Assignment #2

JDBC

KAIST

CS360

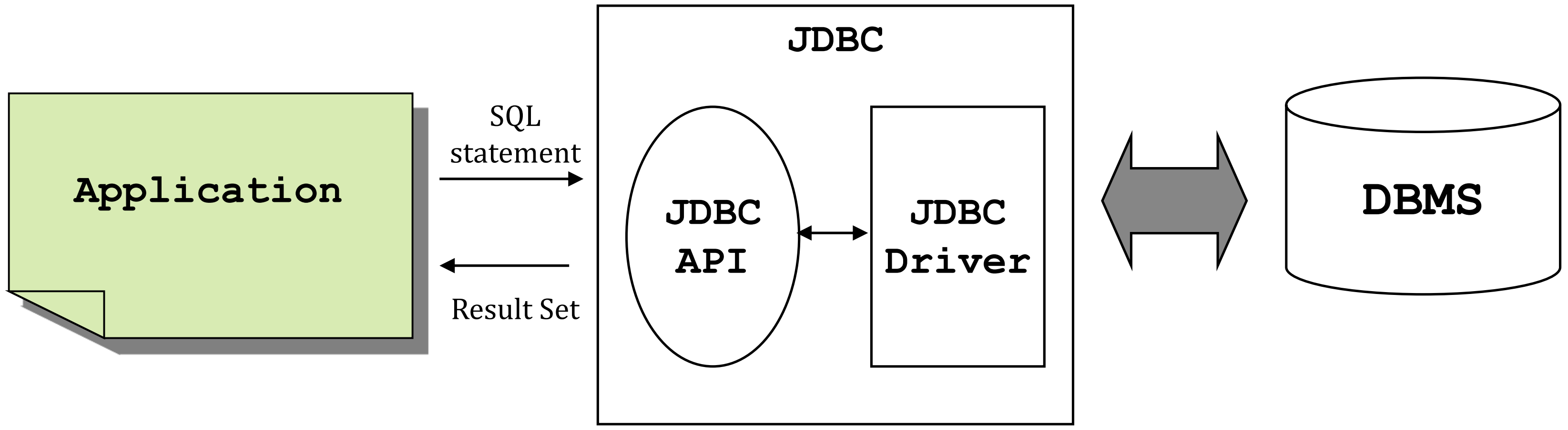
Contents

JDBC

1. Introduction to JDBC
2. Example
3. Main classes & method
4. JDBC driver installation

Introduction to JDBC

- What is JDBC?
  - "Java Database Connectivity"
  - Connector to access DB, when developing applications in Java^{TM} Platform



Example of JDBC code

```
import java.sql.*;

class Test  {
    public static void main(String[] args)  {
        Connection con = null;
        Statement stmt = null;
        try {
            Class.forName("oracle.jdbc.driver.OracleDriver");
            con = DriverManager.getConnection("jdbc:mysql://localhost:3306/"+DBname+"
                        ?characterEncoding=UTF-8&serverTimezone=UTC", user, passwd);
            stmt = con.createStatement();
            ResultSet rs = stmt.executeQuery("select name from product");

            while (rs.next()) {
                String product = rs.getString(1);
                System.out.println(product);
            }
        } catch (Exception e) {
            e.printStackTrace();
        } finally {
            try {
                if (stmt != null) stmt.close();
                if (con != null) con.close();
            } catch (Exception e) { }
        }
    }
}
```

Main classes & method

- Loading JDBC driver
  - Using Class.forName()

```
Class.forName("com.mysql.jdbc.Driver");
```

- Connecting to DB
  - Using DriverManager.getConnection()

```
Connection con =
   DriverManager.getConnection("jdbc:mysql://localhost:33
        06/"+DBname+"?characterEncoding=UTF-8&serverTimezo
        ne=UTC", user, passwd);
```

Main classes & method (cont'd)

- Executing queries
  - Using Statement class

```
Statement stmt = con.createStatement();
StringBuilder ddl = new StringBuilder();
String query = ddl.append("SELECT name FROM product;")
               .toString()
stmt.execute(query);
```

  - Using PreparedStatement class

```
PreparedStatement pstmt =
   con.prepareStatement("INSERT INTO product values(?, ?)");
pstmt.setString(1, "mp3");
pstmt.setInt(2, 150);
pstmt.executeUpdate();
```

※ Use executeUpdate() for insert, update, and delete

Main classes & method (cont’d)

- Cursor operations
  - Use methods of ResultSet class
    - » Ex) next(), getString(), etc.

```
ResultSet rs = stmt.executeQuery(“SELECT name FROM product");
while (rs.next()) {
   String product = rs.getString(1);
   System.out.println(product);
}
```

Main classes & method (cont'd)

- Using 'finally'
  - Before finishing code, connection should be closed

```
try {
          …
   con = DriverManager.getConnection( … );
   stmt = con.createStatement();
          …
} catch (Exception e) {
   e.printStackTrace();
} finally {
  try {
        if (stmt != null) stmt.close();
        if (con != null) con.close();
  } catch (Exception e) {}
}
```

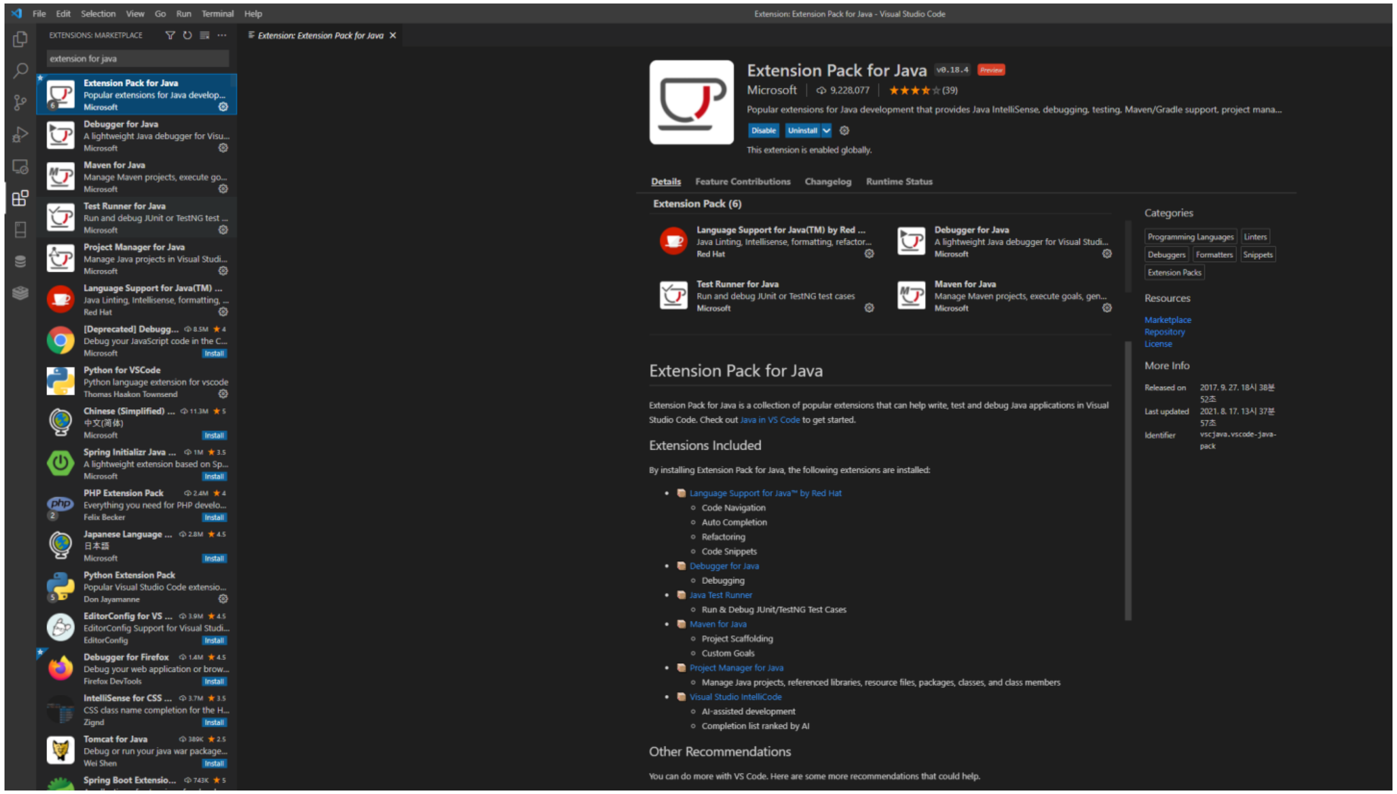
Main classes & method (cont'd)

- Using 'try-with-resources'
  - By declaring and assigning object in try(…), you can close connections without using 'finally'.

```
try(con = DriverManager.getConnection( … );
    stmt = con.createStatement()) {
          …
}
catch (Exception e) {
   e.printStackTrace();
}
```

Java installation

- Download 'Extension Pack for Java'


File Edit Selection View Go Run Terminal Help
Extension: Extension Pack for Java - Visual Studio Code
EXTENSIONS: MARKETPLACE
extension for java
Extension: Extension Pack for Java
Extension Pack for Java
Popular extensions for Java develop...
Microsoft
Debugger for Java
A lightweight Java debugger for Visu...
Microsoft
Maven for Java
Manage Maven projects, execute go...
Microsoft
Test Runner for Java
Run and debug JUnit or TestNG test ...
Microsoft
Project Manager for Java
Manage Java projects in Visual Studi...
Microsoft
Language Support for Java(TM) ...
Java Linting, Intellisense, formatting, ...
Red Hat
[Deprecated] Debugg... 8.5M ★ 4
Debug your JavaScript code in the C...
Microsoft Install
Python for VSCode
Python language extension for vscode
Thomas Haakon Townsend
Chinese (Simplified) ... 11.3M ★ 5
中文(简体)
Microsoft Install
Spring Initializr Java ... 1M ★ 3.5
A lightweight extension based on Sp...
Microsoft Install
PHP Extension Pack 2.4M ★ 4
Everything you need for PHP develo...
Felix Becker Install
Japanese Language ... 2.8M ★ 4.5
日本語
Microsoft Install
Python Extension Pack
Popular Visual Studio Code extensio...
Don Jayamanne
EditorConfig for VS ... 3.9M ★ 4.5
EditorConfig Support for Visual Studi...
EditorConfig Install
Debugger for Firefox 1.4M ★ 4.5
Debug your web application or brow...
Firefox DevTools Install
IntelliSense for CSS ... 3.7M ★ 3.5
CSS class name completion for the H...
Zignd Install
Tomcat for Java 389K ★ 2.5
Debug or run your java war package...
Wei Shen Install
Spring Boot Extensio... 743K ★ 5
Disable
Uninstall
Details
Feature Contributions
Changelog
Runtime Status

Extension Pack for Java v0.18.4 Preview
Microsoft | 9,228,077 | ★★★★☆ (39)
Popular extensions for Java development that provides Java IntelliSense, debugging, testing, Maven/Gradle support, project mana...
This extension is enabled globally.

Extension Pack (6)

Language Support for Java(TM) by Red ...
Java Linting, Intellisense, formatting, refactor...
Red Hat

Debugger for Java
A lightweight Java debugger for Visual Studi...
Microsoft

Test Runner for Java
Run and debug JUnit or TestNG test cases
Microsoft

Maven for Java
Manage Maven projects, execute goals, gen...
Microsoft

Extension Pack for Java

Extension Pack for Java is a collection of popular extensions that can help write, test and debug Java applications in Visual Studio Code. Check out Java in VS Code to get started.

Extensions Included

By installing Extension Pack for Java, the following extensions are installed:

- Language Support for Java™ by Red Hat
  - Code Navigation
  - Auto Completion
  - Refactoring
  - Code Snippets
- Debugger for Java
  - Debugging
- Java Test Runner
  - Run & Debug JUnit/TestNG Test Cases
- Maven for Java
  - Project Scaffolding
  - Custom Goals
- Project Manager for Java
  - Manage Java projects, referenced libraries, resource files, packages, classes, and class members
- Visual Studio IntelliCode
  - AI-assisted development
  - Completion list ranked by AI

Other Recommendations

You can do more with VS Code. Here are some more recommendations that could help.

Categories

Programming Languages | Linters | Debuggers | Formatters | Snippets | Extension Packs

Resources

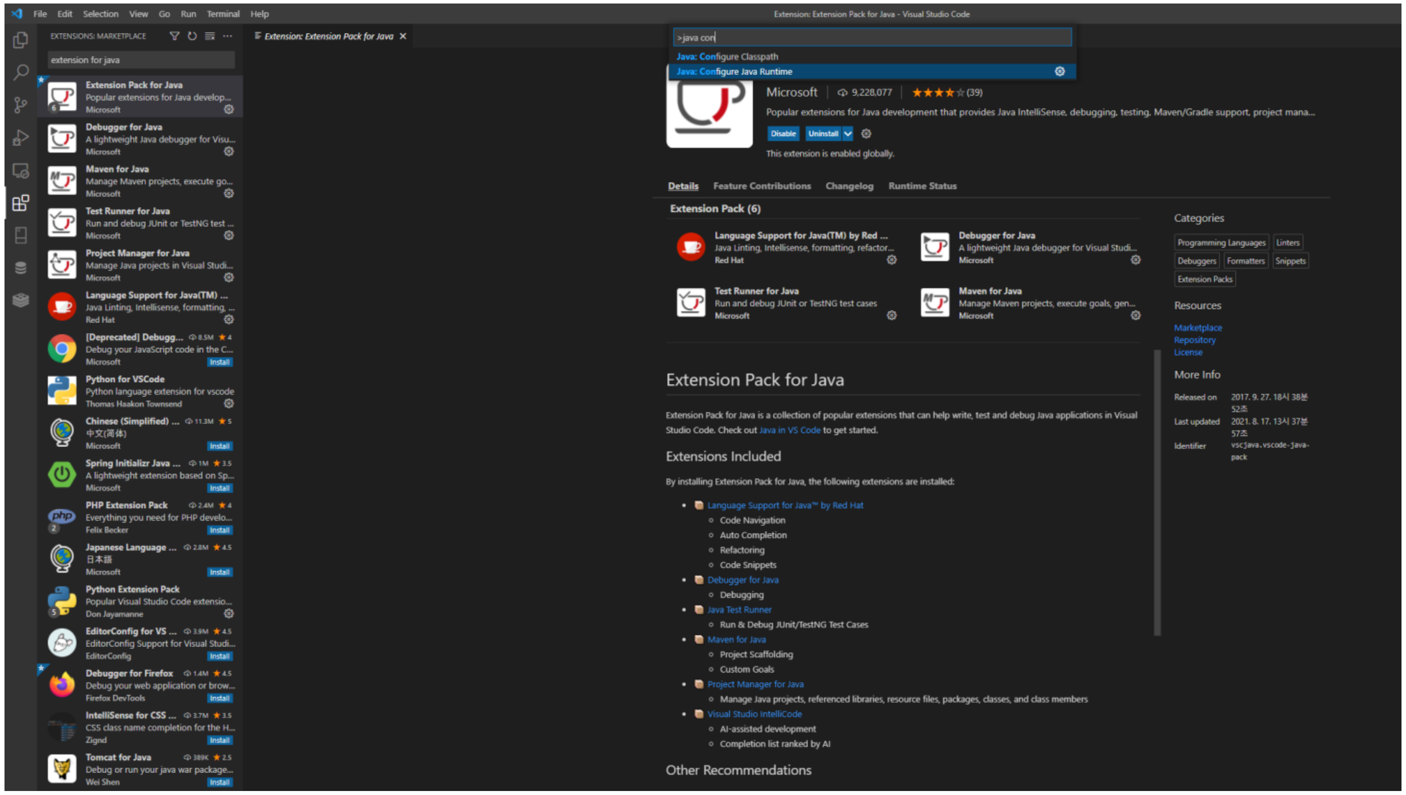
Marketplace
Repository
License

More Info

Released on	2017. 9. 27. 18시 38분 52초
Last updated	2021. 8. 17. 13시 37분 57초
Identifier	vscjava.vscode-java-pack

Java installation using vscode

- Execute a ‘Java: Configure Java Runtime’ in Command Pallete (Ctrl+Shift+P)



File Edit Selection View Go Run Terminal Help

Extension: Extension Pack for Java - Visual Studio Code

EXTENSIONS: MARKETPLACE

extension for java

Extension: Extension Pack for Java

```
>java con
Java: Configure Classpath
Java: Configure Java Runtime
```

Extension Pack for Java		Popular extensions for Java develop...	Microsoft
Debugger for Java		A lightweight Java debugger for Visu...	Microsoft
Maven for Java		Manage Maven projects, execute go...	Microsoft
Test Runner for Java		Run and debug JUnit or TestNG test ...	Microsoft
Project Manager for Java		Manage Java projects in Visual Studi...	Microsoft
Language Support for Java(TM) ...		Java Linting, Intellisense, formatting, ...	Red Hat
[Deprecated] Debugg...	8.5M ★4	Debug your JavaScript code in the C...	Microsoft Install
Python for VSCode		Python language extension for vscode	Thomas Haakon Townsend
Chinese (Simplified) ...	11.3M ★5	中文(简体)	Microsoft Install
Spring Initializr Java ...	1M ★3.5	A lightweight extension based on Sp...	Microsoft Install
PHP Extension Pack	2.4M ★4	Everything you need for PHP develo...	Felix Becker Install
Japanese Language ...	2.8M ★4.5	日本語	Microsoft Install
Python Extension Pack		Popular Visual Studio Code extensio...	Don Jayamanne
EditorConfig for VS ...	3.9M ★4.5	EditorConfig Support for Visual Studi...	EditorConfig Install
Debugger for Firefox	1.4M ★4.5	Debug your web application or brow...	Firefox DevTools Install
IntelliSense for CSS ...	3.7M ★3.5	CSS class name completion for the H...	Zignd Install
Tomcat for Java	389K ★2.5	Debug or run your java war package...	Wei Shen Install

Microsoft | 9,228,077 | ★★★★☆ (39)

Popular extensions for Java development that provides Java IntelliSense, debugging, testing, Maven/Gradle support, project mana...

Disable Uninstall

This extension is enabled globally.

Details Feature Contributions Changelog Runtime Status

Extension Pack (6)

Language Support for Java(TM) by Red ...	Java Linting, Intellisense, formatting, refactor...	Red Hat
Debugger for Java	A lightweight Java debugger for Visual Studi...	Microsoft
Test Runner for Java	Run and debug JUnit or TestNG test cases	Microsoft
Maven for Java	Manage Maven projects, execute goals, gen...	Microsoft

Extension Pack for Java

Extension Pack for Java is a collection of popular extensions that can help write, test and debug Java applications in Visual Studio Code. Check out Java in VS Code to get started.

Extensions Included

By installing Extension Pack for Java, the following extensions are installed:

- Language Support for Java™ by Red Hat
  - Code Navigation
  - Auto Completion
  - Refactoring
  - Code Snippets
- Debugger for Java
  - Debugging
- Java Test Runner
  - Run & Debug JUnit/TestNG Test Cases
- Maven for Java
  - Project Scaffolding
  - Custom Goals
- Project Manager for Java
  - Manage Java projects, referenced libraries, resource files, packages, classes, and class members
- Visual Studio IntelliCode
  - AI-assisted development
  - Completion list ranked by AI

Other Recommendations

Categories

Programming Languages, Linters, Debuggers, Formatters, Snippets, Extension Packs

Resources

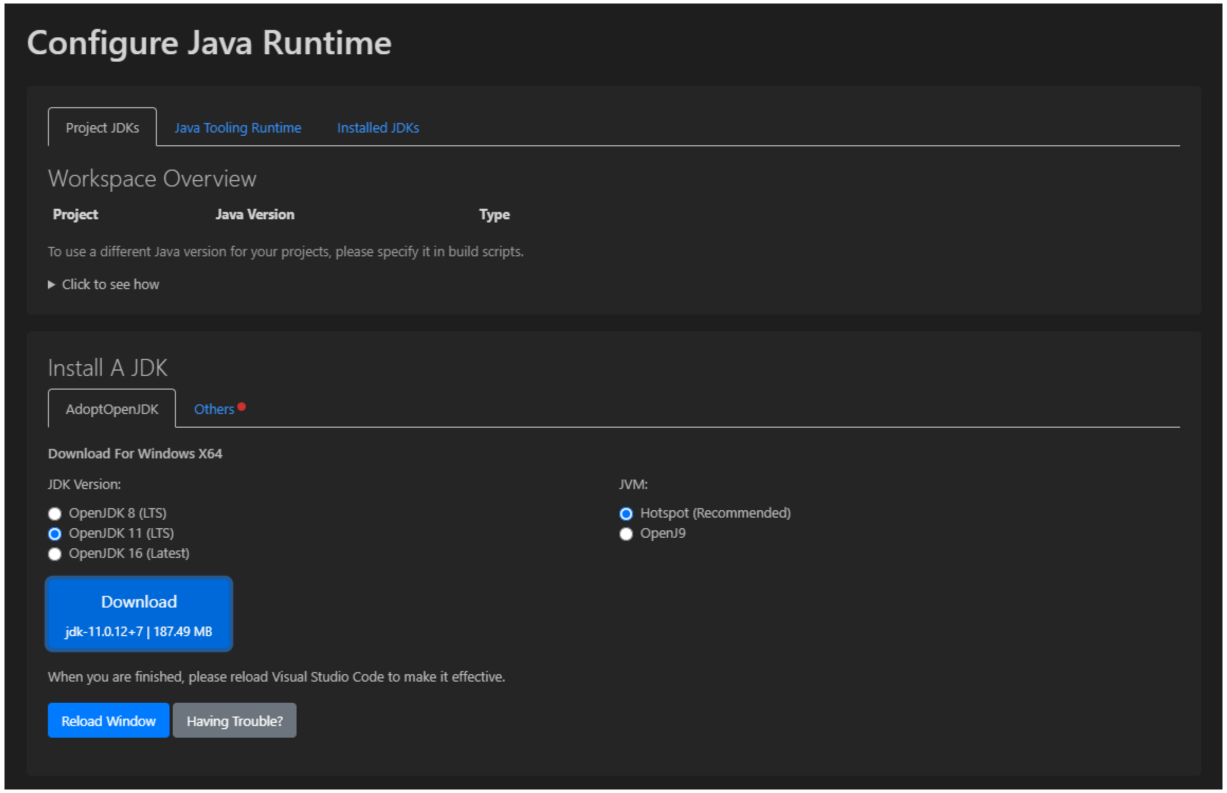
Marketplace
Repository
License

More Info

Released on	2017. 9. 27. 18시 38분 52초
Last updated	2021. 8. 17. 13시 37분 57초
Identifier	vscjava.vscode-java-pack

Java installation using vscode

- Download 'OpenJDK 11' (jdk-11.0.12+7)



Configure Java Runtime

Project JDKs | Java Tooling Runtime | Installed JDKs

Workspace Overview

Project	Java Version	Type

To use a different Java version for your projects, please specify it in build scripts.

▸ Click to see how

Install A JDK

AdoptOpenJDK | Others

Download For Windows X64

JDK Version:

- ○ OpenJDK 8 (LTS)
- [✓ OpenJDK 11 (LTS)]
- ○ OpenJDK 16 (Latest)

JVM:

- [✓ Hotspot (Recommended)]
- ○ OpenJ9

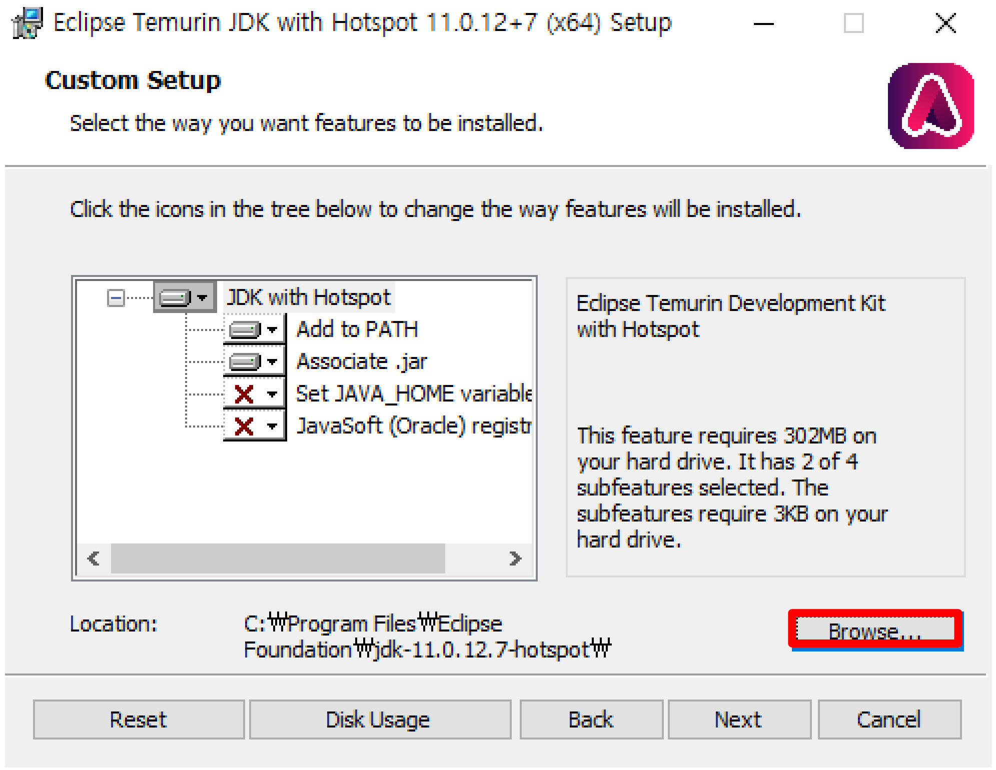
Download
jdk-11.0.12+7 | 187.49 MB

When you are finished, please reload Visual Studio Code to make it effective.

Reload Window | Having Trouble?

Java installation using vscode (windows)

- Change a ‘Eclipse Foundation’ in a location to a ‘Java’



Eclipse Temurin JDK with Hotspot 11.0.12+7 (x64) Setup

Custom Setup

Select the way you want features to be installed.

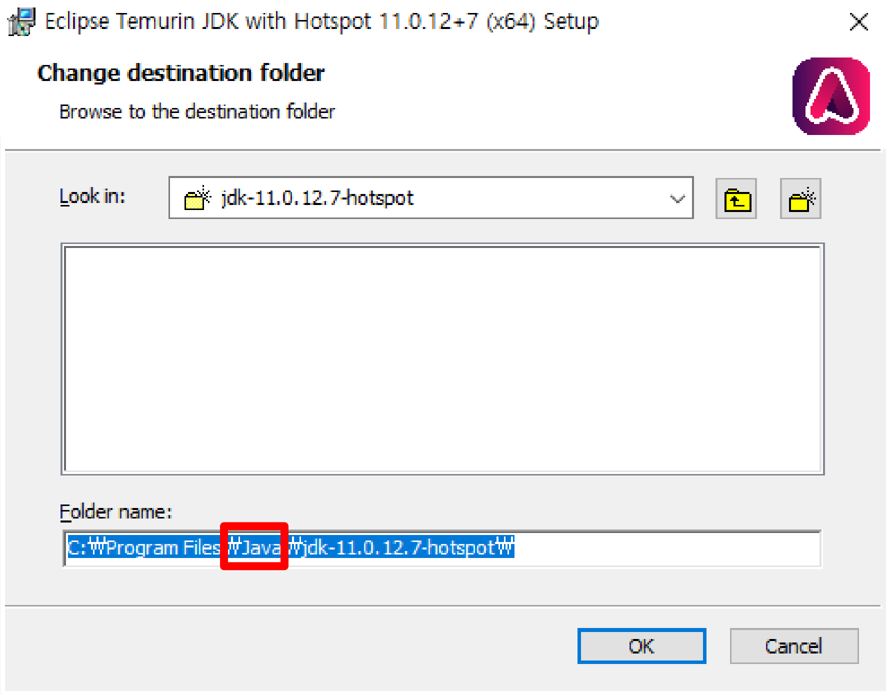
Click the icons in the tree below to change the way features will be installed.

- JDK with Hotspot
  - Add to PATH
  - Associate .jar
  - Set JAVA_HOME variable
  - JavaSoft (Oracle) registr

Eclipse Temurin Development Kit with Hotspot

This feature requires 302MB on your hard drive. It has 2 of 4 subfeatures selected. The subfeatures require 3KB on your hard drive.

Location: C:₩Program Files₩Eclipse Foundation₩jdk-11.0.12.7-hotspot₩



Eclipse Temurin JDK with Hotspot 11.0.12+7 (x64) Setup

Change destination folder

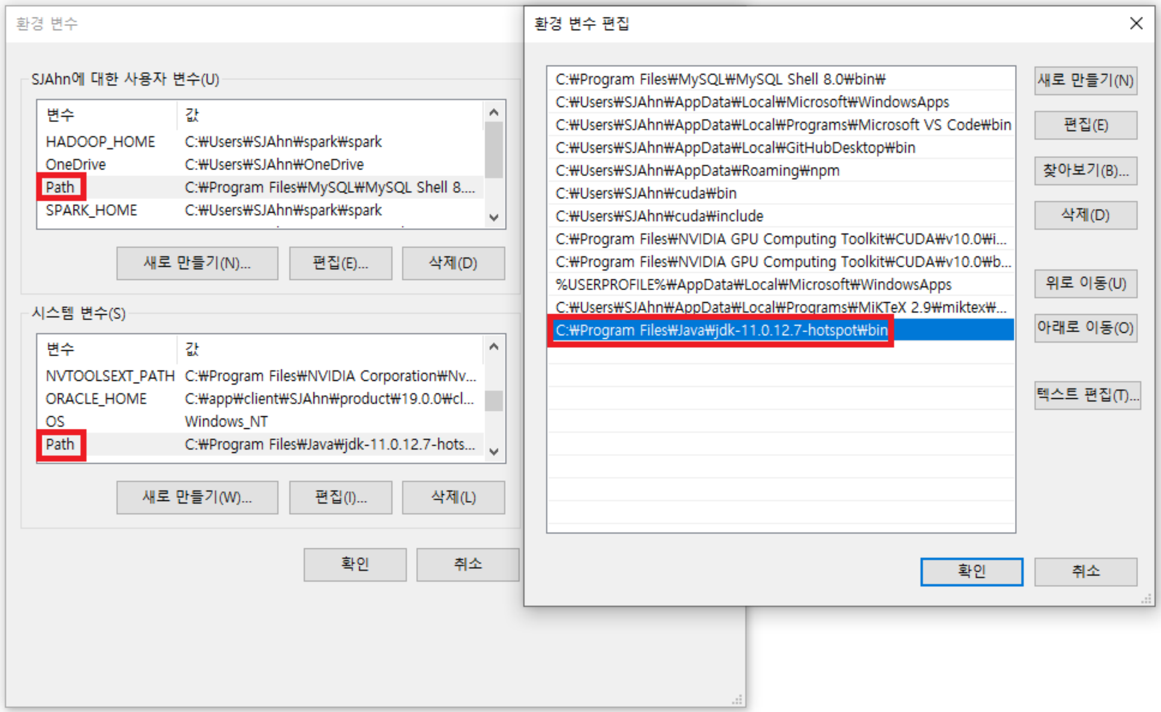
Browse to the destination folder

Look in: jdk-11.0.12.7-hotspot

Folder name: C:₩Program Files₩Java₩jdk-11.0.12.7-hotspot₩

Java installation using vscode (windows)

- Add ‘C:\Program Files\Java\jdk-11.0.12.7-hotspot\bin’ to ***Path*** in both ***user variable*** and ***system variable.***



환경 변수

SJAhn에 대한 사용자 변수(U)

변수	값
HADOOP_HOME	C:₩Users₩SJAhn₩spark₩spark
OneDrive	C:₩Users₩SJAhn₩OneDrive
Path	C:₩Program Files₩MySQL₩MySQL Shell 8....
SPARK_HOME	C:₩Users₩SJAhn₩spark₩spark

시스템 변수(S)

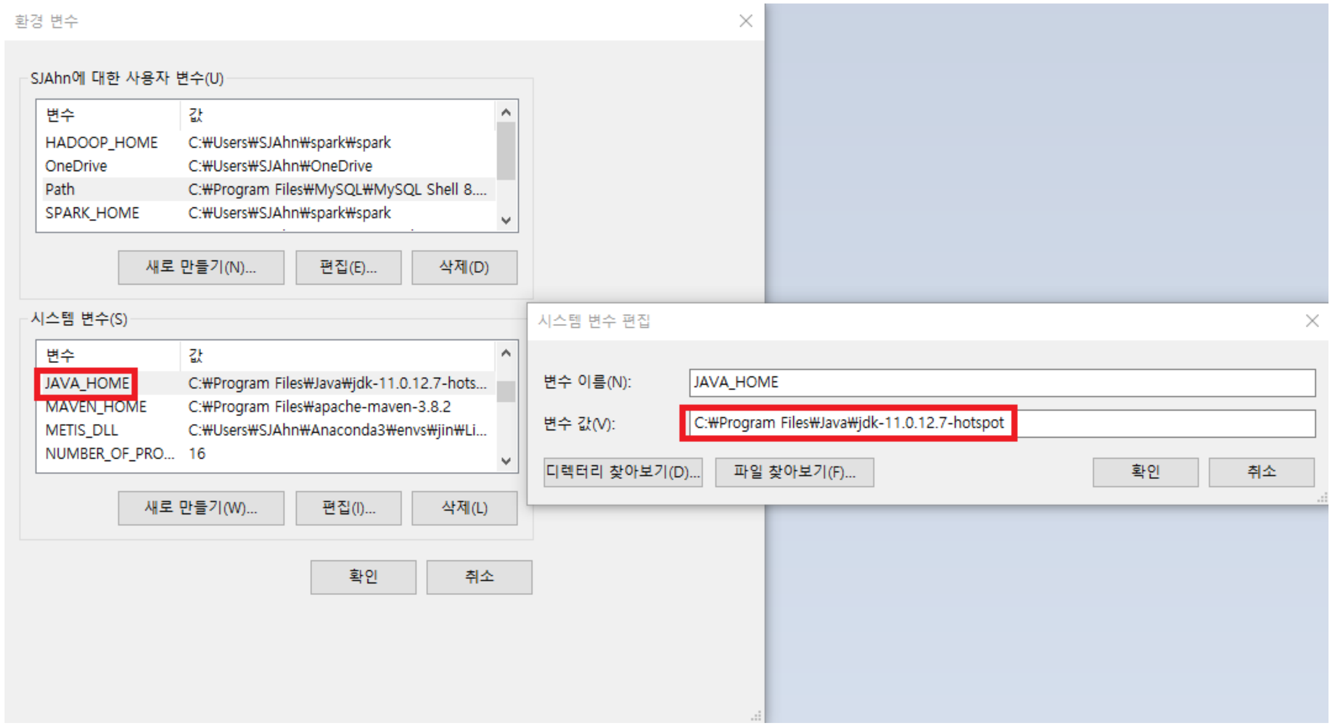
변수	값
NVTOOLSEXT_PATH	C:₩Program Files₩NVIDIA Corporation₩Nv...
ORACLE_HOME	C:₩app₩client₩SJAhn₩product₩19.0.0₩cl...
OS	Windows_NT
Path	C:₩Program Files₩Java₩jdk-11.0.12.7-hots...

환경 변수 편집

```
C:₩Program Files₩MySQL₩MySQL Shell 8.0₩bin₩
C:₩Users₩SJAhn₩AppData₩Local₩Microsoft₩WindowsApps
C:₩Users₩SJAhn₩AppData₩Local₩Programs₩Microsoft VS Code₩bin
C:₩Users₩SJAhn₩AppData₩Local₩GitHubDesktop₩bin
C:₩Users₩SJAhn₩AppData₩Roaming₩npm
C:₩Users₩SJAhn₩cuda₩bin
C:₩Users₩SJAhn₩cuda₩include
C:₩Program Files₩NVIDIA GPU Computing Toolkit₩CUDA₩v10.0₩i...
C:₩Program Files₩NVIDIA GPU Computing Toolkit₩CUDA₩v10.0₩b...
%USERPROFILE%₩AppData₩Local₩Microsoft₩WindowsApps
C:₩Users₩SJAhn₩AppData₩Local₩Programs₩MiKTeX 2.9₩miktex₩...
C:₩Program Files₩Java₩jdk-11.0.12.7-hotspot₩bin
```

Java installation using vscode (windows)

- Add ‘C:\Program Files\Java\jdk-11.0.12.7-hotspot’ to ***JAVA_HOME*** in ***system variable.***



SJAhn에 대한 사용자 변수(U)

변수	값
HADOOP_HOME	C:₩Users₩SJAhn₩spark₩spark
OneDrive	C:₩Users₩SJAhn₩OneDrive
Path	C:₩Program Files₩MySQL₩MySQL Shell 8....
SPARK_HOME	C:₩Users₩SJAhn₩spark₩spark

시스템 변수(S)

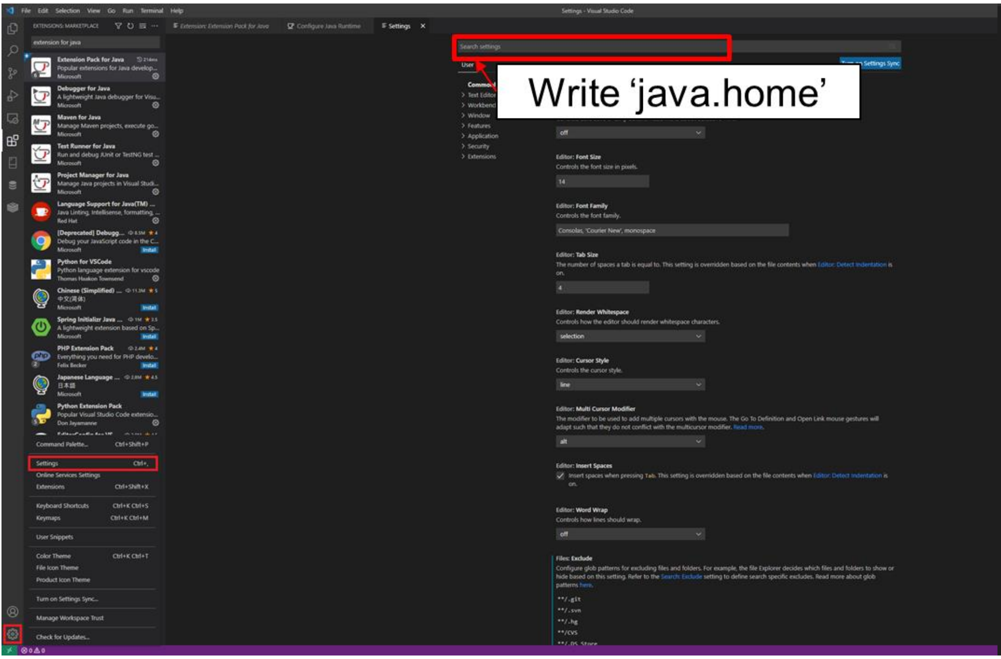
변수	값
JAVA_HOME	C:₩Program Files₩Java₩jdk-11.0.12.7-hots...
MAVEN_HOME	C:₩Program Files₩apache-maven-3.8.2
METIS_DLL	C:₩Users₩SJAhn₩Anaconda3₩envs₩jin₩Li...
NUMBER_OF_PRO...	16

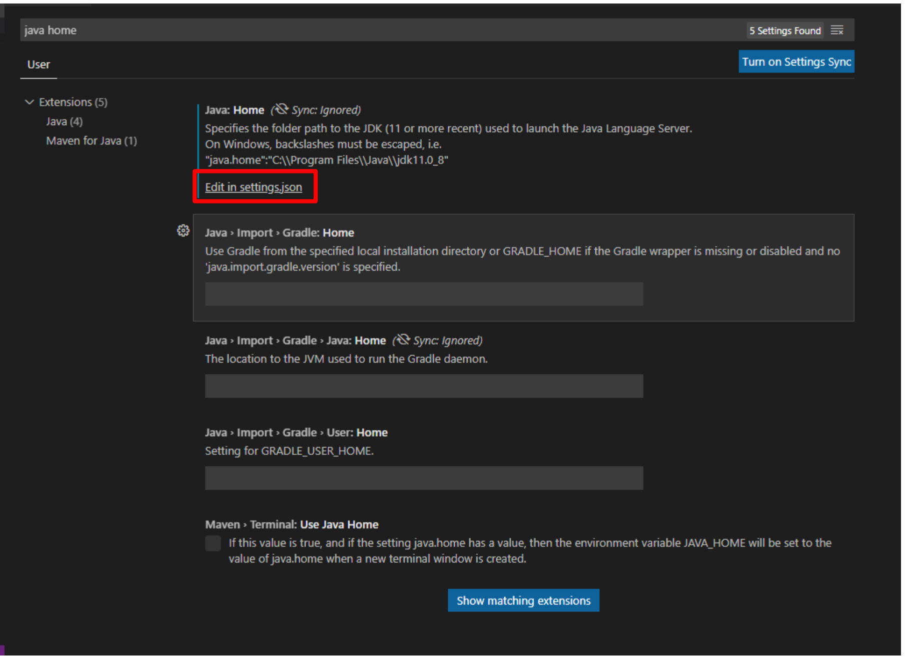
변수 이름(N): JAVA_HOME

변수 값(V): C:₩Program Files₩Java₩jdk-11.0.12.7-hotspot

Java installation using vscode

- Search ‘Settings’ - ‘java.home’-’Edit in settings.json’





Java: Home (Sync: Ignored)
Specifies the folder path to the JDK (11 or more recent) used to launch the Java Language Server.
On Windows, backslashes must be escaped, i.e.
"java.home":"C:\\Program Files\\Java\\jdk11.0_8"

Java › Import › Gradle: Home
Use Gradle from the specified local installation directory or GRADLE_HOME if the Gradle wrapper is missing or disabled and no 'java.import.gradle.version' is specified.

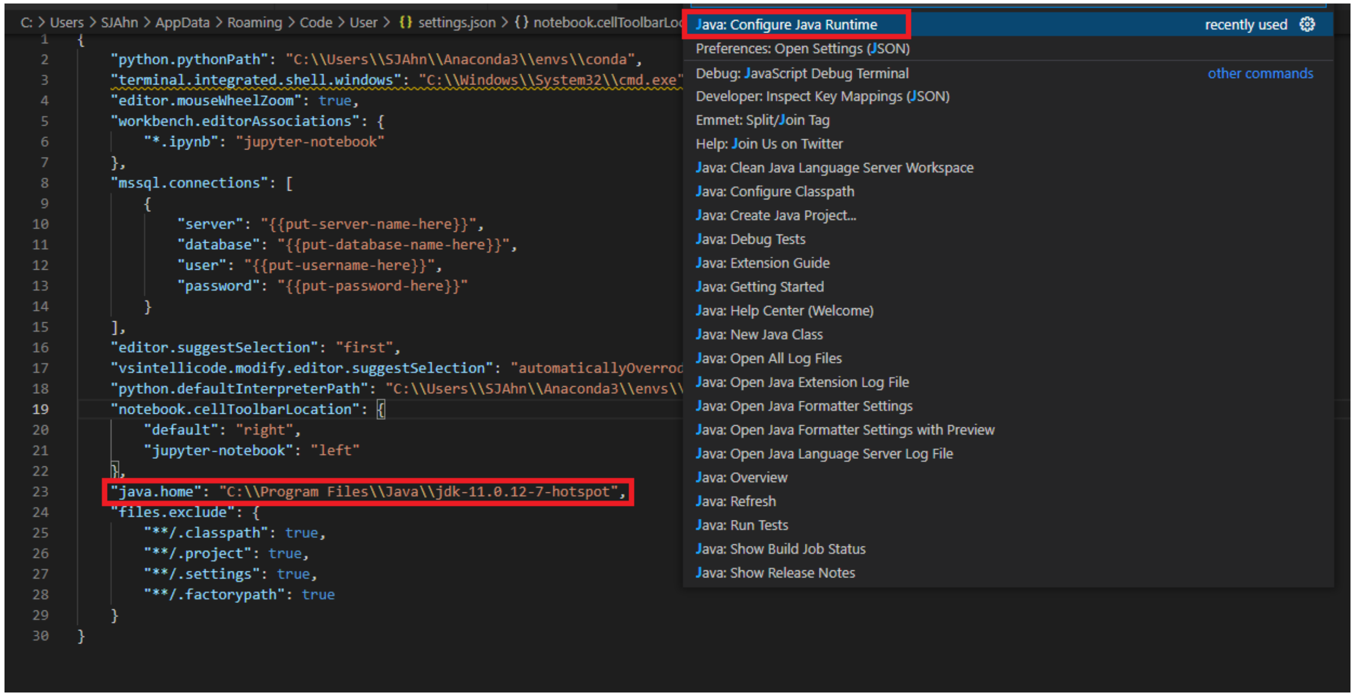
Java › Import › Gradle › Java: Home (Sync: Ignored)
The location to the JVM used to run the Gradle daemon.

Java › Import › Gradle › User: Home
Setting for GRADLE_USER_HOME.

Maven › Terminal: Use Java Home
If this value is true, and if the setting java.home has a value, then the environment variable JAVA_HOME will be set to the value of java.home when a new terminal window is created.

Java installation using vscode (windows)

- Add "java.home": "C:\\Program Files\\Java\\jdk-11.0.12.7-hotspot“ and click ‘Java: Configure Java Runtime’ in command palette.



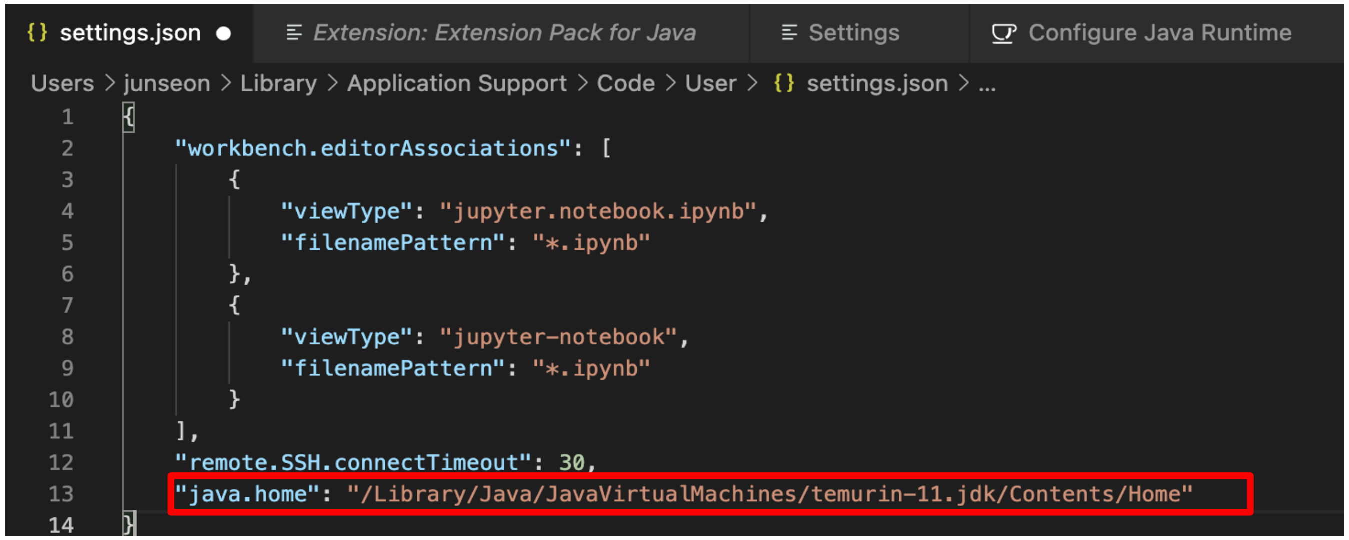
C: > Users > SJAhn > AppData > Roaming > Code > User > {} settings.json > {} notebook.cellToolbarLoc

```
{
    "python.pythonPath": "C:\\Users\\SJAhn\\Anaconda3\\envs\\conda",
    "terminal.integrated.shell.windows": "C:\\Windows\\System32\\cmd.exe"
    "editor.mouseWheelZoom": true,
    "workbench.editorAssociations": {
        "*.ipynb": "jupyter-notebook"
    },
    "mssql.connections": [
        {
            "server": "{{put-server-name-here}}",
            "database": "{{put-database-name-here}}",
            "user": "{{put-username-here}}",
            "password": "{{put-password-here}}"
        }
    ],
    "editor.suggestSelection": "first",
    "vsintellicode.modify.editor.suggestSelection": "automaticallyOverrod
    "python.defaultInterpreterPath": "C:\\Users\\SJAhn\\Anaconda3\\envs\\
    "notebook.cellToolbarLocation": {
        "default": "right",
        "jupyter-notebook": "left"
    },
    "java.home": "C:\\Program Files\\Java\\jdk-11.0.12-7-hotspot",
    "files.exclude": {
        "**/.classpath": true,
        "**/.project": true,
        "**/.settings": true,
        "**/.factorypath": true
    }
}
```

Java: Configure Java Runtime
recently used
Preferences: Open Settings (JSON)
Debug: JavaScript Debug Terminal
other commands
Developer: Inspect Key Mappings (JSON)
Emmet: Split/Join Tag
Help: Join Us on Twitter
Java: Clean Java Language Server Workspace
Java: Configure Classpath
Java: Create Java Project...
Java: Debug Tests
Java: Extension Guide
Java: Getting Started
Java: Help Center (Welcome)
Java: New Java Class
Java: Open All Log Files
Java: Open Java Extension Log File
Java: Open Java Formatter Settings
Java: Open Java Formatter Settings with Preview
Java: Open Java Language Server Log File
Java: Overview
Java: Refresh
Java: Run Tests
Java: Show Build Job Status
Java: Show Release Notes

Java installation using vscode (mac)

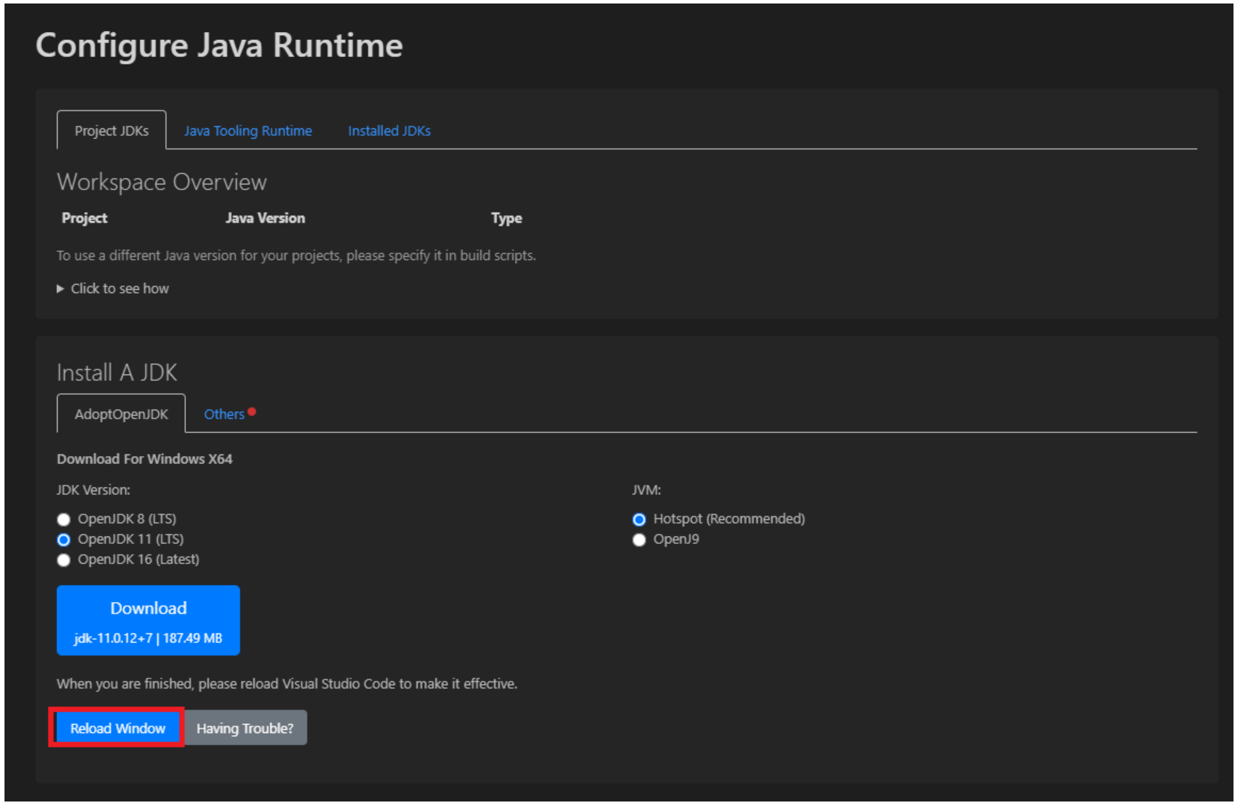
- Add "java.home": "/Library/Java/JavaVirtualMachines/temurin-11.jdk/Contents/Home" and click 'Java: Configure Java Runtime' in command palette.


{} settings.json ●
Extension: Extension Pack for Java
Settings
Configure Java Runtime
Users > junseon > Library > Application Support > Code > User > {} settings.json > ...

```
{
    "workbench.editorAssociations": [
        {
            "viewType": "jupyter.notebook.ipynb",
            "filenamePattern": "*.ipynb"
        },
        {
            "viewType": "jupyter-notebook",
            "filenamePattern": "*.ipynb"
        }
    ],
    "remote.SSH.connectTimeout": 30,
    "java.home": "/Library/Java/JavaVirtualMachines/temurin-11.jdk/Contents/Home"
}
```

Java installation using vscode

- Go back to 'Configure Java Runtime' (p13~14) and click 'Reload Window'



Configure Java Runtime

Workspace Overview

Project	Java Version	Type

To use a different Java version for your projects, please specify it in build scripts.

▸ Click to see how

Install A JDK

Download For Windows X64

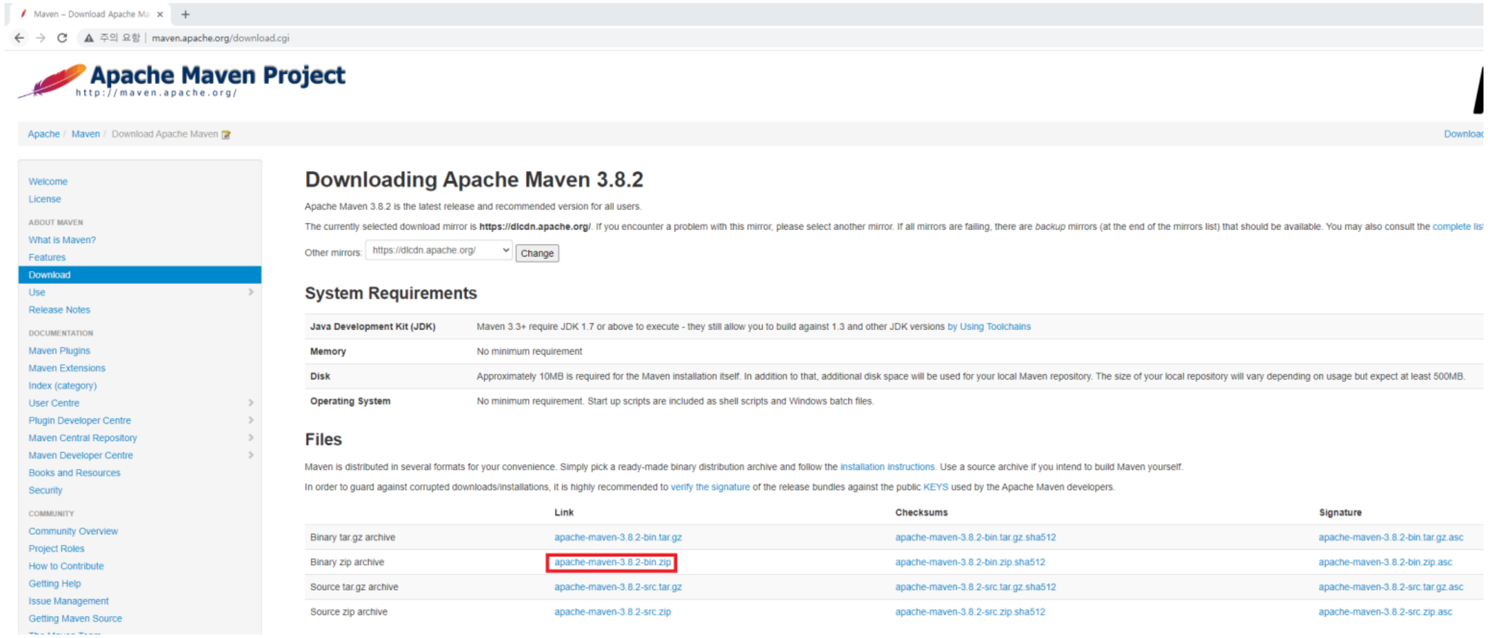
JDK Version:
- OpenJDK 8 (LTS)
- [✓ OpenJDK 11 (LTS)]
- OpenJDK 16 (Latest)

JVM:
- [✓ Hotspot (Recommended)]
- OpenJ9

When you are finished, please reload Visual Studio Code to make it effective.

Maven installation

- Download ‘maven’
  - Go to ‘http://maven.apache.org/download.cgi’
  - Click ‘Binary zip archive’
  - Unzip it in ‘C:\Program Files’



Downloading Apache Maven 3.8.2

Apache Maven 3.8.2 is the latest release and recommended version for all users.

The currently selected download mirror is **https://dlcdn.apache.org/**. If you encounter a problem with this mirror, please select another mirror. If all mirrors are failing, there are *backup* mirrors (at the end of the mirrors list) that should be available. You may also consult the complete lis

Other mirrors: https://dlcdn.apache.org/ Change

System Requirements

Java Development Kit (JDK)	Maven 3.3+ require JDK 1.7 or above to execute - they still allow you to build against 1.3 and other JDK versions by Using Toolchains
Memory	No minimum requirement
Disk	Approximately 10MB is required for the Maven installation itself. In addition to that, additional disk space will be used for your local Maven repository. The size of your local repository will vary depending on usage but expect at least 500MB.
Operating System	No minimum requirement. Start up scripts are included as shell scripts and Windows batch files.

Files

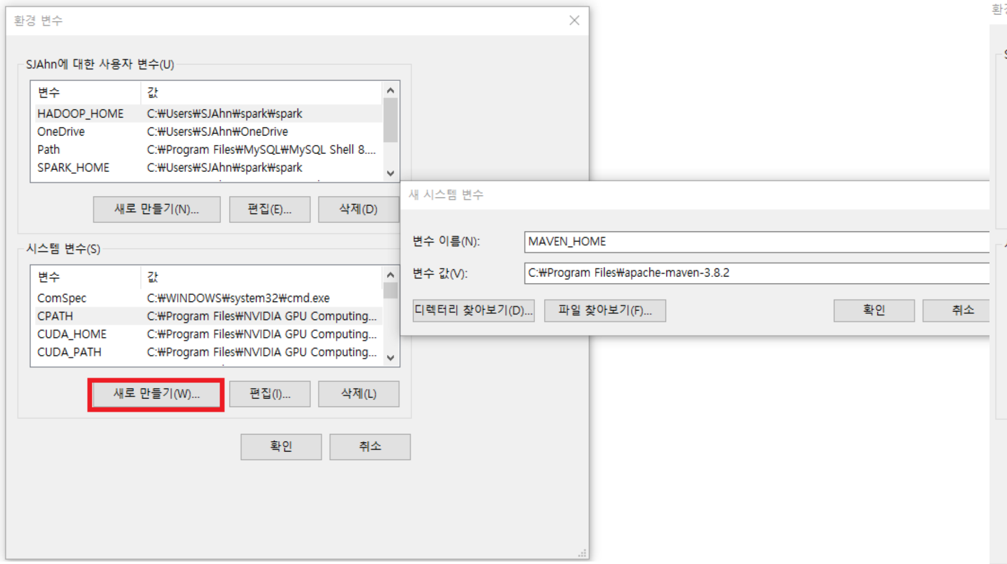
Maven is distributed in several formats for your convenience. Simply pick a ready-made binary distribution archive and follow the installation instructions. Use a source archive if you intend to build Maven yourself.

In order to guard against corrupted downloads/installations, it is highly recommended to verify the signature of the release bundles against the public KEYS used by the Apache Maven developers.

	Link	Checksums	Signature
Binary tar.gz archive	apache-maven-3.8.2-bin.tar.gz	apache-maven-3.8.2-bin.tar.gz.sha512	apache-maven-3.8.2-bin.tar.gz.asc
Binary zip archive	$\boxed{\text{apache-maven-3.8.2-bin.zip}}$	apache-maven-3.8.2-bin.zip.sha512	apache-maven-3.8.2-bin.zip.asc
Source tar.gz archive	apache-maven-3.8.2-src.tar.gz	apache-maven-3.8.2-src.tar.gz.sha512	apache-maven-3.8.2-src.tar.gz.asc
Source zip archive	apache-maven-3.8.2-src.zip	apache-maven-3.8.2-src.zip.sha512	apache-maven-3.8.2-src.zip.asc

Maven installation (windows)

- Setting ‘environmental variable’
  - Add a ‘C:\Program Files\apache-maven-3.8.2’ to a ‘MAVEN_HOME’ system variable with
  - Add a ‘%MAVEN_HOME%\bin’ to a ‘Path’ among system variables.



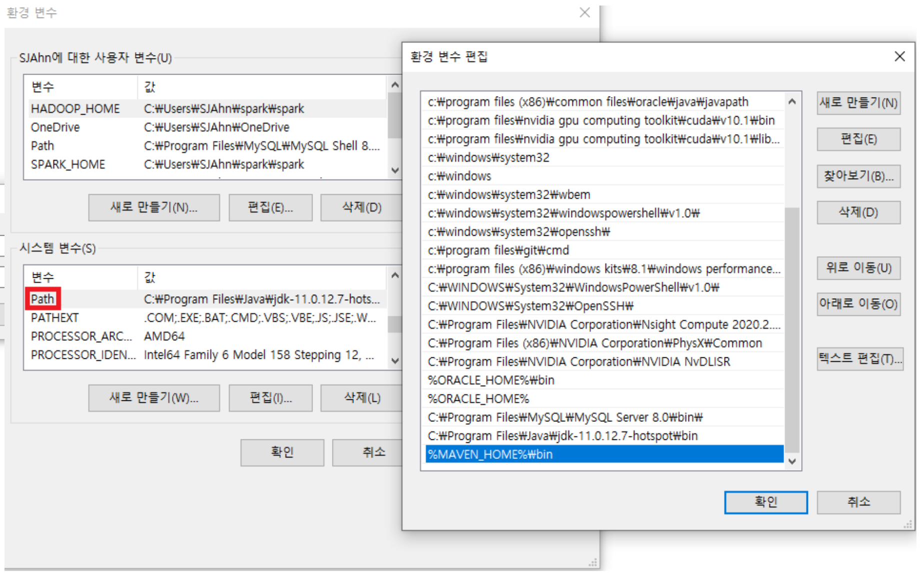
변수	값
HADOOP_HOME	C:₩Users₩SJAhn₩spark₩spark
OneDrive	C:₩Users₩SJAhn₩OneDrive
Path	C:₩Program Files₩MySQL₩MySQL Shell 8....
SPARK_HOME	C:₩Users₩SJAhn₩spark₩spark

변수	값
ComSpec	C:₩WINDOWS₩system32₩cmd.exe
CPATH	C:₩Program Files₩NVIDIA GPU Computing...
CUDA_HOME	C:₩Program Files₩NVIDIA GPU Computing...
CUDA_PATH	C:₩Program Files₩NVIDIA GPU Computing...

새 시스템 변수

변수 이름(N): MAVEN_HOME

변수 값(V): C:₩Program Files₩apache-maven-3.8.2



변수	값
HADOOP_HOME	C:₩Users₩SJAhn₩spark₩spark
OneDrive	C:₩Users₩SJAhn₩OneDrive
Path	C:₩Program Files₩MySQL₩MySQL Shell 8....
SPARK_HOME	C:₩Users₩SJAhn₩spark₩spark

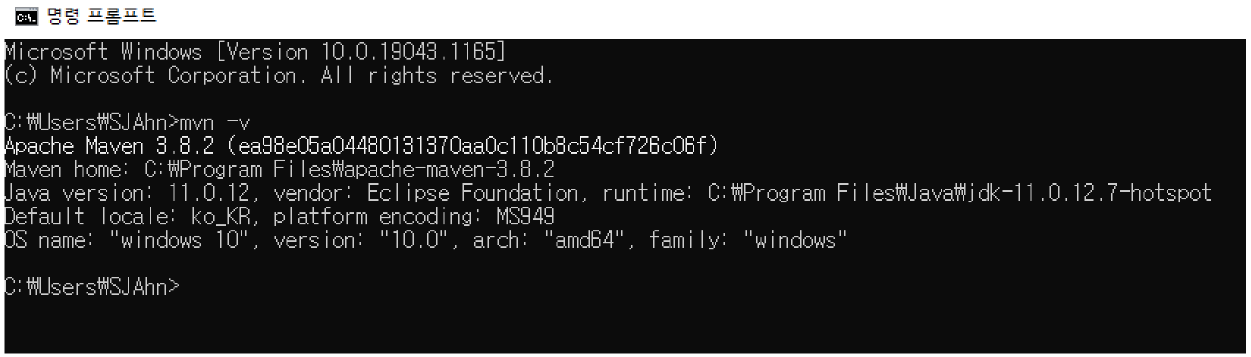
변수	값
Path	C:₩Program Files₩Java₩jdk-11.0.12.7-hots...
PATHEXT	.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.W...
PROCESSOR_ARC...	AMD64
PROCESSOR_IDEN...	Intel64 Family 6 Model 158 Stepping 12, ...

환경 변수 편집

```
c:₩program files (x86)₩common files₩oracle₩java₩javapath
c:₩program files₩nvidia gpu computing toolkit₩cuda₩v10.1₩bin
c:₩program files₩nvidia gpu computing toolkit₩cuda₩v10.1₩lib...
c:₩windows₩system32
c:₩windows
c:₩windows₩system32₩wbem
c:₩windows₩system32₩windowspowershell₩v1.0₩
c:₩windows₩system32₩openssh₩
c:₩program files₩git₩cmd
c:₩program files (x86)₩windows kits₩8.1₩windows performance...
C:₩WINDOWS₩System32₩WindowsPowerShell₩v1.0₩
C:₩WINDOWS₩System32₩OpenSSH₩
C:₩Program Files₩NVIDIA Corporation₩Nsight Compute 2020.2....
C:₩Program Files (x86)₩NVIDIA Corporation₩PhysX₩Common
C:₩Program Files₩NVIDIA Corporation₩NVIDIA NvDLISR
%ORACLE_HOME%₩bin
%ORACLE_HOME%
C:₩Program Files₩MySQL₩MySQL Server 8.0₩bin₩
C:₩Program Files₩Java₩jdk-11.0.12.7-hotspot₩bin
%MAVEN_HOME%₩bin
```

Maven installation (windows)

- Check whether you download maven properly
  - Type ‘mvn –v’ in command line.



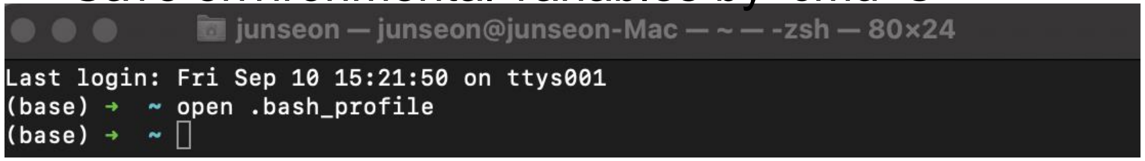
```
Microsoft Windows [Version 10.0.19043.1165]
(c) Microsoft Corporation. All rights reserved.

C:₩Users₩SJAhn>mvn -v
Apache Maven 3.8.2 (ea98e05a04480131370aa0c110b8c54cf726c06f)
Maven home: C:₩Program Files₩apache-maven-3.8.2
Java version: 11.0.12, vendor: Eclipse Foundation, runtime: C:₩Program Files₩Java₩jdk-11.0.12.7-hotspot
Default locale: ko_KR, platform encoding: MS949
OS name: "windows 10", version: "10.0", arch: "amd64", family: "windows"

C:₩Users₩SJAhn>
```

Maven installation (mac)

- Download 'Binary tar.gz archive'

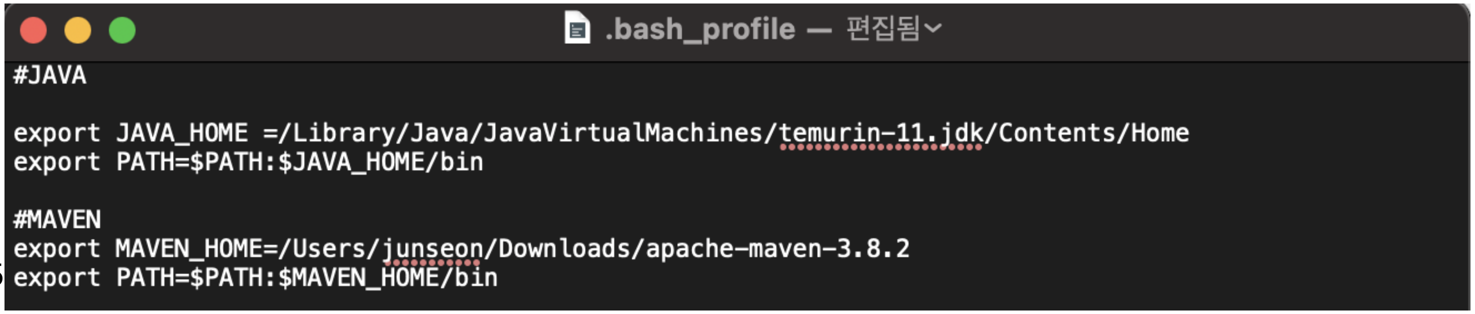
Maven installation (mac)

- Setting 'environmental variable'
  - Create a file for setting
    - touch .bash_profile
    - open .bash_profile
  - Set a maven downloaded path as "MAVEN_HOME"
  - Set PATH=$PATH:MAVEN_HOME/bin
  - Save environmental variables by 'cmd+s'



junseon — junseon@junseon-Mac — ~ — -zsh — 80×24

```
Last login: Fri Sep 10 15:21:50 on ttys001
(base) ➜  ~ open .bash_profile
(base) ➜  ~ 
```

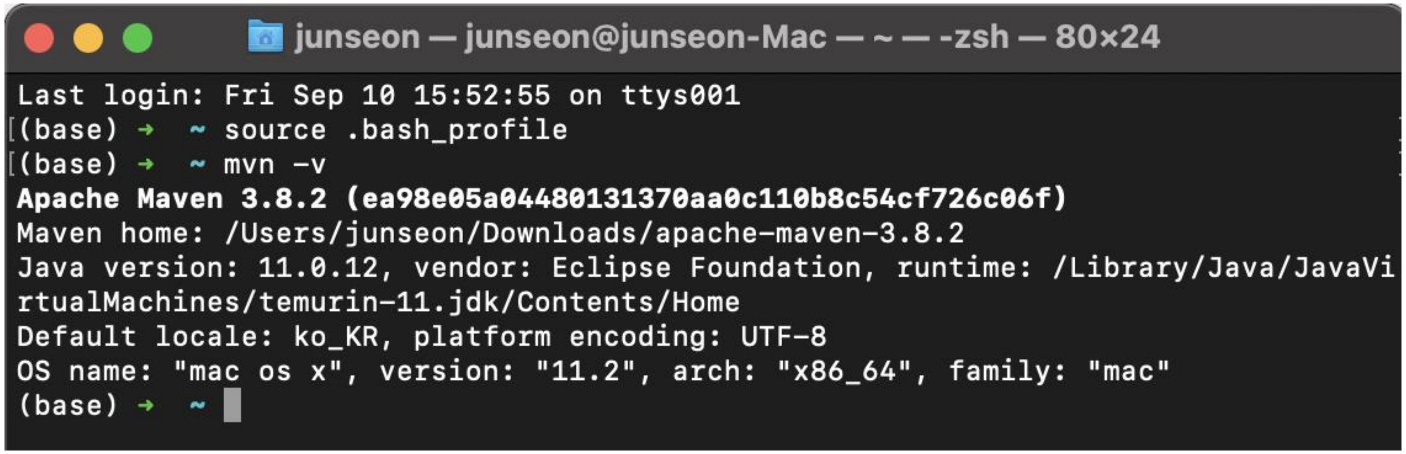


.bash_profile — 편집됨

```
#JAVA

export JAVA_HOME =/Library/Java/JavaVirtualMachines/temurin-11.jdk/Contents/Home
export PATH=$PATH:$JAVA_HOME/bin

#MAVEN
export MAVEN_HOME=/Users/junseon/Downloads/apache-maven-3.8.2
export PATH=$PATH:$MAVEN_HOME/bin
```

Maven installation (mac)

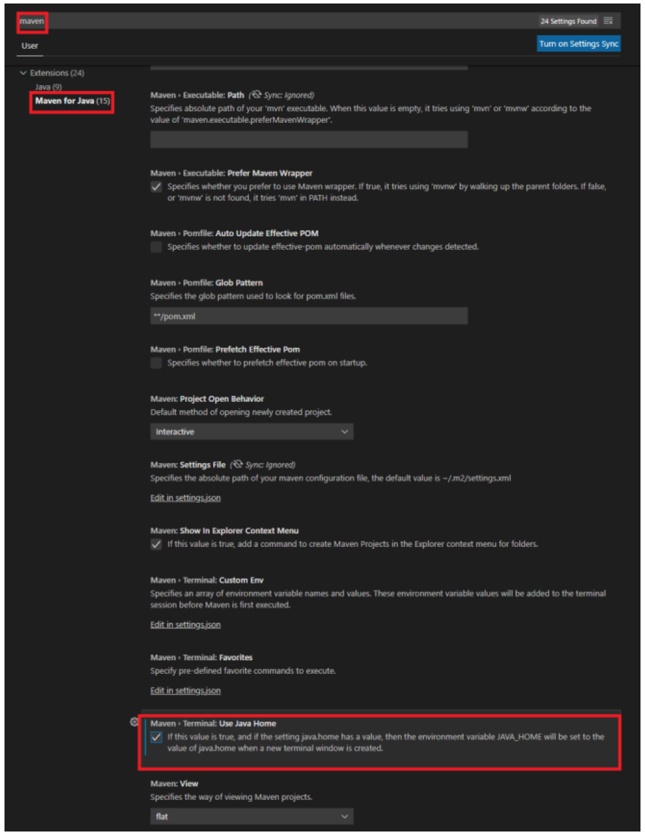
- 'source .bash_profile'
- Type ‘mvn –v‘ to check you download successfully



```
Last login: Fri Sep 10 15:52:55 on ttys001
(base) ➜  ~ source .bash_profile
(base) ➜  ~ mvn -v
Apache Maven 3.8.2 (ea98e05a04480131370aa0c110b8c54cf726c06f)
Maven home: /Users/junseon/Downloads/apache-maven-3.8.2
Java version: 11.0.12, vendor: Eclipse Foundation, runtime: /Library/Java/JavaVi
rtualMachines/temurin-11.jdk/Contents/Home
Default locale: ko_KR, platform encoding: UTF-8
OS name: "mac os x", version: "11.2", arch: "x86_64", family: "mac"
(base) ➜  ~ 
```

Create JDBC Project with vscode

- ‘Settings’- Search ’maven’ - ‘Maven for Java’ - Check ‘Maven>Terminal : User Java Home’



maven — 24 Settings Found

User — Turn on Settings Sync

Extensions (24)
Java (9)
Maven for Java (15)

Maven › Executable: **Path** (Sync: Ignored)
Specifies absolute path of your 'mvn' executable. When this value is empty, it tries using 'mvn' or 'mvnw' according to the value of 'maven.executable.preferMavenWrapper'.

Maven › Executable: **Prefer Maven Wrapper**
✓ Specifies whether you prefer to use Maven wrapper. If true, it tries using 'mvnw' by walking up the parent folders. If false, or 'mvnw' is not found, it tries 'mvn' in PATH instead.

Maven › Pomfile: **Auto Update Effective POM**
☐ Specifies whether to update effective-pom automatically whenever changes detected.

Maven › Pomfile: **Glob Pattern**
Specifies the glob pattern used to look for pom.xml files.
**/pom.xml

Maven › Pomfile: **Prefetch Effective Pom**
☐ Specifies whether to prefetch effective pom on startup.

Maven: **Project Open Behavior**
Default method of opening newly created project.
Interactive

Maven: **Settings File** (Sync: Ignored)
Specifies the absolute path of your maven configuration file, the default value is ~/.m2/settings.xml
Edit in settings.json

Maven: **Show In Explorer Context Menu**
✓ If this value is true, add a command to create Maven Projects in the Explorer context menu for folders.

Maven › Terminal: **Custom Env**
Specifies an array of environment variable names and values. These environment variable values will be added to the terminal session before Maven is first executed.
Edit in settings.json

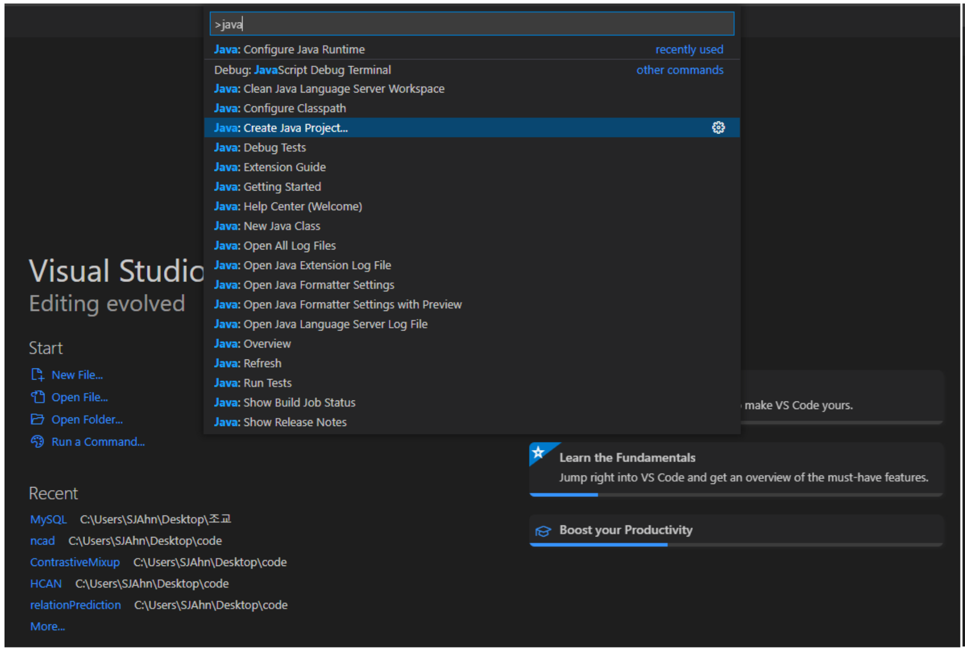
Maven › Terminal: **Favorites**
Specify pre-defined favorite commands to execute.
Edit in settings.json

Maven › Terminal: **Use Java Home**
✓ If this value is true, and if the setting java.home has a value, then the environment variable JAVA_HOME will be set to the value of java.home when a new terminal window is created.

Maven: **View**
Specifies the way of viewing Maven projects.
flat

Create JDBC Project with vscode (cont'd)

- Reopen vscode - Find ‘Java:Create Java Project’ - Maven – maven-archetype-quickstart’


>java

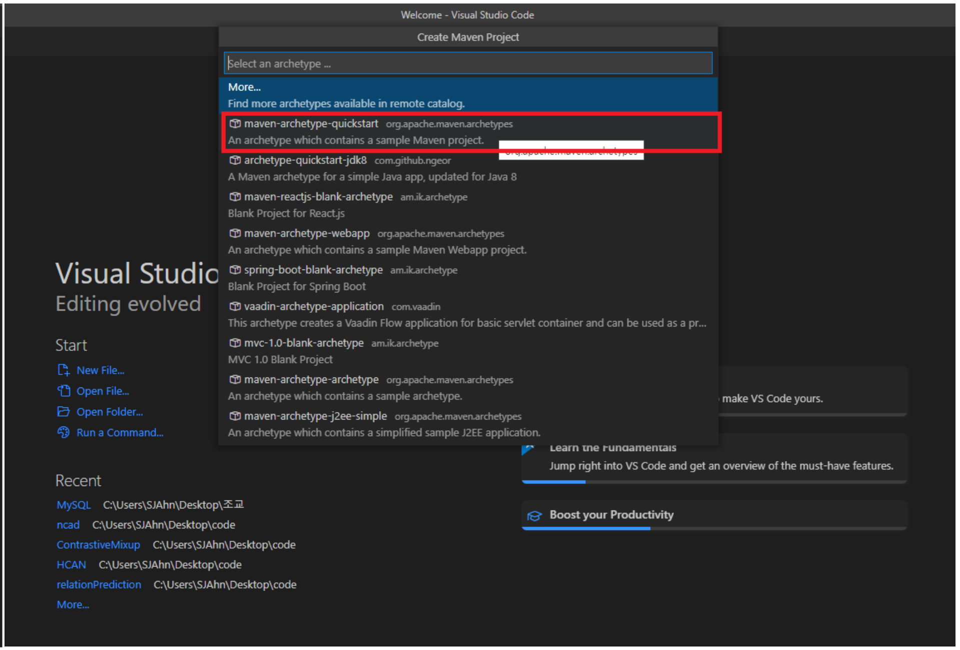
Java: Configure Java Runtime — recently used
Debug: JavaScript Debug Terminal — other commands
Java: Clean Java Language Server Workspace
Java: Configure Classpath
Java: Create Java Project...
Java: Debug Tests
Java: Extension Guide
Java: Getting Started
Java: Help Center (Welcome)
Java: New Java Class
Java: Open All Log Files
Java: Open Java Extension Log File
Java: Open Java Formatter Settings
Java: Open Java Formatter Settings with Preview
Java: Open Java Language Server Log File
Java: Overview
Java: Refresh
Java: Run Tests
Java: Show Build Job Status
Java: Show Release Notes

Visual Studio
Editing evolved

Start
New File...
Open File...
Open Folder...
Run a Command...

Recent
MySQL C:\Users\SJAhn\Desktop\조교
ncad C:\Users\SJAhn\Desktop\code
ContrastiveMixup C:\Users\SJAhn\Desktop\code
HCAN C:\Users\SJAhn\Desktop\code
relationPrediction C:\Users\SJAhn\Desktop\code
More...

make VS Code yours.
Learn the Fundamentals
Jump right into VS Code and get an overview of the must-have features.
Boost your Productivity


Welcome - Visual Studio Code

Create Maven Project

Select an archetype ...

More...
Find more archetypes available in remote catalog.

maven-archetype-quickstart org.apache.maven.archetypes
An archetype which contains a sample Maven project.

archetype-quickstart-jdk8 com.github.ngeor
A Maven archetype for a simple Java app, updated for Java 8

maven-reactjs-blank-archetype am.ik.archetype
Blank Project for React.js

maven-archetype-webapp org.apache.maven.archetypes
An archetype which contains a sample Maven Webapp project.

spring-boot-blank-archetype am.ik.archetype
Blank Project for Spring Boot

vaadin-archetype-application com.vaadin
This archetype creates a Vaadin Flow application for basic servlet container and can be used as a pr...

mvc-1.0-blank-archetype am.ik.archetype
MVC 1.0 Blank Project

maven-archetype-archetype org.apache.maven.archetypes
An archetype which contains a sample archetype.

maven-archetype-j2ee-simple org.apache.maven.archetypes
An archetype which contains a simplified sample J2EE application.

Visual Studio
Editing evolved

Start
New File...
Open File...
Open Folder...
Run a Command...

Recent
MySQL C:\Users\SJAhn\Desktop\조교
ncad C:\Users\SJAhn\Desktop\code
ContrastiveMixup C:\Users\SJAhn\Desktop\code
HCAN C:\Users\SJAhn\Desktop\code
relationPrediction C:\Users\SJAhn\Desktop\code
More...

make VS Code yours.
Learn the Fundamentals
Jump right into VS Code and get an overview of the must-have features.
Boost your Productivity

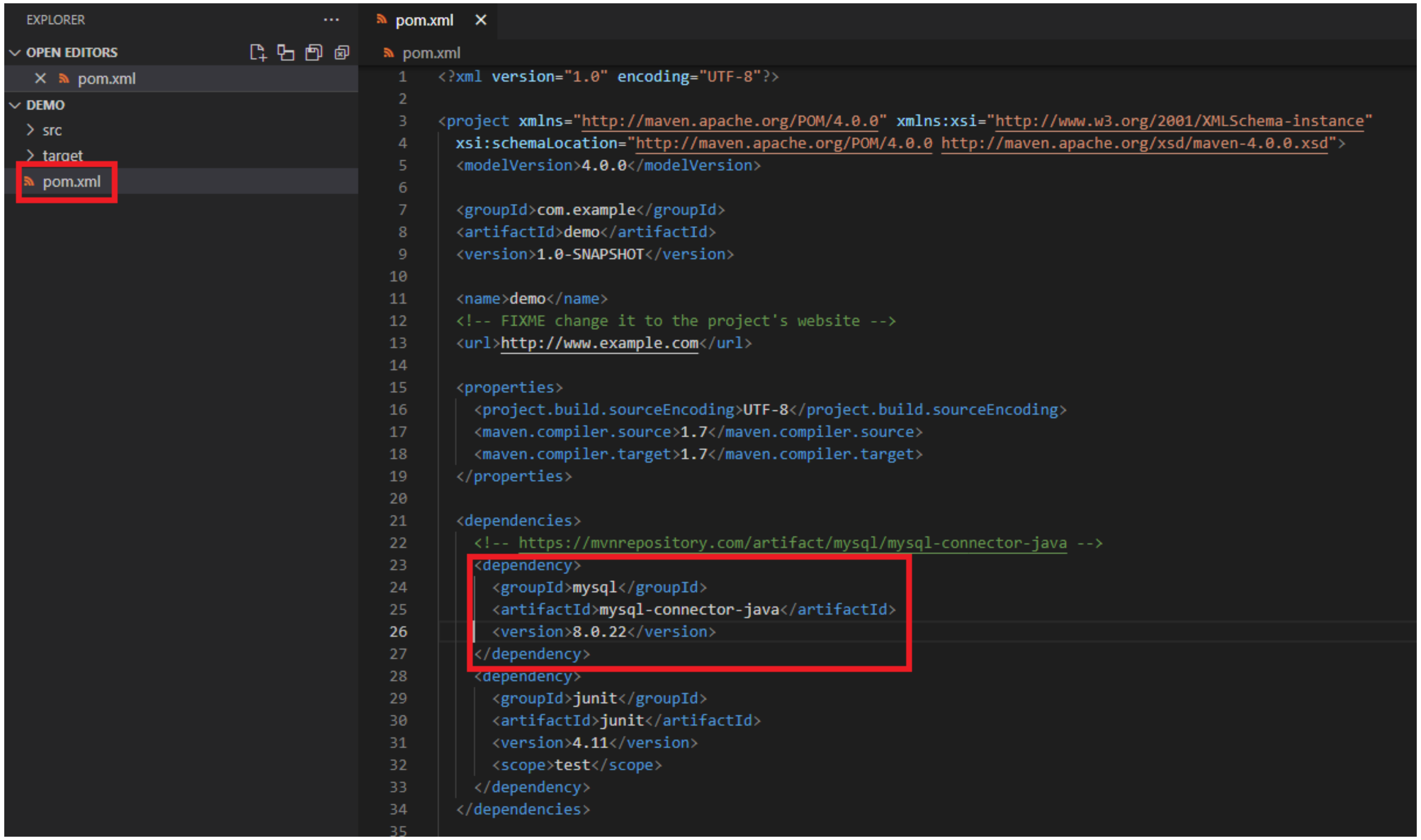
Create JDBC Project with vscode (cont'd)

- Setting dependency
  - Add following codes to <dependencies> of ‘pom.xml’ file
  - <dependency>

```
  <groupId>mysql</groupId>
  <artifactId>mysql-connector-java</artifactId>
  <version>8.0.22</version>
</dependency>
```

Create JDBC Project with vscode (cont'd)

- Setting dependency (cont'd)



```xml
<?xml version="1.0" encoding="UTF-8"?>

<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>

  <groupId>com.example</groupId>
  <artifactId>demo</artifactId>
  <version>1.0-SNAPSHOT</version>

  <name>demo</name>
  <!-- FIXME change it to the project's website -->
  <url>http://www.example.com</url>

  <properties>
    <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
    <maven.compiler.source>1.7</maven.compiler.source>
    <maven.compiler.target>1.7</maven.compiler.target>
  </properties>

  <dependencies>
    <!-- https://mvnrepository.com/artifact/mysql/mysql-connector-java -->
    <dependency>
      <groupId>mysql</groupId>
      <artifactId>mysql-connector-java</artifactId>
      <version>8.0.22</version>
    </dependency>
    <dependency>
      <groupId>junit</groupId>
      <artifactId>junit</artifactId>
      <version>4.11</version>
      <scope>test</scope>
    </dependency>
  </dependencies>
```

Assignment #2

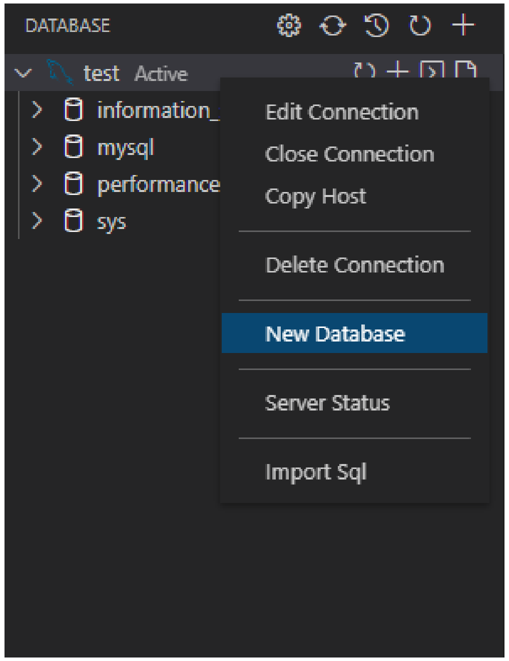
1. Rules
2. Setup for Assignment
3. Assignment

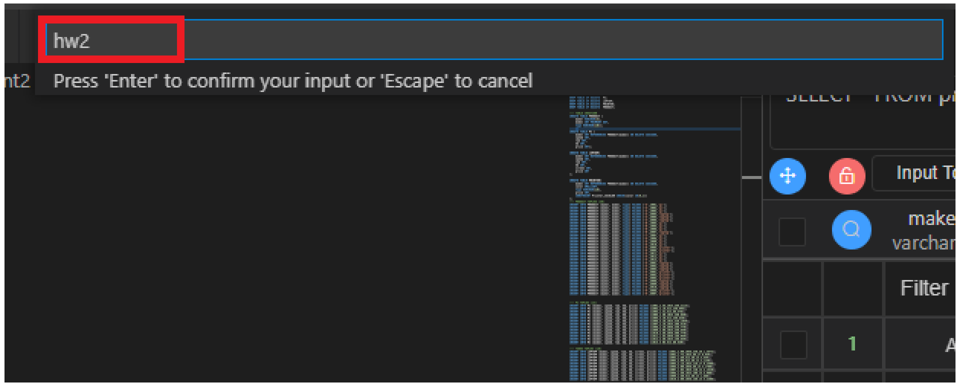
Rules

- **Due**
  - Oct 6, (~23:59) (Delay is not accepted)
- **Submission standard**
  - You should submit a *[cs360_hw2_student ID].zip* file that contains a *App.java* file
  - You can either modify a skeleton code we provided on KLMS or make a new App.java file.
  - Upload the .zip file to the course homepage
- **Evaluation**
  - Each question contributes equally to the score
  - Do not cheat others. Both of them will get no point.

Setup

1. Make ‘hw2’ database in vscode



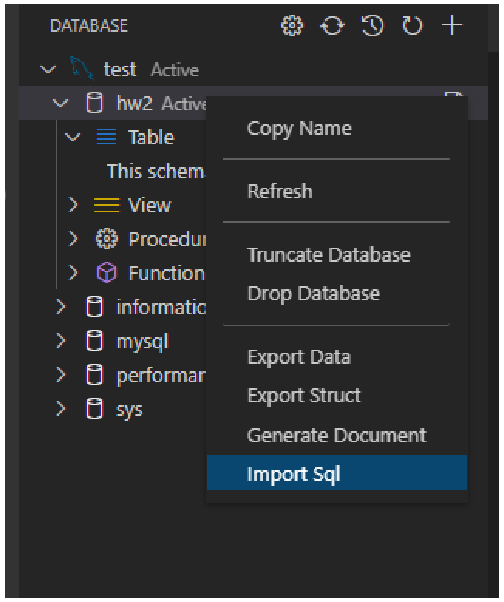


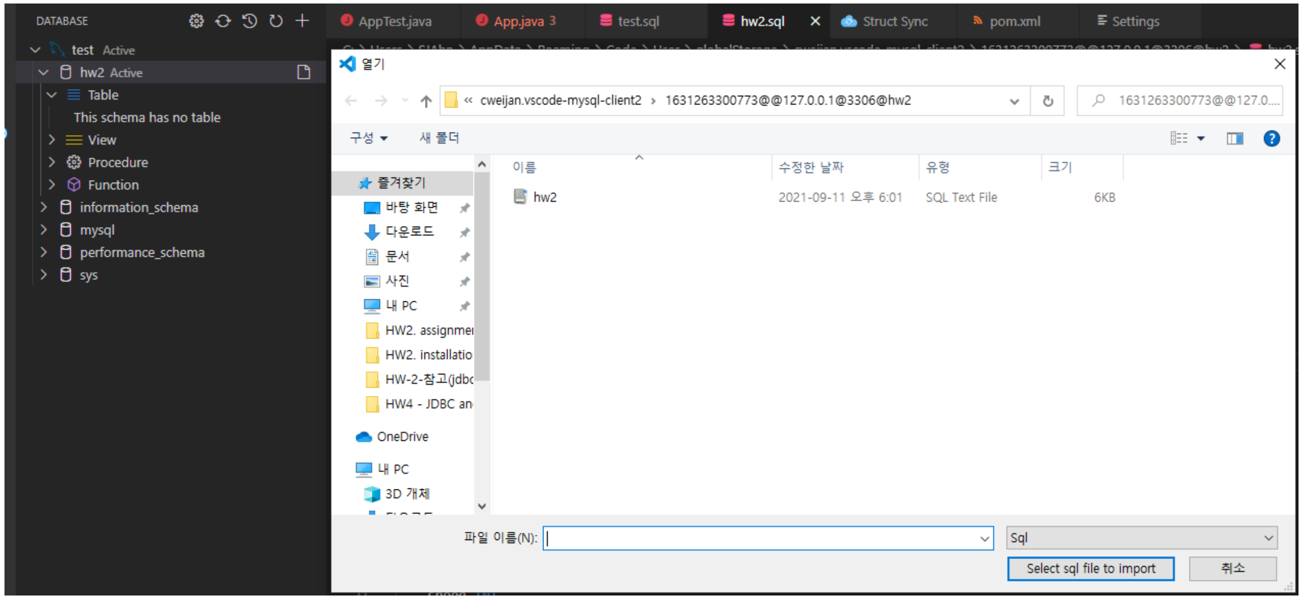
hw2

Press 'Enter' to confirm your input or 'Escape' to cancel

Setup (cont'd)

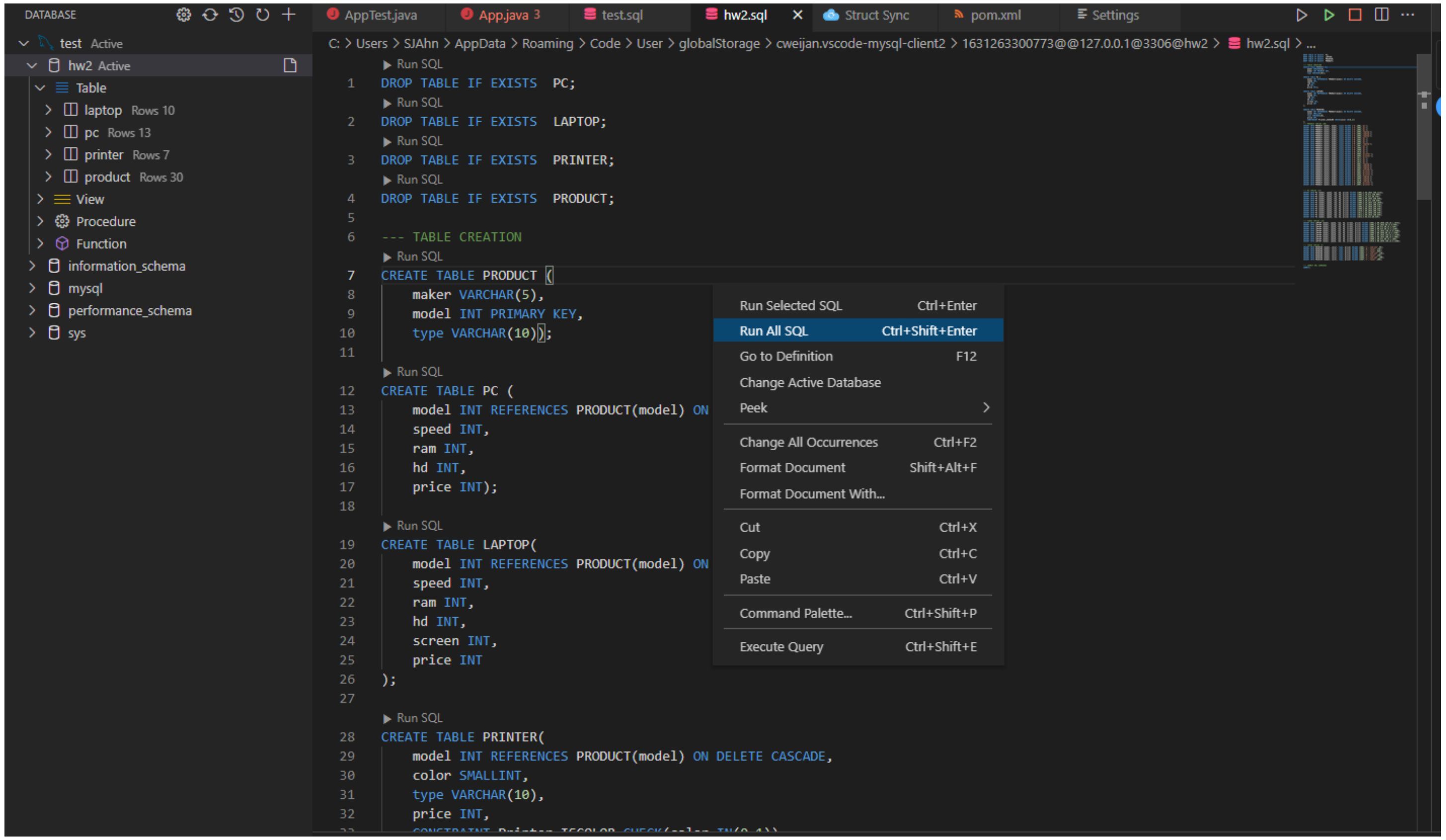
2. Download *hw2.sql* from the course homepage
3. Import hw2.sql.





Setup (cont'd)

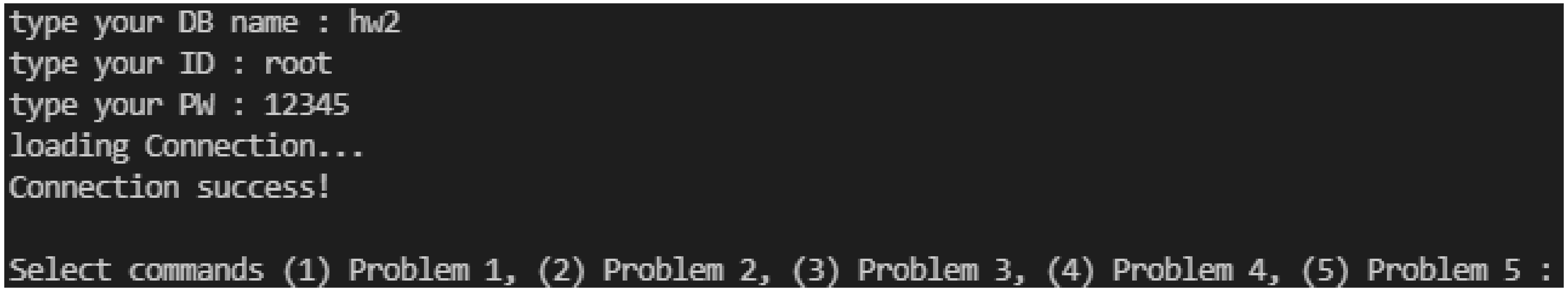
4. Run the *hw2.sql* file


DATABASE
test Active
hw2 Active
Table
laptop Rows 10
pc Rows 13
printer Rows 7
product Rows 30
View
Procedure
Function
information_schema
mysql
performance_schema
sys
AppTest.java
App.java 3
test.sql
hw2.sql
Struct Sync
pom.xml
Settings
C: > Users > SJAhn > AppData > Roaming > Code > User > globalStorage > cweijan.vscode-mysql-client2 > 1631263300773@@127.0.0.1@3306@hw2 > hw2.sql > ...
Run Selected SQL Ctrl+Enter
Run All SQL Ctrl+Shift+Enter
Go to Definition F12
Change Active Database
Peek
Change All Occurrences Ctrl+F2
Format Document Shift+Alt+F
Format Document With...
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Command Palette... Ctrl+Shift+P
Execute Query Ctrl+Shift+E

```
▶ Run SQL
DROP TABLE IF EXISTS  PC;
▶ Run SQL
DROP TABLE IF EXISTS  LAPTOP;
▶ Run SQL
DROP TABLE IF EXISTS  PRINTER;
▶ Run SQL
DROP TABLE IF EXISTS  PRODUCT;

--- TABLE CREATION
▶ Run SQL
CREATE TABLE PRODUCT (
    maker VARCHAR(5),
    model INT PRIMARY KEY,
    type VARCHAR(10));

▶ Run SQL
CREATE TABLE PC (
    model INT REFERENCES PRODUCT(model) ON
    speed INT,
    ram INT,
    hd INT,
    price INT);

▶ Run SQL
CREATE TABLE LAPTOP(
    model INT REFERENCES PRODUCT(model) ON
    speed INT,
    ram INT,
    hd INT,
    screen INT,
    price INT
);

▶ Run SQL
CREATE TABLE PRINTER(
    model INT REFERENCES PRODUCT(model) ON DELETE CASCADE,
    color SMALLINT,
    type VARCHAR(10),
    price INT,
```

Setup (cont'd)

5. Connect to hw2 database by running the given skeleton code.



```
type your DB name : hw2
type your ID : root
type your PW : 12345
loading Connection...
Connection success!

Select commands (1) Problem 1, (2) Problem 2, (3) Problem 3, (4) Problem 4, (5) Problem 5 :
```

HW2 Database

- Design of Database

PRODUCT	maker	<u>model</u>	type
	A	1001	pc
	A	1002	pc
	...		

PC	<u>model</u>	speed	ram	hd	price
	1001	2.66	1024	250	2114
	1002	2.10	512	250	995
	...				

LAPTOP	<u>model</u>	speed	ram	hd	screen	price
	2001	2.00	2048	240	20.1	3673
	2002	1.73	1024	80	17.0	949
	...					

PRINTER	<u>model</u>	color	type	price
	3001	1	ink-jet	99
	3002	0	laser	239
	...			

Assignment #2

- Problem 1
  - Ask the user for the maximum price and minimum values of the speed, RAM, hard disk, and screen size that they will accept. Find all the laptops that satisfy these requirements. Print their specifications (all attributes of Laptop) and their manufacturer.

Assignment #2 (cont'd)

- Problem 2.
  - Ask the user for a manufacturer, model number, speed, RAM, hard-disk size, and price of a new PC. Check that there is no PC with that model number. Print a warning if so, and otherwise insert the information into tables Product and PC. And then print Product and PC tables

Assignment #2 (cont'd)

- Problem 3.
  - Ask the user for a price and find the PC whose price is closest to the desired price. Print the maker, model number, and RAM of the PC

Assignment #2 (cont'd)

- Problem 4.
  - Ask the user for a manufacturer. Print the specifications of all products by that manufacturer. That is, print the model number, product-type, and all the attributes of whichever relation is appropriate for that type.
  - For example,
    - » Print model, speed, ram, hd, screen and price for laptops
    - » Print model, color, type and price for printers

Assignment #2 (cont'd)

- Problem 5.
  - Ask the user for a "budget" (total price of a PC and printer), and a minimum speed of the PC. Find the cheapest "system" (PC plus printer) that is within the budget and minimum speed, but make the printer a color printer if possible. Print the model numbers for the chosen system.