Using VanillaDB

Database Systems
DataLab, CS, NTHU
Spring, 2025

VanillaDB

Simple, fast, and extensible database system prototypes.

Projects

- There are 3 projects in VanillaDB

  - Single-server DBMS: VanillaCore

  - Benchmarking: VanillaBench

  - Communication module for distributed DBMSs: VanillaComm

Outline

- VanillaCore

  - Prepare Everything You Need

  - Server Properties

  - Starting Up VanillaCore
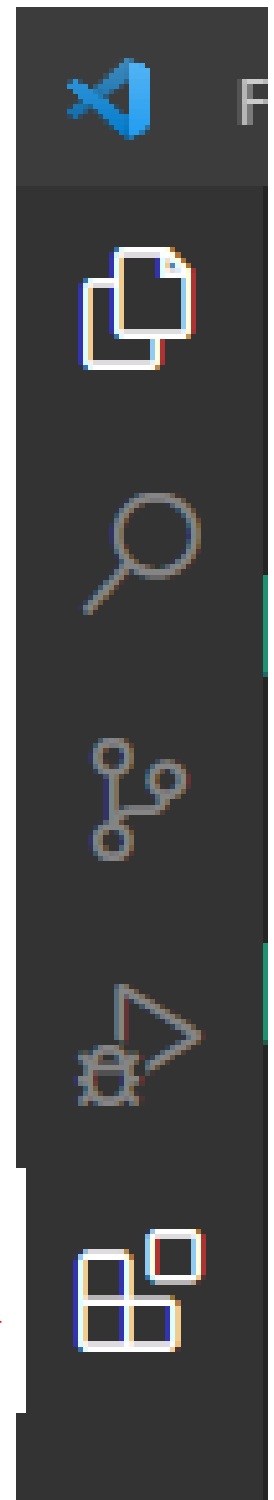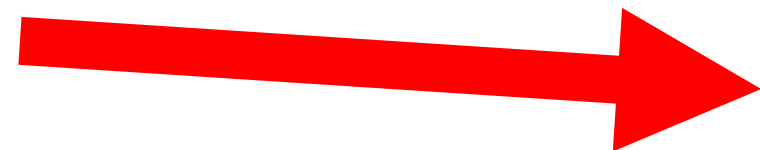
  - Console SQL Interpreter

Outline

- VanillaCore

  - **Prepare Everything You Need**

  - Server Properties

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Setting Up Environment

- JDK 17

  - https://www.oracle.com/java/technologies/javase/jdk17-archive-downloads.html

- VS Code

  - https://code.visualstudio.com/
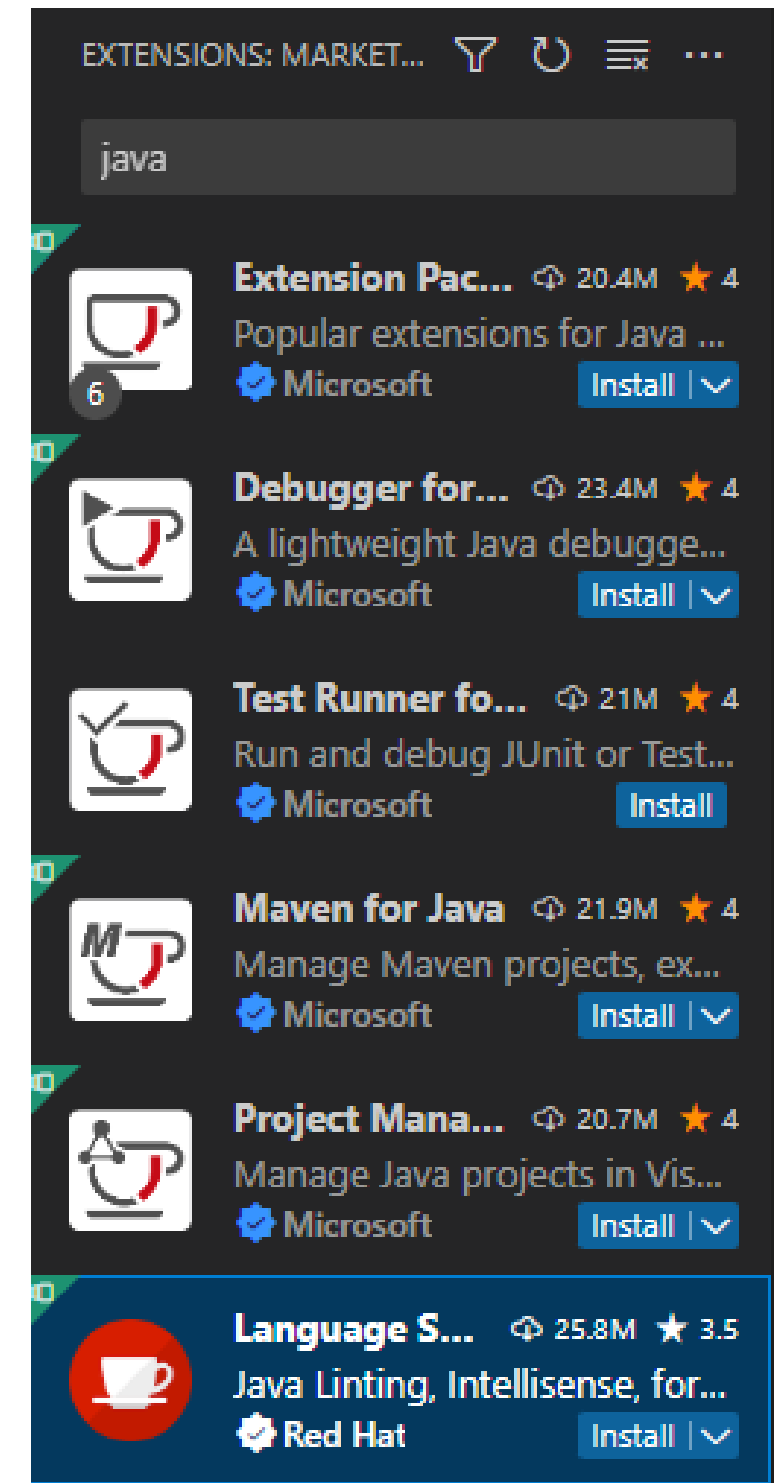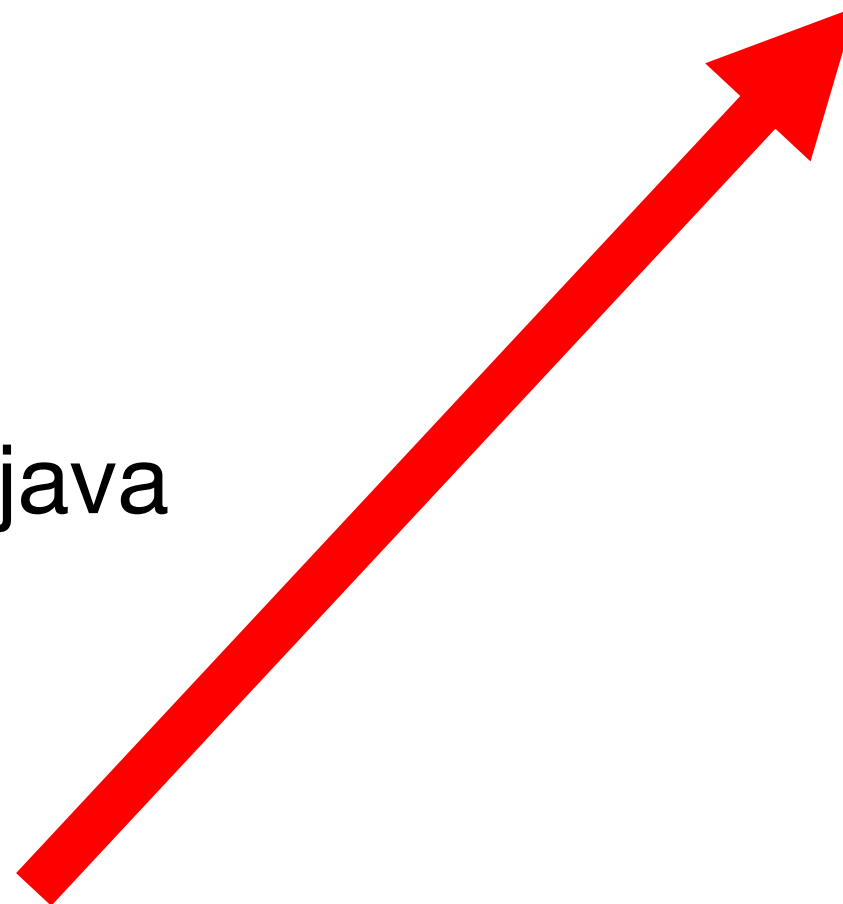
Setting Up Environment

- VS Code

  - First open VScode and go to market

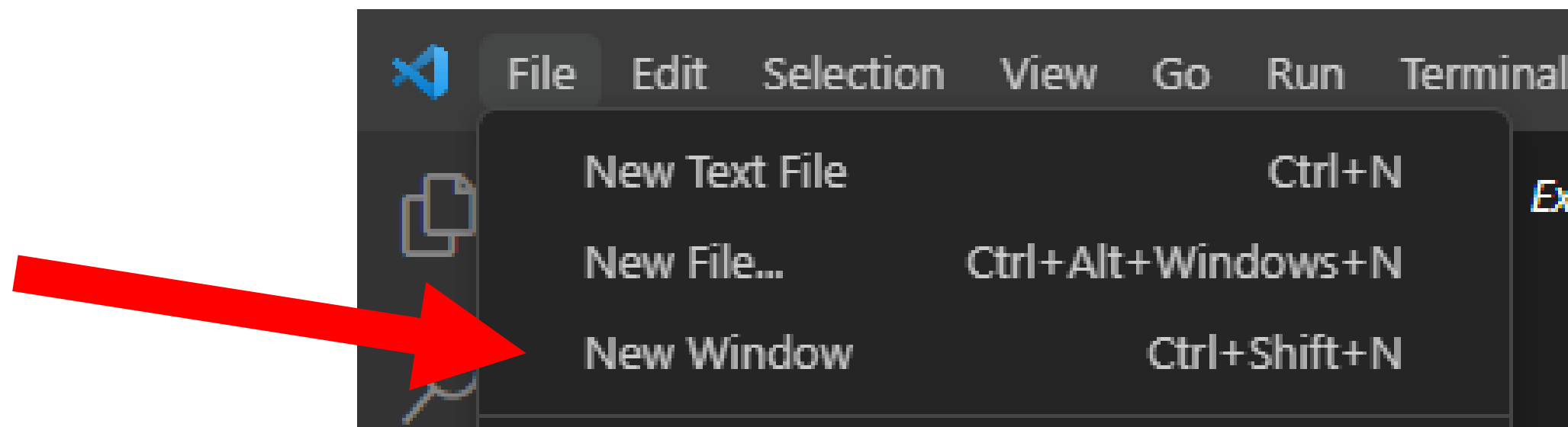# Setting Up Environment

- VS Code

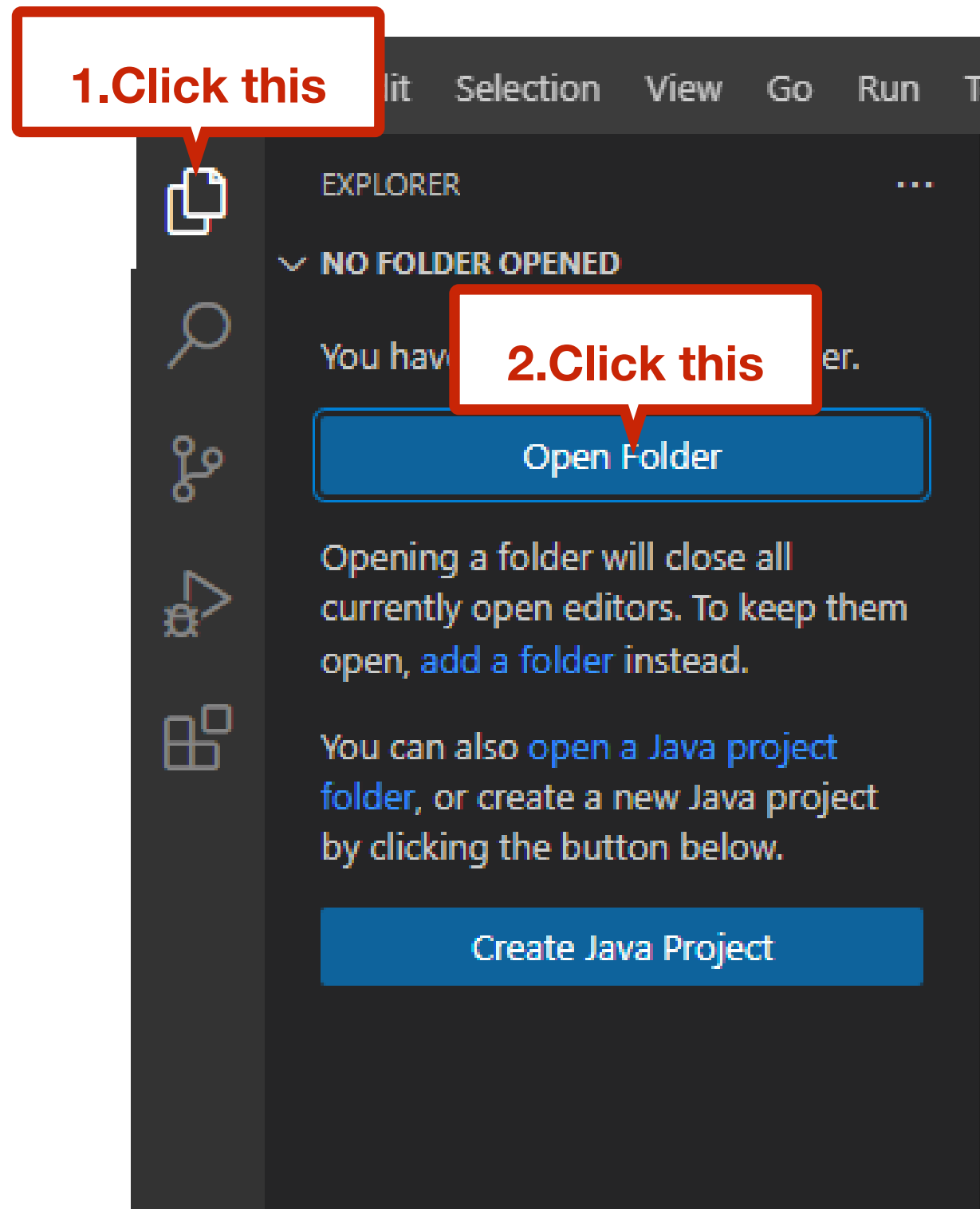 - search for java

install all of these

Setting Up Environment

- VS Code

  - when installation completed,open a new window and stand by.
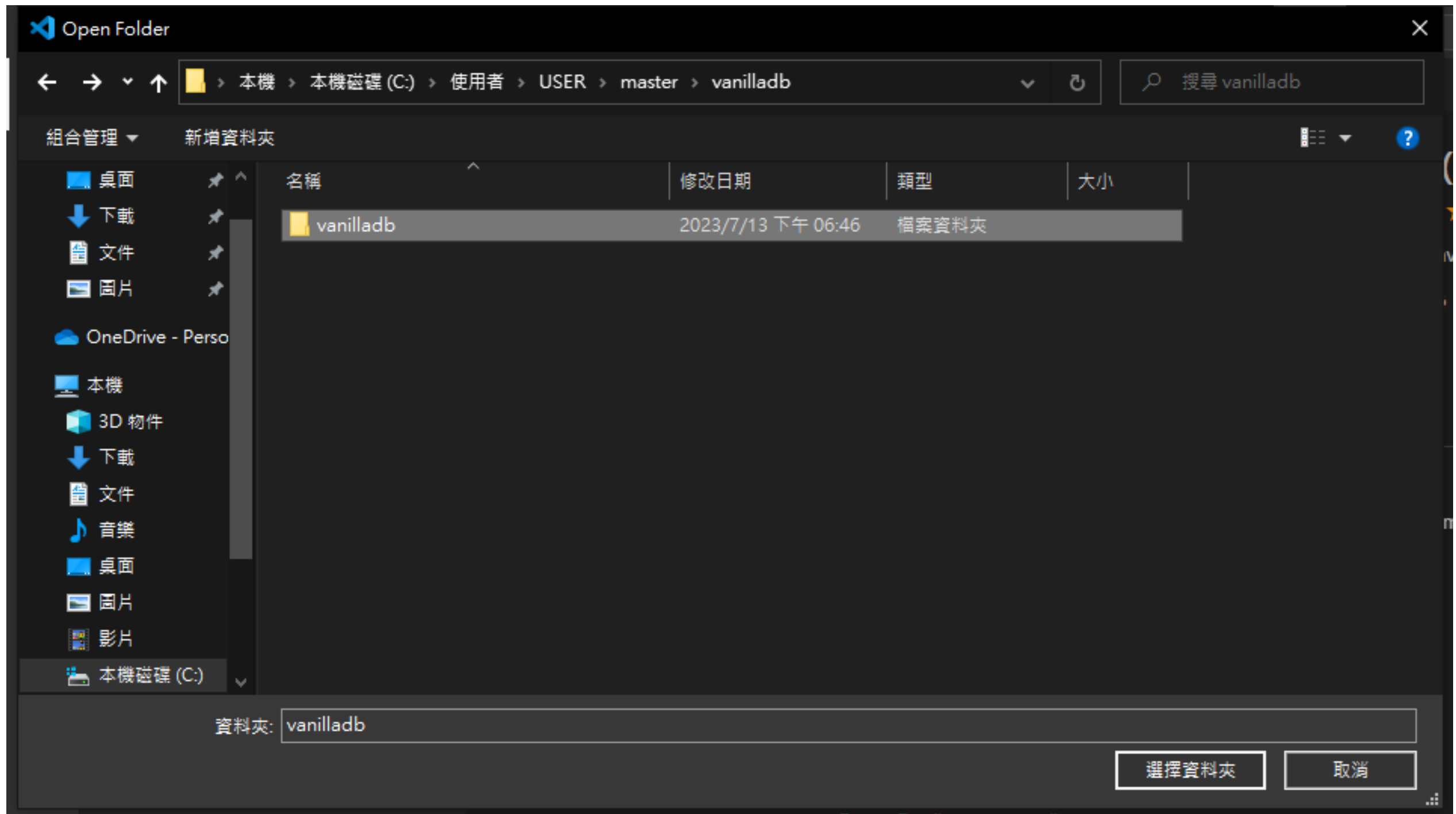
Downloading The Project

- Clone VanillaDB here

  - https://shwu10.cs.nthu.edu.tw/courses/databases/2025-spring/vanilladb

How to Import VanillaCore

Choose vanilladb to be your workspace

Open Folder   ✕

← → ∨ ↑ | 📁 > 本機 > 本機磁碟 (C:) > 使用者 > USER > master > vanilladb   ∨ ⟳ | 🔍 搜尋 vanilladb

組合管理 ▾   新增資料夾   ▤ ▾   ❓

📺 桌面   📌 ⌃   名稱   ^   修改日期   類型   大小
⬇ 下載   📌   📁 vanilladb   2023/7/13 下午 06:46   檔案資料夾
📄 文件   📌
🖼 圖片   📌

☁ OneDrive - Perso

💻 本機
🗂 3D 物件
⬇ 下載
📄 文件
🎵 音樂
📺 桌面
🖼 圖片
🎞 影片
💽 本機磁碟 (C:)   ∨

            資料夾: vanilladb

                                                              選擇資料夾   取消

Do not select 'core-patch' as the workspace!
choose 'vanilladb' where core-patch is inside!

Done
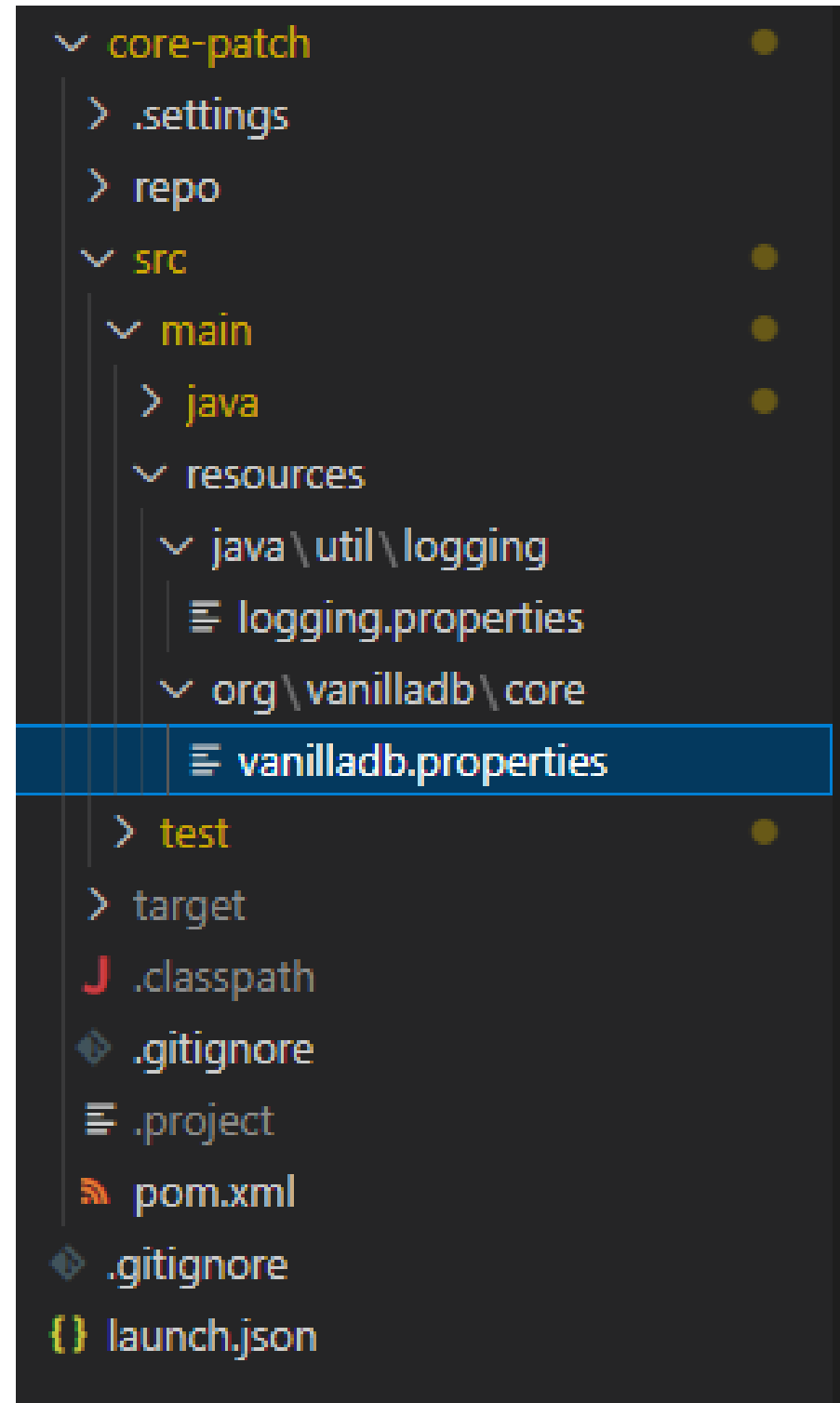
Outline
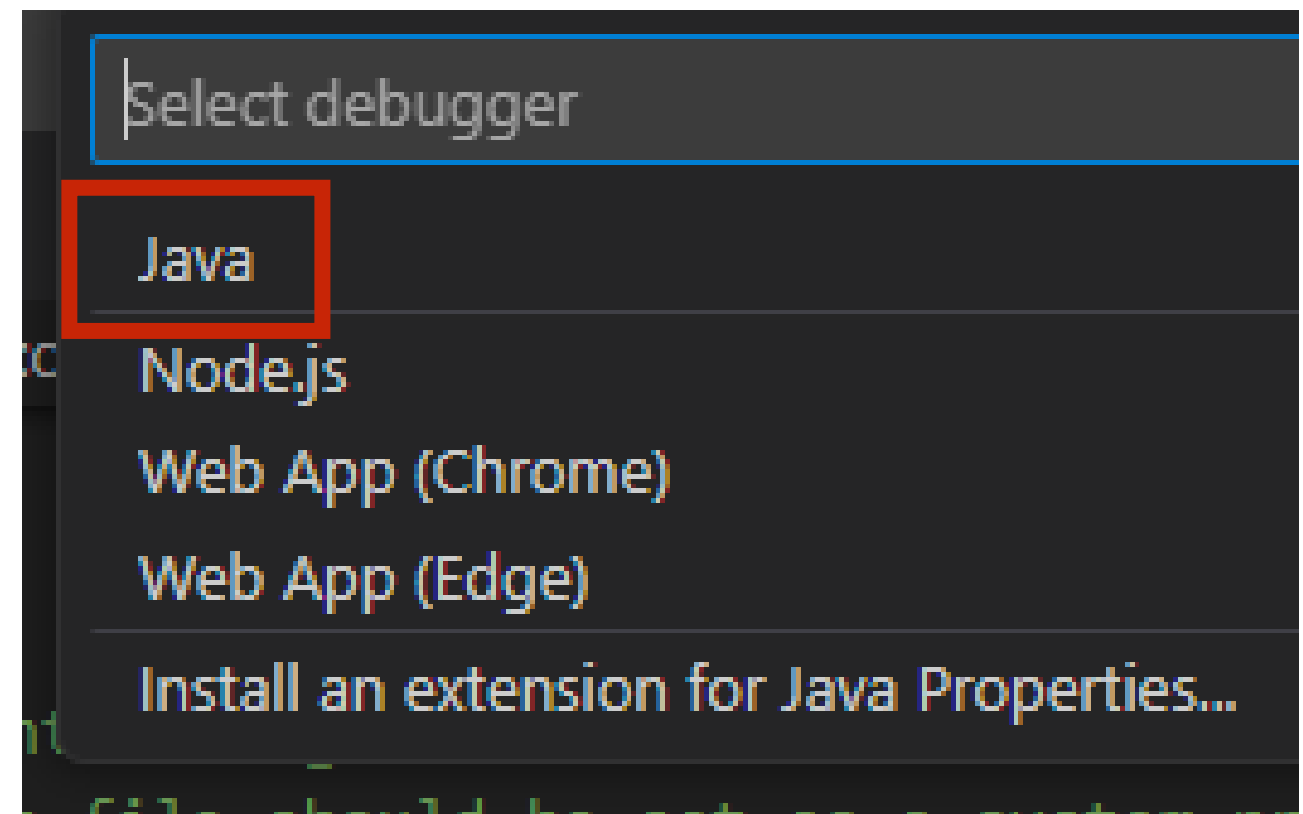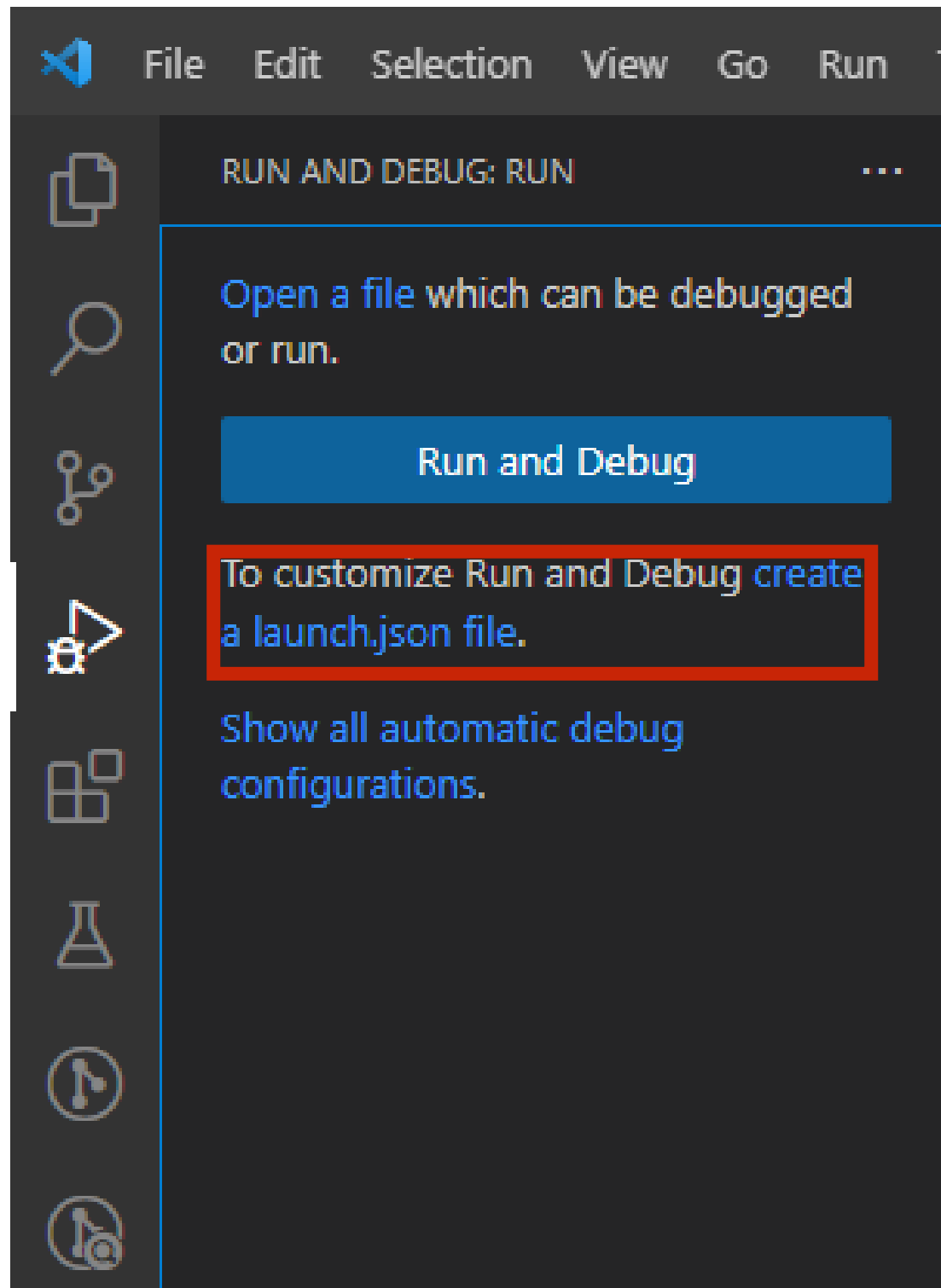
- VanillaCore

  - Prepare Everything You Need

  - Server Properties

  - Starting Up VanillaCore

  - Console SQL Interpreter

VanillaCore Properties File

- Configurations for VanillaCore are all stored in a properties file

VanillaCore Properties

vanilladb.properties

```
vanilladb.properties  ✕

core-patch > src > main > resources > org > vanilladb > core > ☰ vanilladb.properties
24
25
26    #
27    # File package settings
28    #
29
30    # The number of bytes in a block.  A common value is 4K.
31    org.vanilladb.core.storage.file.Page.BLOCK_SIZE=4096
32    # The parent directory of database files.
33    org.vanilladb.core.storage.file.FileMgr.DB_FILES_DIR=
34    # The directory of log files.
35    org.vanilladb.core.storage.file.FileMgr.LOG_FILES_DIR=
36    org.vanilladb.core.storage.file.io.IoAllocator.USE_O_DIRECT=false
37
38
39    #
40    # Buffer package settings
41    #
42
43    # The maximum waiting time for pinning a buffer. Original value is 10 seconds.
44    org.vanilladb.core.storage.buffer.BufferMgr.MAX_TIME=10000
45    # The epsilon value for tuning waiting time.
46    org.vanilladb.core.storage.buffer.BufferMgr.EPSILON=50
47    # The size of buffer pool.
48    org.vanilladb.core.storage.buffer.BufferMgr.BUFFER_POOL_SIZE=1024
49
50
51    #
52    # Log package settings
53    #
54
55    # The name of vanilladb's log file.
56    org.vanilladb.core.storage.log.LogMgr.LOG_FILE=vanilladb.log
57
58
59    #
60    # Concurrency package settings
61    #
62
63    # The maximum waiting time for lock. Original value is 10 seconds.
64    org.vanilladb.core.storage.tx.concurrency.LockTable.MAX_TIME=10000
65    # The epsilon value for tuning waiting time.
66    org.vanilladb.core.storage.tx.concurrency.LockTable.EPSILON=50
67
```

vanilladb.properties

```
#
# File package settings
#

# The number of bytes in a block.  A common value is 4K.
org.vanilladb.core.storage.file.Page.BLOCK_SIZE=4096
# The parent directory of database files.
org.vanilladb.core.storage.file.FileMgr.DB_FILES_DIR=
# The directory of log files.
org.vanilladb.core.storage.file.FileMgr.LOG_FILES_DIR=
org.vanilladb.core.storage.file.io.IoAllocator.USE_O_DIRECT=false
```

Example of windows path:
C:\\Users\\XXXX\\Downloads\\vanilladb

- Your DataBase files will be stored in this directory

- If it is empty, the Default directory would be your User directory

Outline

- VanillaCore

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  - Server Properties

- **Starting Up VanillaCore**

  - Console SQL Interpreter

Starting Up VanillaCore

- To start up a VanillaCore server, we have to give it the following arguments

  - Database Directory Name

  - The locations of properties files
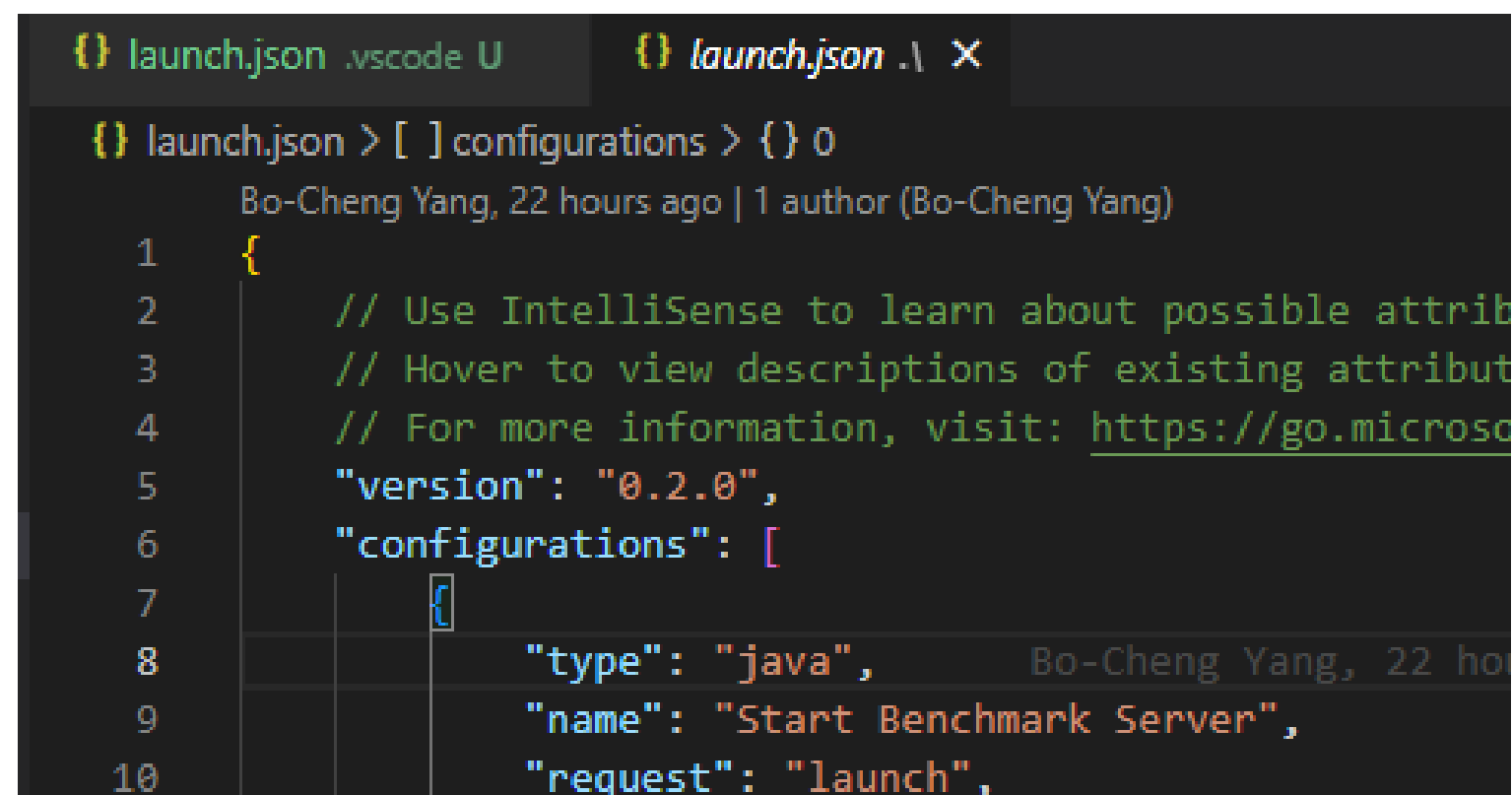
[Icon Source]

Setting Run Configuration

EXPLORER

∨ TEST

> .metadata
∨ .vscode
{} launch.json   U
> bench
∨ core-patch
  > .settings
  > repo
  ∨ src
    ∨ main
      > java
      ∨ resources
        ∨ java\util\logging
          ≡ logging.properties
        ∨ org\vanilladb\core
          ≡ vanilladb.properties
    > test
  > target
  classpath

{} launch.json U ✕

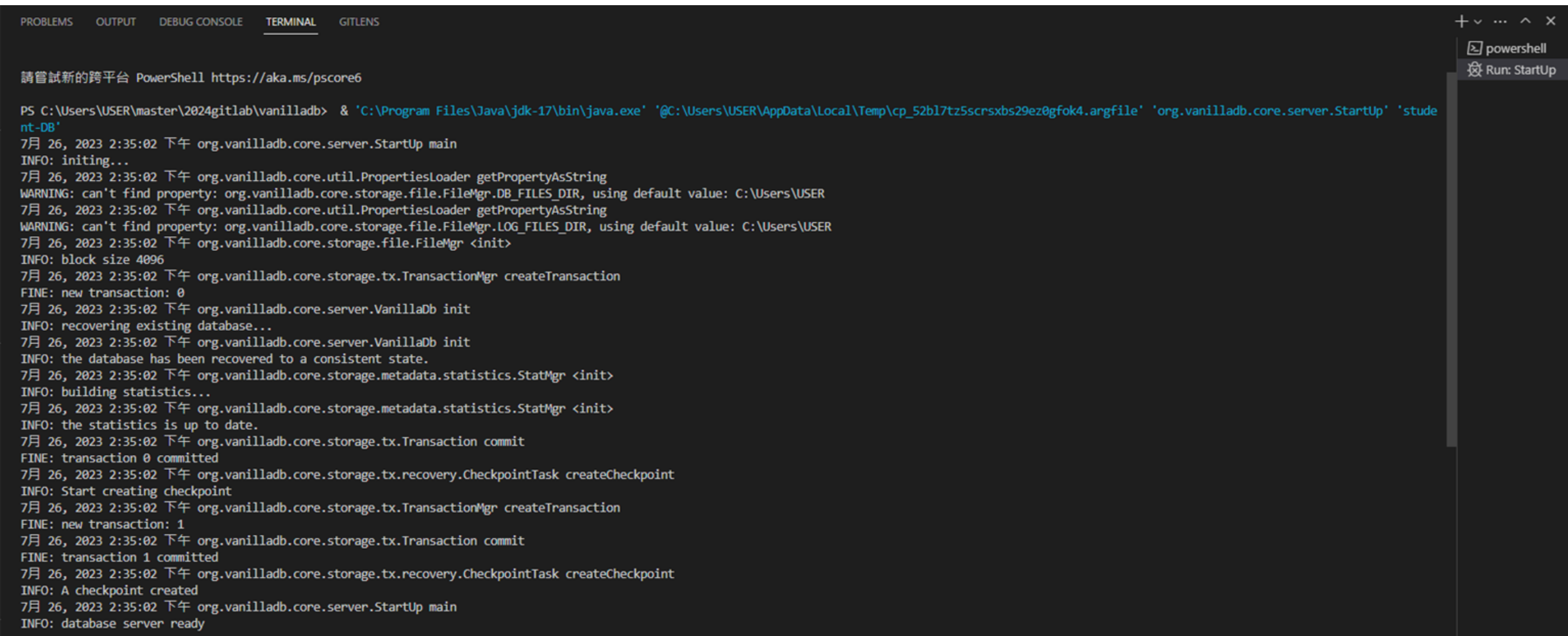.vscode > {} launch.json > [ ] configurations > {} 0

```json
1   {
2       // Use IntelliSense to learn about possible attributes.
3       // Hover to view descriptions of existing attributes.
4       // For more information, visit: https://go.microsoft.com/fwlink/?linkid=830387
5       "version": "0.2.0",
6       "configurations": [
7           {
8               "type": "java",
9               "name": "Current File",
10              "request": "launch",
11              "mainClass": "${file}"
12          },
13          {
14              "type": "java",
15              "name": "App",
16              "request": "launch",
17              "mainClass": "org.vanilladb.bench.App",
18              "projectName": "bench"
19          },
20          {
```

auto generated content

core-patch

.gitignore

{} launch.json

open our launch.json

{} launch.json .vscode U   {} *launch.json* .\ ✕

{} launch.json > [ ] configurations > {} 0

Bo-Cheng Yang, 22 hours ago | 1 author (Bo-Cheng Yang)

```
 1  {
 2      // Use IntelliSense to learn about possible attrib
 3      // Hover to view descriptions of existing attribut
 4      // For more information, visit: https://go.microso
 5      "version": "0.2.0",
 6      "configurations": [
 7          {
 8              "type": "java",          Bo-Cheng Yang, 22 ho
 9              "name": "Start Benchmark Server",
10              "request": "launch",
```

copy our content to your launch.json

Arguments (1/2)

- Program Arguments

  - Format

    ```
    [Database Directory Name]
    ```

  - Example

    ```
    student-db
    ```

Arguments (2/2)

- VM Arguments

  - For logging properties

```
-Djava.util.logging.config.file=target/classes/java/util/logging/logging.properties
```

  - For VanillaCore properties

```
-Dorg.vanilladb.core.config.file=target/classes/org/vanilladb/core/vanilladb.properties
```

```json
{} launch.json U ✕

.vscode > {} launch.json > ...
1    {
2        // Use IntelliSense to learn about possible attributes.
3        // Hover to view descriptions of existing attributes.
4        // For more information, visit: https://go.microsoft.com/fwlink/?linkid=830387
5        "version": "0.2.0",
6        "configurations": [
7            {
8                "type": "java",
9                "name": "Start Core Server",
10               "request": "launch",
11               "mainClass": "org.vanilladb.core.server.StartUp",
12               "projectName": "core-patch",
13               "args": "student-db",
14               "vmArgs": "-Djava.util.logging.config.file=target/classes/java/util/logging/logging.properties -Dorg
15           },
16           {
17               "type": "java",
18               "name": "ConsoleSQLInterpreter",
19               "request": "launch",
20               "mainClass": "org.vanilladb.core.util.ConsoleSQLInterpreter",
21               "projectName": "core-patch"
22           }
23       ]
24   }
```

You can copy those arguments from
[here](),
then hit 'Apply' and 'Run'

select startup and run without debugging!

Server Messages (1/3)

You should see this if there is nothing wrong.

Server Messages (2/3)


```
Problems   @ Javadoc   Declaration   Console ⅋
VanillaDB_Start [Java Application] /Library/Java/JavaVirtualMachines/jdk1.7.0_45.jdk/Contents/Home/bin/java (2016年2月24日 下午9:53:15)
二月 24, 2016 9:53:15 下午 org.vanilladb.core.server.StartUp main
資訊: initing...
二月 24, 2016 9:53:15 下午 org.vanilladb.core.util.PropertiesLoader <init>
警告: error reading the config file: null, using defaults
二月 24, 2016 9:53:15 下午 org.vanilladb.core.util.PropertiesLoader getPropertyAsClass
警告: can't find property: org.vanilladb.core.server.VanillaDb.QUERYPLANNER, using default value: class org.vanilladb.core.query.planner.opt
二月 24, 2016 9:53:15 下午 org.vanilladb.core.util.PropertiesLoader getPropertyAsClass
警告: can't find property: org.vanilladb.core.server.VanillaDb.UPDATEPLANNER, using default value: class org.vanilladb.core.query.planner.in
二月 24, 2016 9:53:15 下午 org.vanilladb.core.util.PropertiesLoader getPropertyAsString
警告: can't find property: org.vanilladb.core.storage.file.FileMgr.DB_FILES_DIR, using default value: /Users/SISQUAKE
二月 24, 2016 9:53:15 下午 org.vanilladb.core.util.PropertiesLoader getPropertyAsString
警告: can't find property: org.vanilladb.core.storage.file.FileMgr.LOG_FILES_DIR, using default value: /Users/SISQUAKE
二月 24, 2016 9:53:15 下午 org.vanilladb.core.util.PropertiesLoader getPropertyAsInteger
警告: can't find property: org.vanilladb.core.storage.file.Page.BLOCK_SIZE, using default value: 4096
二月 24, 2016 9:53:15 下午 org.vanilladb.core.storage.file.FileMgr <init>
資訊: block size 4096
二月 24, 2016 9:53:15 下午 org.vanilladb.core.util.PropertiesLoader getPropertyAsString
警告: can't find property: org.vanilladb.core.storage.log.LogMgr.LOG_FILE, using default value: vanilladb.log
```

If you saw any 'Warning' message,
you should check it carefully.

Server Messages (3/3)

- "error reading config file, using default "

  - It usually happens when you give a wrong location for a config file

- "can't find property: …., using default: …"

  - It means that there is a property missing in your config file

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- Console SQL Interpreter

Console SQL Interpreter

- You can use Console SQL Interpreter we provide in VanillaCore to connect with server

Console SQL Interpreter

- To use Console SQL Interpreter, just follow these steps
- 1.run server first!(mention above)
- 2.select "ConsoleSQLInterpreter"
- 3.run without debugging!
- 4.done

RUN AN... ▷ ConsoleSC ∨ ⚙ ⋯

Start Core Server

ConsoleSQLInterpreter

Node.js...

Add Configuration...

∨ VARIABLES
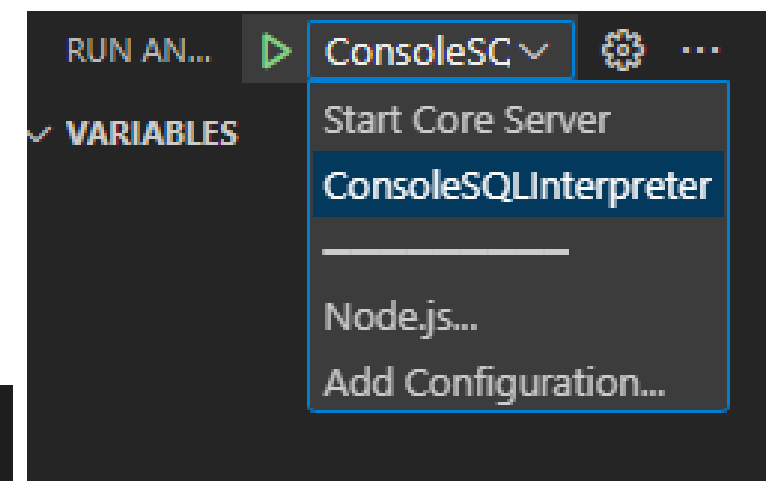
PROBLEMS   OUTPUT   DEBUG CONSOLE   **TERMINAL**   GITLENS
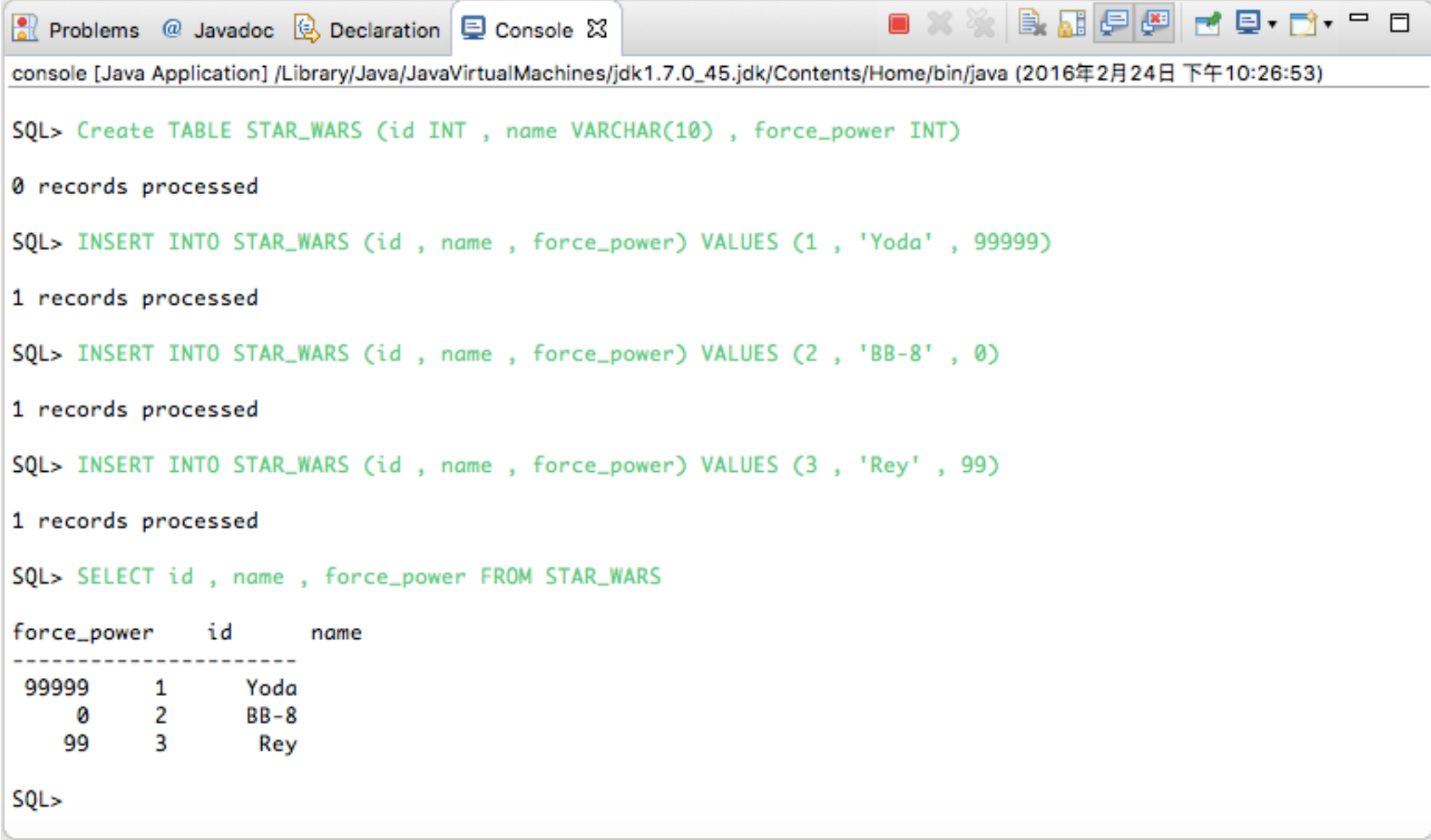
Windows PowerShell
Copyright (C) Microsoft Corporation. 著作權所有，並保留一切權利。

請嘗試新的跨平台 PowerShell https://aka.ms/pscore6

PS C:\Users\USER\master\2024gitlab\vanilladb> & 'C:\Program Files\Java\jdk-17\bin\java.e
eter'

SQL>

write some sql here!

Try it !

Q&A

- To see what exactly queries you can use, please check here

  - https://shwu10.cs.nthu.edu.tw/courses/databases/2025-spring/faq/-/blob/master/Vanilladb_Sql.md

  - If you got any problem, you can check here first

  - https://shwu10.cs.nthu.edu.tw/courses/databases/2025-spring/faq

  - If your problem was very unique, just send a email let us know