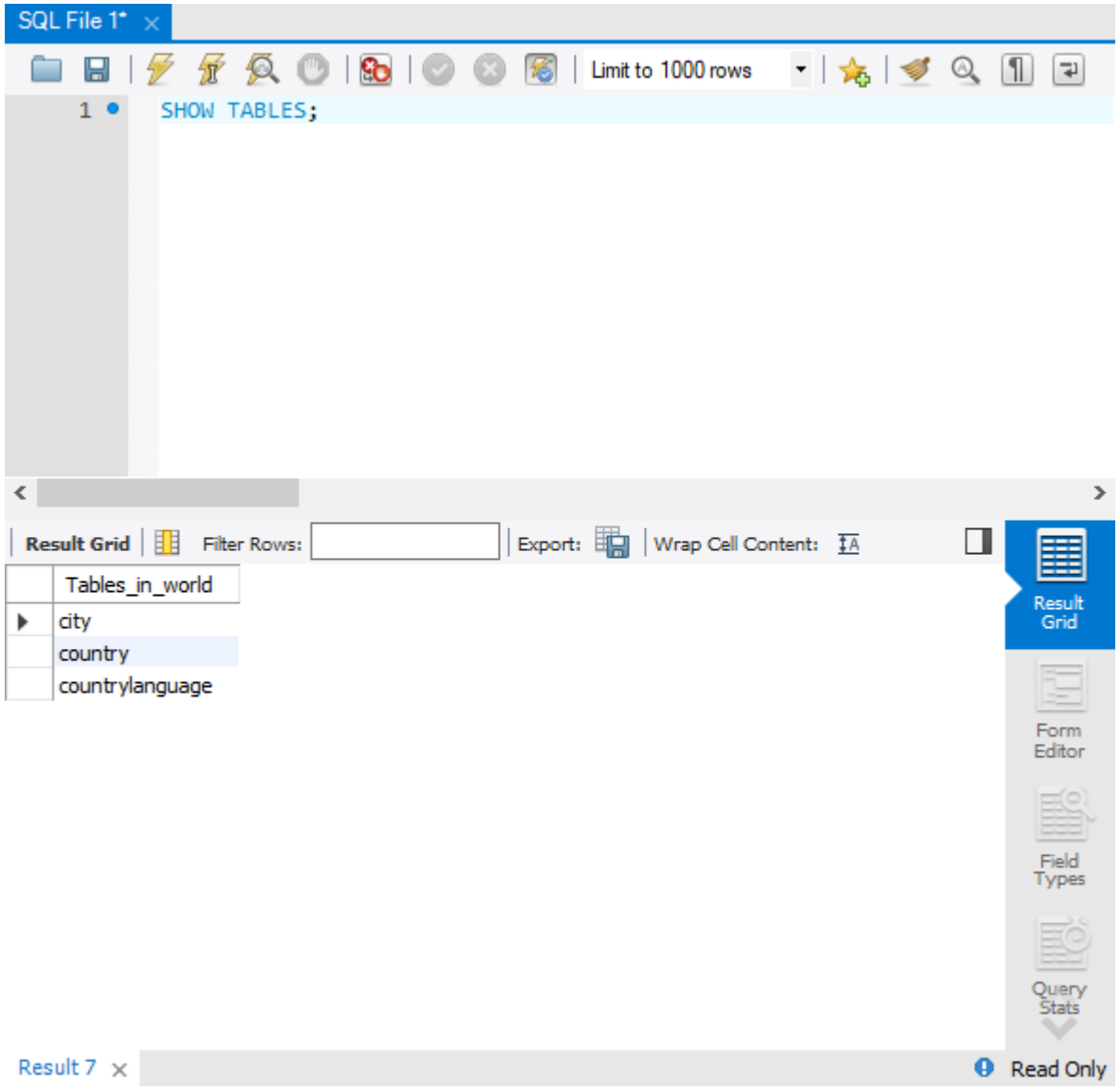
```
USE database_name
```



- Workbench에서 직접 선택해 사용 가능
  - [Navigator] → [SCHEMAS] → 데이터베이스 선택

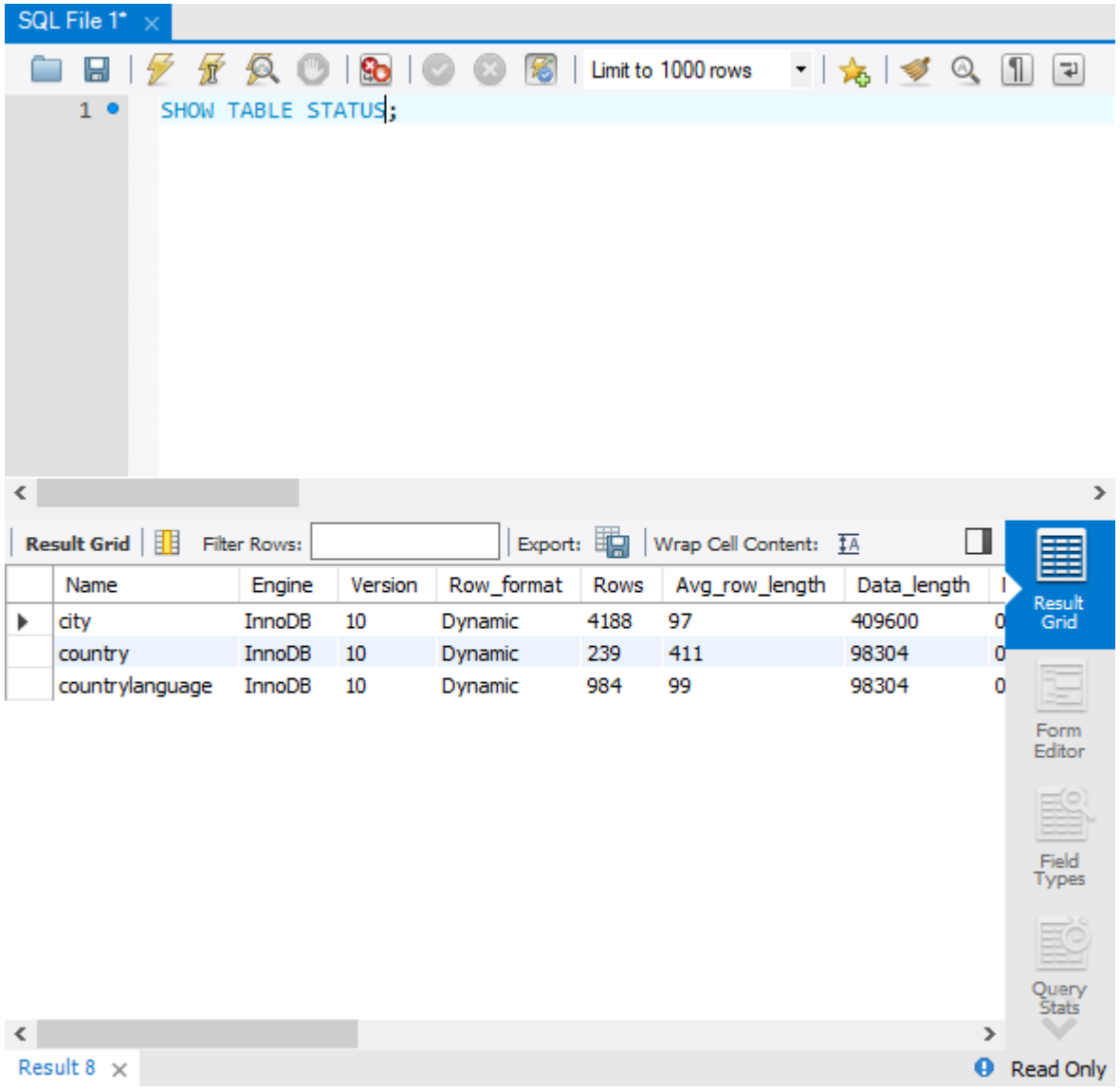
SHOW TABLE

- 데이터베이스 world의 테이블 이름 보기



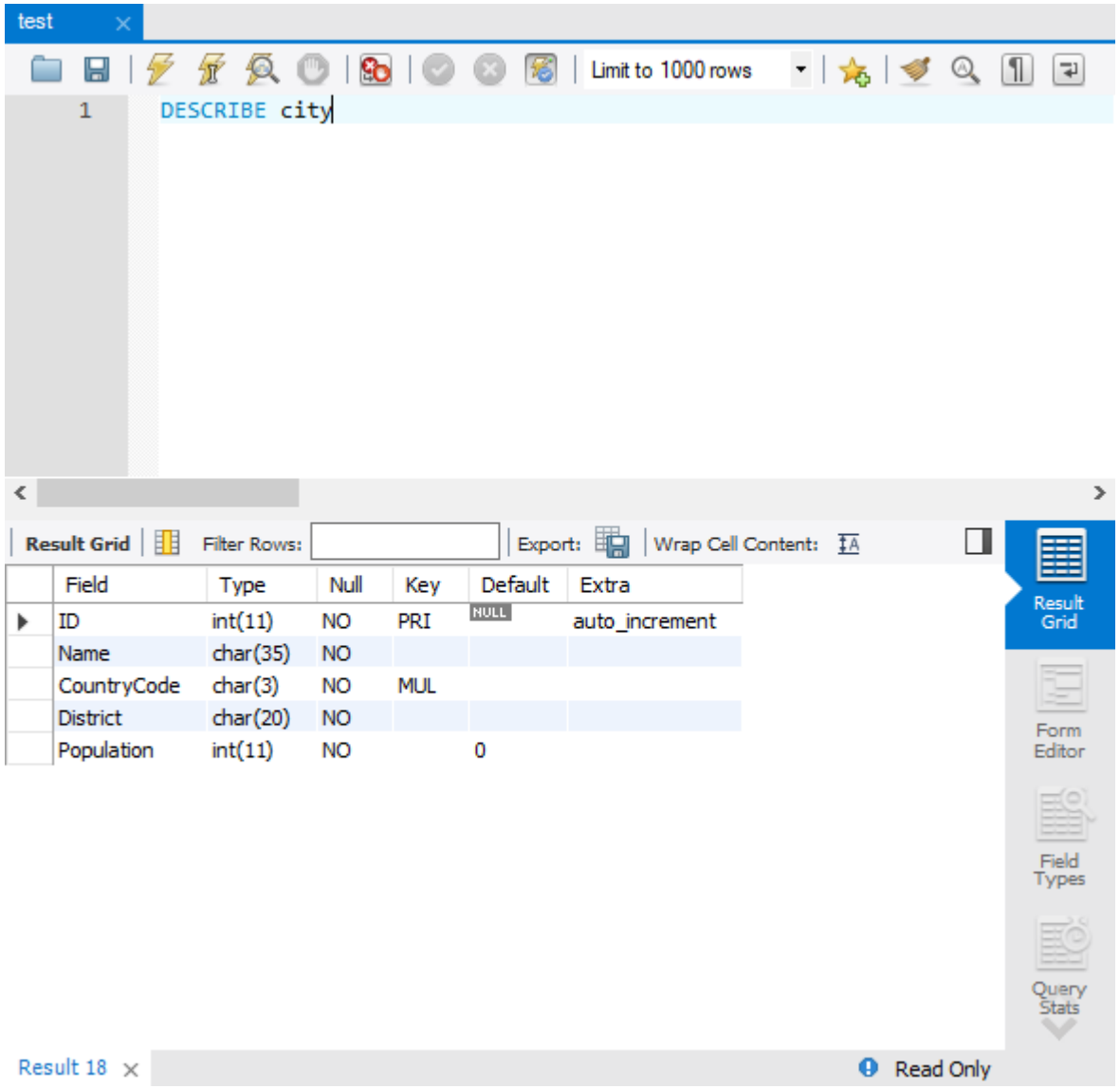
SHOW TABLE STATUS

- 데이터베이스 world의 테이블 정보 조회



DESCRIBE (DESC)

- city 테이블에 무슨 열이 있는지 확인
  - DESCRIBE city;
  - DESC city;



LAB #1

country 테이블과 countrylanguage 테이블 정보 보기

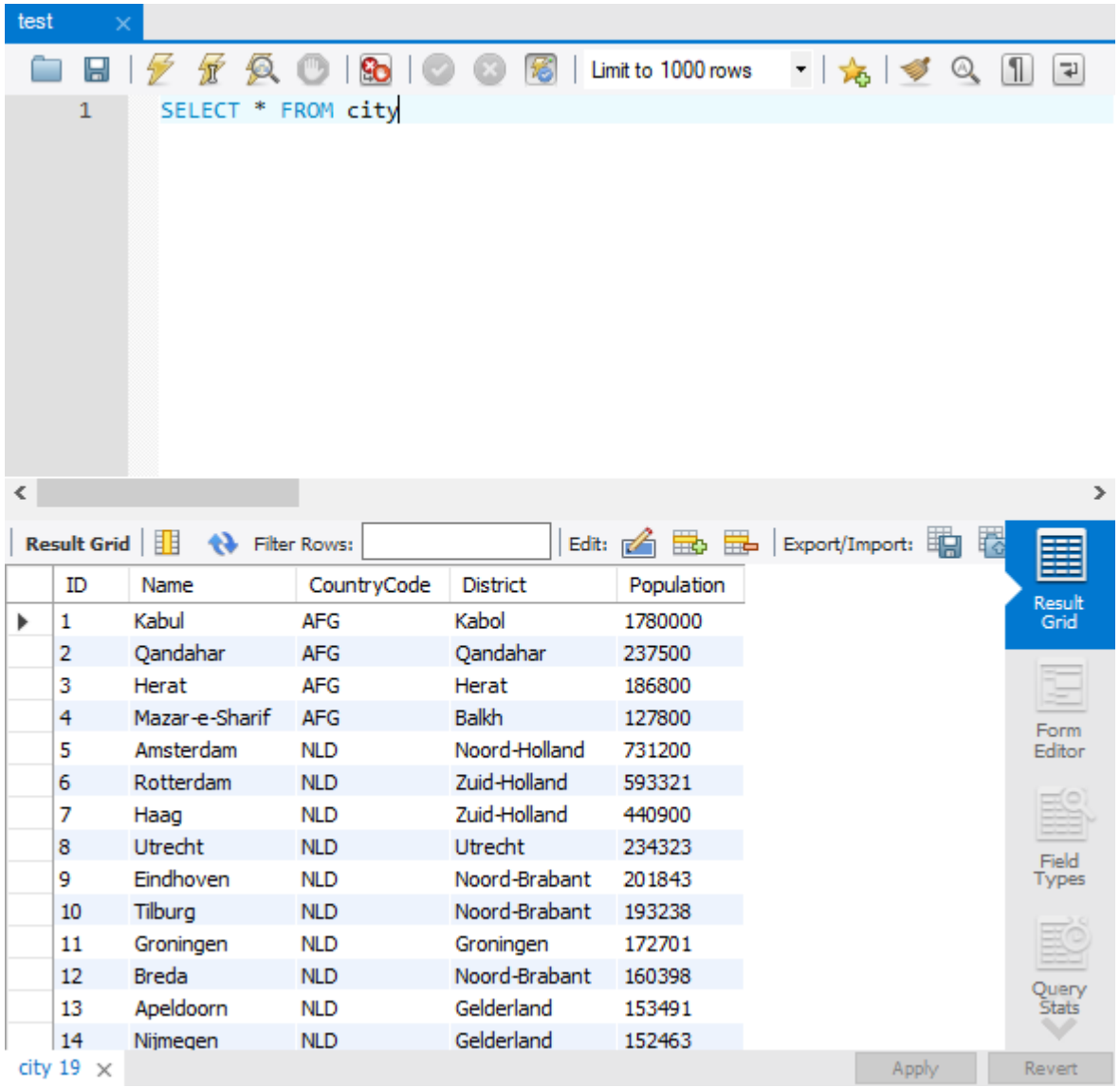
SELECT

- <SELECT... FROM>
- 요구하는 데이터를 가져오는 구문
- 일반적으로 가장 많이 사용되는 구문
- 데이터베이스 내 테이블에서 원하는 정보를 추출
- SELECT의 구문 형식

```
SELECT select_expr
        [FROM table_references]
        [WHERE where_condition]
        [GROUP BY {col_name | expr | position}]
        [HAVING where_condition]
        [ORDER BY {col_name | expr | position}]
```

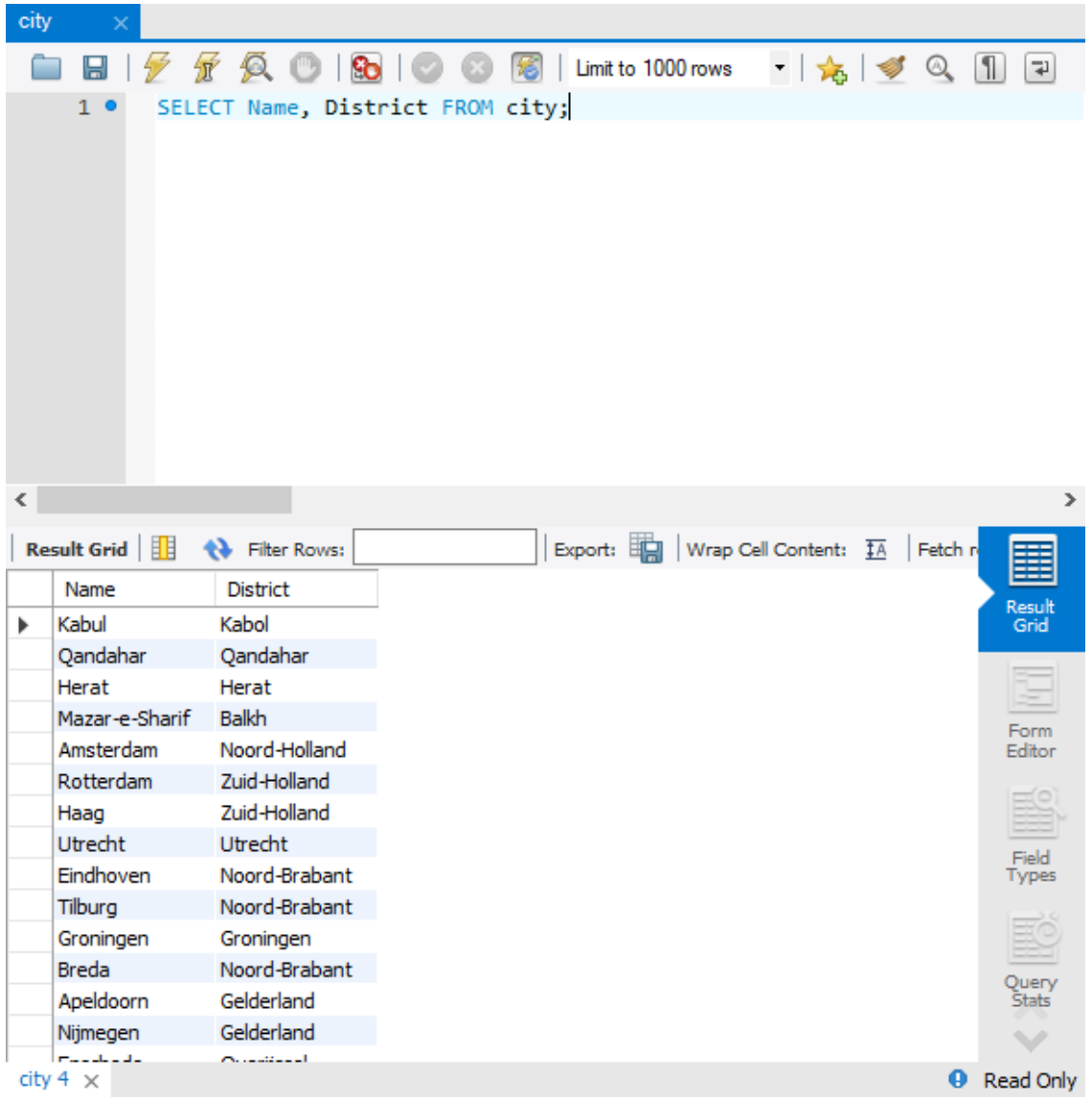
SELECT

- SELECT *



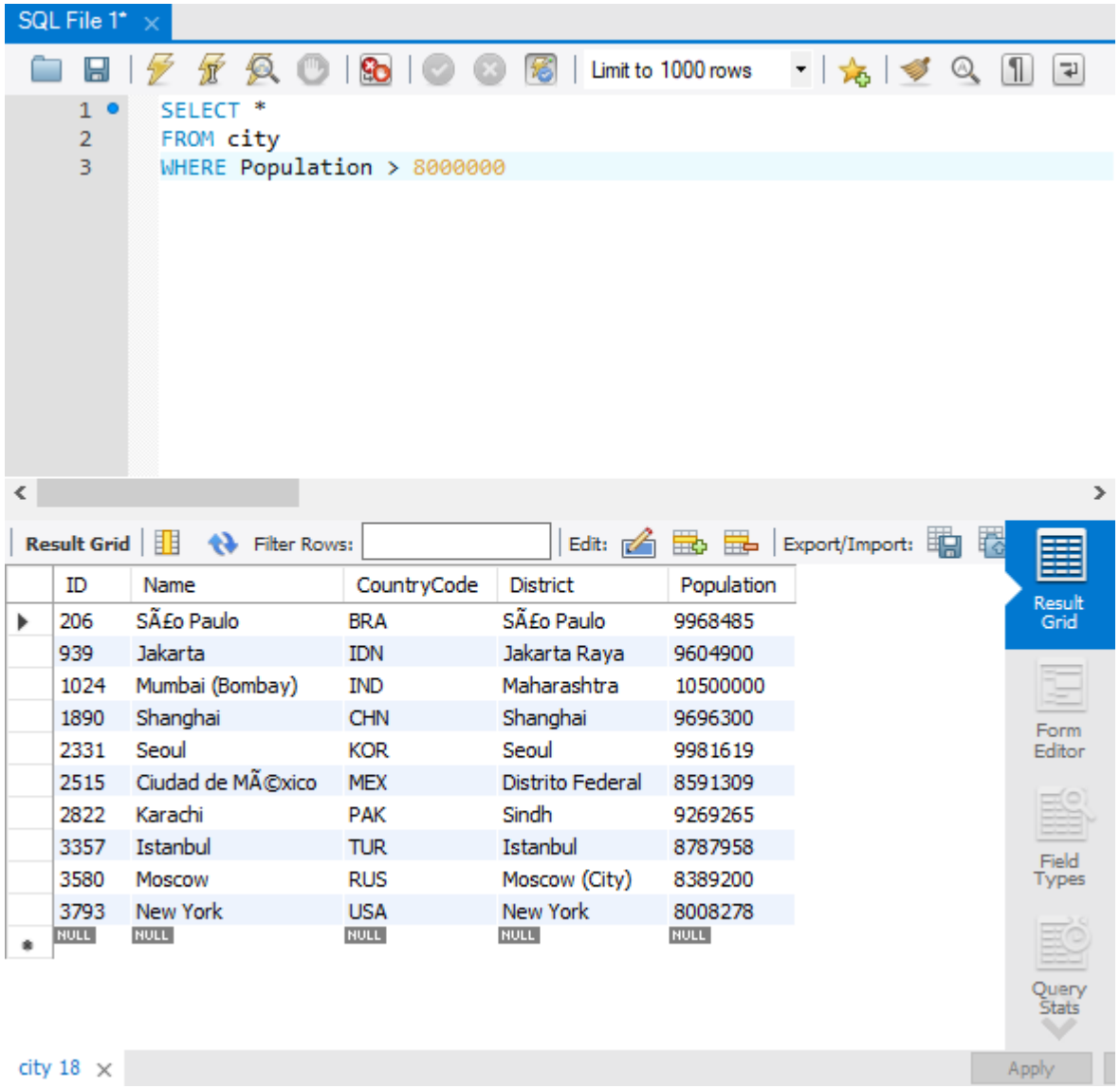
SELECT

- SELECT 열 이름
  - 테이블에서 필요로 하는 열만 가져오기 가능
  - 여러 개의 열을 가져오고 싶을 때는 콤마로 구분
  - 열 이름의 순서는 출력하고 싶은 순서대로 배열 가능



SELECT FROM WHERE

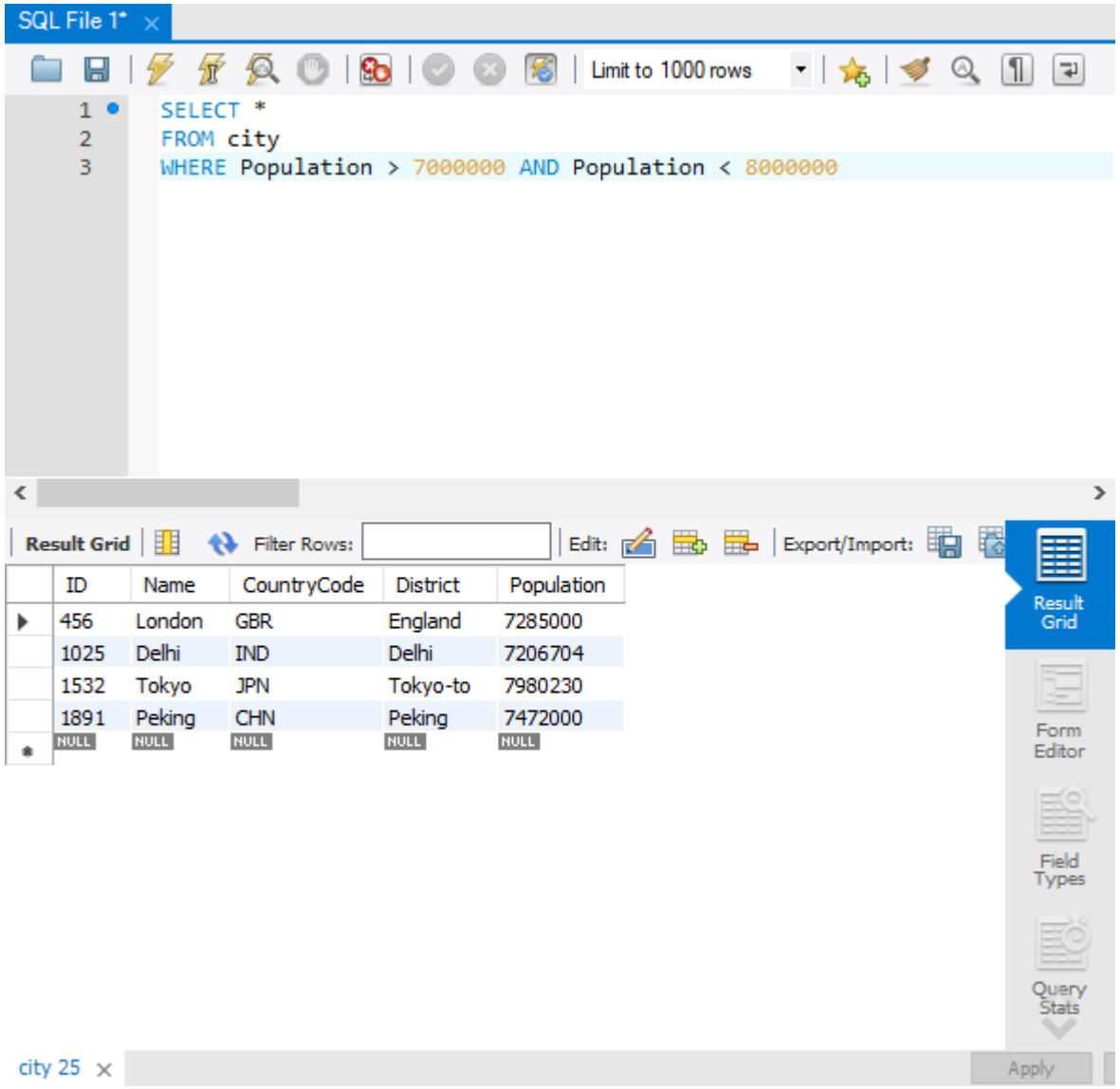
- 기본적인 WHERE절
  - 조회하는 결과에 특정한 조건으로 원하는 데이터만 보고 싶을 때 사용
  - SELECT 필드이름 FROM 테이블이름 WHERE 조건식;
  - 조건이 없을 경우 테이블의 크기가 클수록 찾는 시간과 노력이 증가



SELECT FROM WHERE

- 관계 연산자의 사용
  - OR 연산자
  - AND 연산자
  - 조건 연산자(=, <, >, <=, >=, < >, != 등)
  - 관계 연산자(NOT, AND, OR 등)
  - 연산자의 조합으로 데이터를 효율적으로 추출

- MySQL 함수 및 연산자: https://dev.mysql.com/doc/refman/8.0/en/functions.html



LAB #02

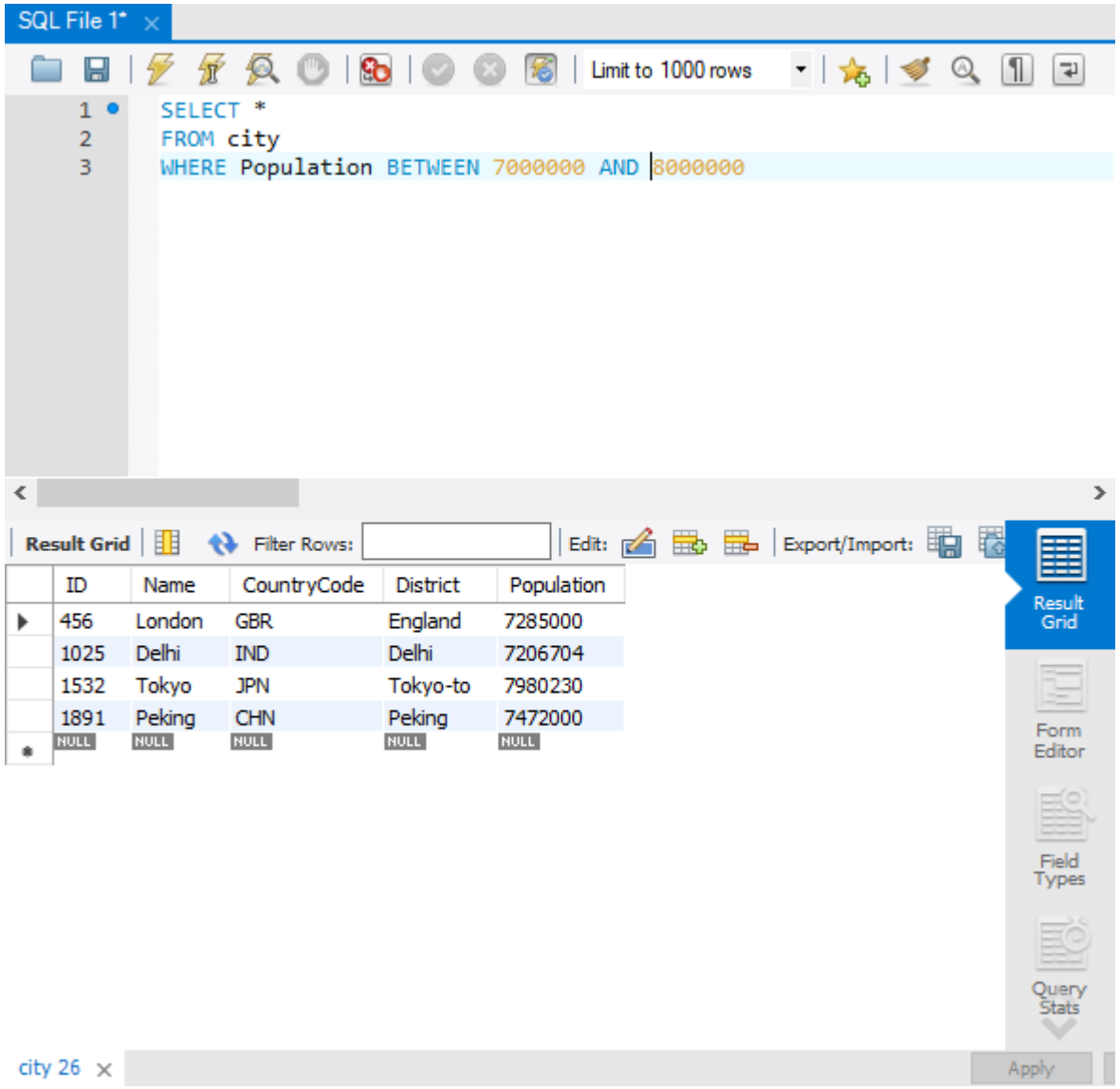
한국에 있는 도시들 보기

미국에 있는 도시들 보기

한국에 있는 도시들 중에
인구 수가 1,000,000 이상인 도시 보기

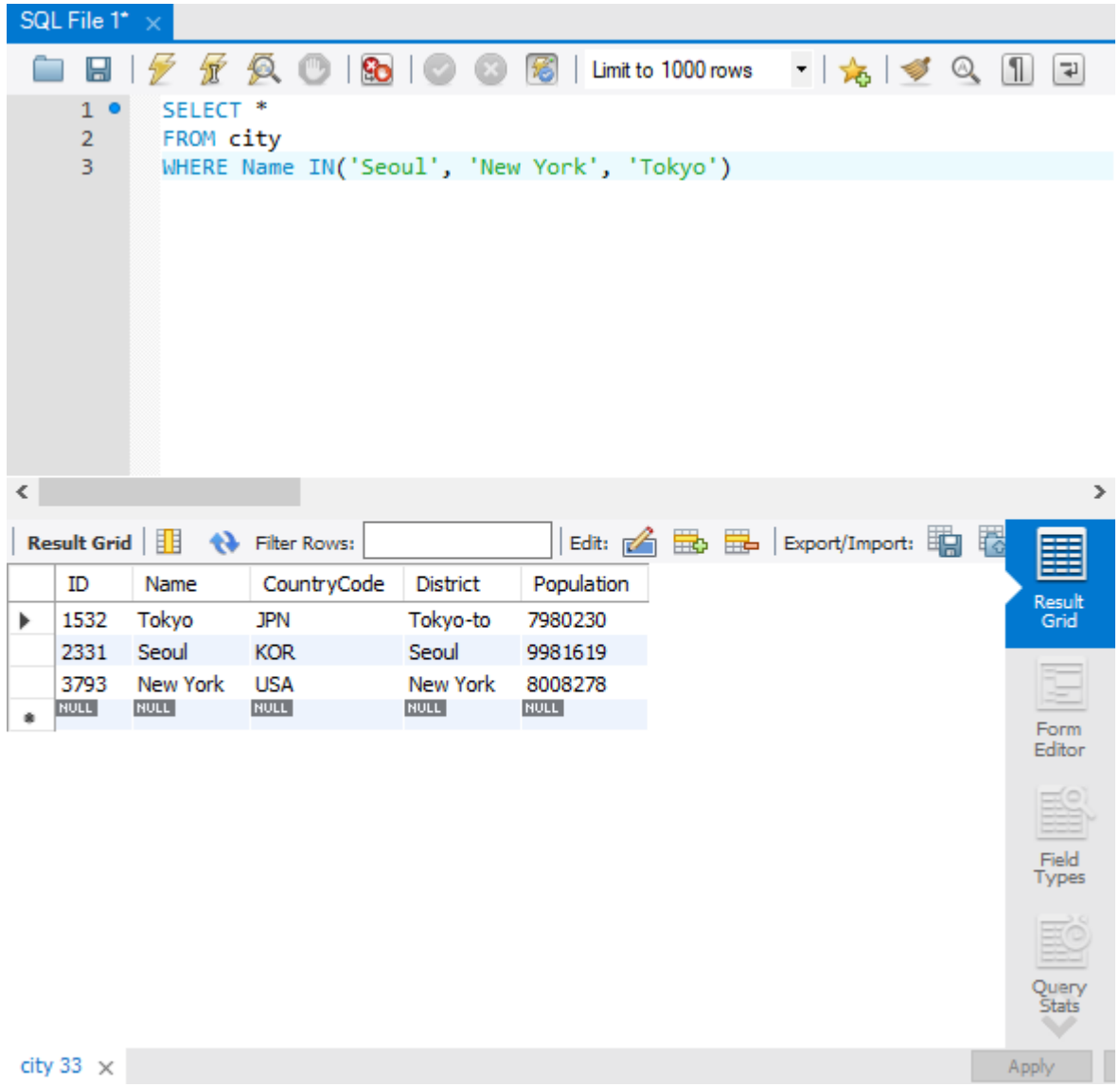
BETWEEN

- 데이터가 숫자로 구성되어 있어 연속적인 값은 BETWEEN… AND 사용 가능



IN

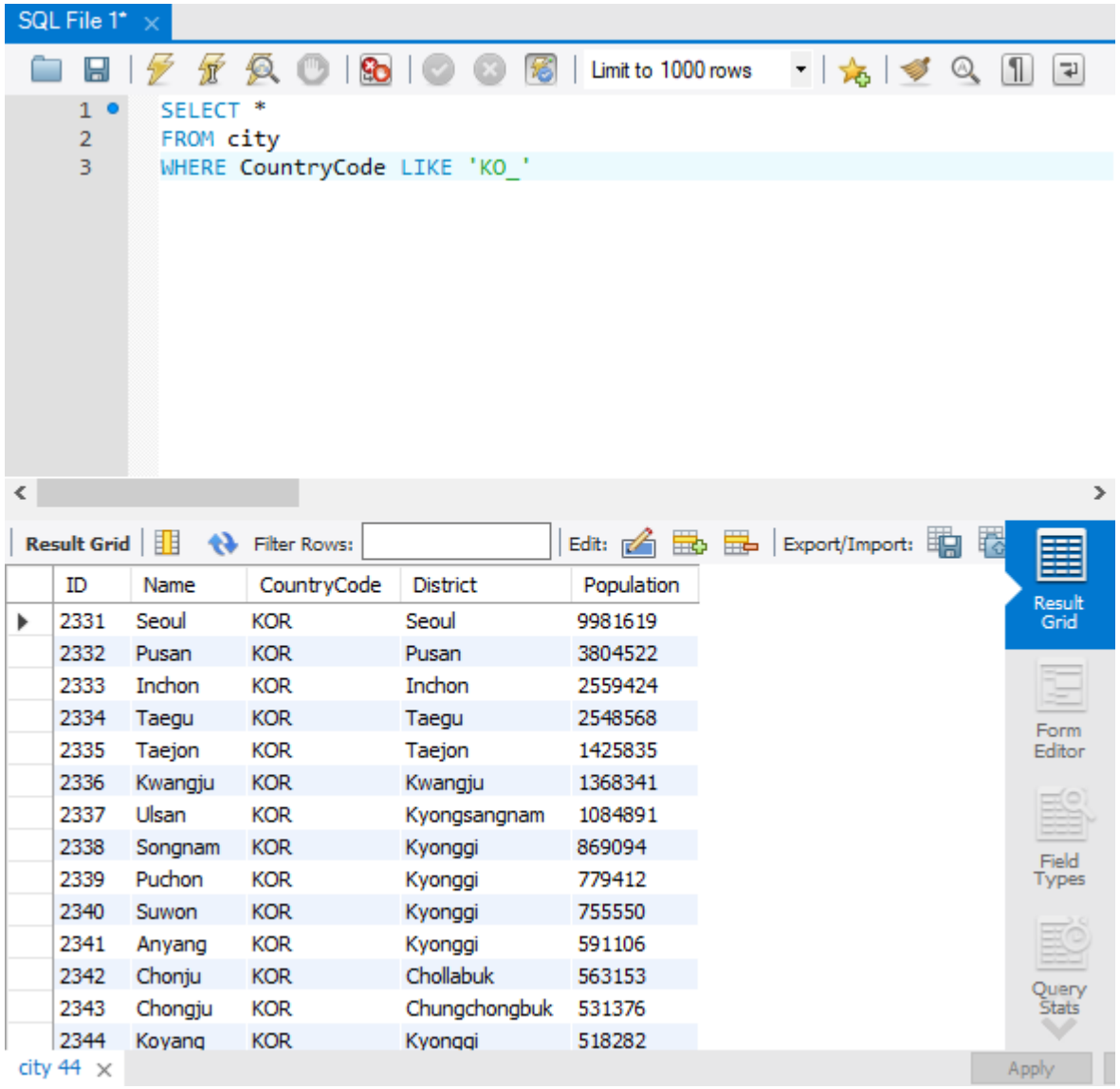
- 이산적인Discrete 값의 조건에서는 IN( ) 사용 가능



한국, 미국, 일본의 도시들 보기

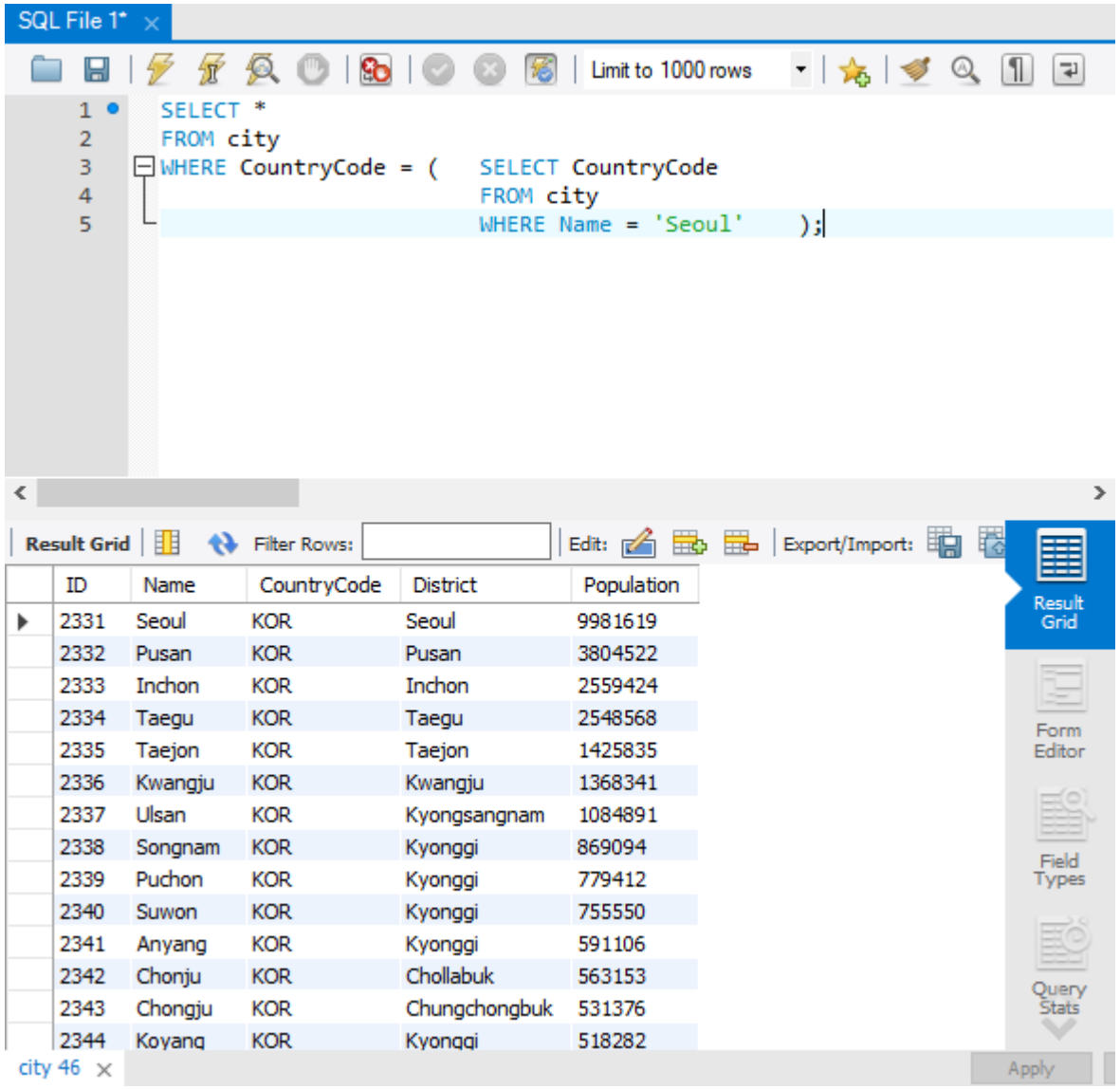
LIKE

- 문자열의 내용 검색하기 위해 LIKE 연산자 사용
- 문자 뒤에 % - 무엇이든(%) 허용
- 한 글자와 매치하기 위해서는 '_'사용



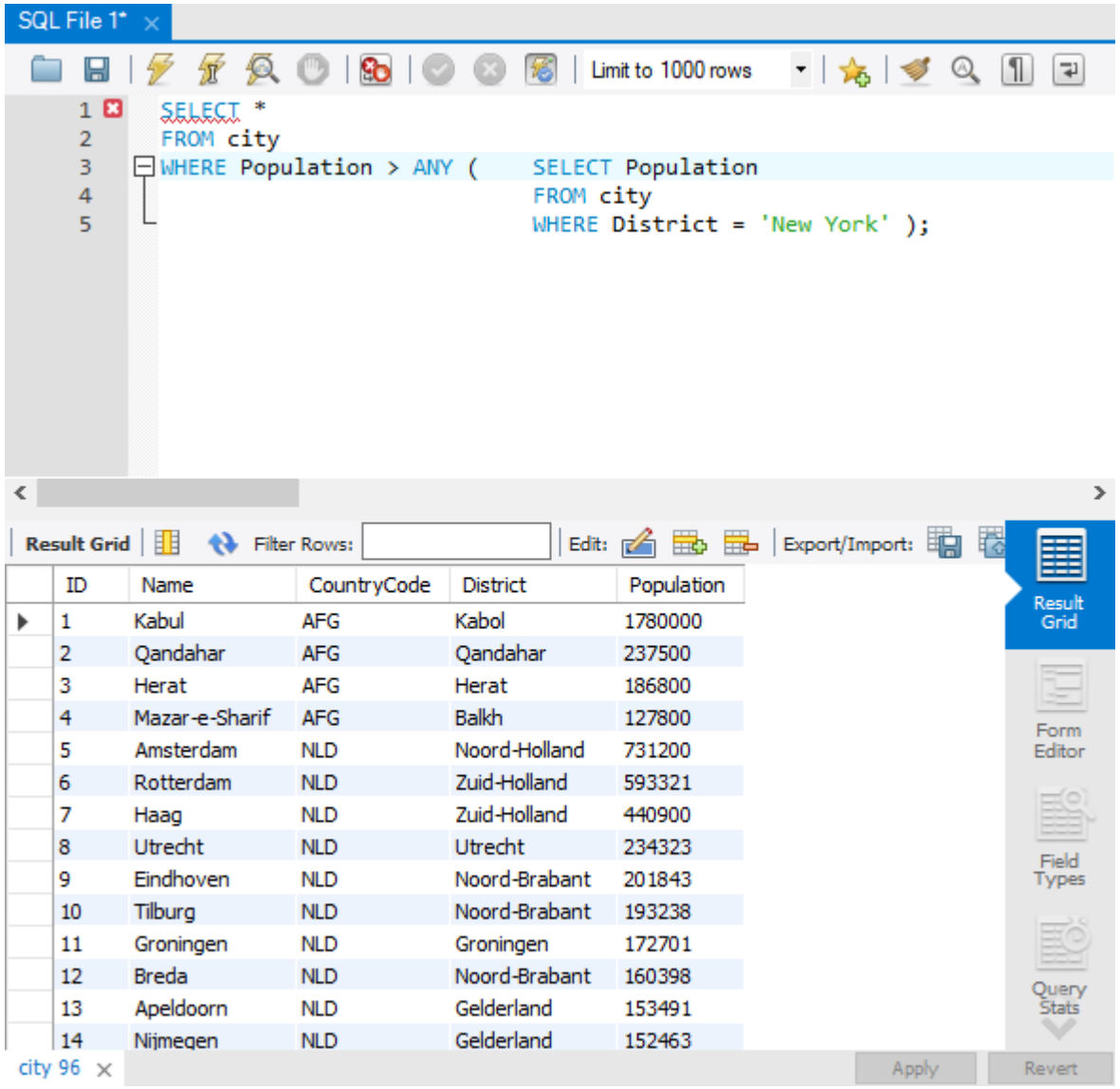
Sub Query

- 서브 쿼리SubQuery
- 쿼리문 안에 또 쿼리문이 들어 있는 것
- 서브 쿼리의 결과가 둘 이상이 되면 에러 발생



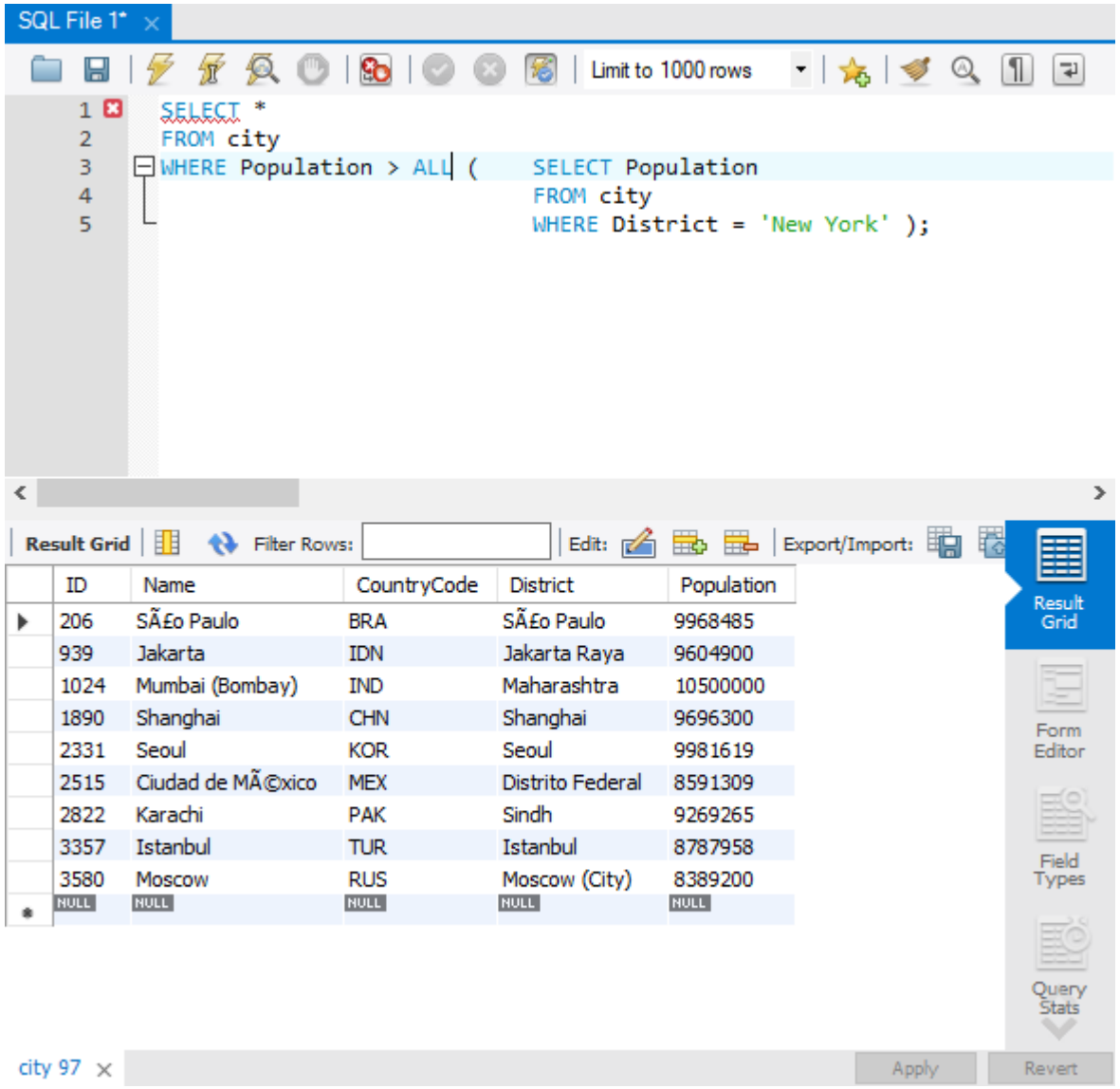
ANY

- 서브쿼리의 여러 개의 결과 중 한 가지만 만족해도 가능
- SOME은 ANY와 동일한 의미로 사용
- = ANY 구문은 IN과 동일한 의미



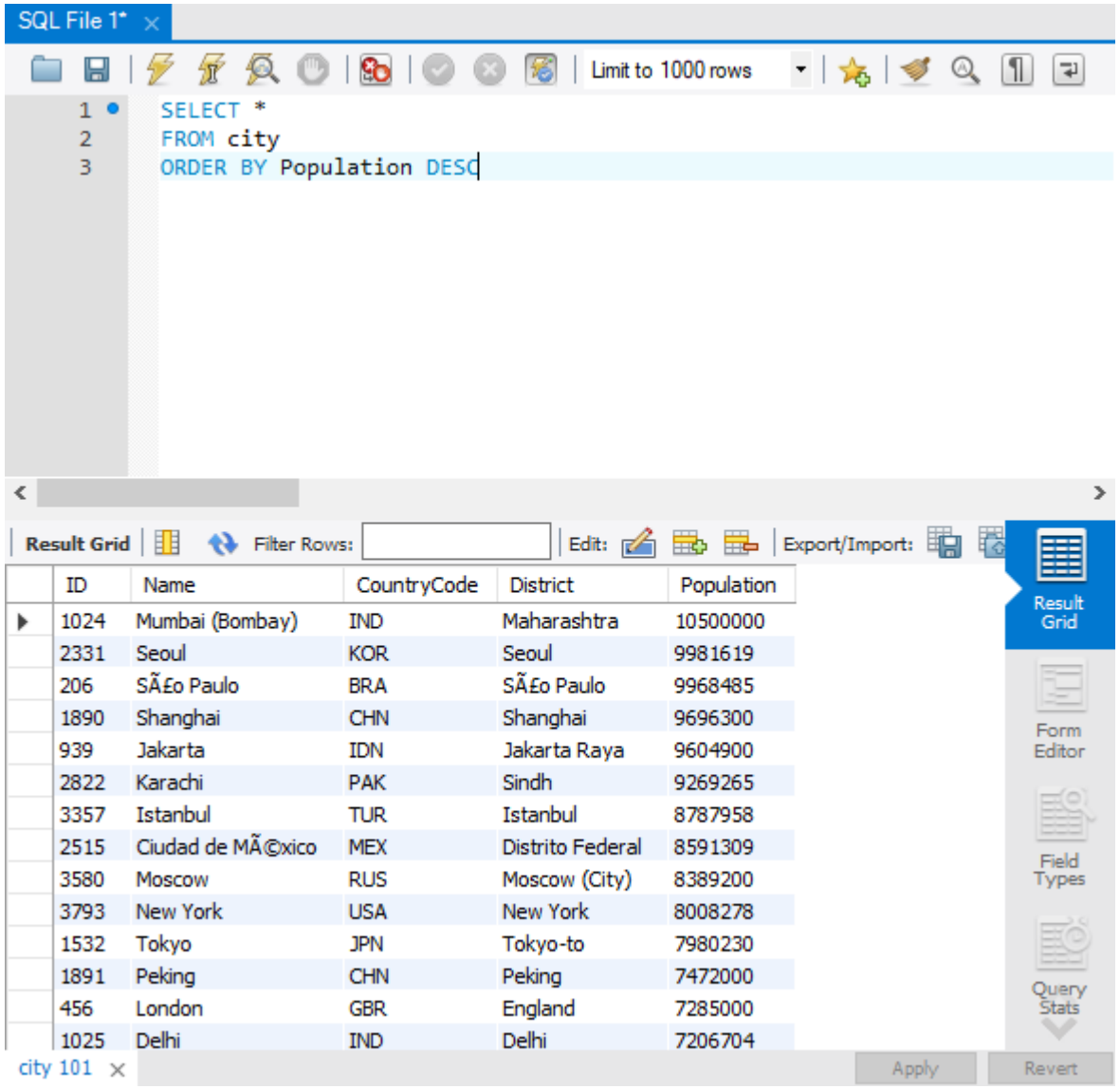
ALL

- 서브쿼리의 여러 개의 결과를 모두 만족시켜야 함



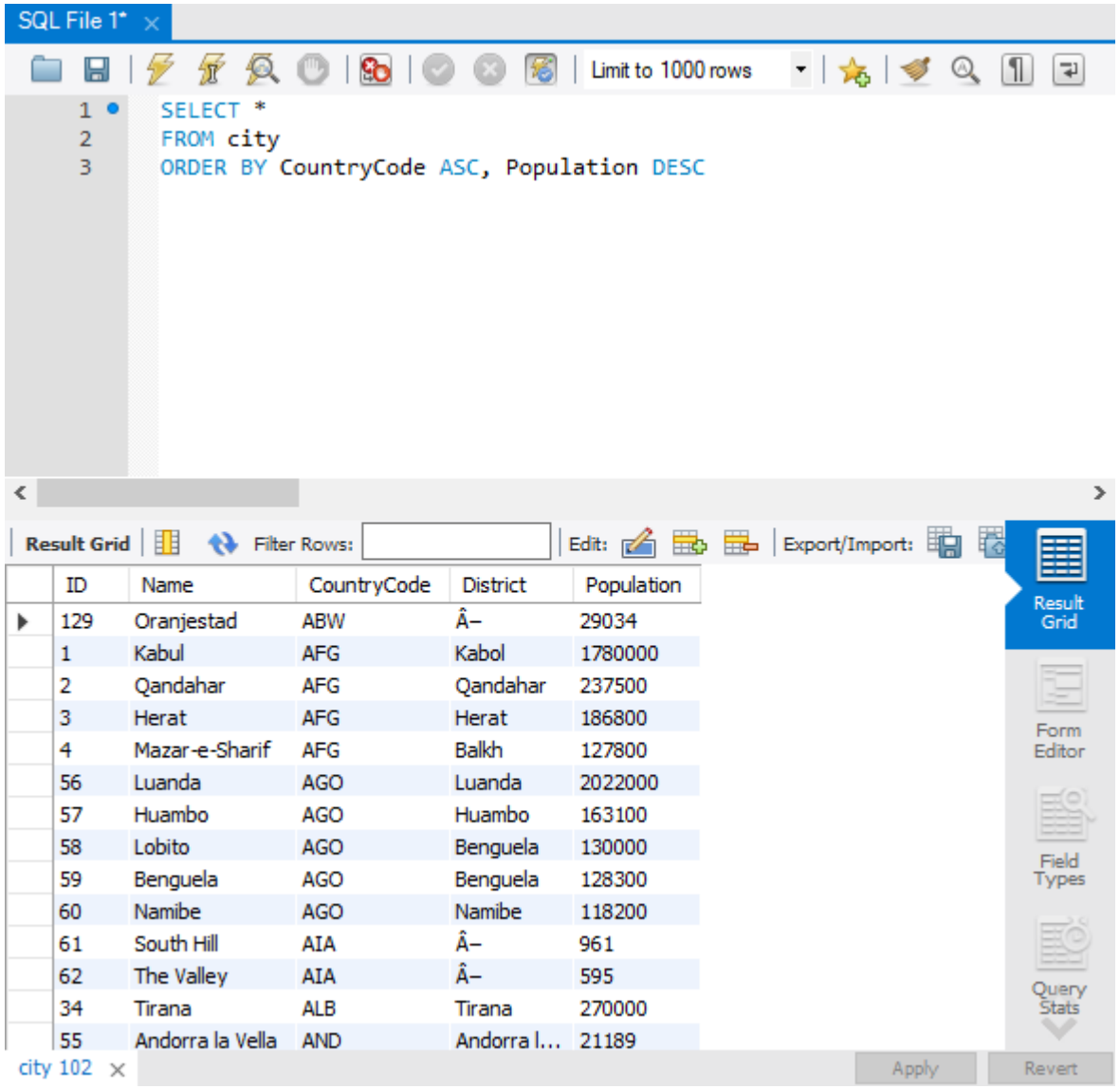
ORDER BY

- 결과가 출력되는 순서를 조절하는 구문
- 기본적으로 오름차순ASCENDING 정렬
- 내림차순DESCENDING 으로 정렬
  - 열 이름 뒤에 DESC 적어줄 것
- ASC(오름차순)는 default이므로 생략 가능



ORDER BY

- ORDER BY 구문을 혼합해 사용하는 구문도 가능



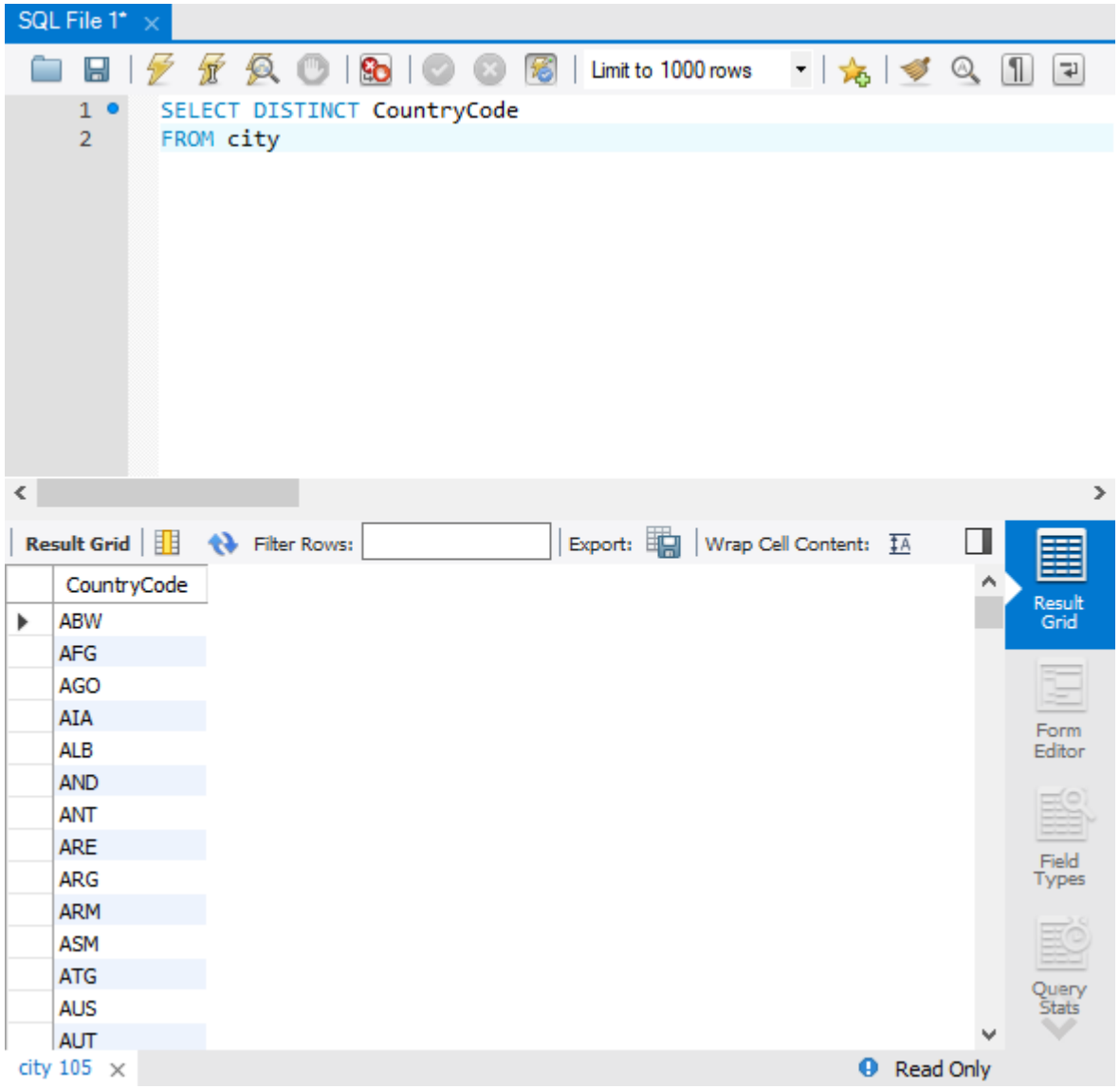
LAB #04

인구수로 내림차순하여 한국에 있는 도시 보기

국가 면적 크기로 내림차순하여 나라 보기
(country table)

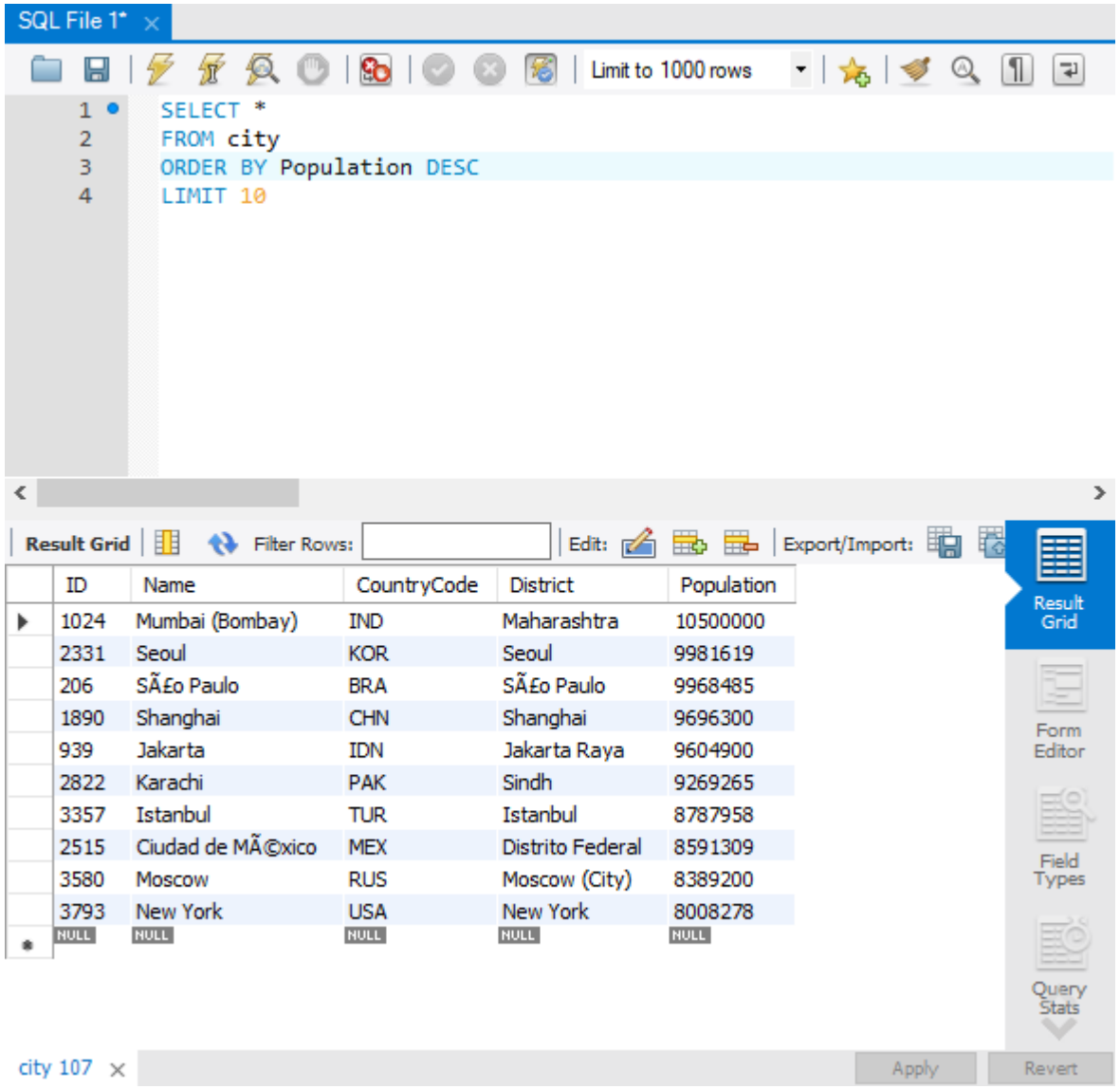
DISTINCT

- 중복된 것은 1개씩만 보여주면서 출력
- 테이블의 크기가 클수록 효율적



LIMIT

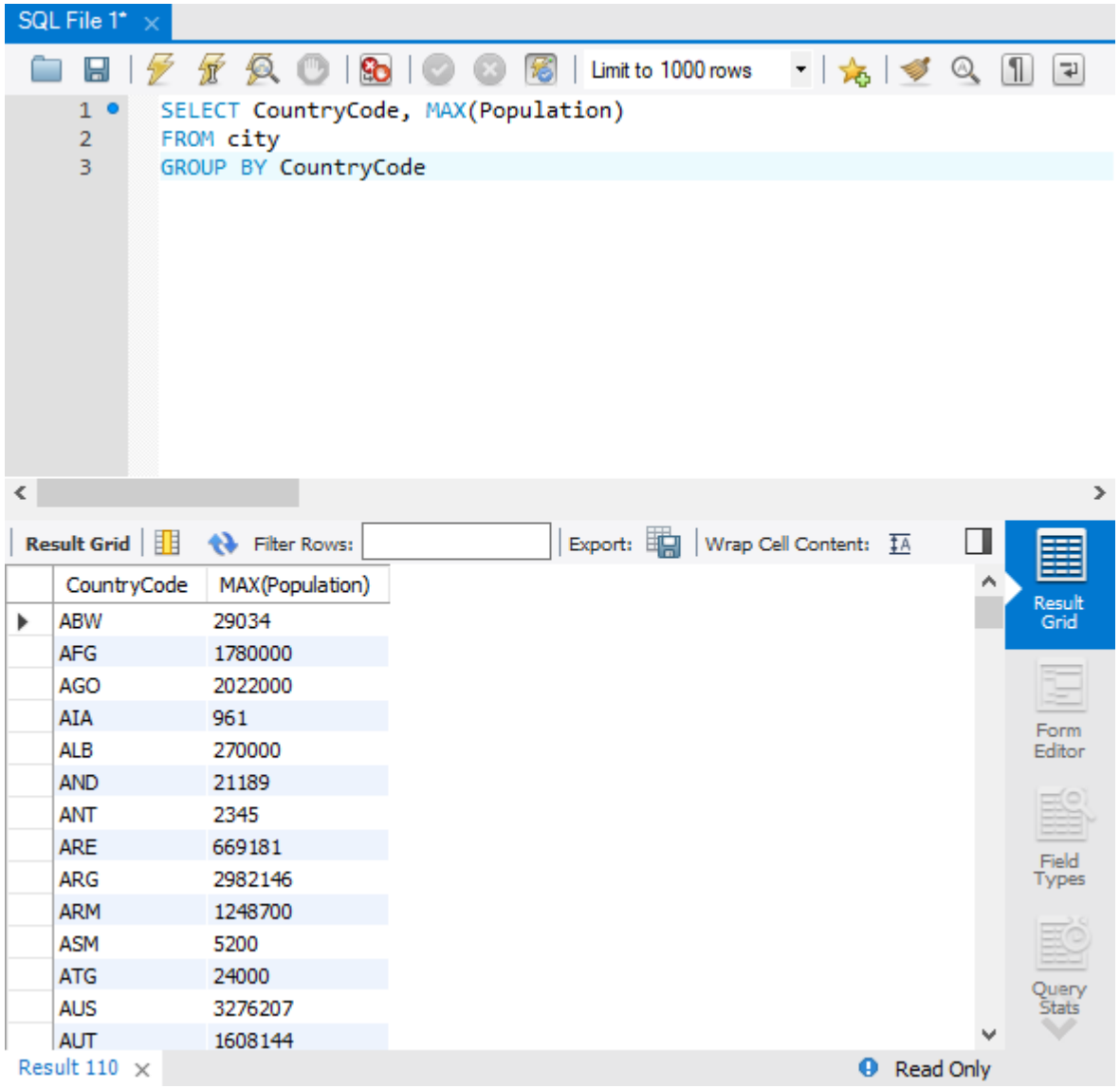
- 출력 개수를 제한
- 상위의 N개만 출력하는 'LIMIT N' 구문
- 서버의 처리량을 많이 사용해 서버의 전반적인 성능을 나쁘게 하는 악성 쿼리문 개선할 때 사용



GROUP BY

- 그룹으로 묶어주는 역할
- 집계 함수Aggregate Function를 함께 사용
  - AVG(): 평균
  - MIN(): 최소값
  - MAX(): 최대값
  - COUNT(): 행의 개수
  - COUNT(DISTINCT): 중복 제외된 행의 개수
  - STDEV(): 표준 편차
  - VARIANCE(): 분산
- 효율적인 데이터 그룹화Grouping
- 읽기 좋게 하기 위해 별칭Alias 사용

```
1    SELECT CountryCode, MAX(Population) AS 'Population'
2    FROM city
3    GROUP BY CountryCode
```



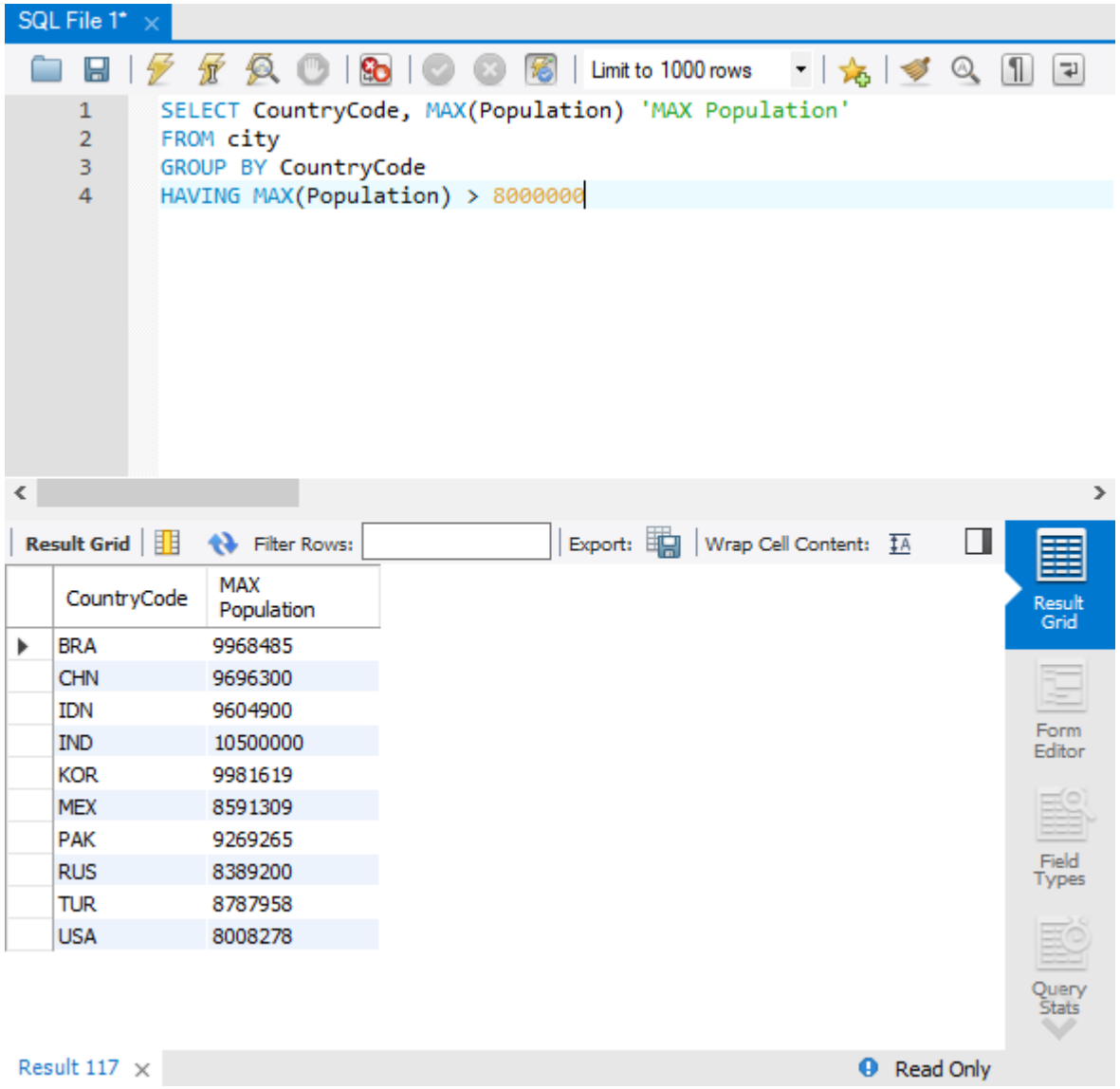
LAB #05

도시는 몇개인가?

도시들의 평균 인구수는?

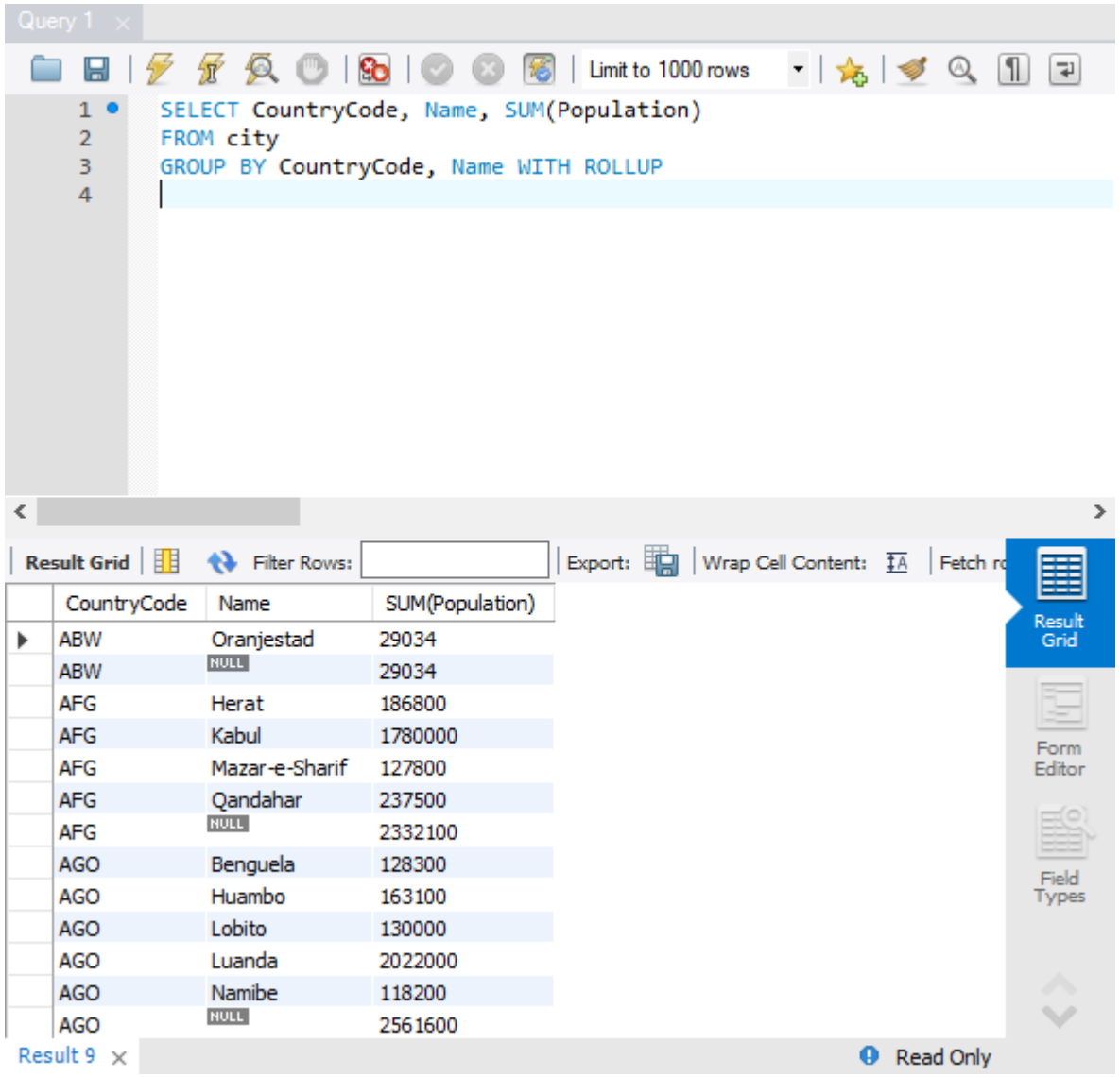
HAVING

- WHERE과 비슷한 개념으로 조건 제한
- 집계 함수에 대해서 조건 제한하는 편리한 개념
- HAVING절은 반드시 GROUP BY절 다음에 나와야 함



ROLLUP

- 총합 또는 중간합계가 필요할 경우 사용
- GROUP BY절과 함께 WITH ROLLUP문 사용



CountryCode	Name	SUM(Population)
ABW	Oranjestad	29034
ABW	NULL	29034
AFG	Herat	186800
AFG	Kabul	1780000
AFG	Mazar-e-Sharif	127800
AFG	Qandahar	237500
AFG	NULL	2332100
AGO	Benguela	128300
AGO	Huambo	163100
AGO	Lobito	130000
AGO	Luanda	2022000
AGO	Namibe	118200
AGO	NULL	2561600

JOIN

- JOIN은 데이터베이스 내의 여러 테이블에서 가져온 레코드를 조합하여 하나의 테이블이나 결과 집합으로 표현

SQL File 4*

Limit to 1000 rows

```
1  SELECT * FROM city
2  JOIN country
3  ON city.CountryCode = country.Code
4
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Fetch r

ID	Name	CountryCode	District	Population	Code	Name	Co
1	Kabul	AFG	Kabol	1780000	AFG	Afghanistan	Asia
2	Qandahar	AFG	Qandahar	237500	AFG	Afghanistan	Asia
3	Herat	AFG	Herat	186800	AFG	Afghanistan	Asia
4	Mazar-e-Sharif	AFG	Balkh	127800	AFG	Afghanistan	Asia
5	Amsterdam	NLD	Noord-Holland	731200	NLD	Netherlands	Eur
6	Rotterdam	NLD	Zuid-Holland	593321	NLD	Netherlands	Eur
7	Haag	NLD	Zuid-Holland	440900	NLD	Netherlands	Eur
8	Utrecht	NLD	Utrecht	234323	NLD	Netherlands	Eur
9	Eindhoven	NLD	Noord-Brabant	201843	NLD	Netherlands	Eur
10	Tilburg	NLD	Noord-Brabant	193238	NLD	Netherlands	Eur
11	Groningen	NLD	Groningen	172701	NLD	Netherlands	Eur
12	Breda	NLD	Noord-Brabant	160398	NLD	Netherlands	Eur
13	Apeldoorn	NLD	Gelderland	153491	NLD	Netherlands	Eur

Result Grid | Form Editor | Field Types | Query Stats

Result 14 | Read Only

LAB #06

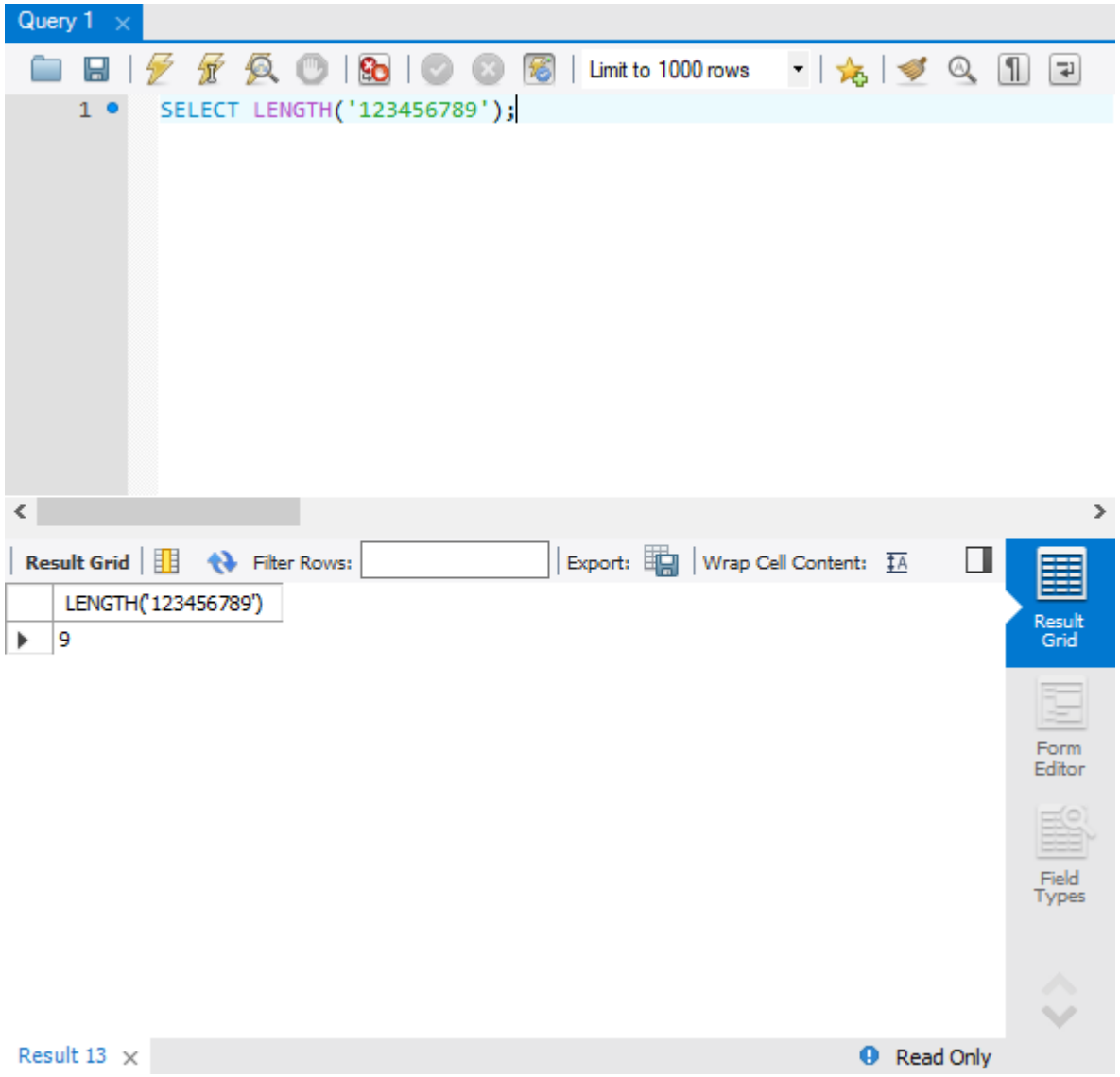
city, country, countrylanguage 테이블 3개를 JOIN 하기

MySQL 내장함수

- 사용자의 편의를 위해 다양한 기능의 내장 함수를 미리 정의하여 제공
- 대표적인 내장 함수의 종류
  - 문자열 함수
  - 수학 함수
  - 날짜와 시간 함수

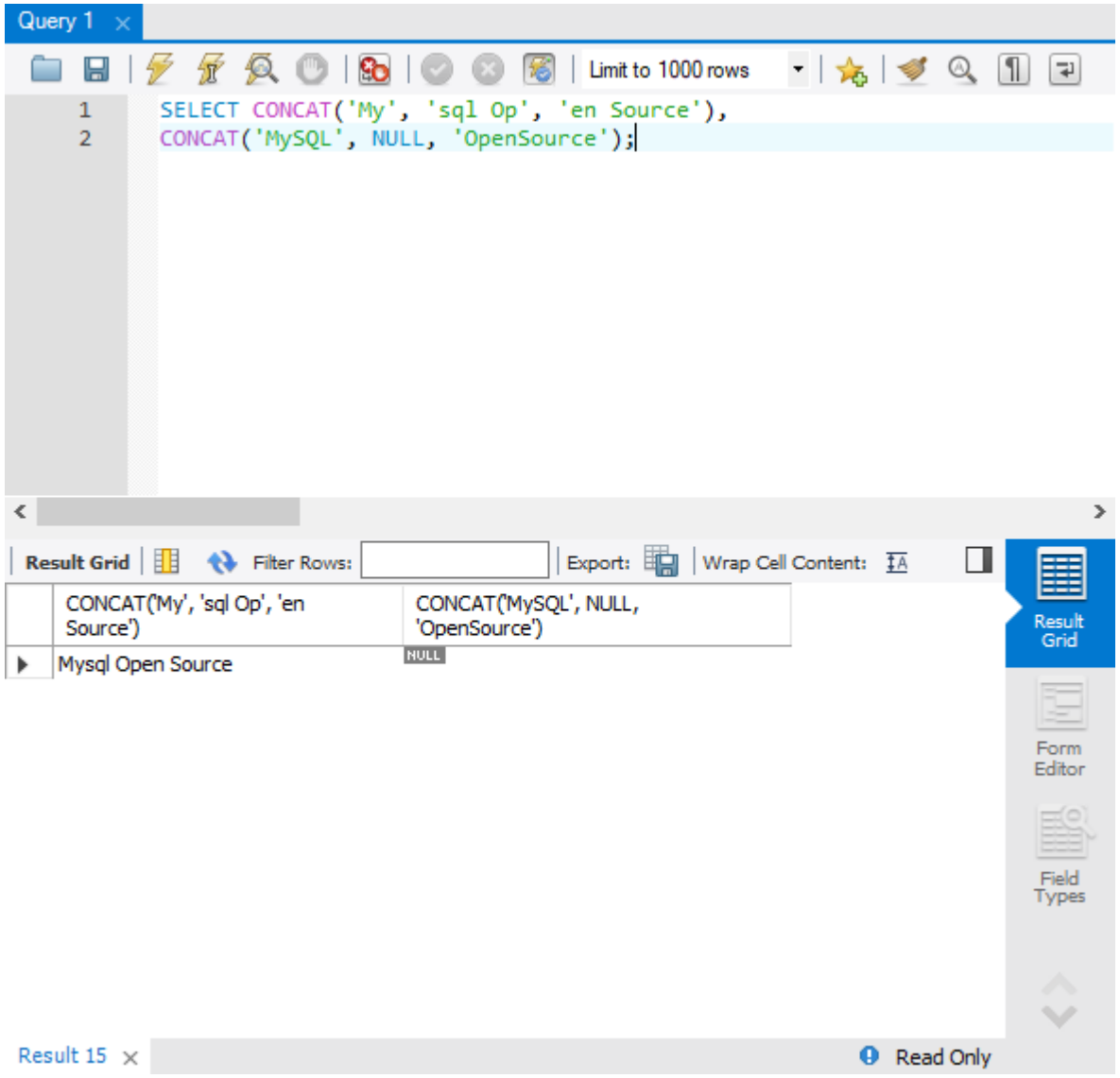
LENGTH()

- 전달받은 문자열의 길이를 반환



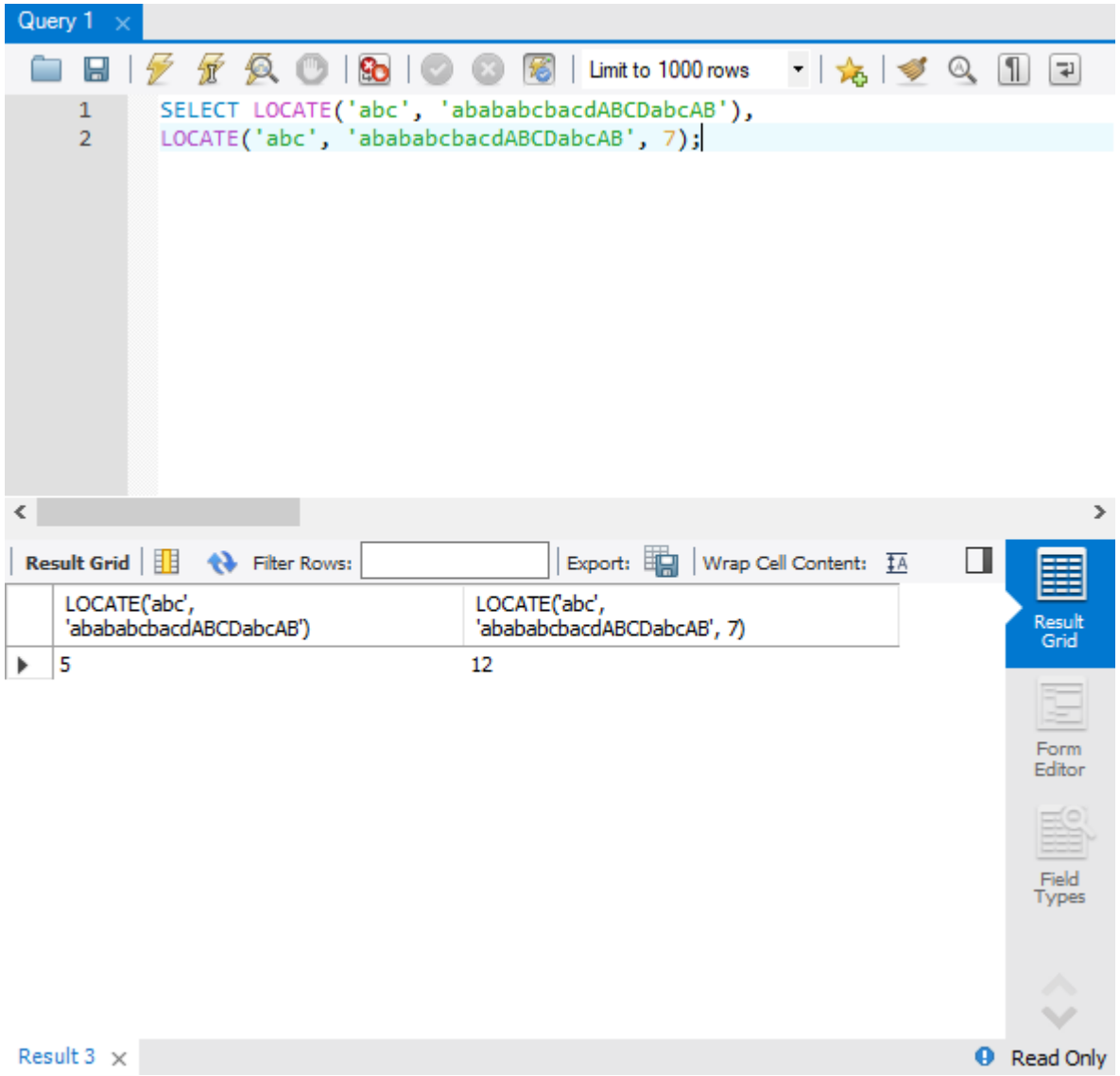
CONCAT()

- 전달받은 문자열을 모두 결합하여 하나의 문자열로 반환
- 전달받은 문자열 중 하나라도 NULL이 존재하면 NULL을 반환



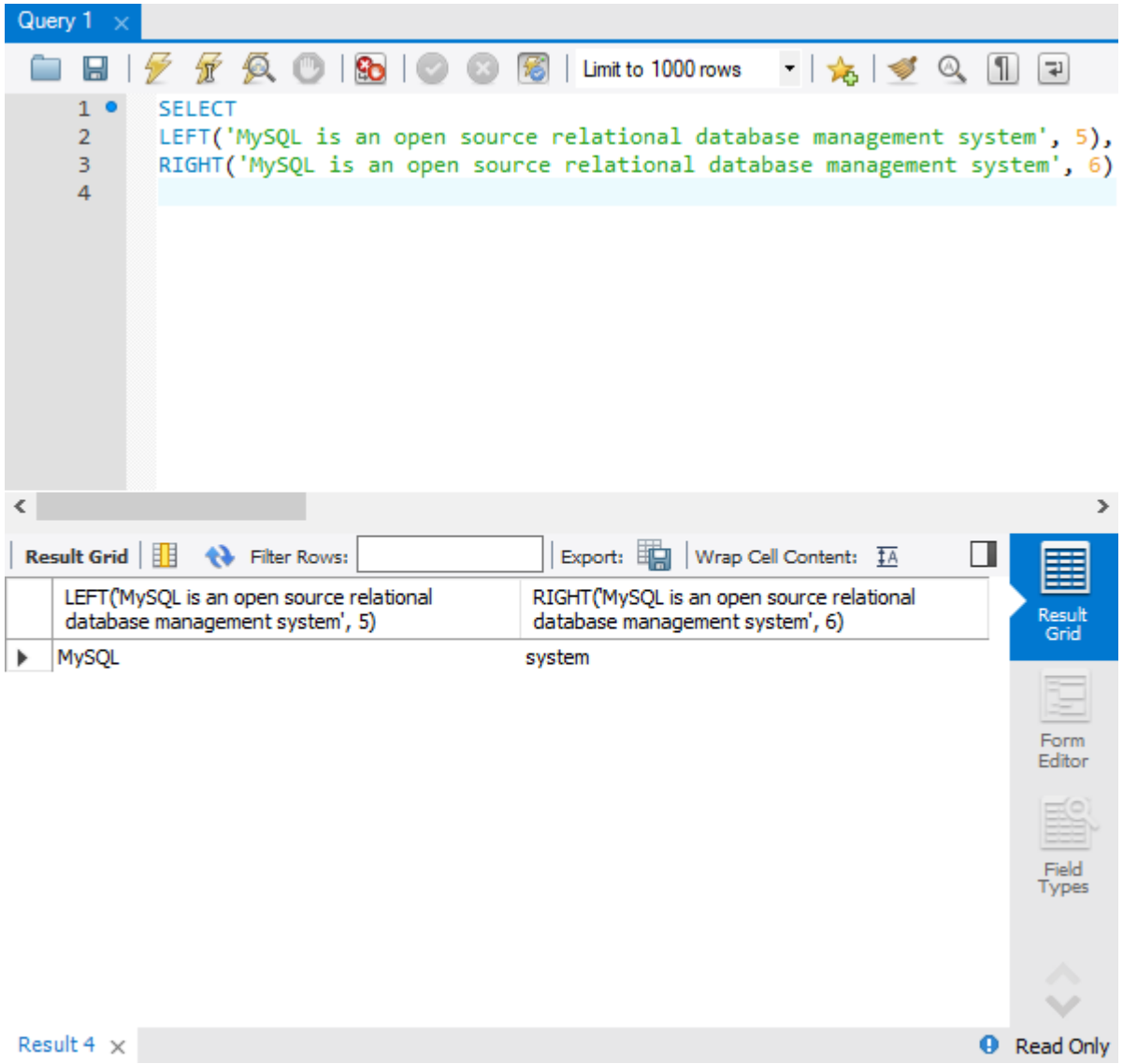
LOCATE()

- 문자열 내에서 찾는 문자열이 처음으로 나타나는 위치를 찾아서 해당 위치를 반환
- 찾는 문자열이 문자열 내에 존재하지 않으면 0을 반환
- MySQL에서는 문자열의 시작 인덱스를 1부터 계산



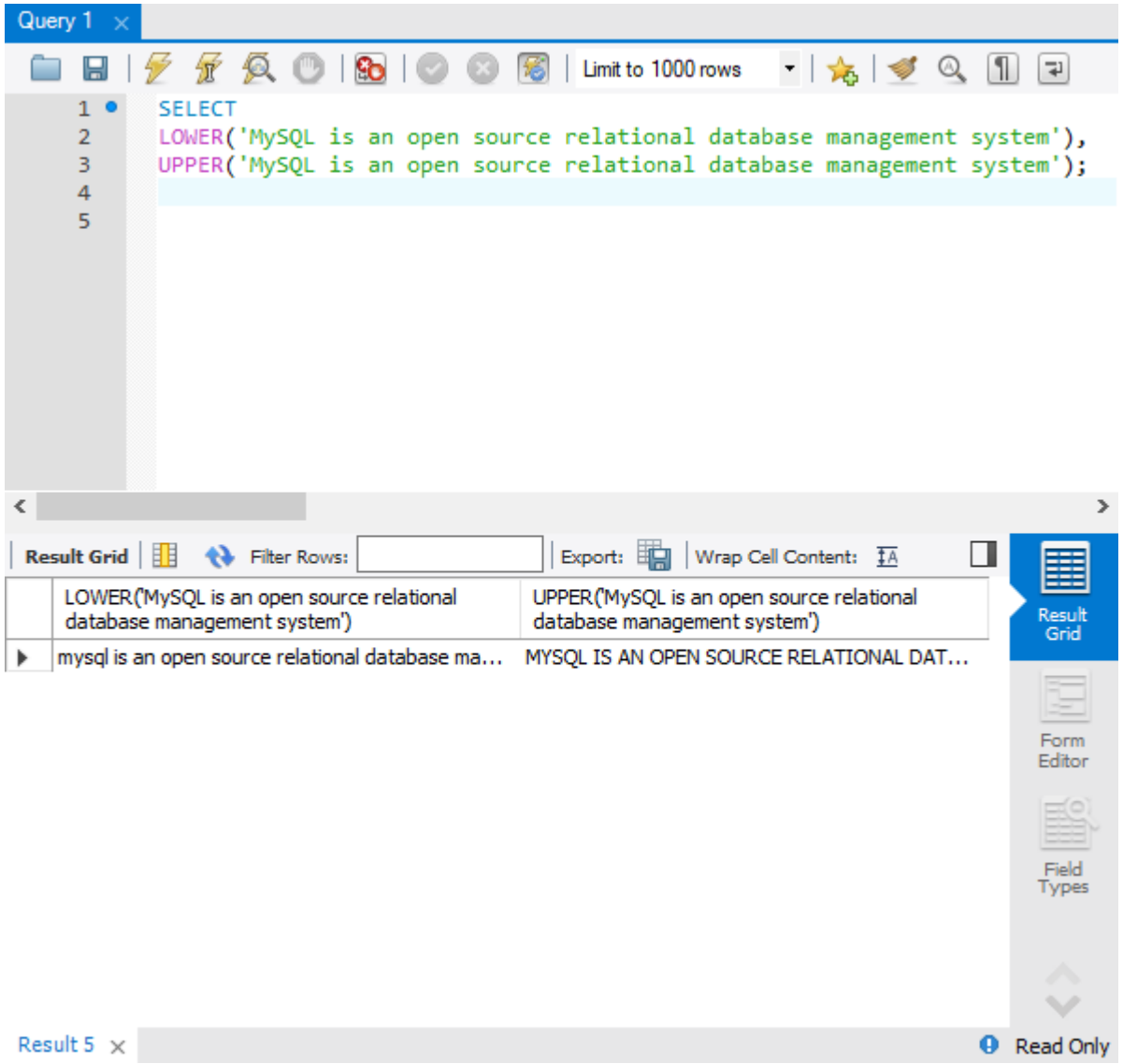
LEFT(), RIGHT()

- LEFT(): 문자열의 왼쪽부터 지정한 개수만큼의 문자를 반환
- RIGHT(): 문자열의 오른쪽부터 지정한 개수만큼의 문자를 반환



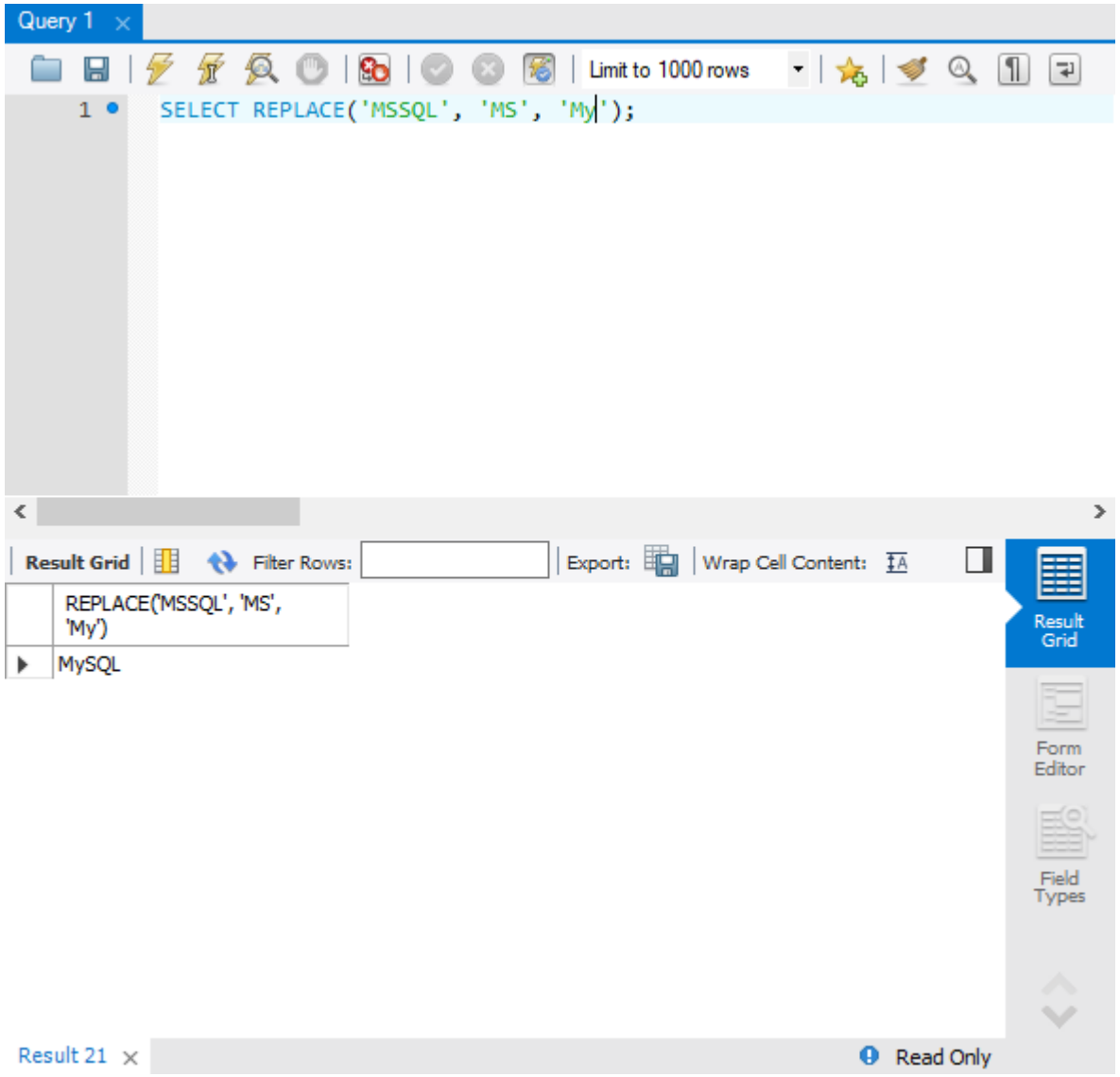
LOWER(), UPPER()

- LOWER(): 문자열의 문자를 모두 소문자로 변경
- UPPER(): 문자열의 문자를 모두 대문자로 변경



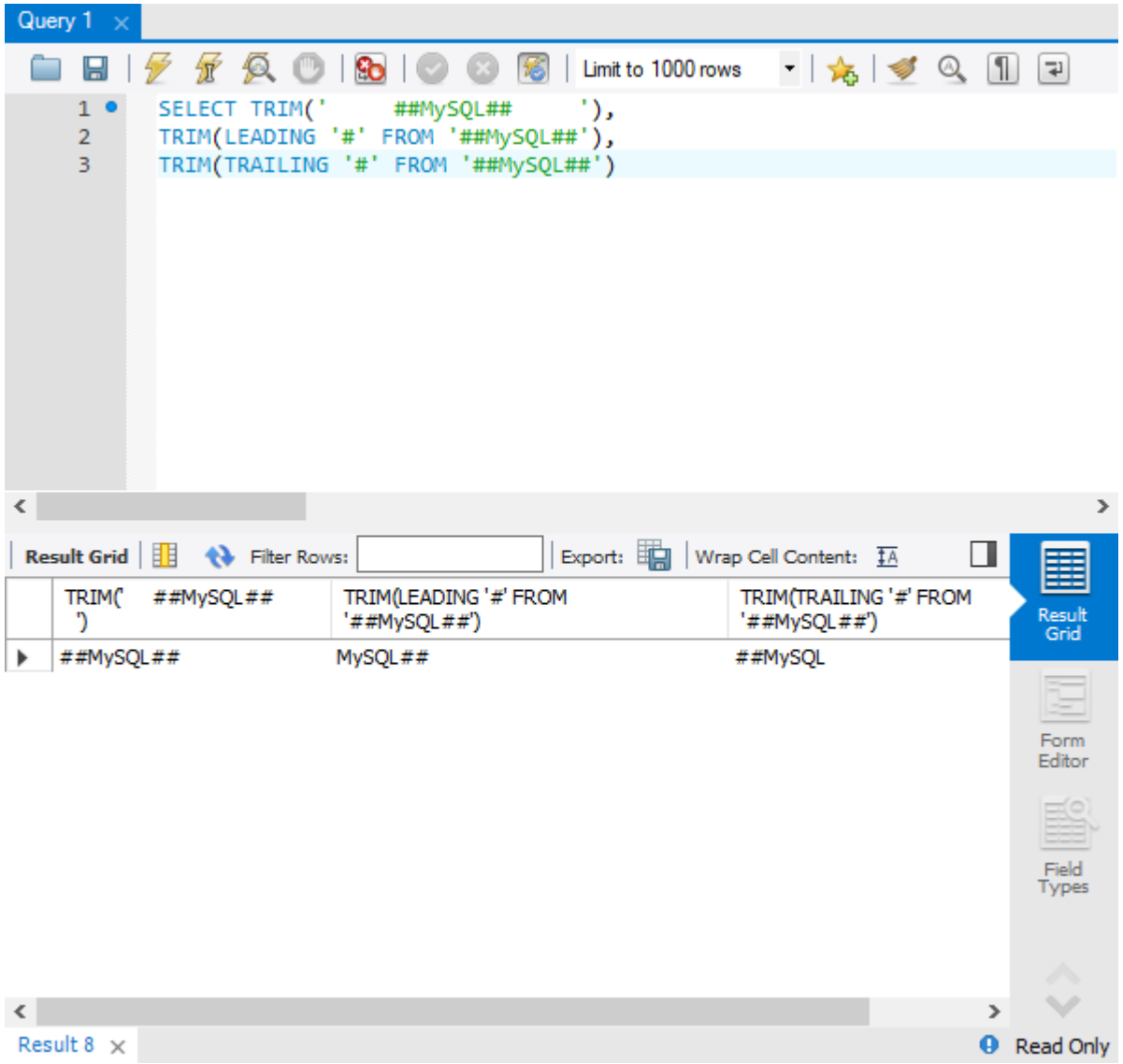
REPLACE()

- 문자열에서 특정 문자열을 대체 문자열로 교체



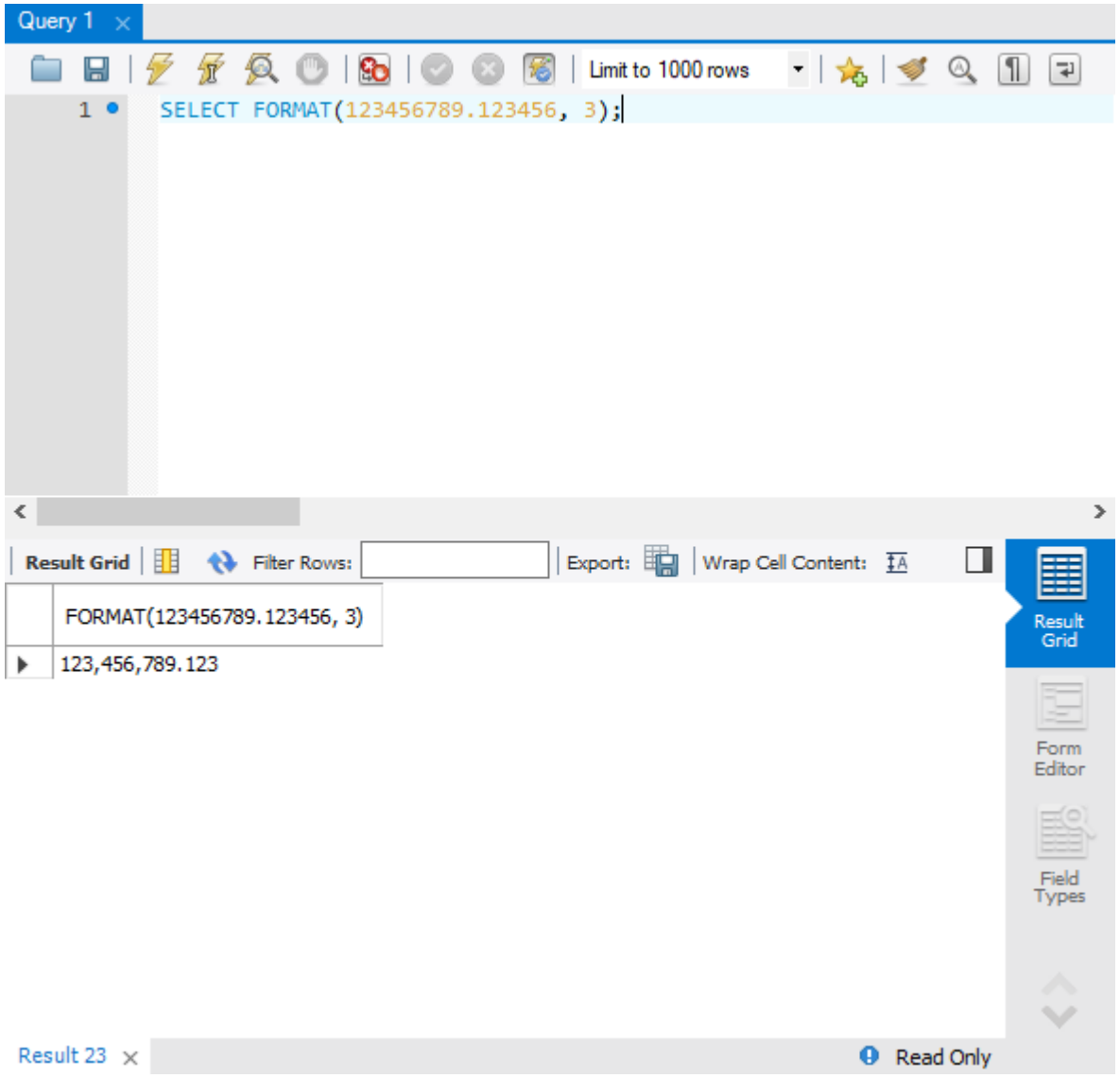
TRIM()

- 문자열의 앞이나 뒤, 또는 양쪽 모두에 있는 특정 문자를 제거
- TRIM() 함수에서 사용할 수 있는 지정자
  - BOTH : 전달받은 문자열의 양 끝에 존재하는 특정 문자를 제거 (기본 설정)
  - LEADING : 전달받은 문자열 앞에 존재하는 특정 문자를 제거
  - TRAILING : 전달받은 문자열 뒤에 존재하는 특정 문자를 제거
- 만약 지정자를 명시하지 않으면, 자동으로 BOTH로 설정
- 제거할 문자를 명시하지 않으면, 자동으로 공백을 제거



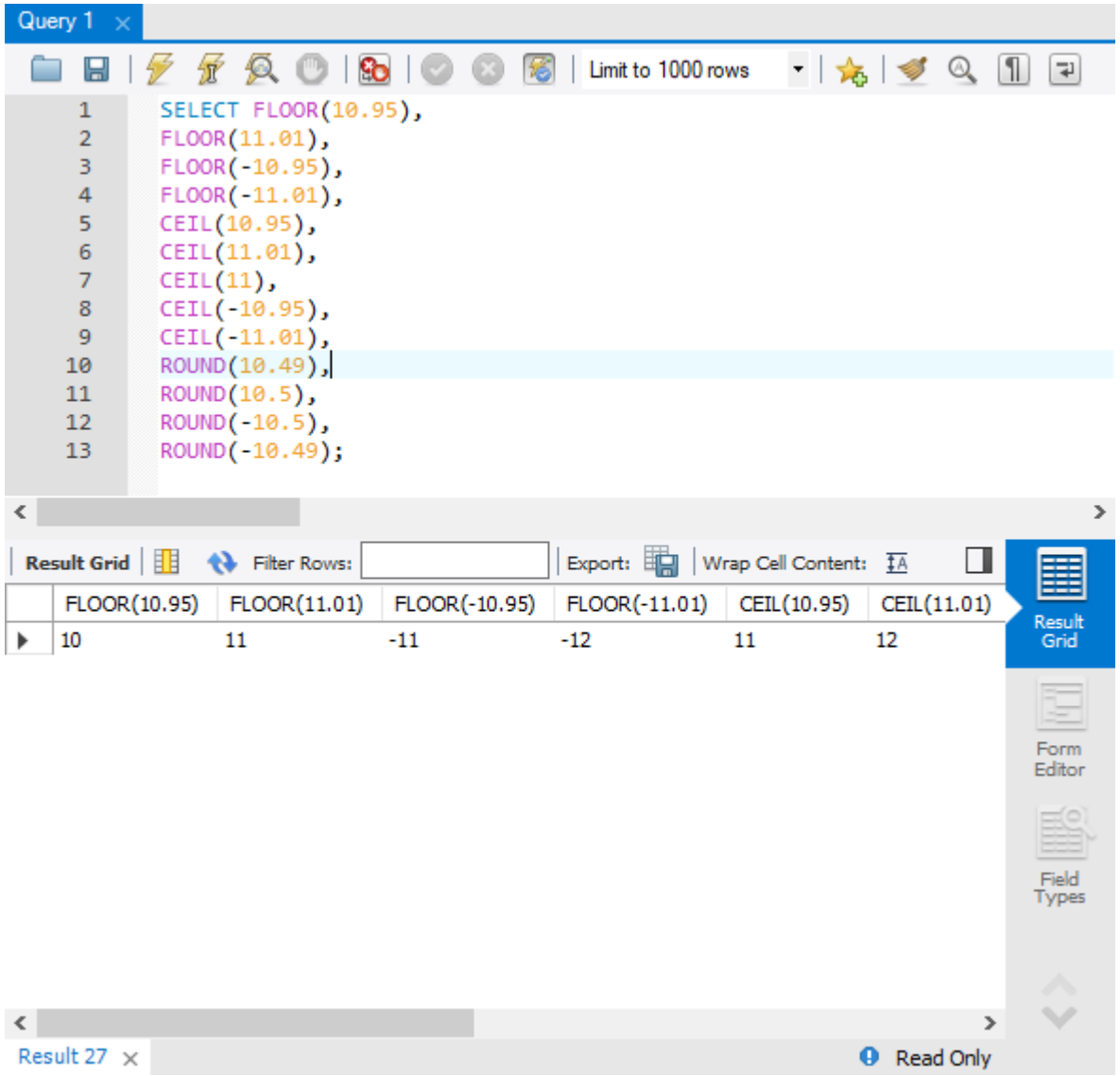
FORMAT()

- 숫자 타입의 데이터를 세 자리마다 쉼표(,)를 사용하는 '#,###,###.##' 형식으로 변환
- 반환되는 데이터의 형식은 문자열 타입
- 두 번째 인수는 반올림할 소수 부분의 자릿수



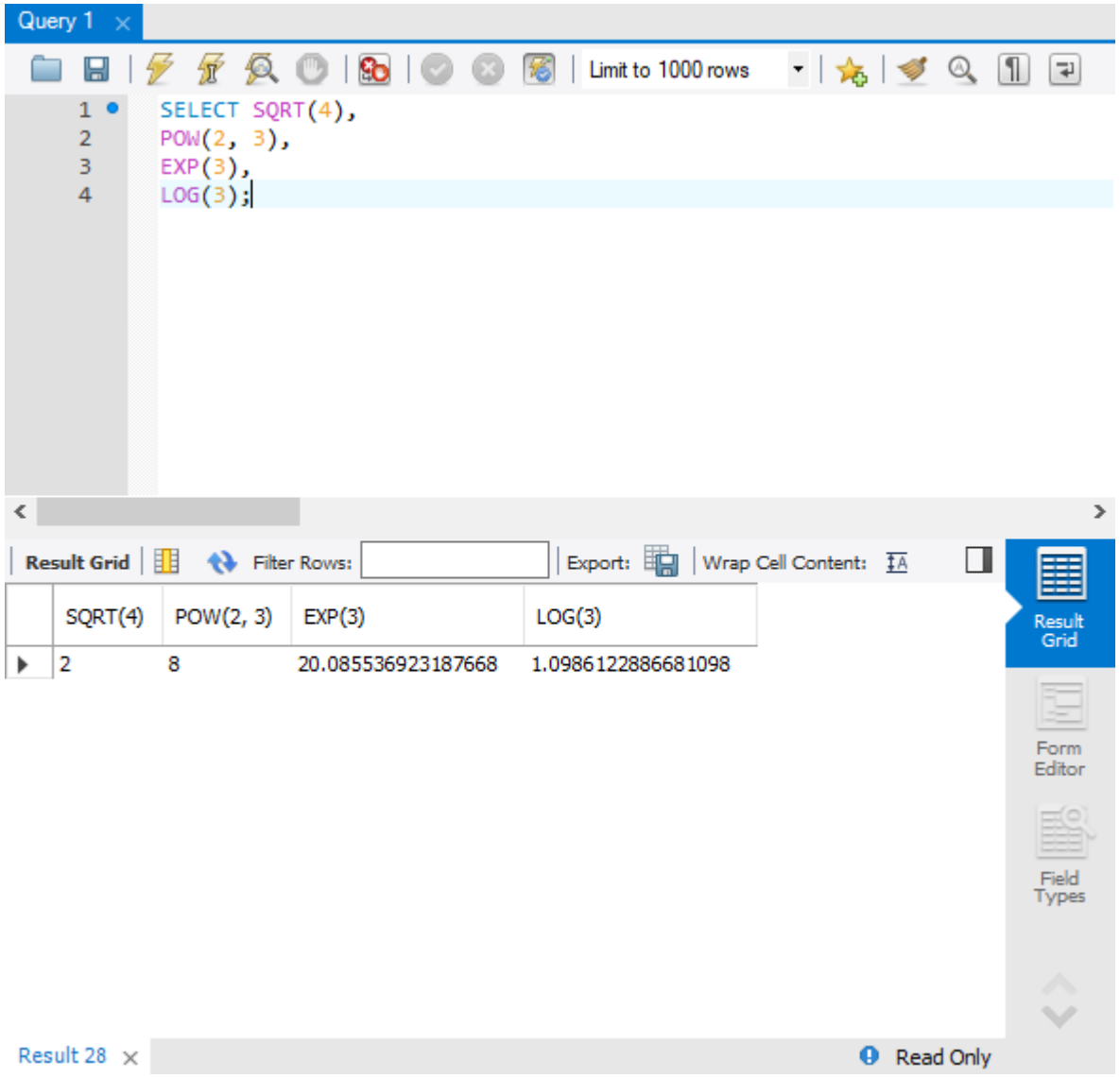
FLOOR(), CEIL(), ROUNT()

- FLOOR(): 내림
- CEIL(): 올림
- ROUND(): 반올림



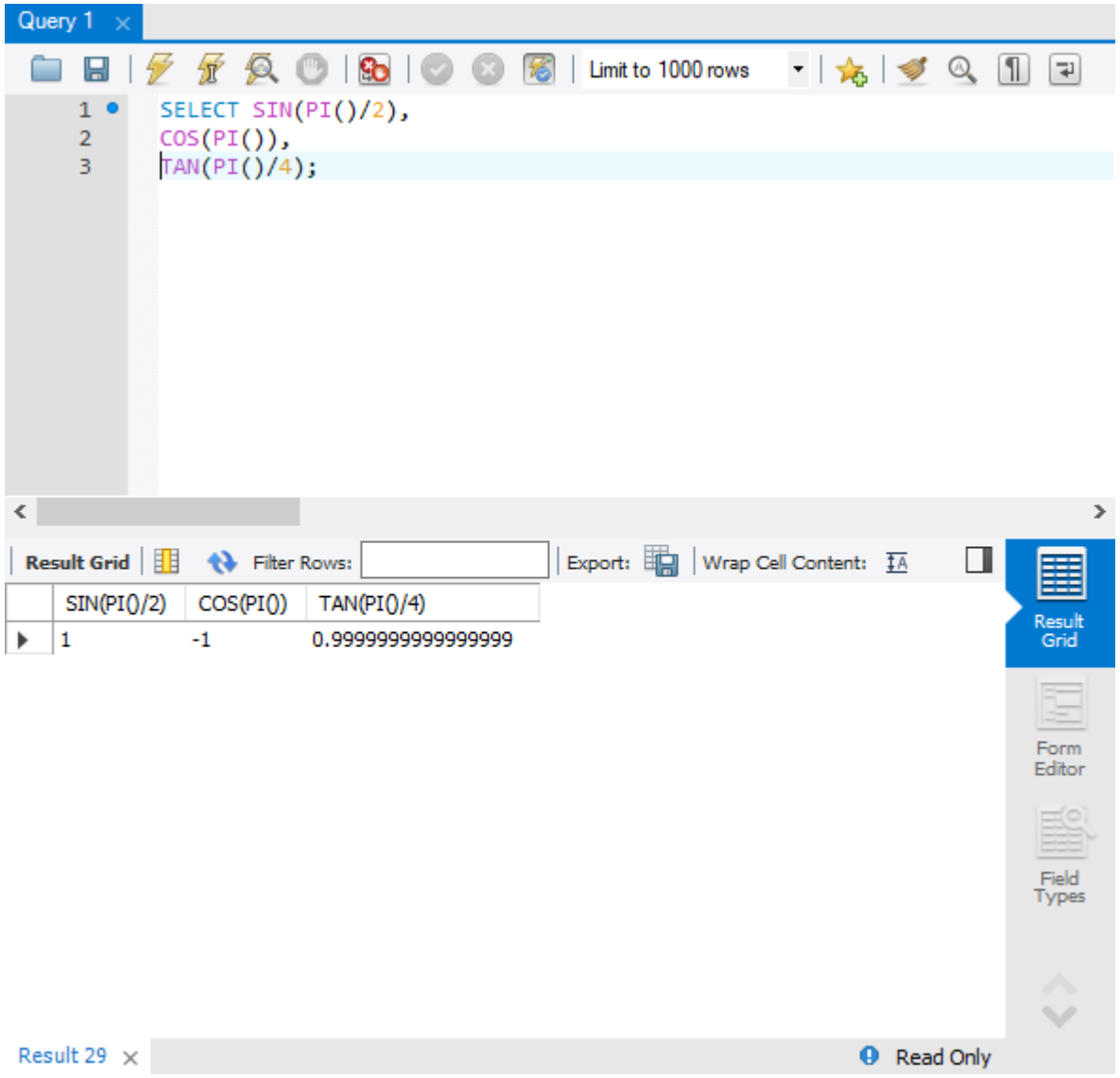
SQRT(), POW(), EXP(), LOG()

- SQRT(): 양의 제곱근
- POW(): 첫 번째 인수로는 밑수를 전달하고, 두 번째 인수로는 지수를 전달하여 거듭제곱 계산
- EXP(): 인수로 지수를 전달받아, e의 거듭제곱을 계산
- LOG(): 자연로그 값을 계산



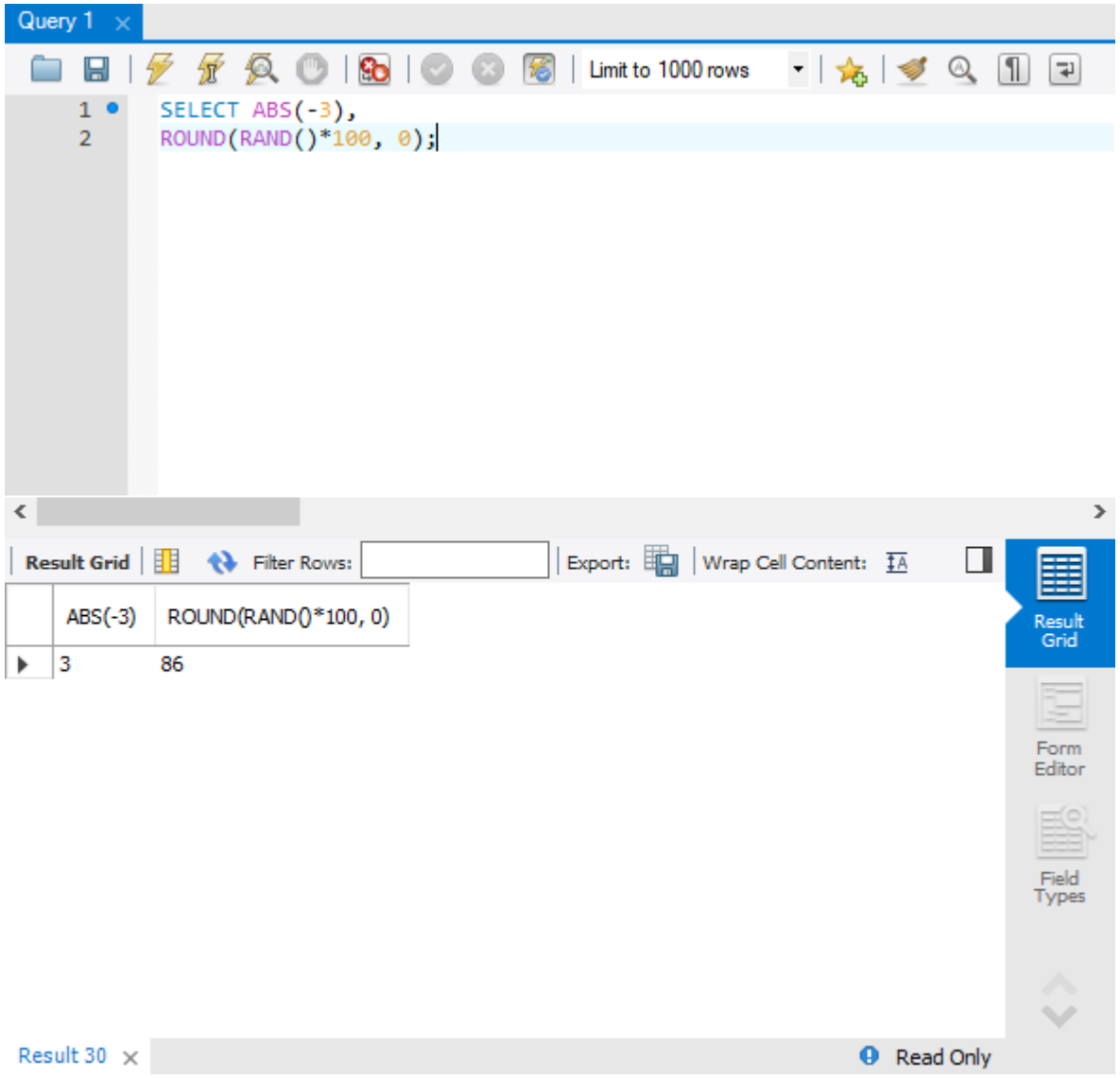
SIN(), COS(), TAN()

- SIN(): 사인값 반환
- COS(): 코사인값 반환
- TAN(): 탄젠트값 반환



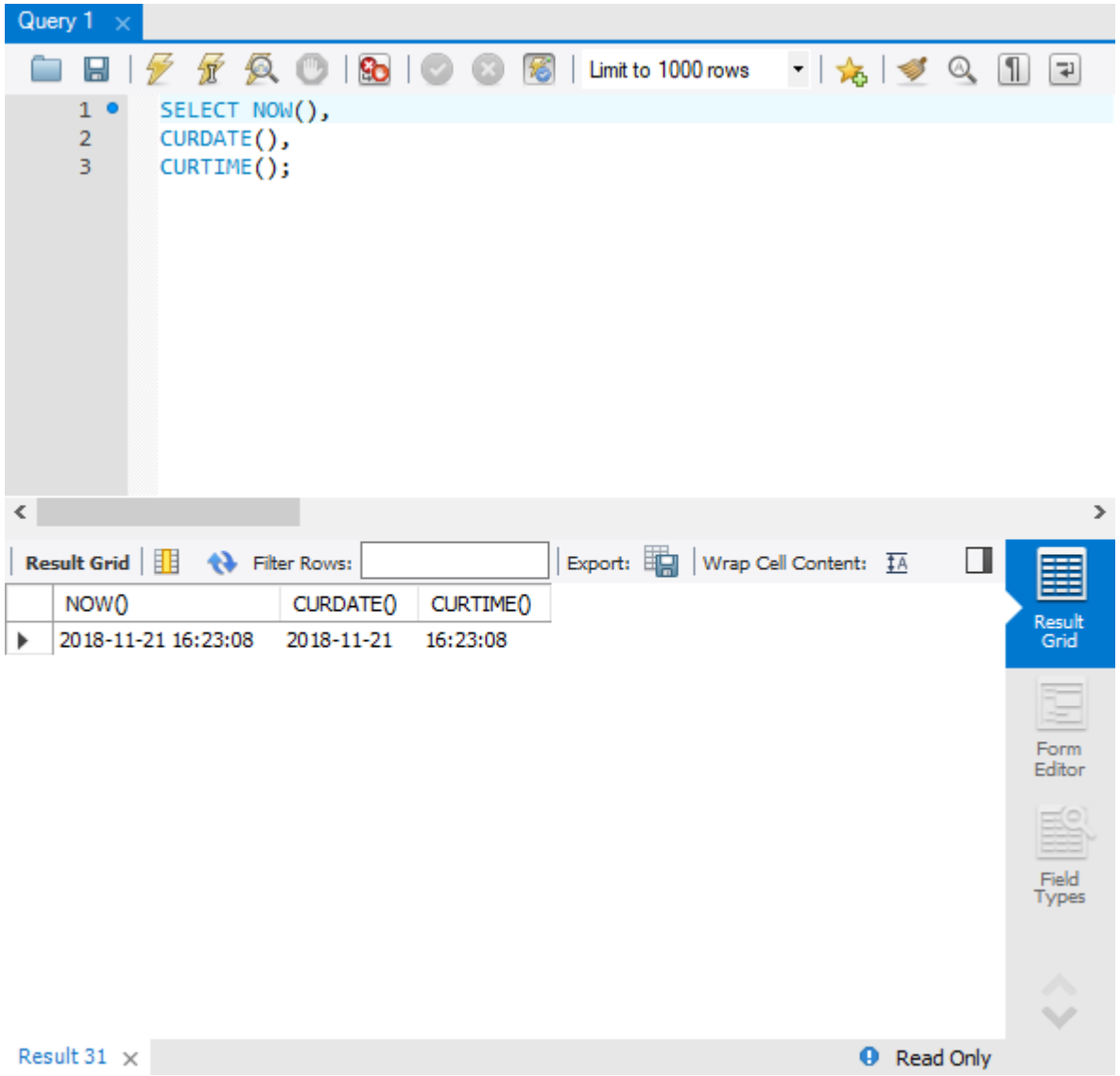
ABS(), RAND()

- ABS(X): 절대값을 반환
- RAND(): 0.0보다 크거나 같고 1.0보다 작은 하나의 실수를 무작위로 생성



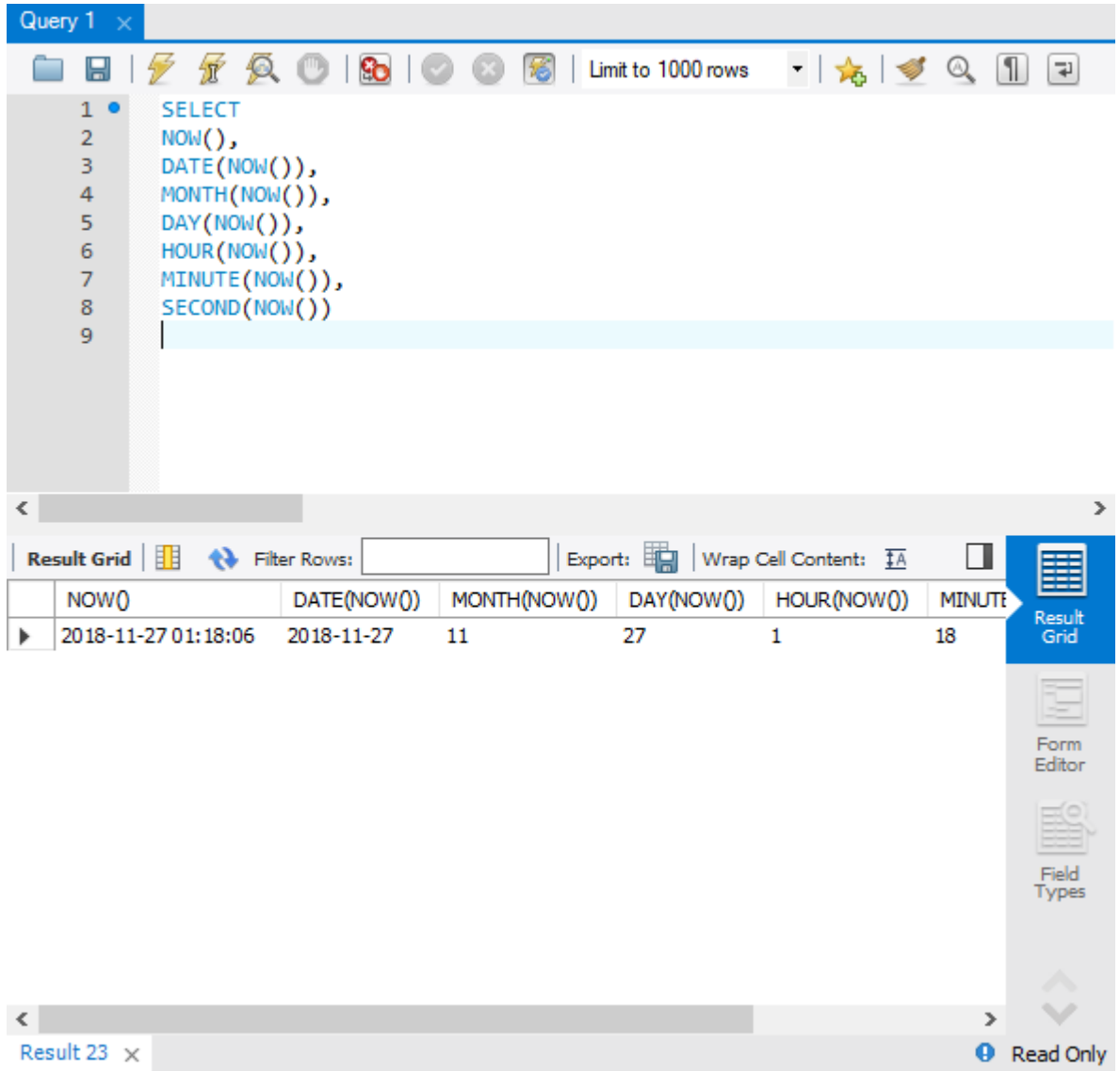
NOW(), CURDATE(), CURTIME()

- NOW(): 현재 날짜와 시간을 반환, 반환되는 값은 'YYYY-MM-DD HH:MM:SS' 또는 YYYYMMDDHHMMSS 형태로 반환
- CURDATE(): 현재 날짜를 반환, 이때 반환되는 값은 'YYYY-MM-DD' 또는 YYYYMMDD 형태로 반환
- CURTIME(): 현재 시각을 반환, 이때 반환되는 값은 'HH:MM:SS' 또는 HHMMSS 형태로 반환



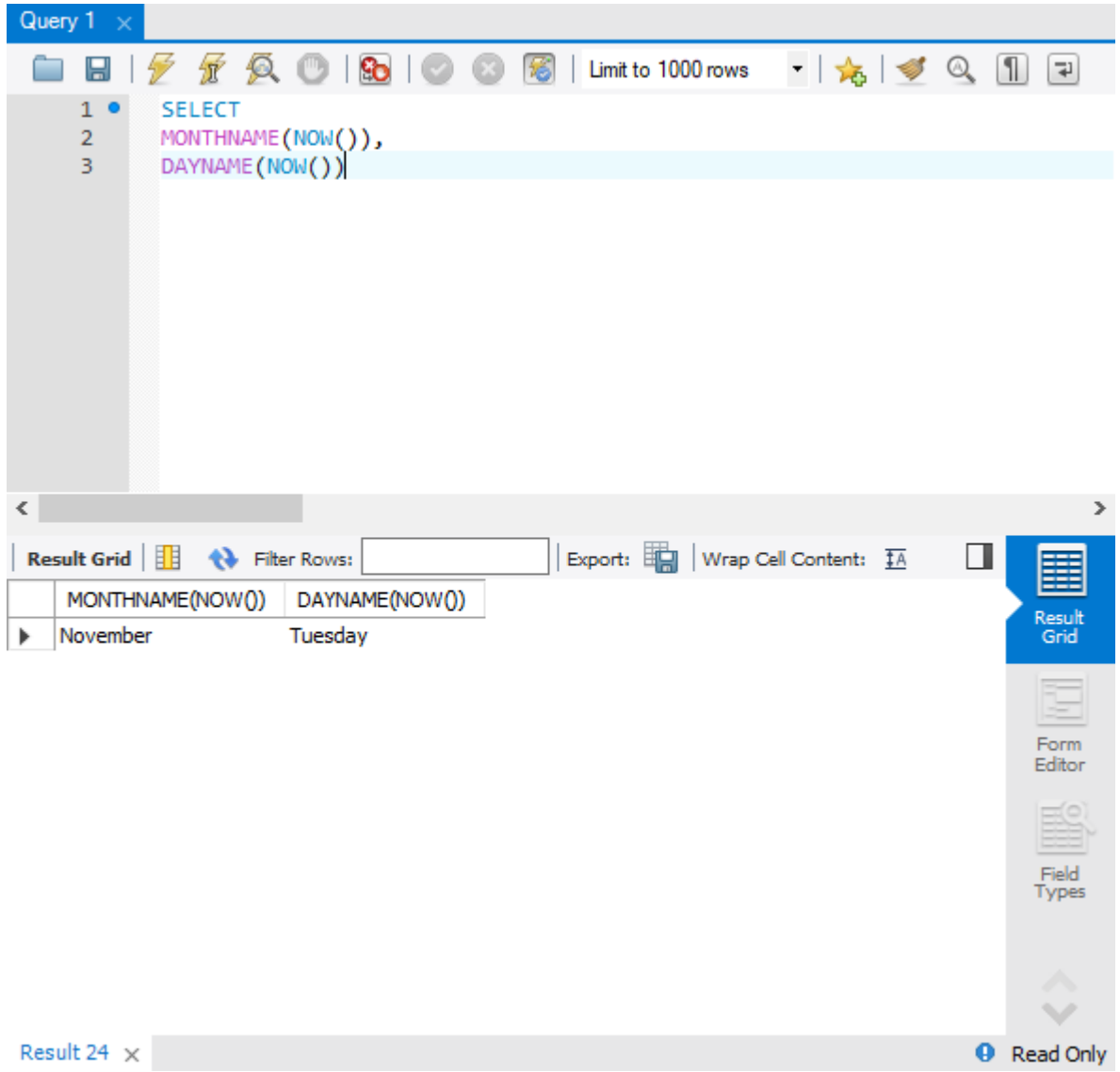
DATE(), MONTH(), DAY(), HOUR(), MINUTE(), SECOND()

- DATE(): 전달받은 값에 해당하는 날짜 정보를 반환
- MONTH(): 월에 해당하는 값을 반환하며, 0부터 12 사이의 값을 가짐
- DAY(): 일에 해당하는 값을 반환하며, 0부터 31 사이의 값을 가짐
- HOUR(): 시간에 해당하는 값을 반환하며, 0부터 23 사이의 값을 가짐
- MINUTE(): 분에 해당하는 값을 반환하며, 0부터 59 사이의 값을 가짐
- SECOND(): 초에 해당하는 값을 반환하며, 0부터 59 사이의 값을 가짐



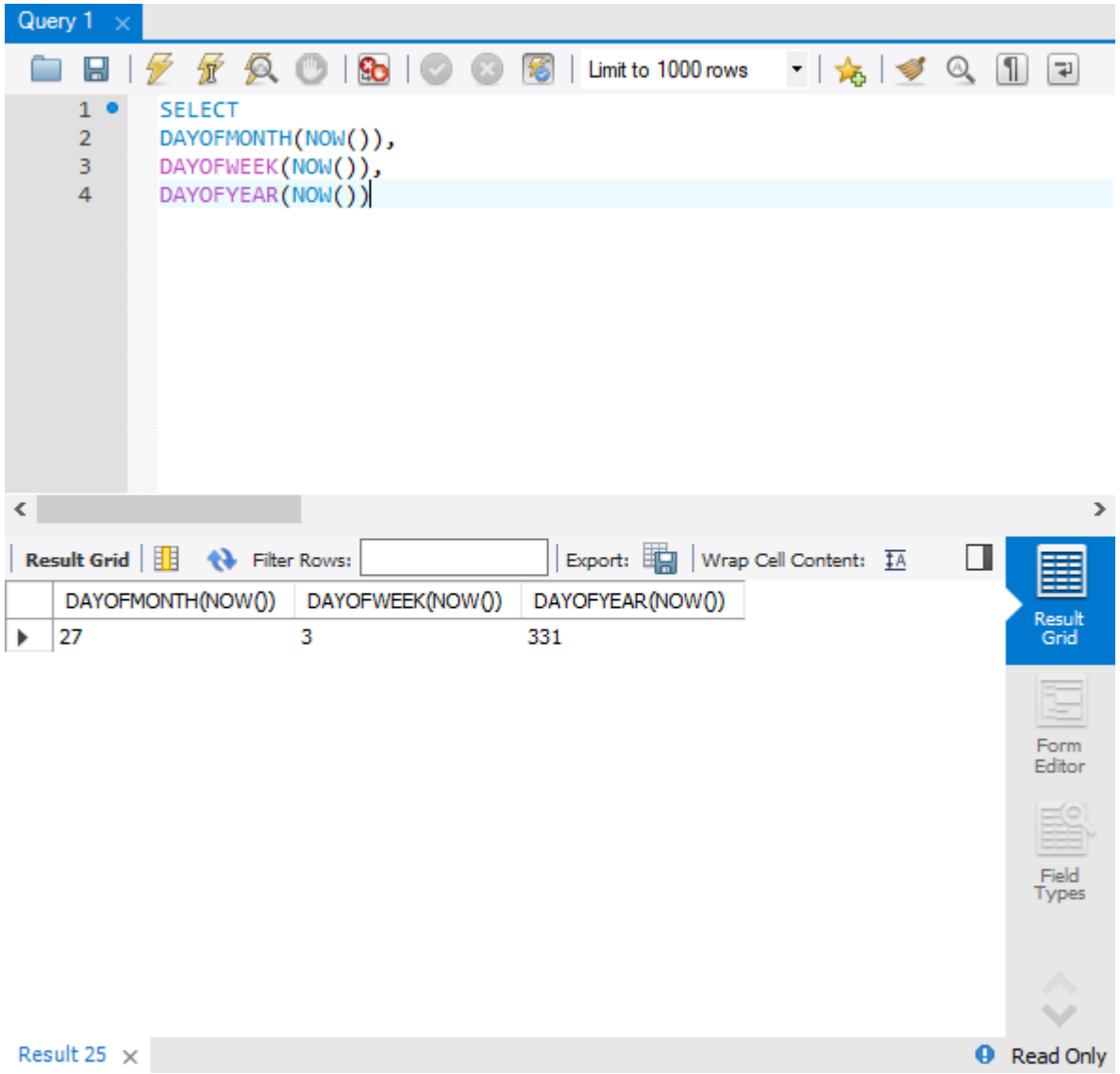
MONTHNAME(), DAYNAME()

- MONTHNAME(): 월에 해당하는 이름을 반환
- DAYNAME(): 요일에 해당하는 이름을 반환



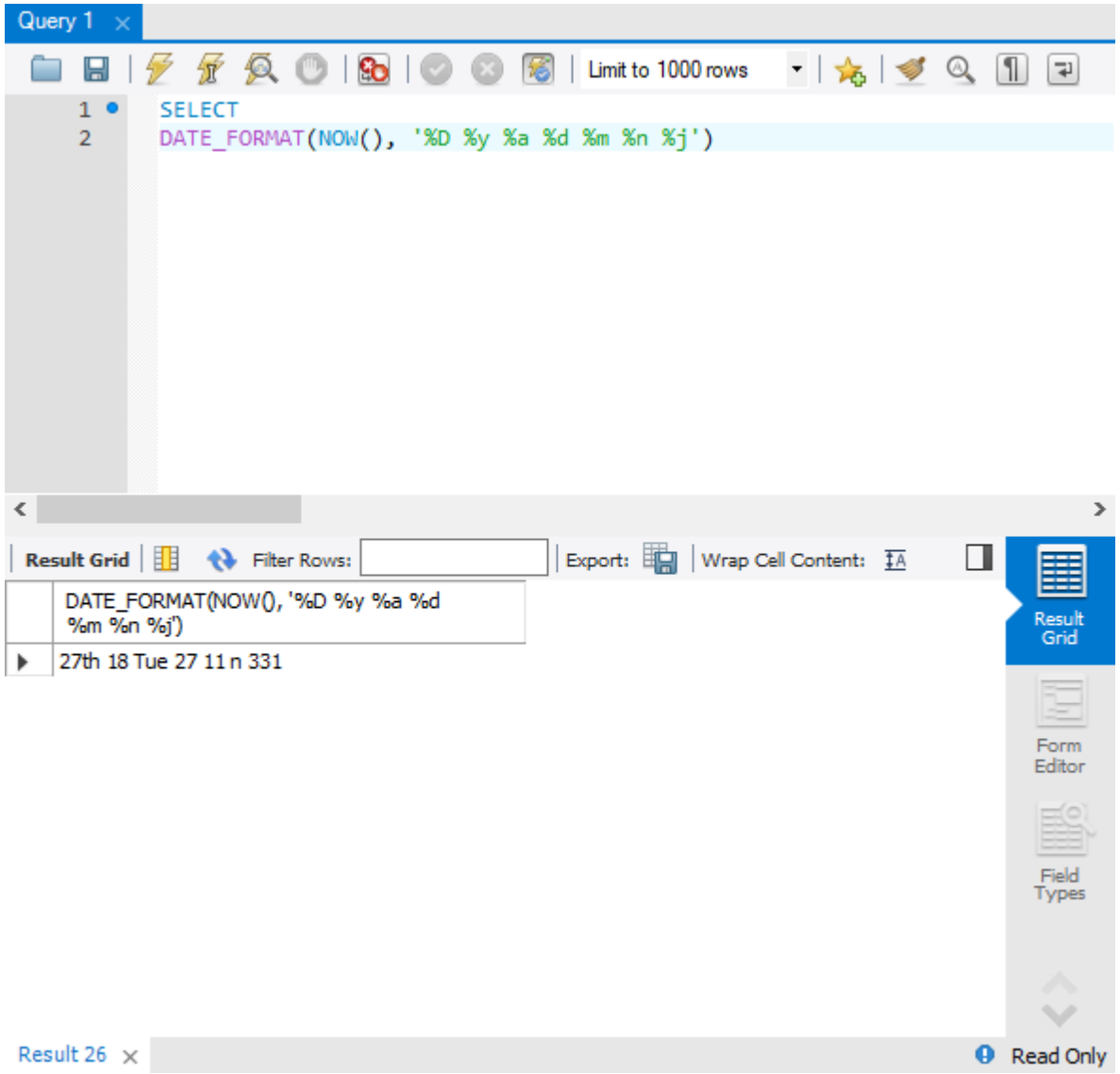
DAYOFWEEK(), DAYOFMONTH(), DAYOFYEAR()

- DAYOFWEEK(): 일자가 해당 주에서 몇 번째 날인지를 반환, 1부터 7 사이의 값을 반환 (일요일 = 1, 토요일 = 7)
- DAYOFMONTH(): 일자가 해당 월에서 몇 번째 날인지를 반환, 0부터 31 사이의 값을 반환
- DAYOFYEAR(): 일자가 해당 연도에서 몇 번째 날인지를 반환, 1부터 366 사이의 값을 반환

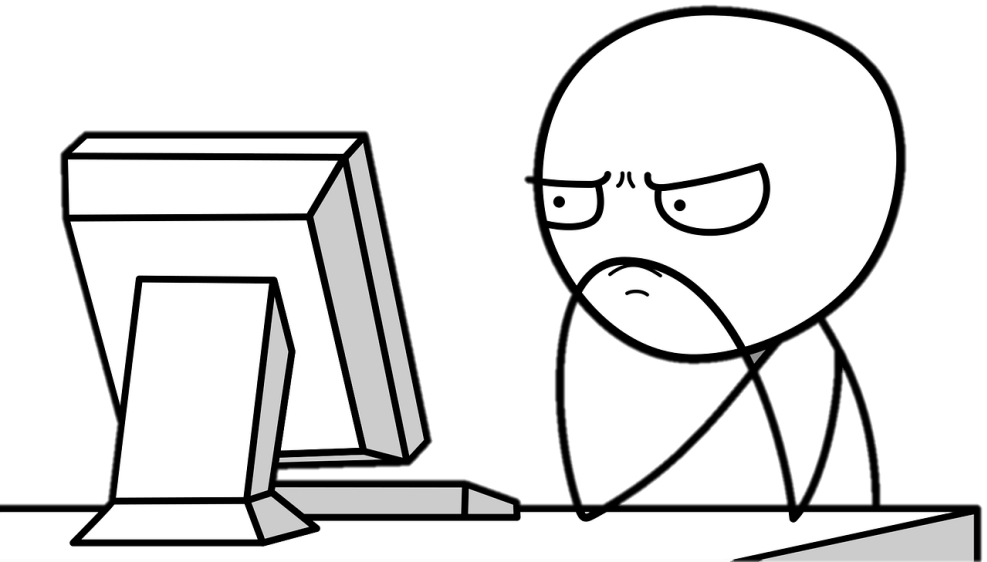


DATE_FORMAT()

- 전달받은 형식에 맞춰 날짜와 시간 정보를 문자열로 반환
- MySQL Date and Time Function: https://dev.mysql.com/doc/refman/8.0/en/date-and-time-functions.html

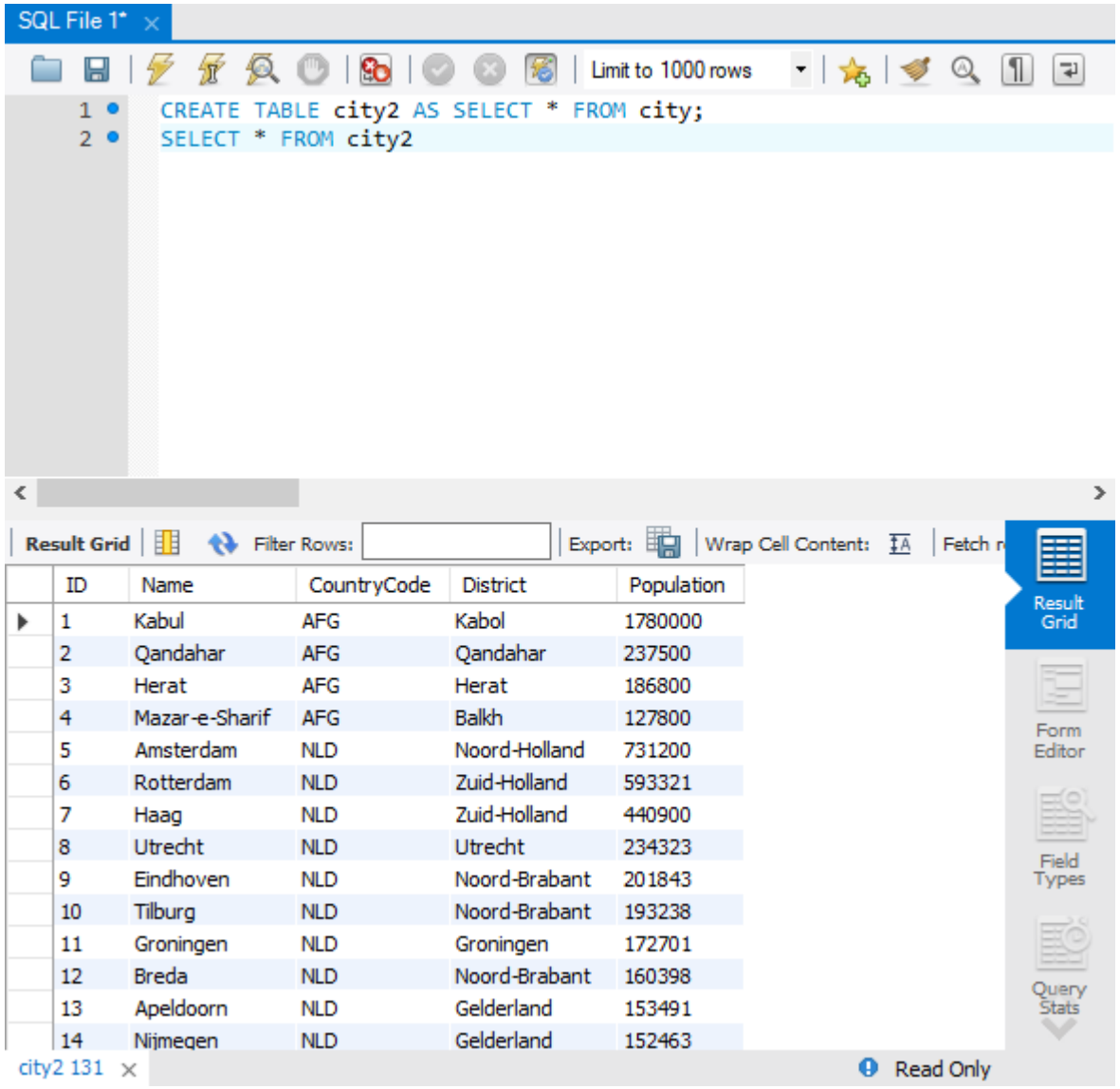


4. SQL 고급



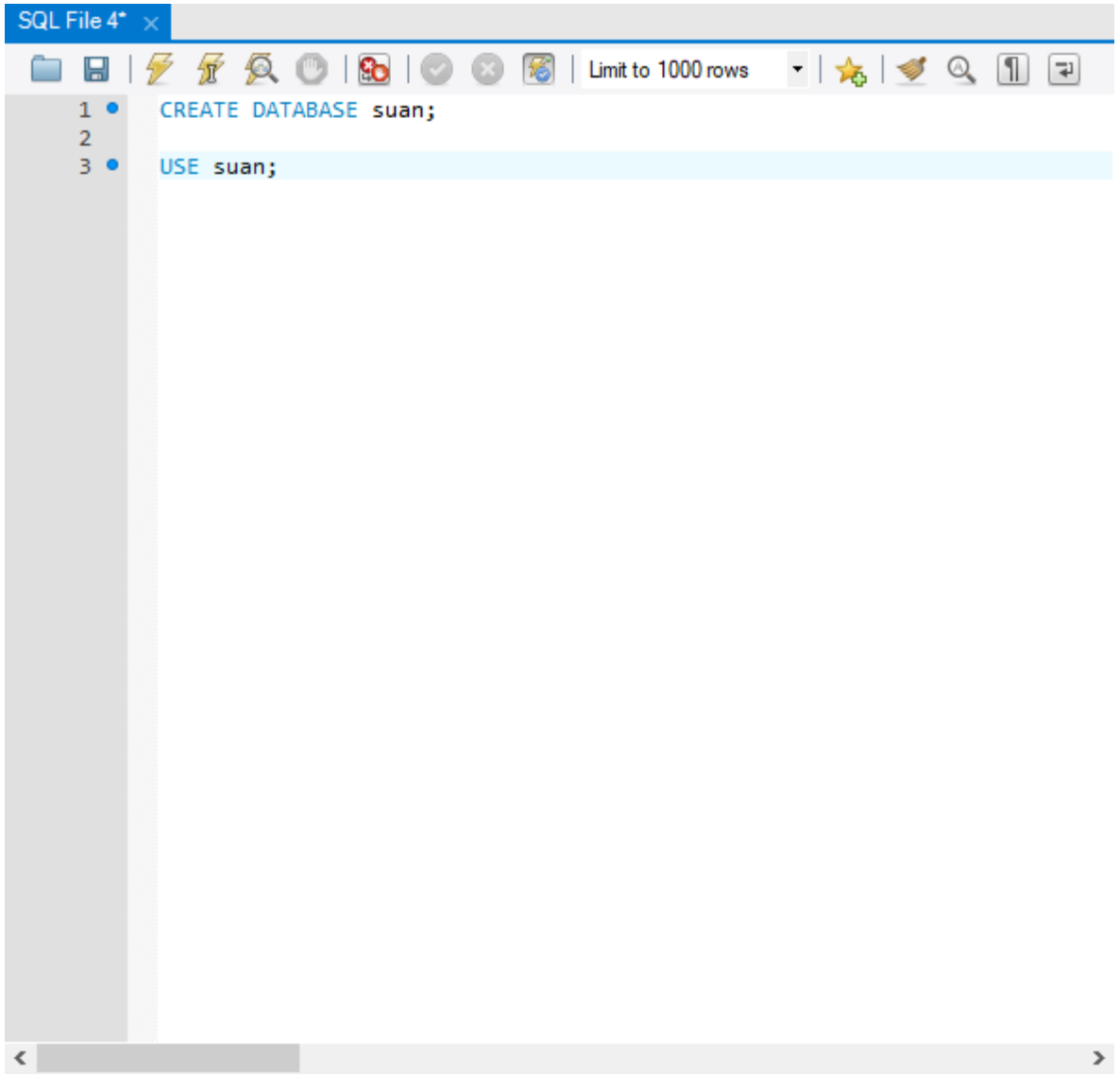
CREATE TABLE AS SELECT

- city 테이블과 똑같은 city2 테이블 생성



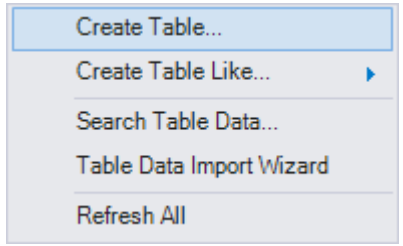
CREATE DATBASE

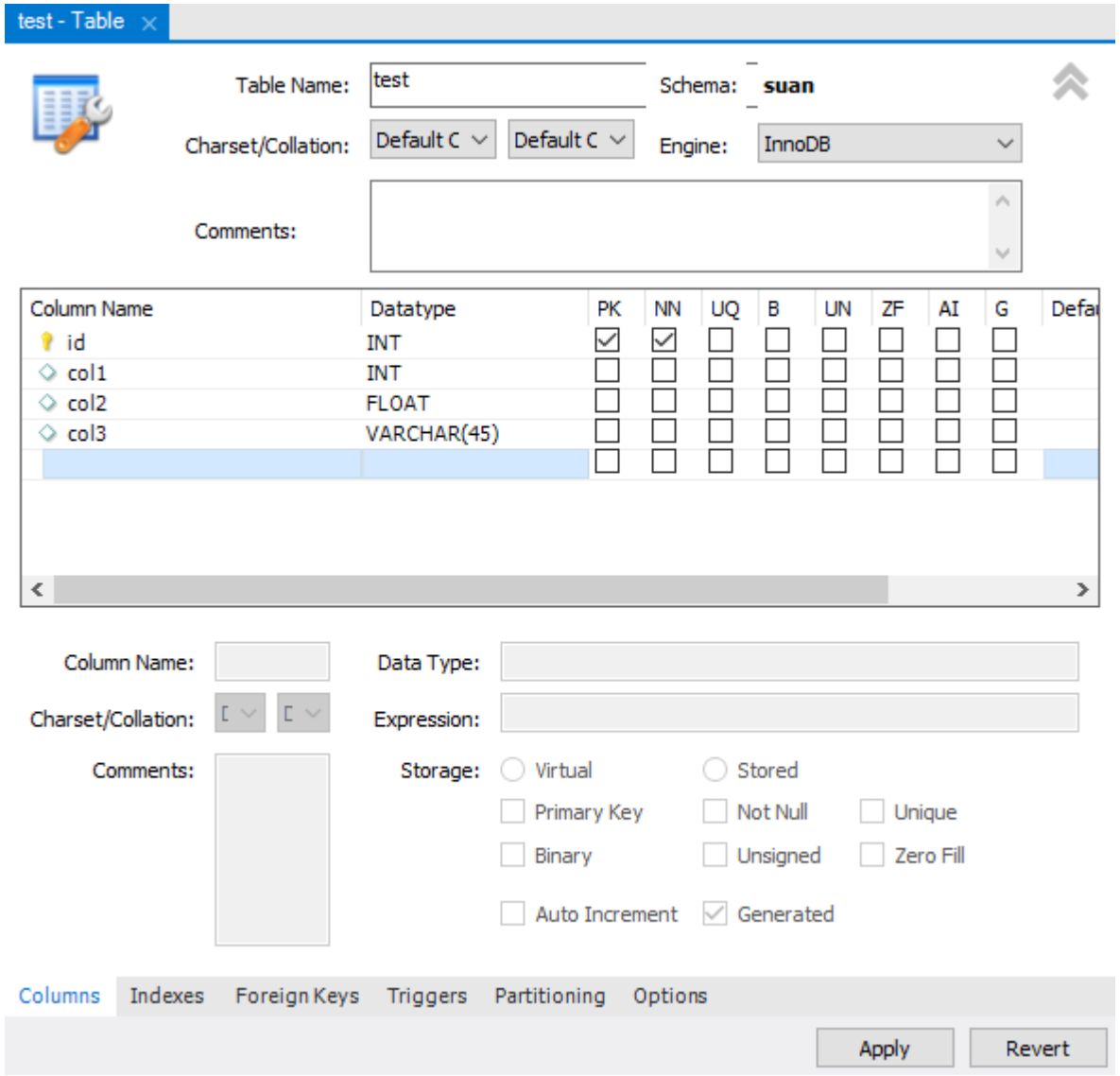
- CREATE DATABASE 문은 새로운 데이터베이스를 생성
- USE문으로 새 데이터베이스를 사용



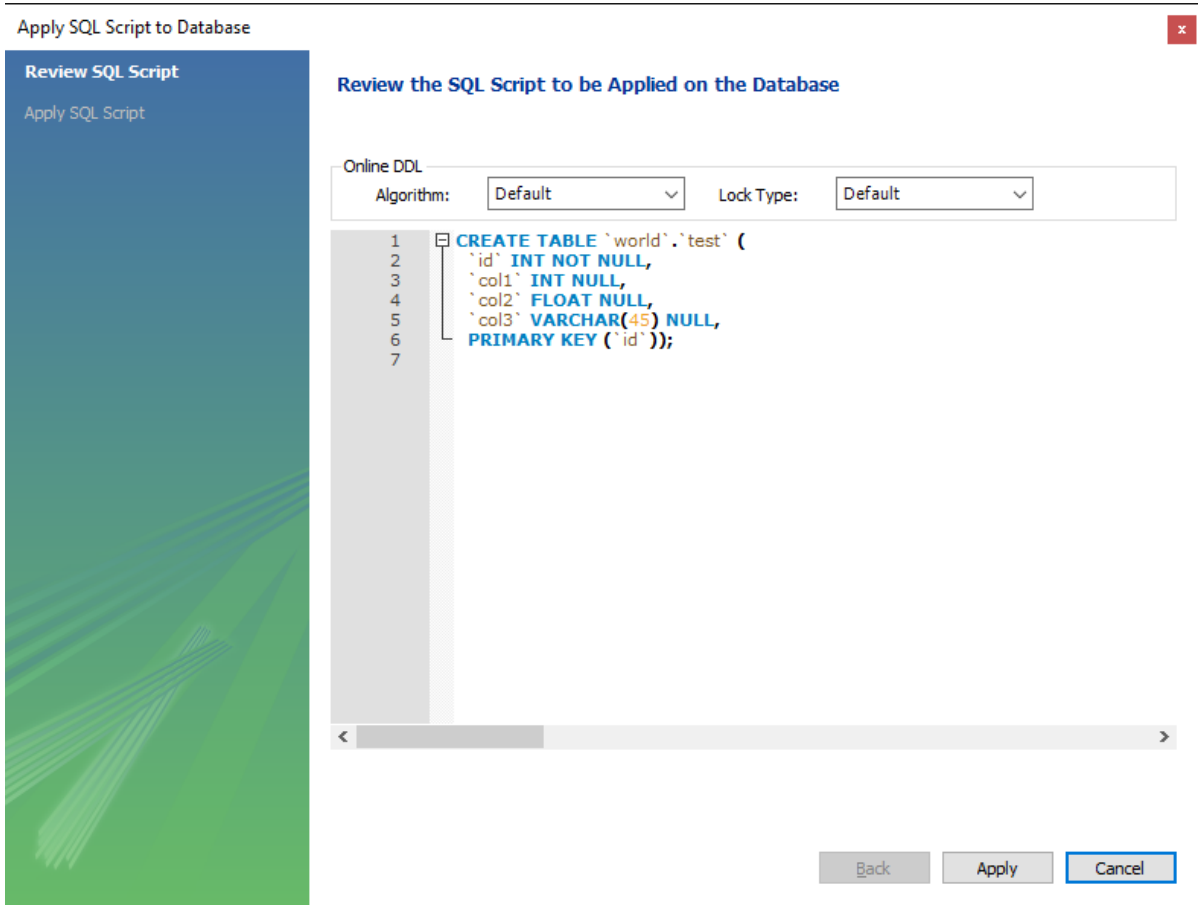
CREATE TABLE (MySQL Workbench)

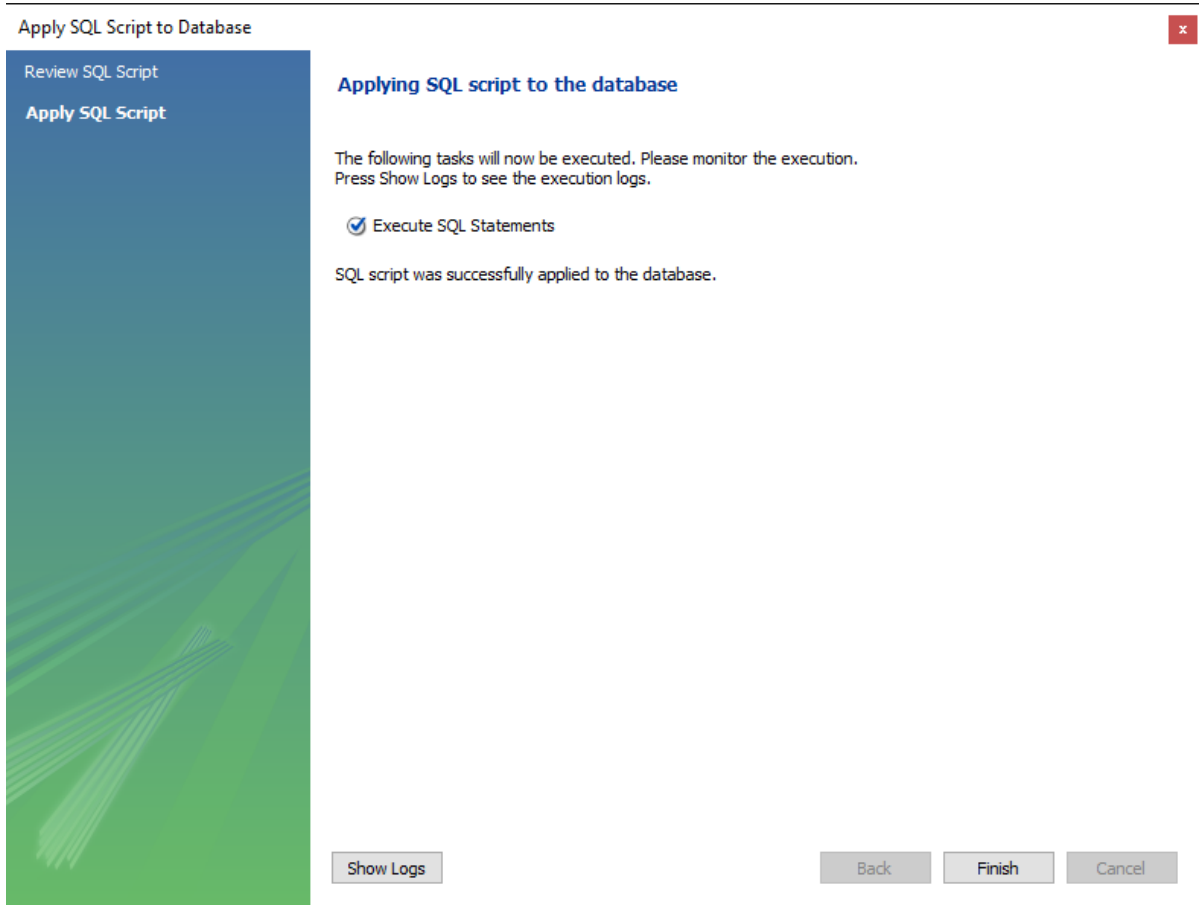
- 데이터 타입:
  https://dev.mysql.com/doc/refman/8.0/en/data-types.html





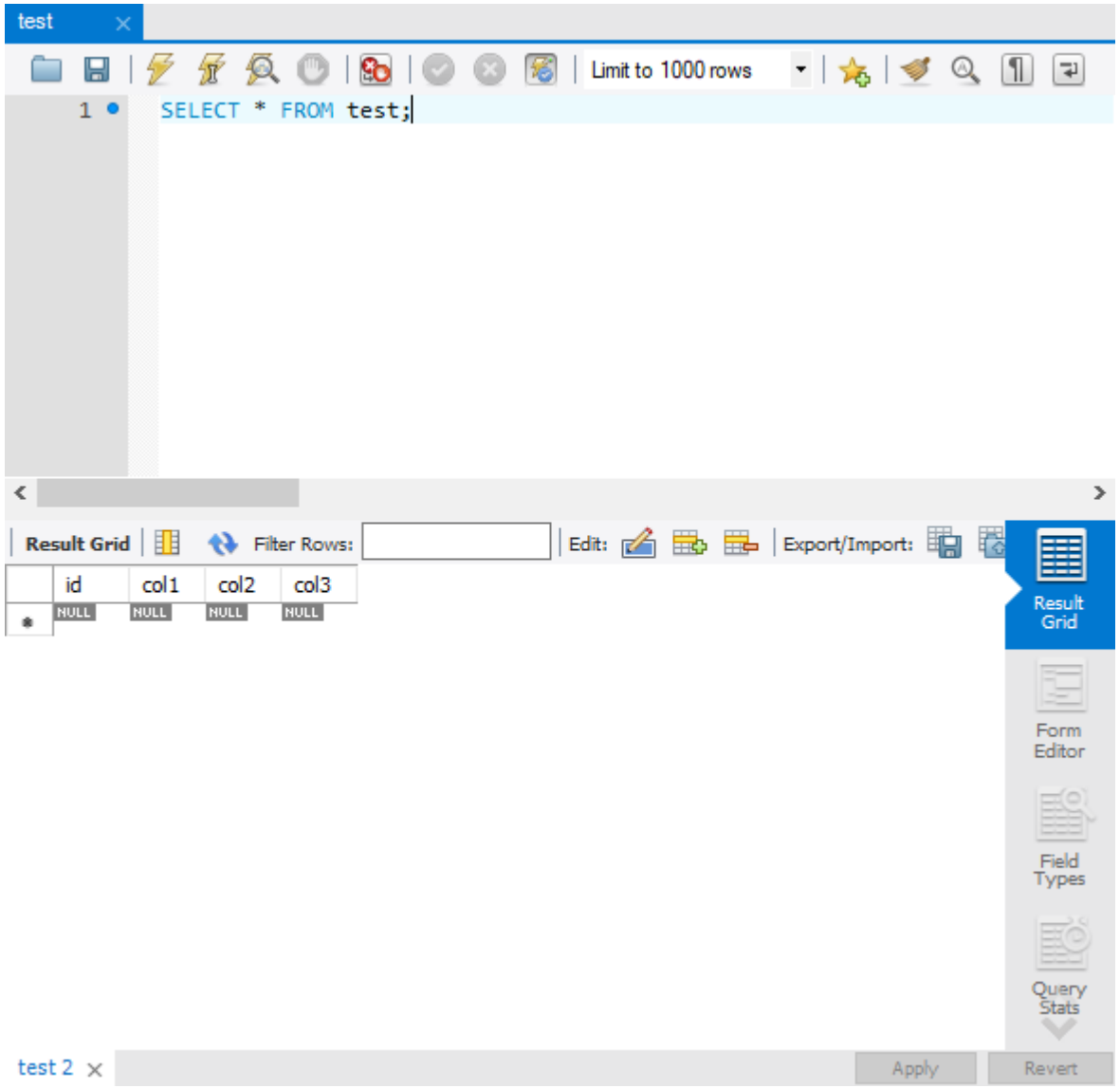
CREATE TABLE (MySQL Workbench)





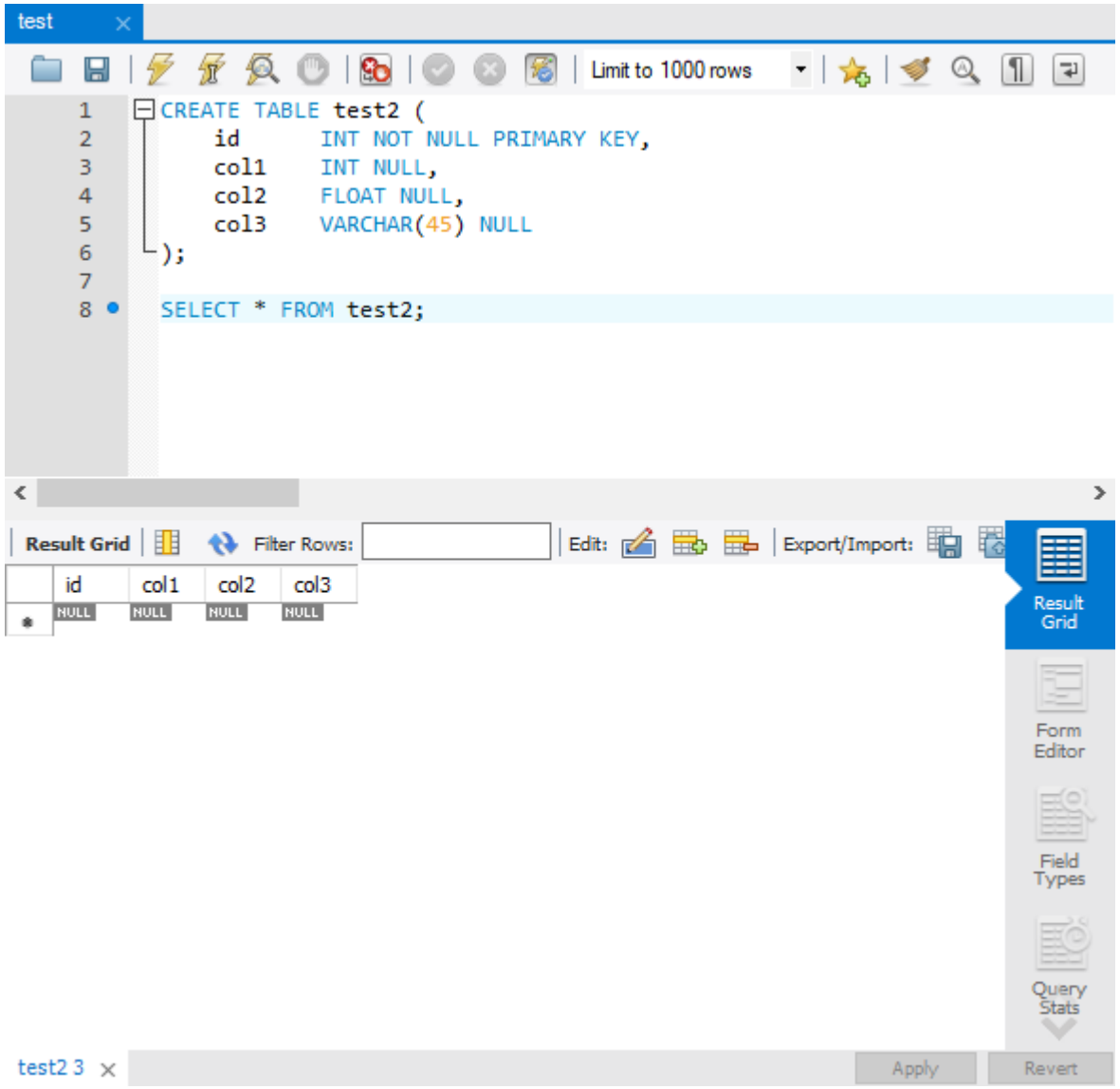
CREATE TABLE (MySQL Workbench)

- test 테이블 생성 완료



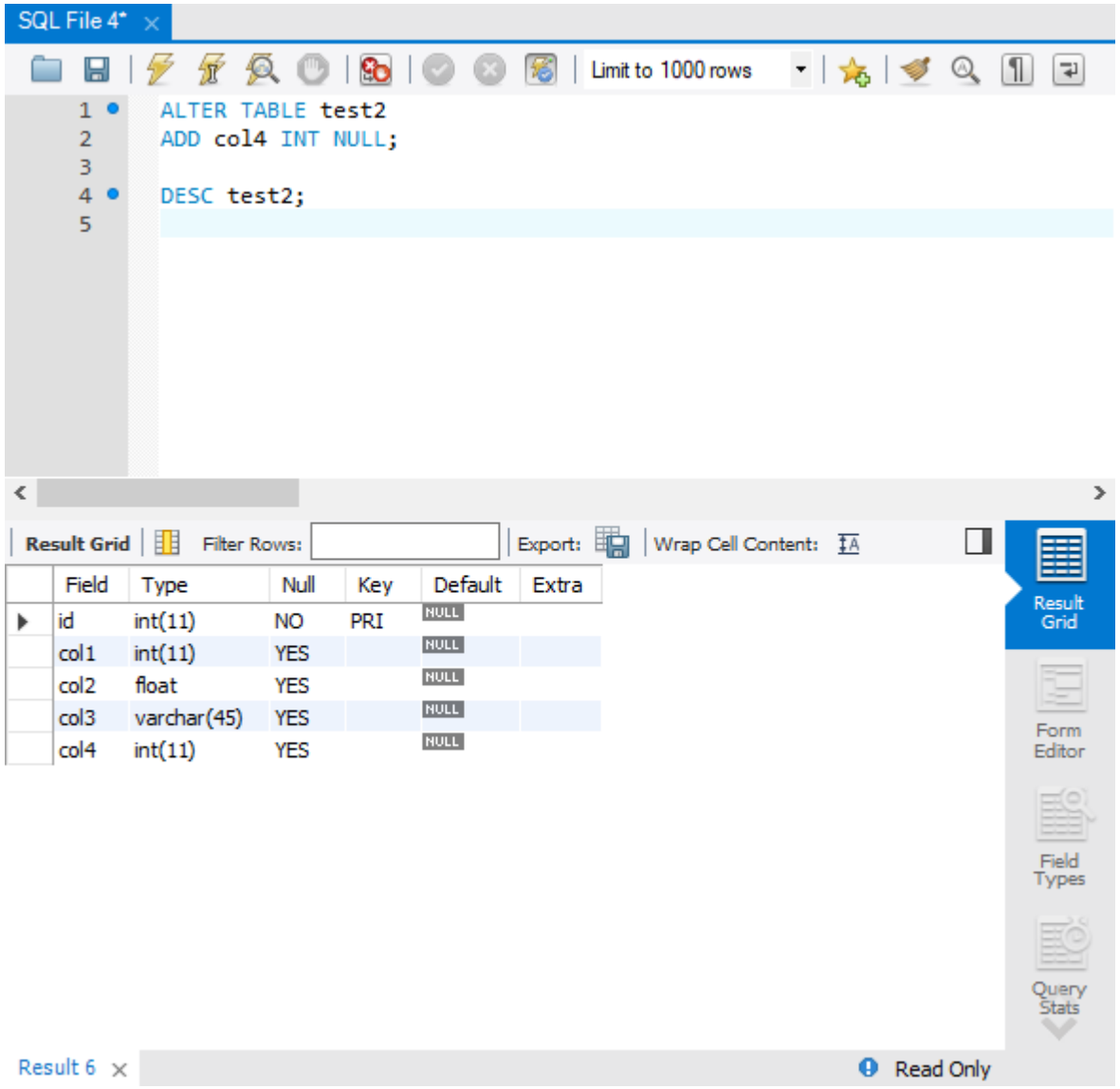
CREATE TABLE

- test2 테이블 생성 완료



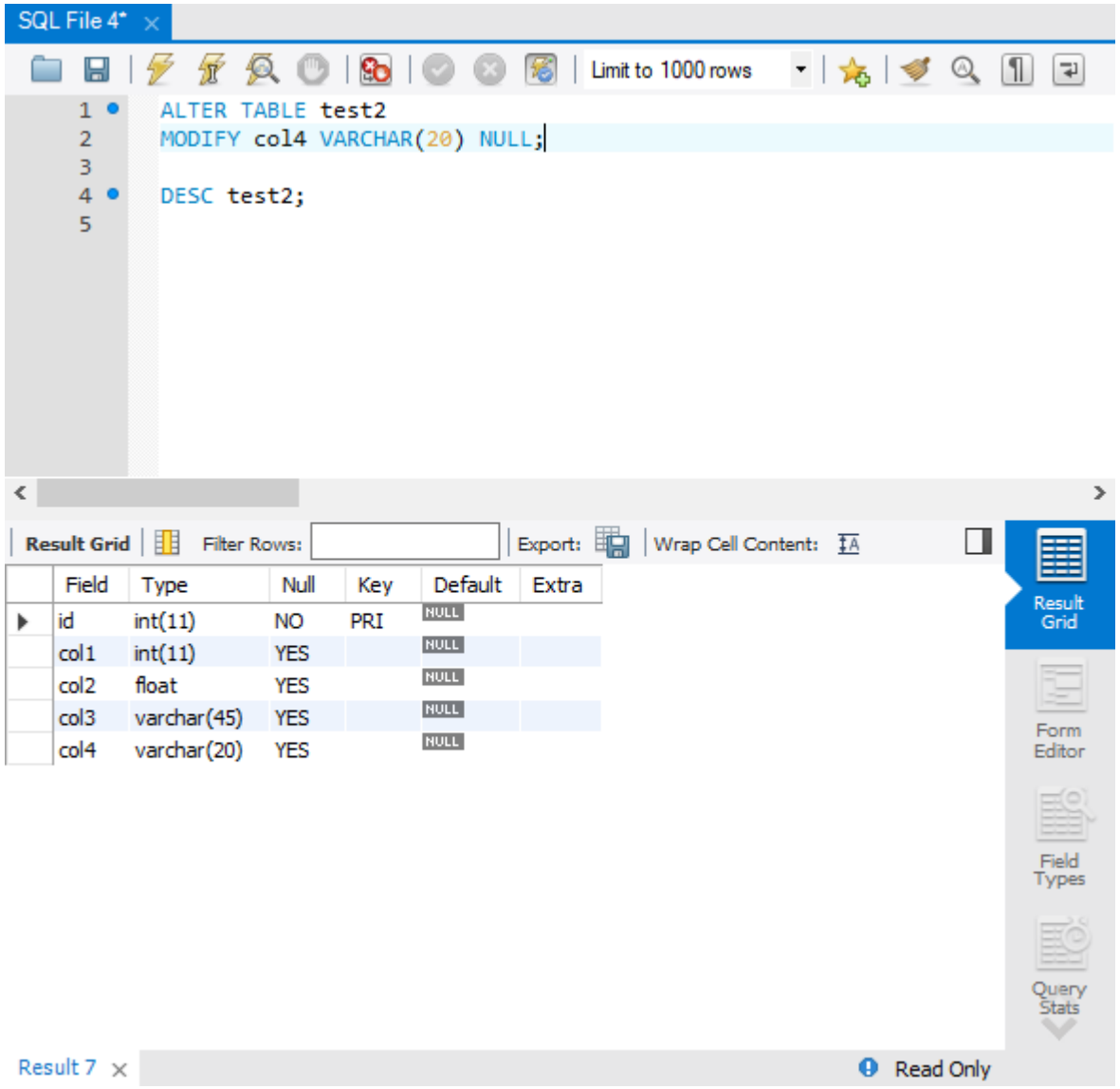
ALTER TABLE

- ALTER TABLE 문과 함께 ADD 문을 사용하면, 테이블에 컬럼을 추가할 수 있음



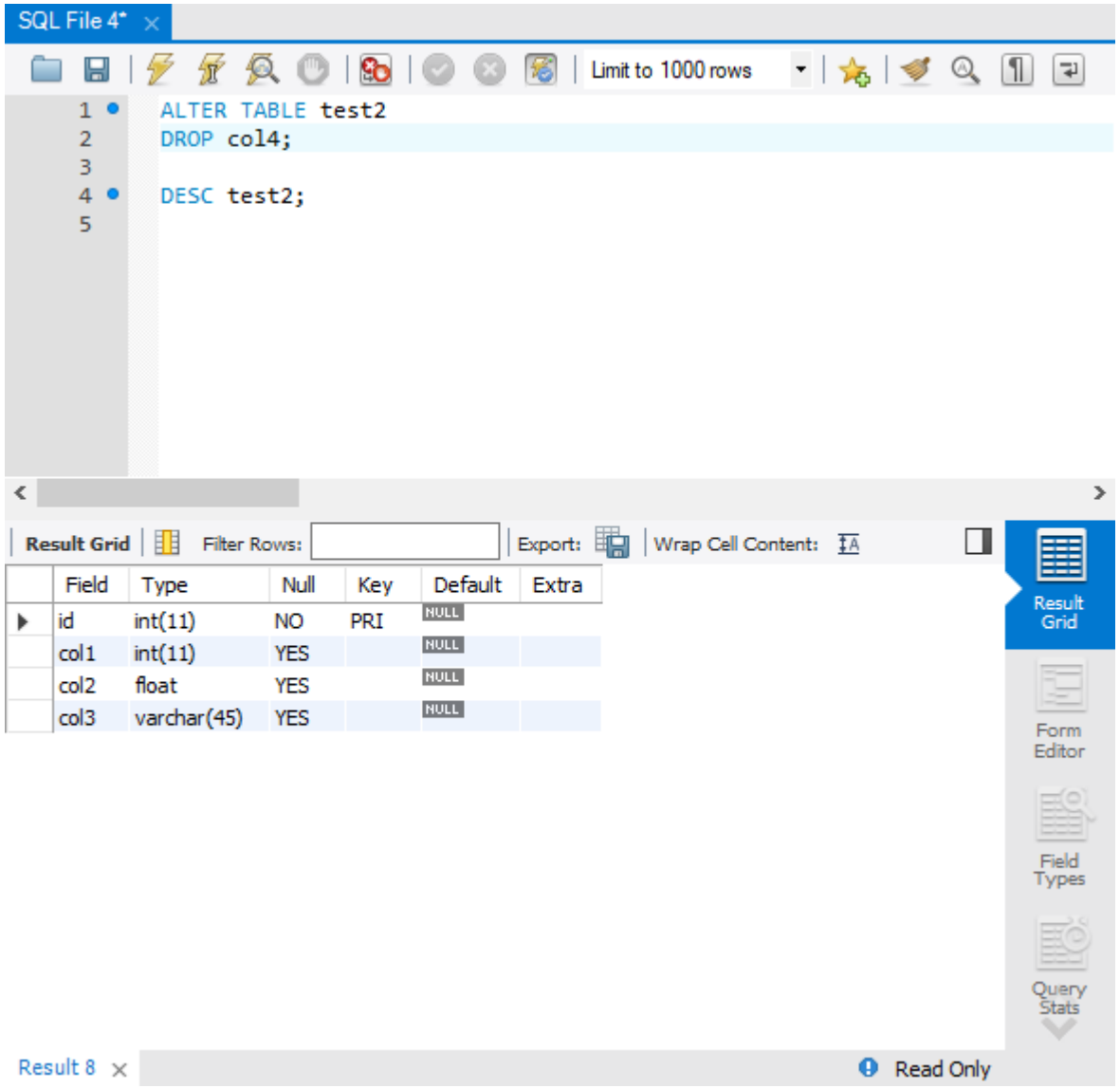
ALTER TABLE

- ALTER TABLE 문과 함께 MODIFY 문을 사용하면, 테이블의 컬럼 타입을 변경할 수 있음



ALTER TABLE

- ALTER TABLE 문과 함께 DROP 문을 사용하면, 테이블에 컬럼을 제거할 수 있음

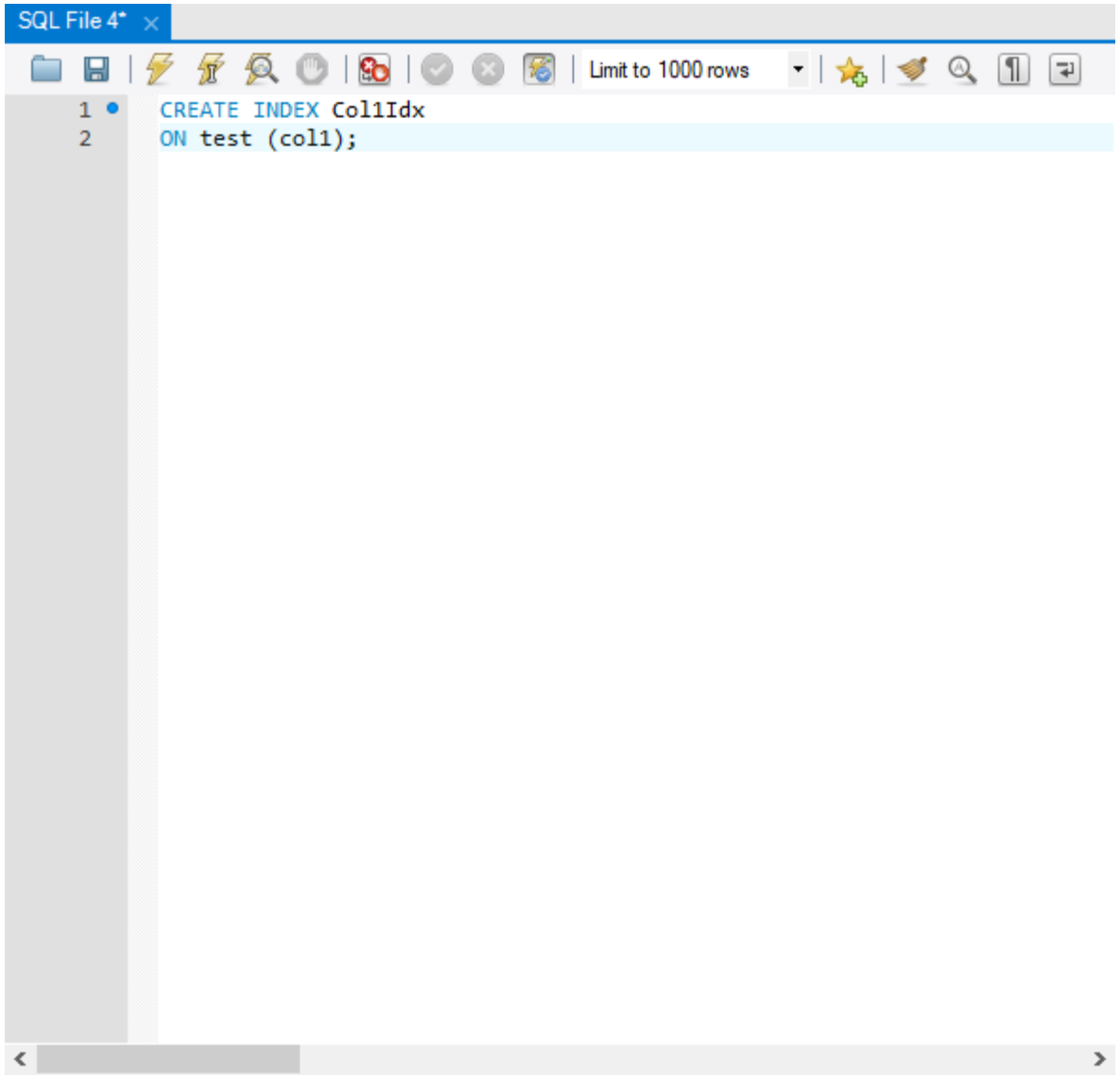


인덱스Index

- 테이블에서 원하는 데이터를 빠르게 찾기 위해 사용
- 일반적으로 데이터를 검색할 때 순서대로 테이블 전체를 검색하므로 데이터가 많으면 많을수록 탐색하는 시간이 늘어남
- 검색과 질의를 할 때 테이블 전체를 읽지 않기 때문에 빠름
- 설정된 컬럼 값을 포함한 데이터의 삽입, 삭제, 수정 작업이 원본 테이블에서 이루어질 경우, 인덱스도 함께 수정되어야 함
- 인덱스가 있는 테이블은 처리 속도가 느려질 수 있으므로 수정보다는 검색이 자주 사용되는 테이블에서 사용하는 것이 좋음

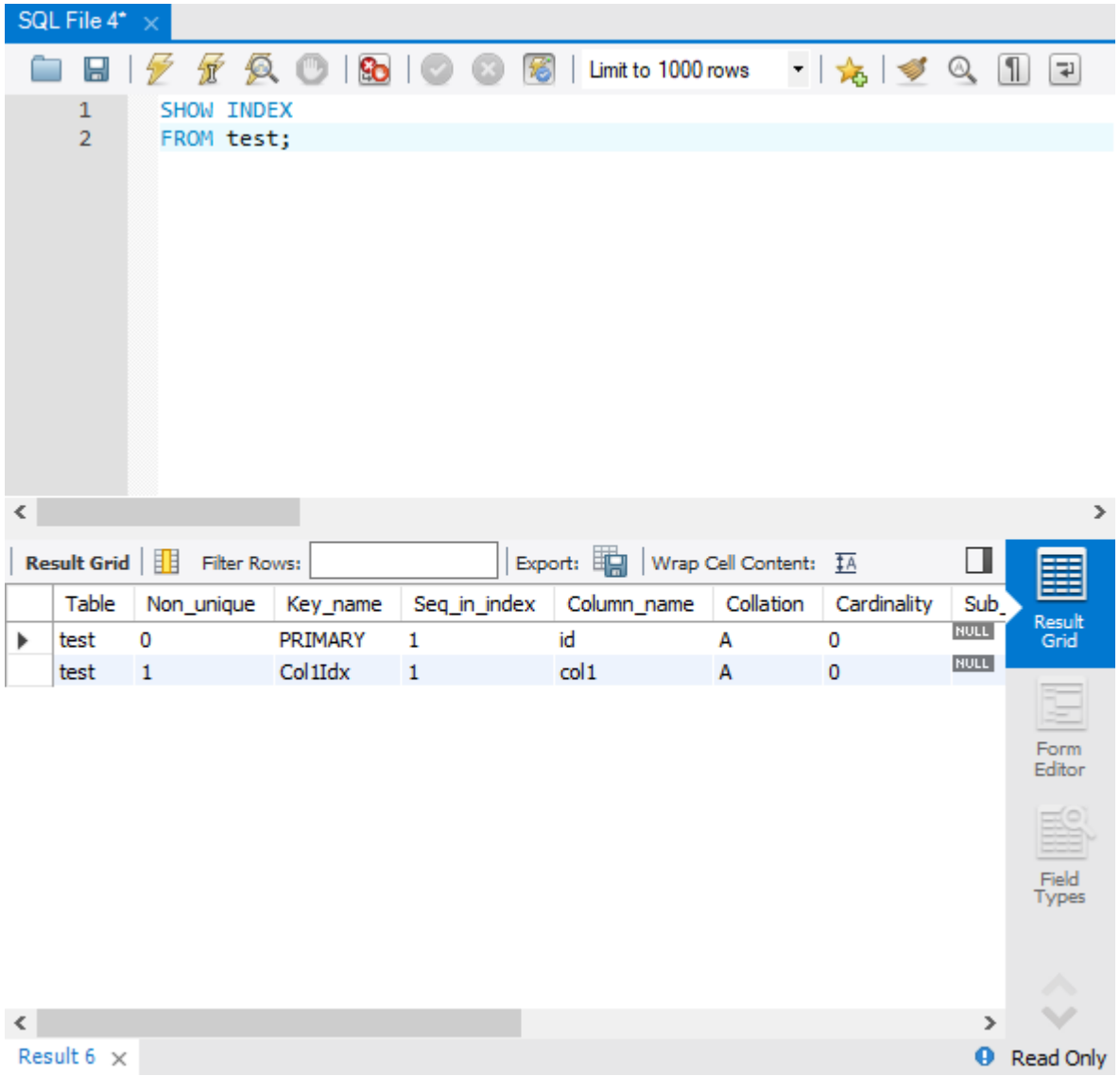
CREATE INDEX

- CREATE INDEX 문을 사용하여 인덱스를 생성



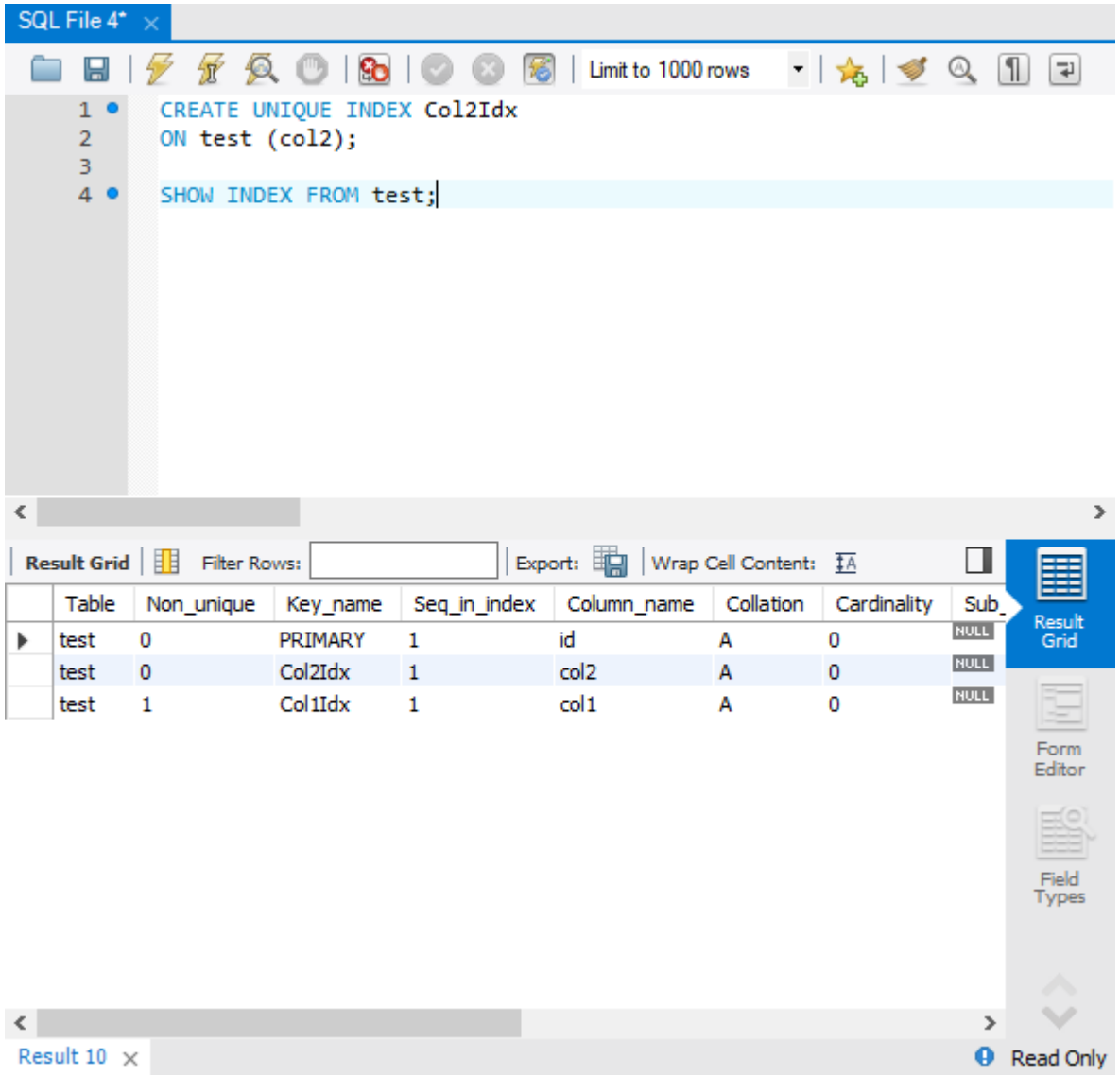
SHOW INDEX

- 인덱스 정보 보기



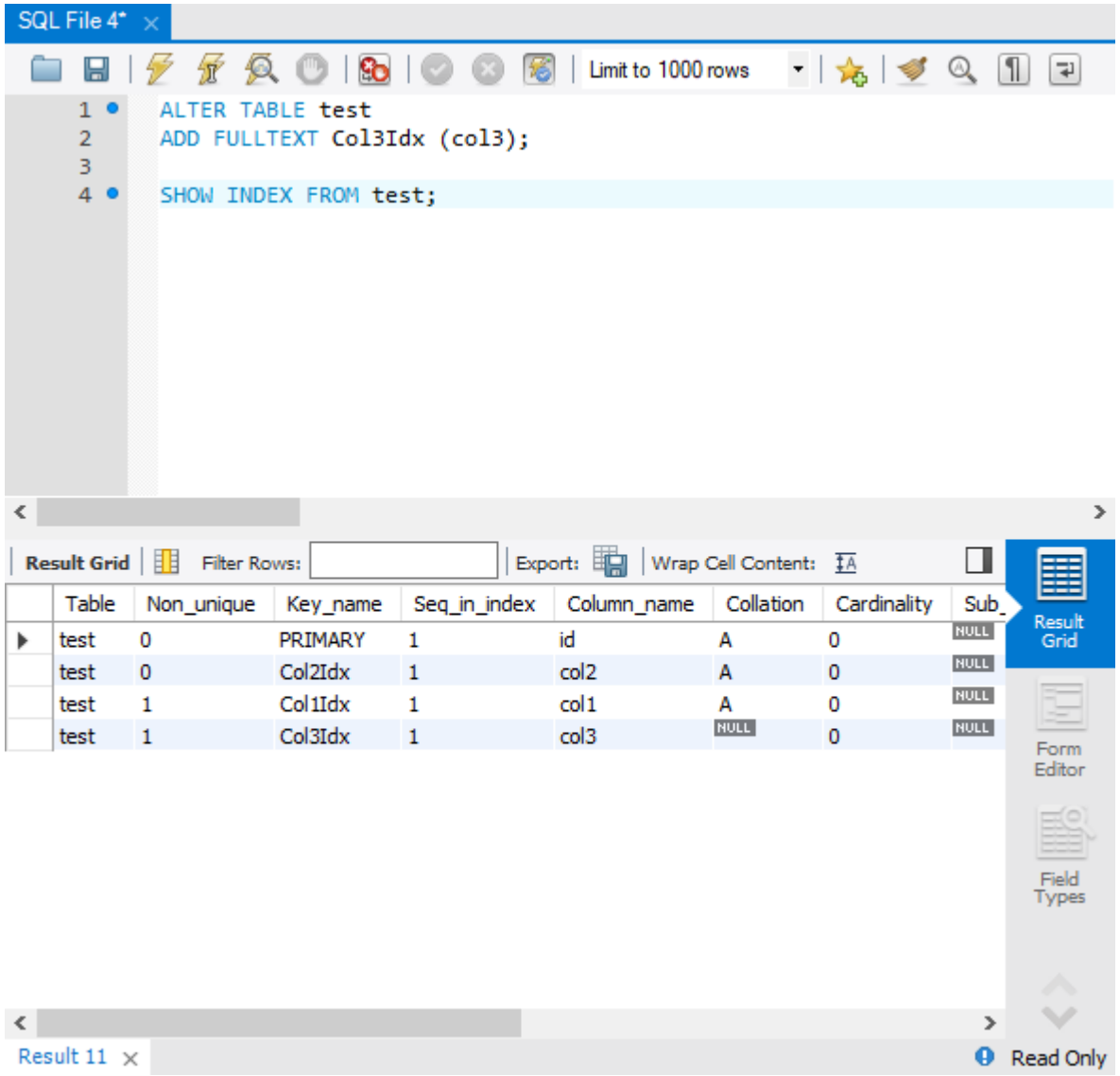
CREATE UNIQUE INDEX

- 중복 값을 허용하지 않는 인덱스



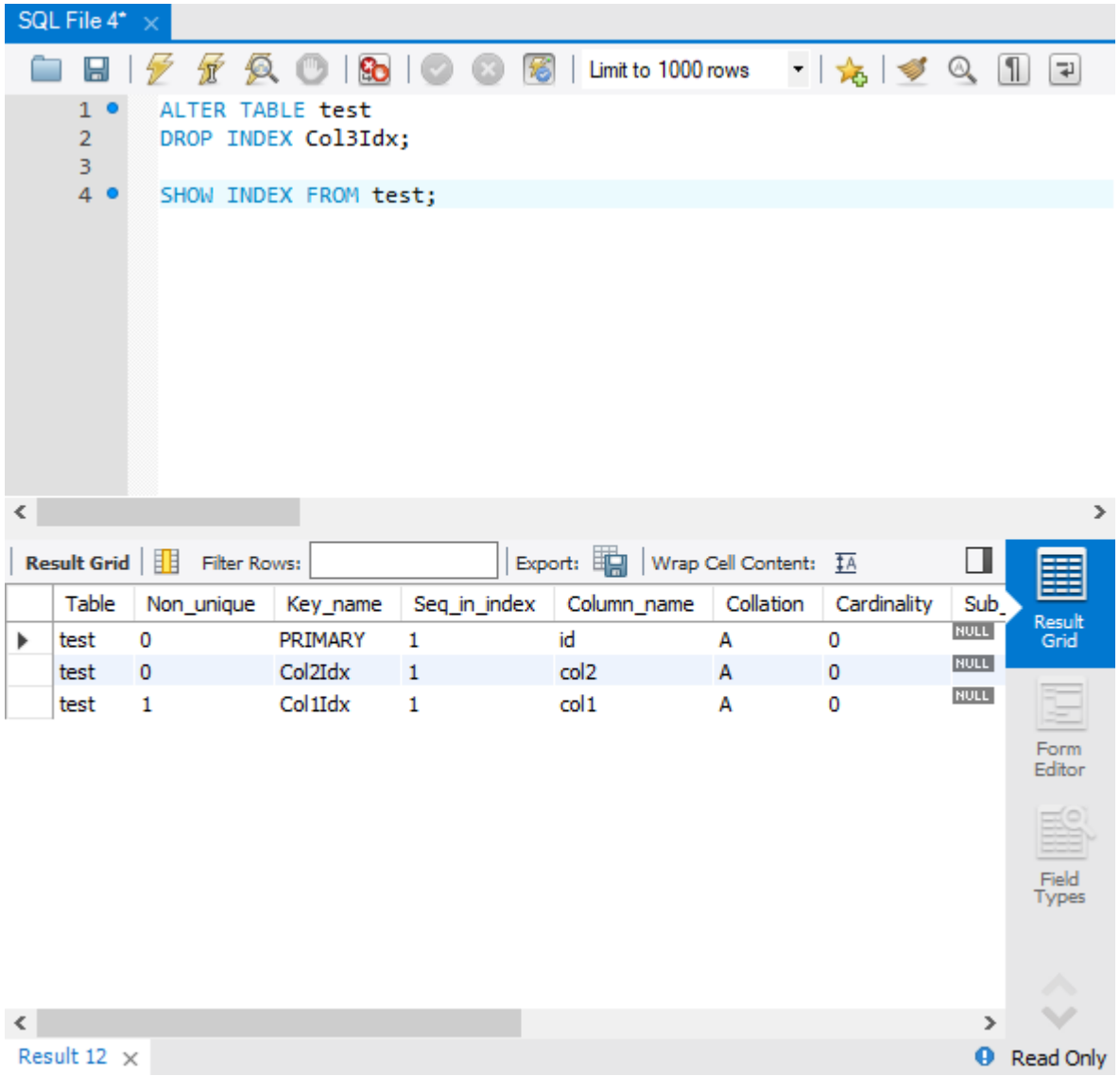
FULLTEXT INDEX

- FULLTEXT INDEX는 일반적인 인덱스와는 달리 매우 빠르게 테이블의 모든 텍스트 컬럼을 검색



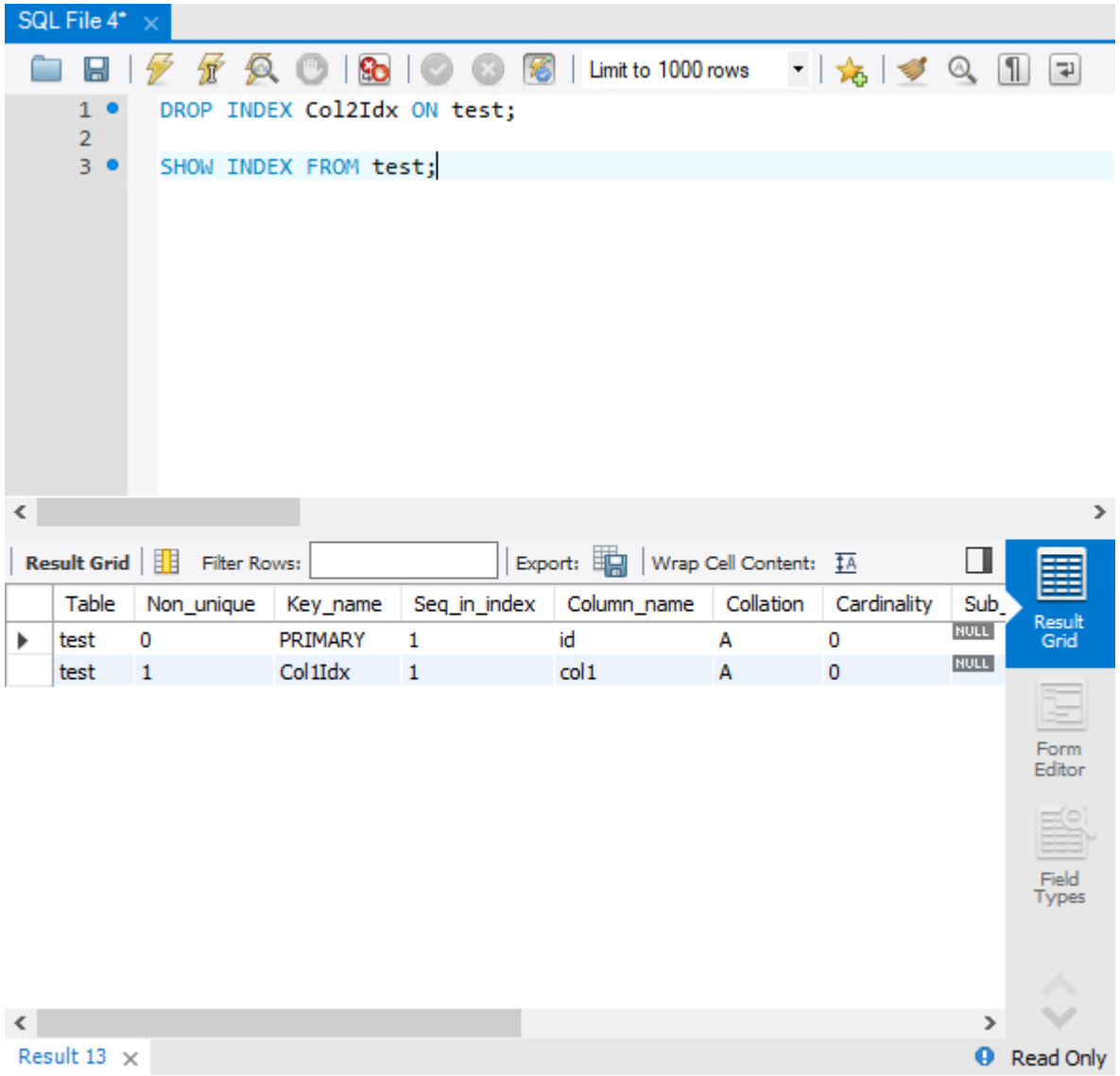
INDEX 삭제 (ALTER)

- ALTER 문을 사용하여 테이블에 추가된 인덱스 삭제



INDEX 삭제 (DROP INDEX)

- DROP 문을 사용하여 해당 테이블에서 명시된 인덱스를 삭제
- DROP 문은 내부적으로 ALTER 문으로 자동 변환되어 명시된 이름의 인덱스를 삭제



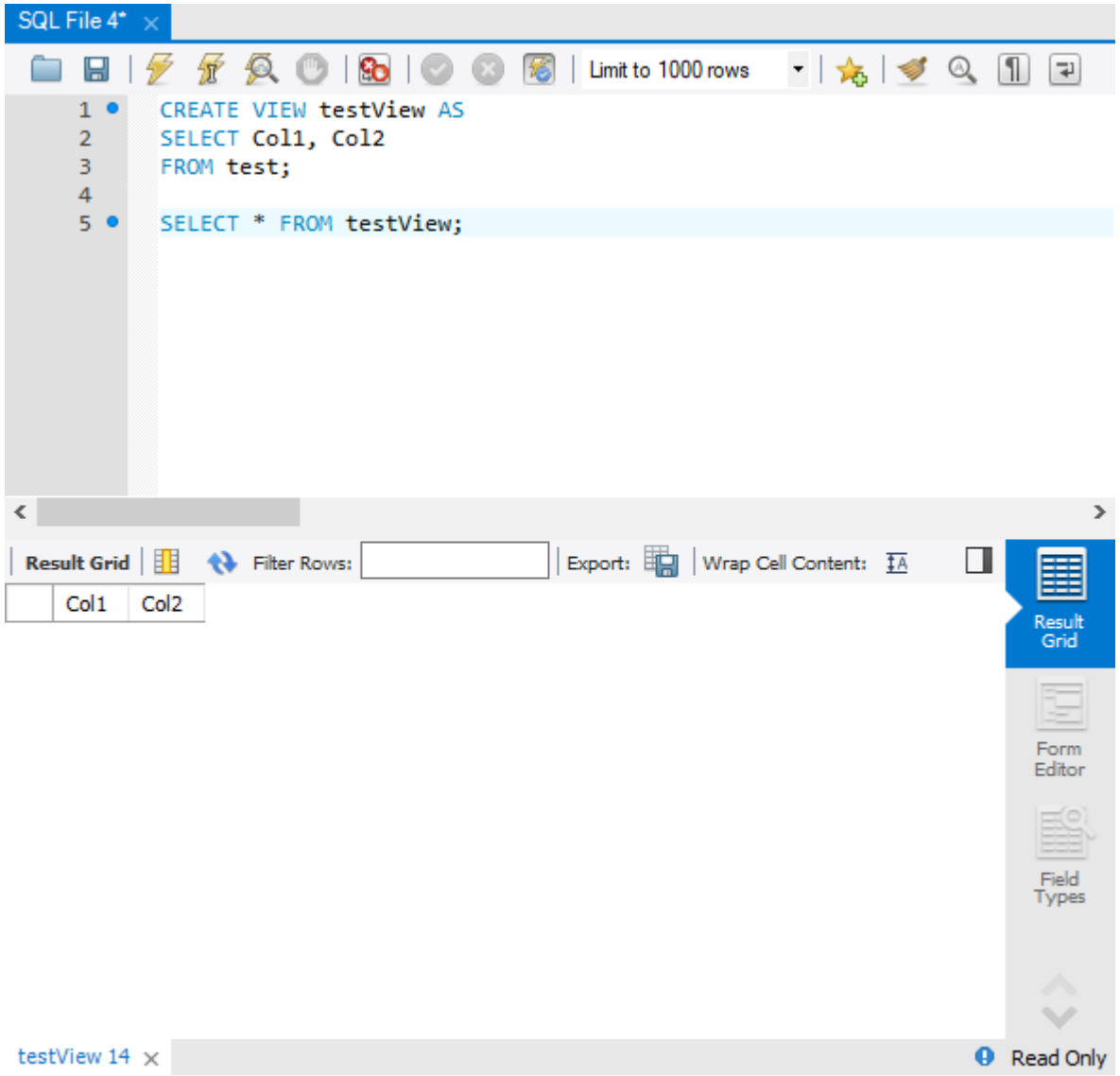
VIEW

- 뷰view는 데이터베이스에 존재하는 일종의 가상 테이블
- 실제 테이블처럼 행과 열을 가지고 있지만, 실제로 데이터를 저장하진 않음
- MySQL에서 뷰는 다른 테이블이나 다른 뷰에 저장되어 있는 데이터를 보여주는 역할만 수행
- 뷰를 사용하면 여러 테이블이나 뷰를 하나의 테이블처럼 볼 수 있음

- 뷰의 장점
  - 특정 사용자에게 테이블 전체가 아닌 필요한 컬럼만 보여줄 수 있음
  - 복잡한 쿼리를 단순화해서 사용
  - 쿼리 재사용 가능
- 뷰의 단점
  - 한 번 정의된 뷰는 변경할 수 없음
  - 삽입, 삭제, 갱신 작업에 많은 제한 사항을 가짐
  - 자신만의 인덱스를 가질 수 없음

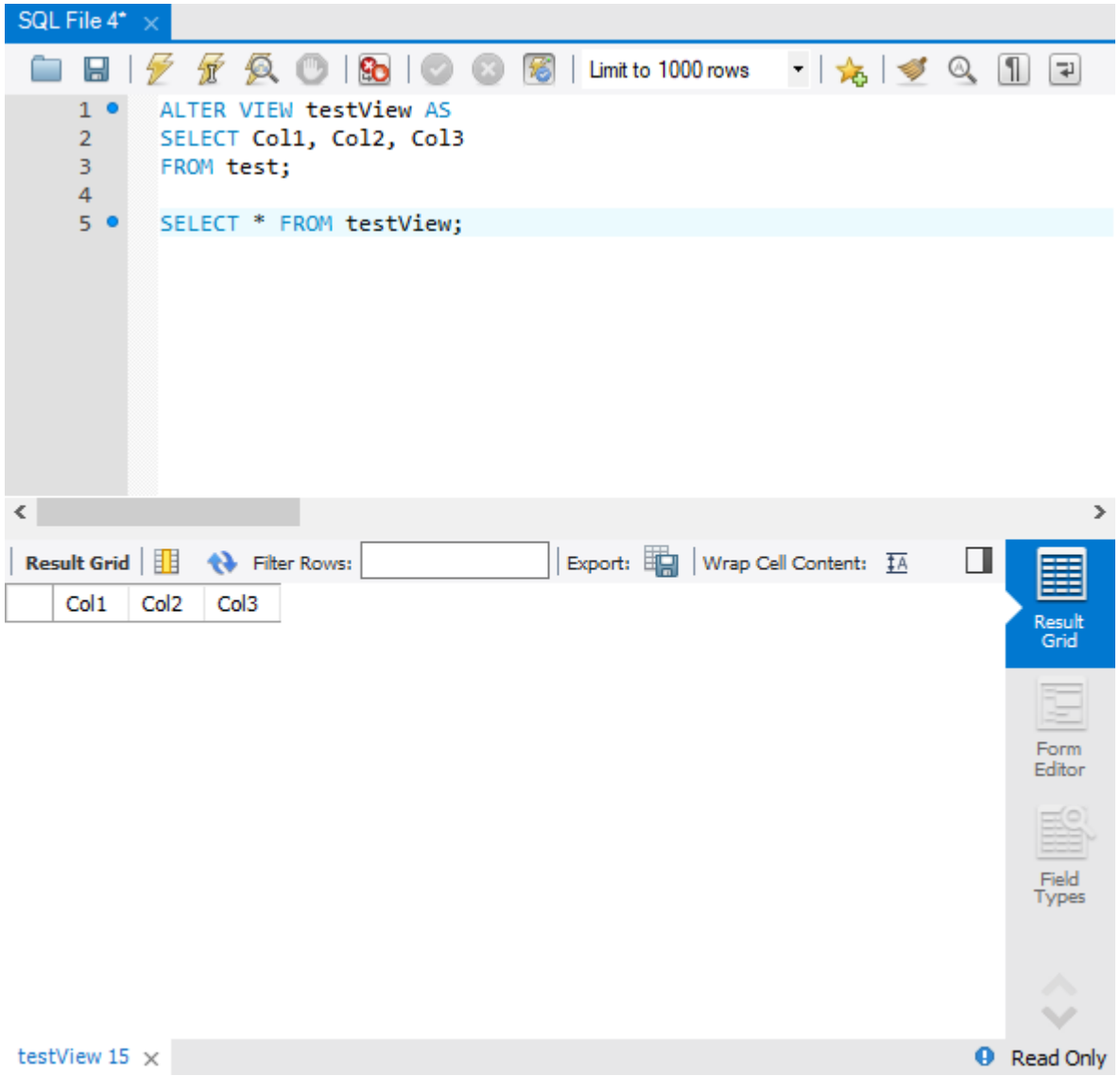
CREATE VIEW

- CREATE VIEW 문을 사용하여 뷰 생성



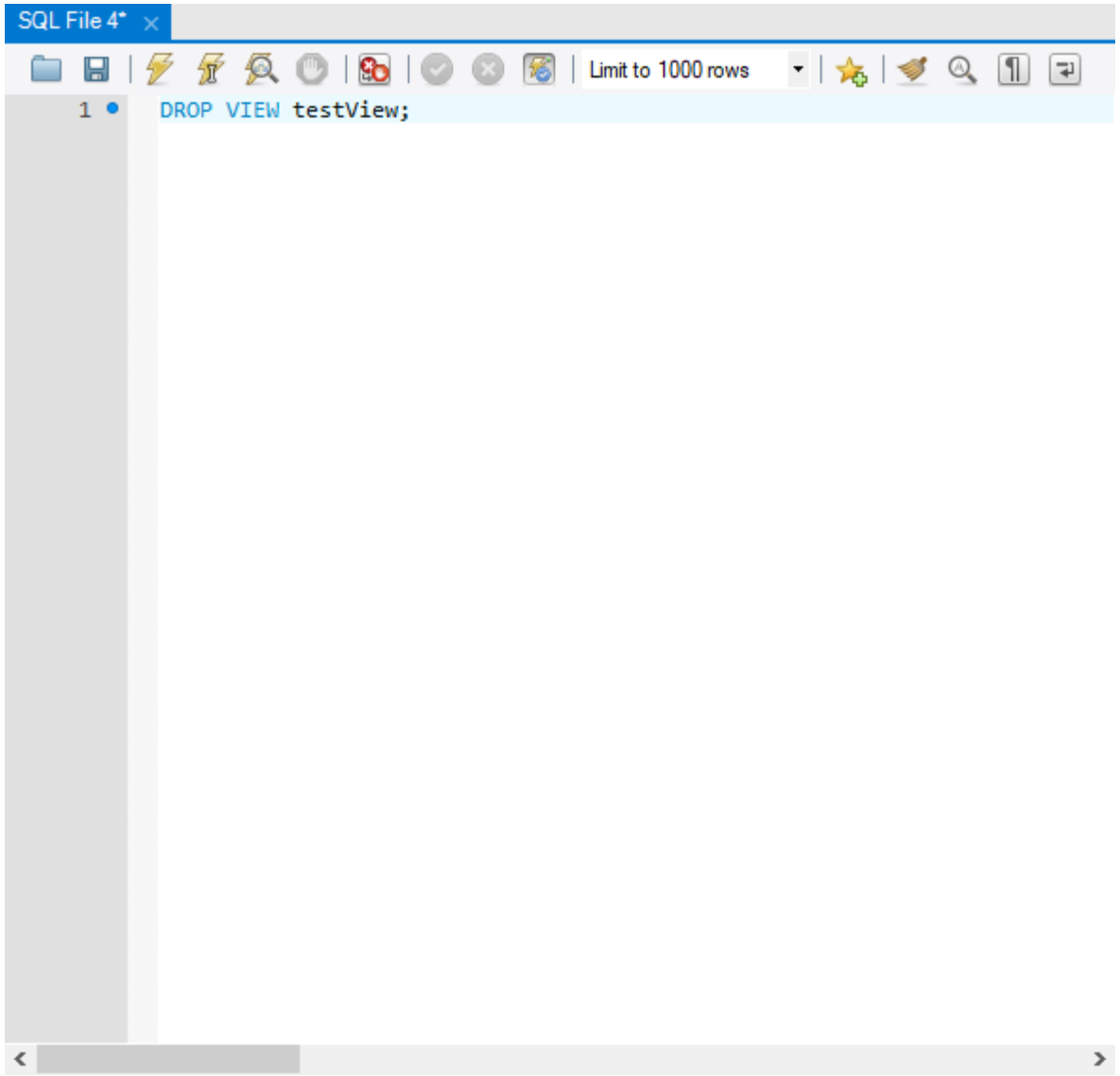
ALTER VIEW

- ALTER 문을 사용하여 뷰를 수정



DROP VIEW

- DROP 문을 사용하여 생성된 뷰를 삭제

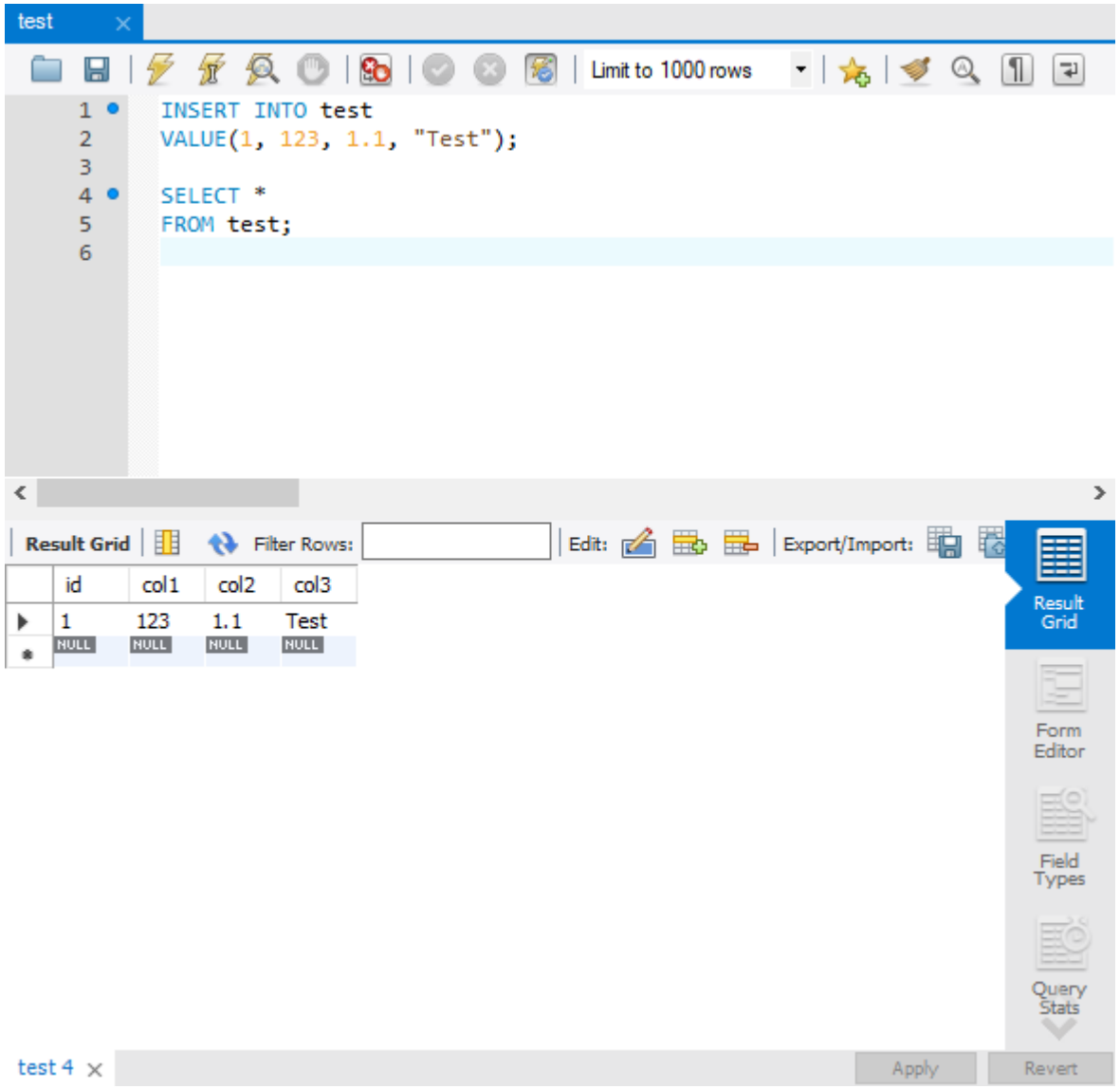


LAB #07

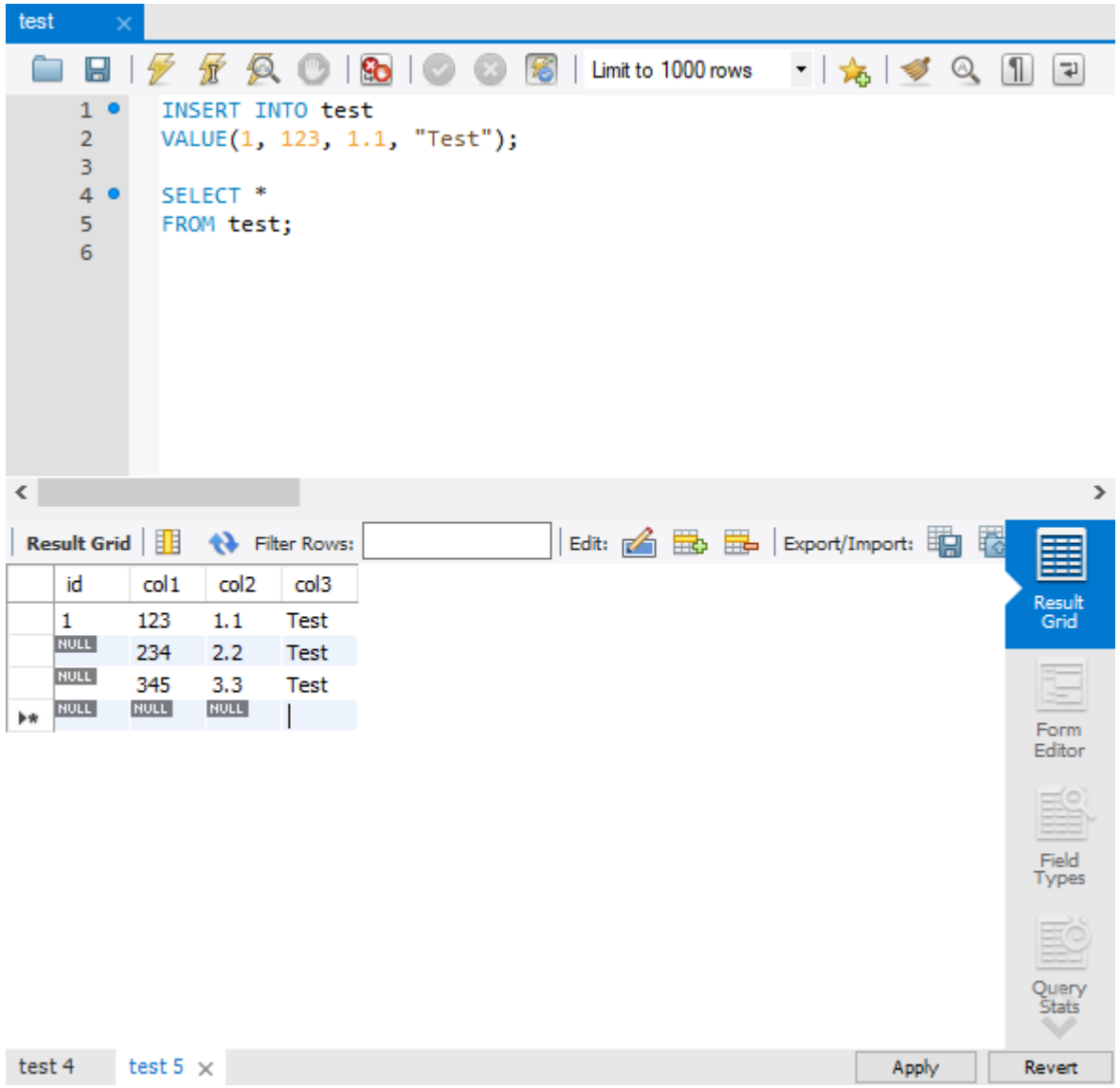
city, country, countrylanguage 테이블을 JOIN하고,
한국에 대한 정보만 뷰 생성하기

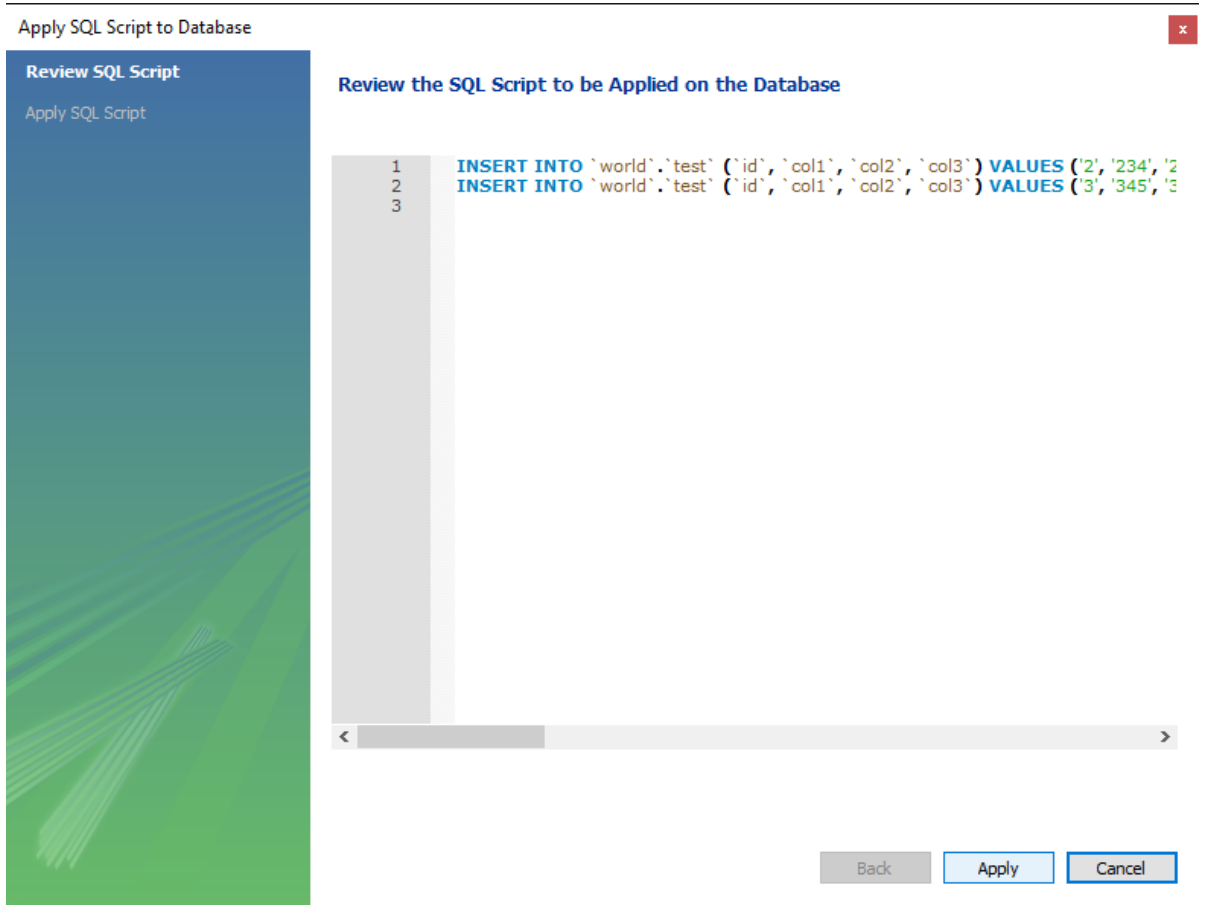
INSERT

- 테이블 이름 다음에 나오는 열 생략 가능
- 생략할 경우에 VALUE 다음에 나오는 값들의 순서 및 개수가 테이블이 정의된 열 순서 및 개수와 동일해야 함



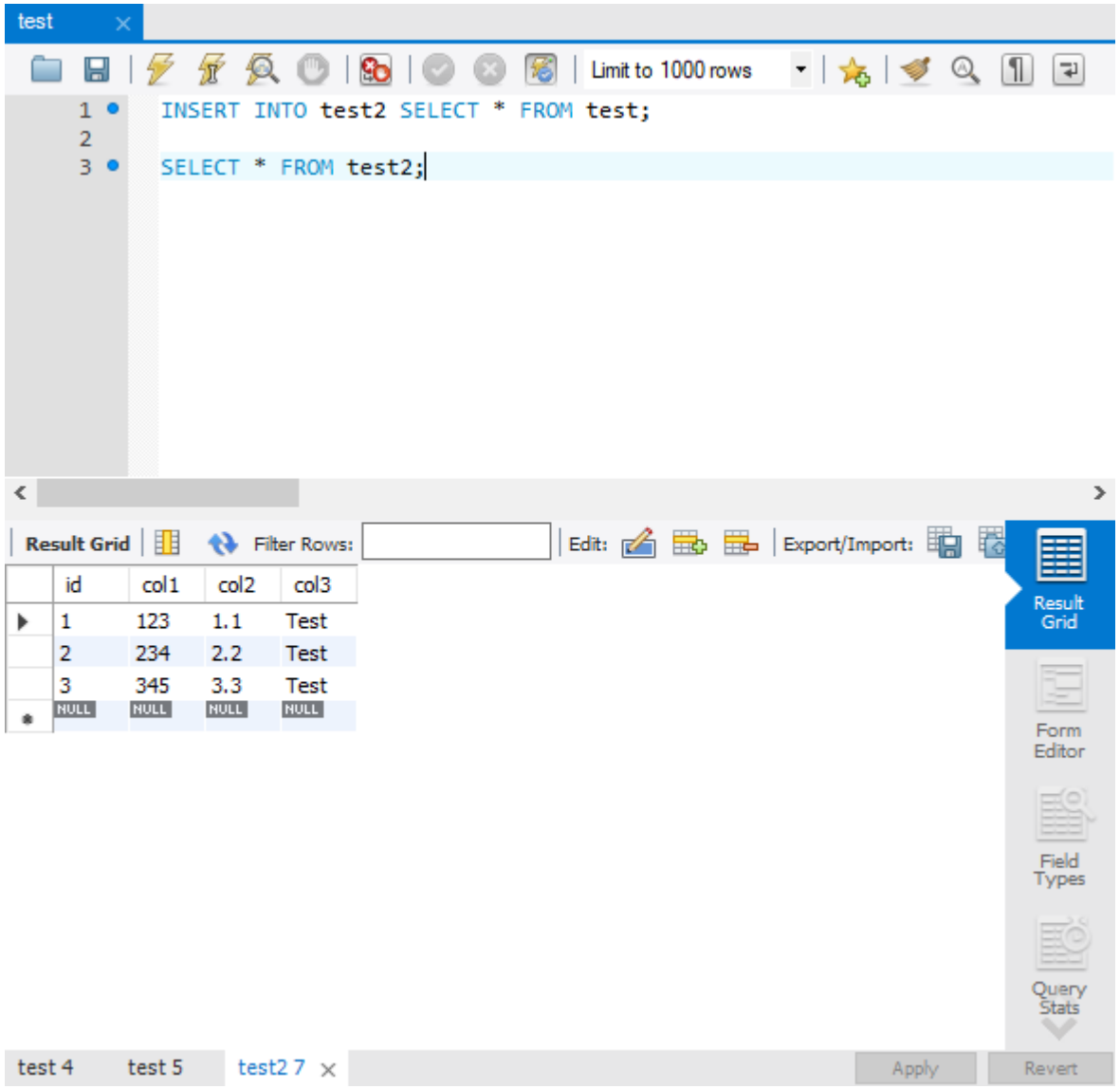
INSERT (MySQL Workbench)





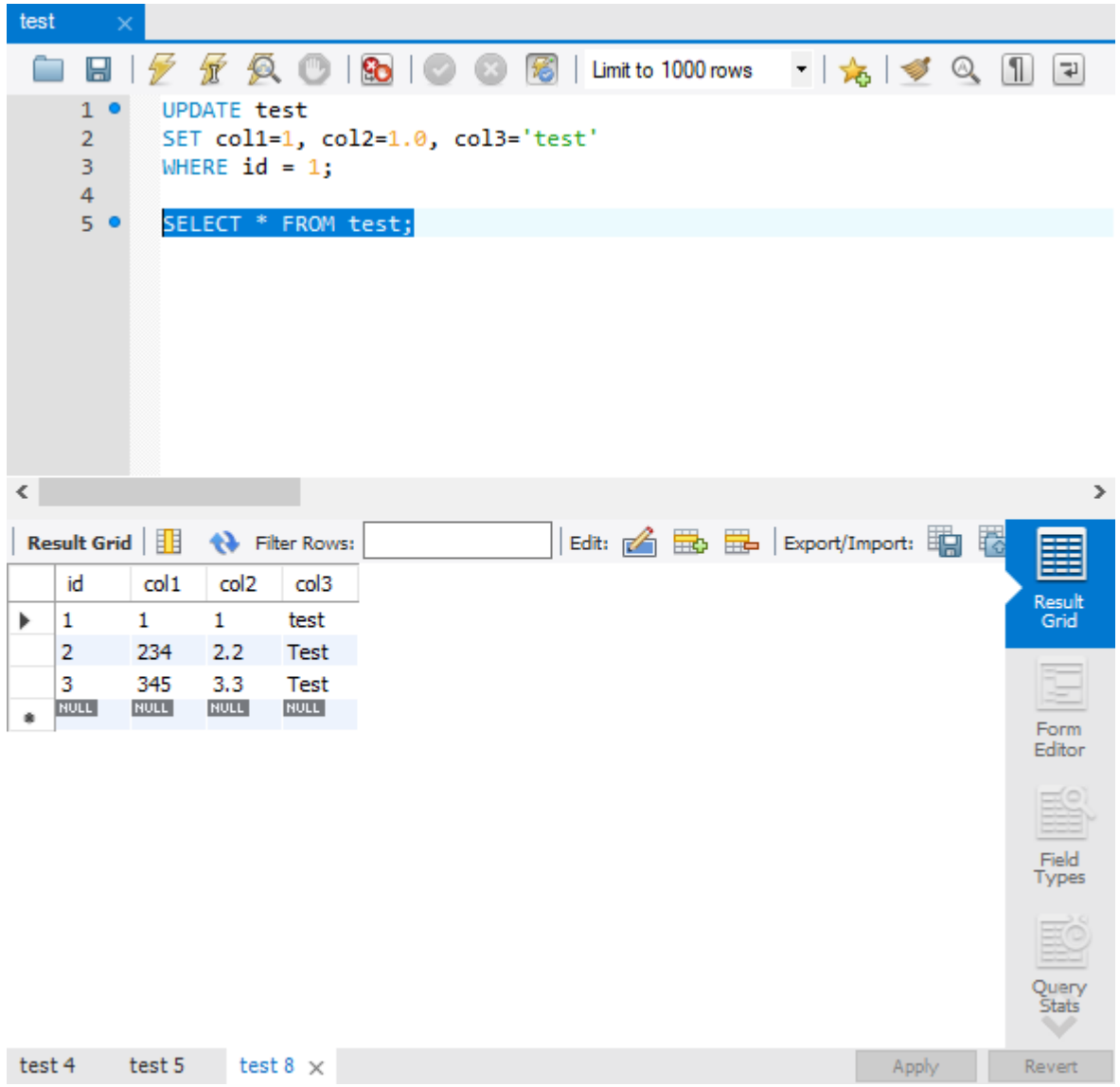
INSERT INTO SELECT

- test 테이블에 있는 내용을 test2 테이블에 삽입



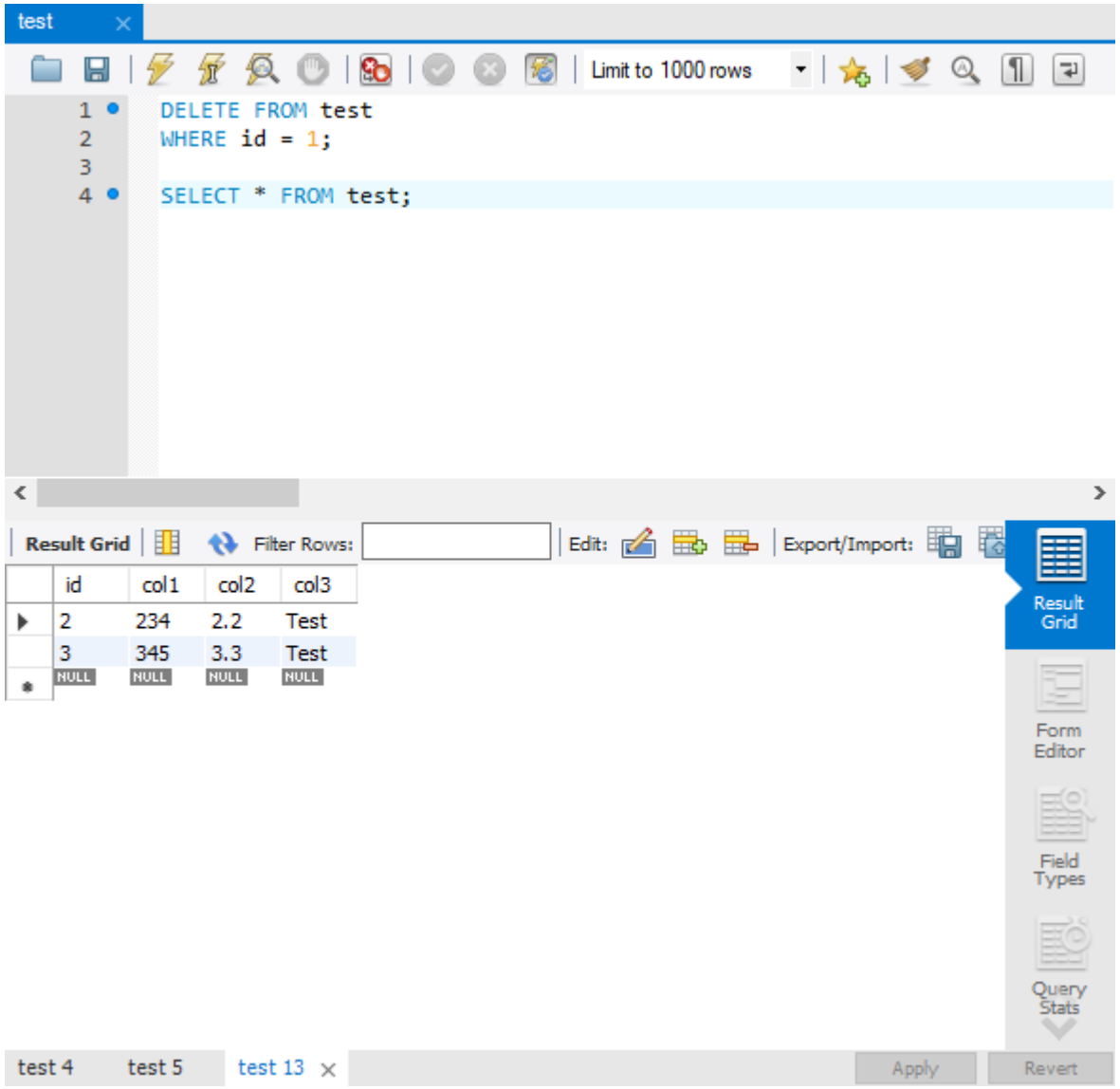
UPDATE

- 기존에 입력되어 있는 값 변경하는 구문
- WHERE절 생략 가능하나 테이블의 전체 행의 내용 변경



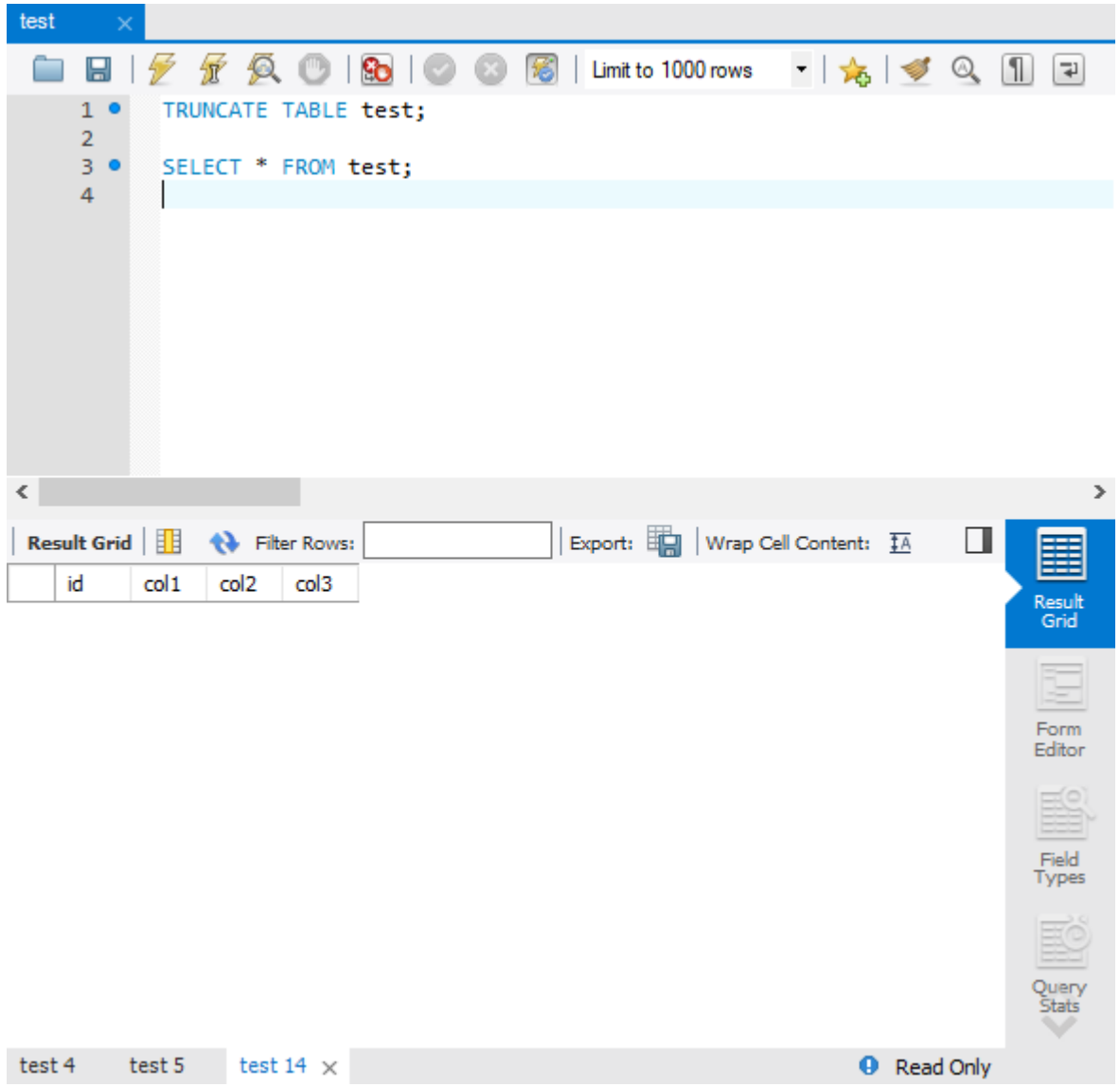
DELETE

- 행 단위로 데이터 삭제하는 구문
- DELETE FROM 테이블이름 WHERE 조건;
- 데이터는 지워지지만 테이블 용량은 줄어들지 않음
- 원하는 데이터만 지울 수 있음
- 삭제 후 잘못 삭제한 것을 되돌릴 수 있음



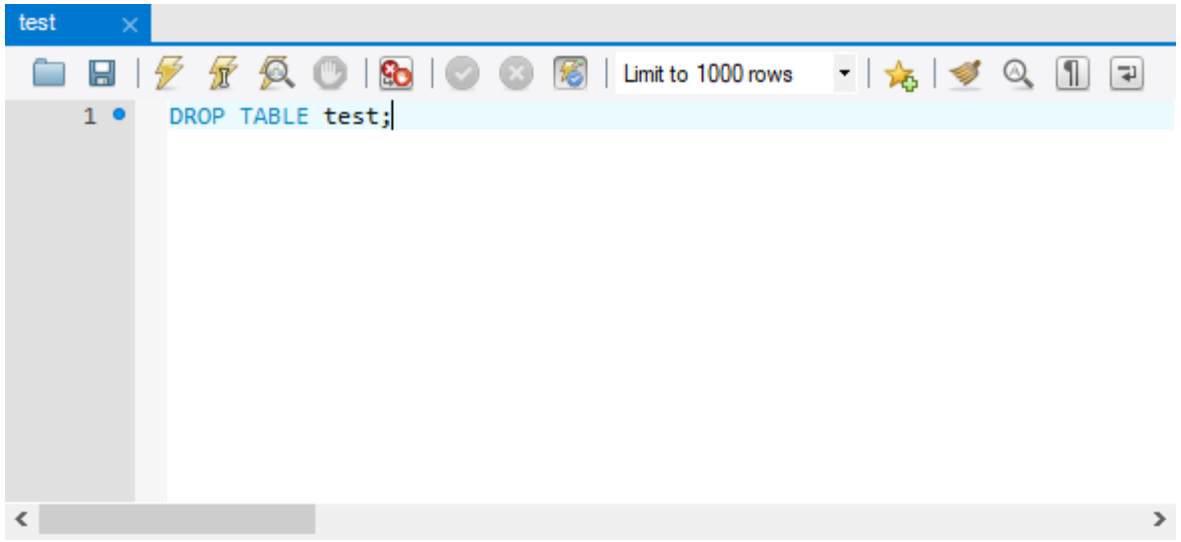
TRUNCATE

- 용량이 줄어 들고, 인덱스 등도 모두 삭제
- 테이블은 삭제하지는 않고, 데이터만 삭제
- 한꺼번에 다 지워야 함
- 삭제 후 절대 되돌릴 수 없음



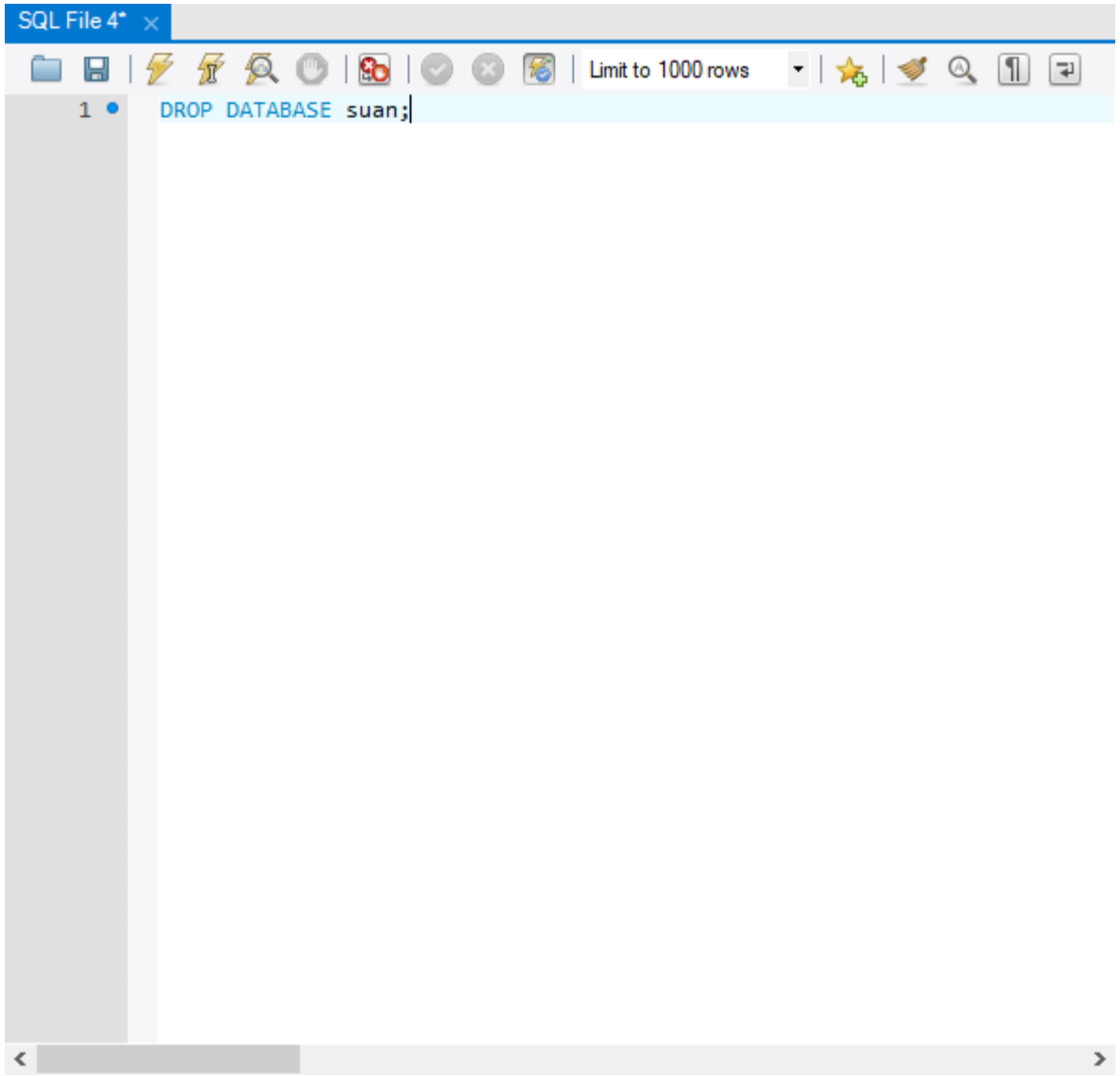
DROP TABLE

- 데이블 전체를 삭제, 공간, 객체를 삭제
- 삭제 후 절대 되돌릴 수 없음



DROP DATABASE

- DROP DATABASE 문은 해당 데이터베이스를 삭제



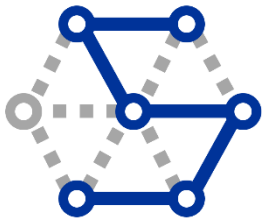
LAB #08

자신만의 연락처 테이블 만들기

이름, 전화번호, 주소, 이메일, …

(참고) 데이터 타입:

https://dev.mysql.com/doc/refman/8.0/en/data-types.html



suanlab

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