

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

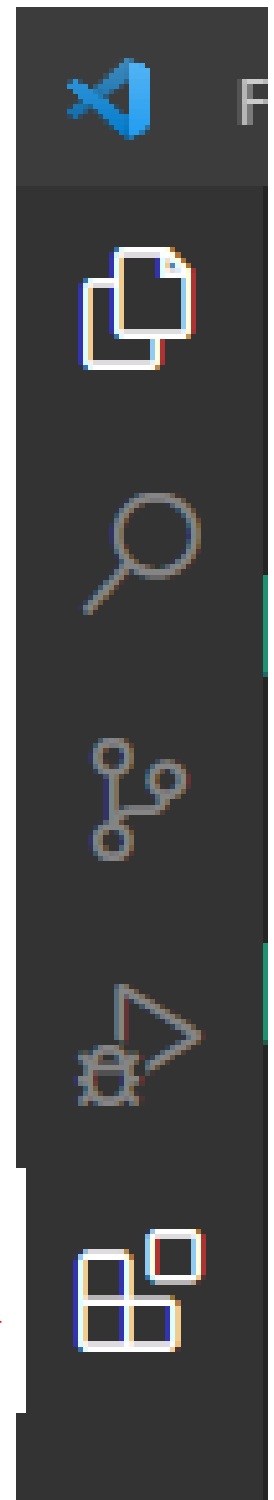
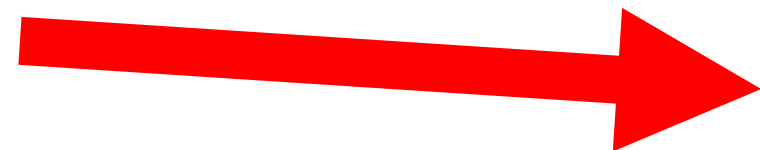
- VanillaCore
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Setting Up Environment

- JDK 17
 - <https://www.oracle.com/java/technologies/javase/jdk17-archive-downloads.html>
- VS Code
 - <https://code.visualstudio.com/>

Setting Up Environment

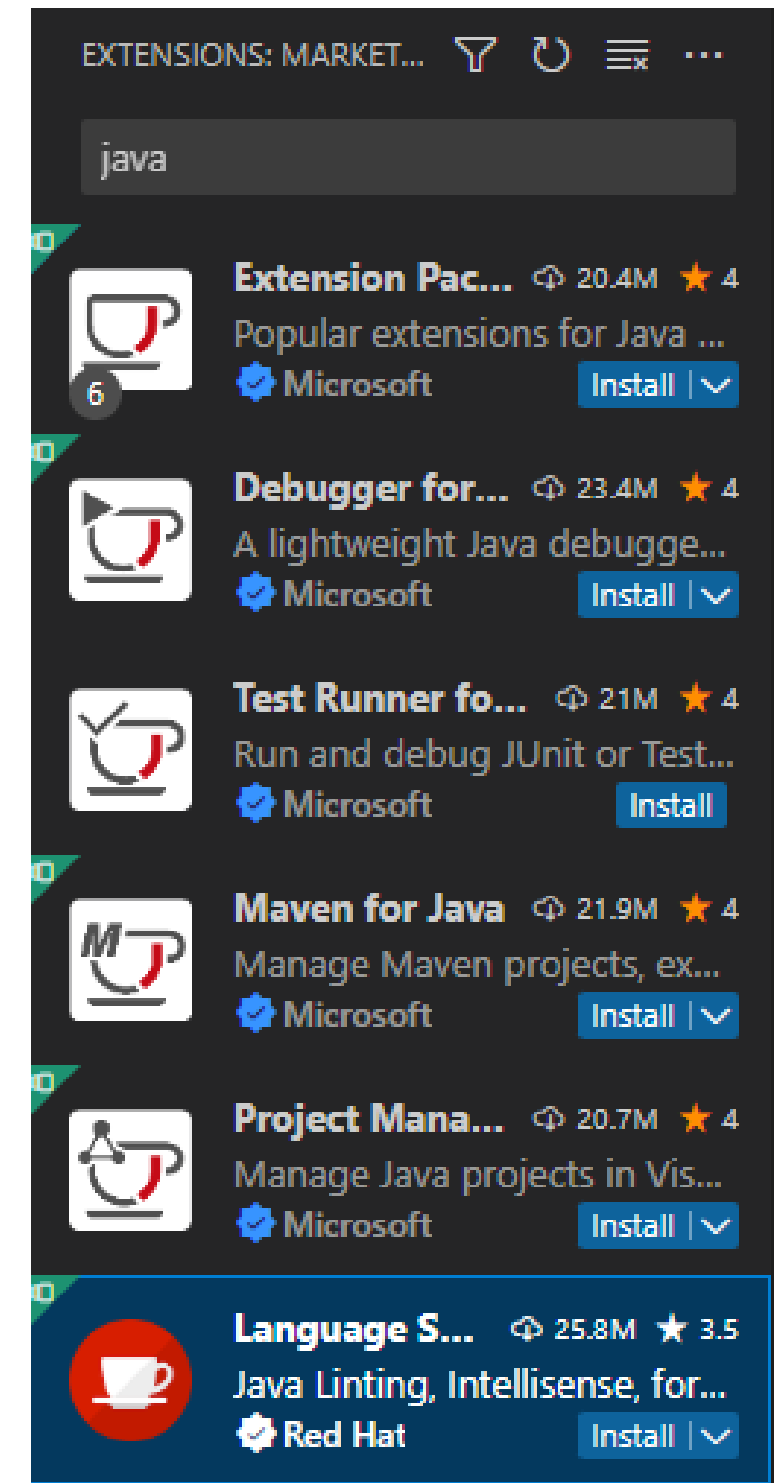
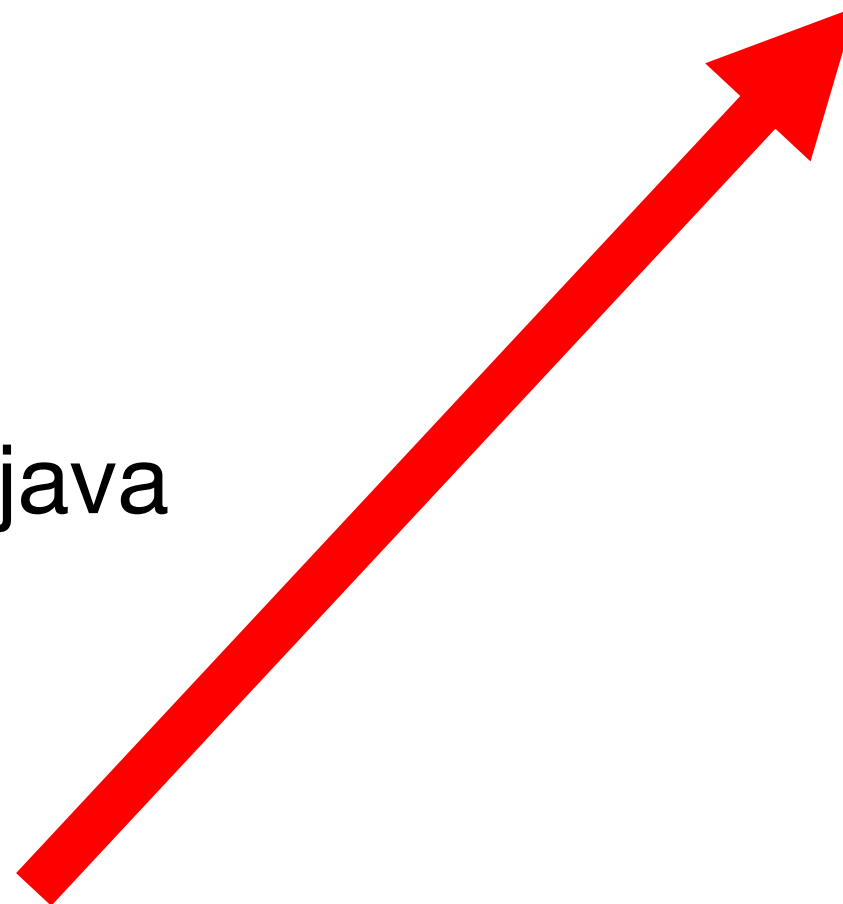
- VS Code
 - First open VScode and go to market



Setting Up Environment

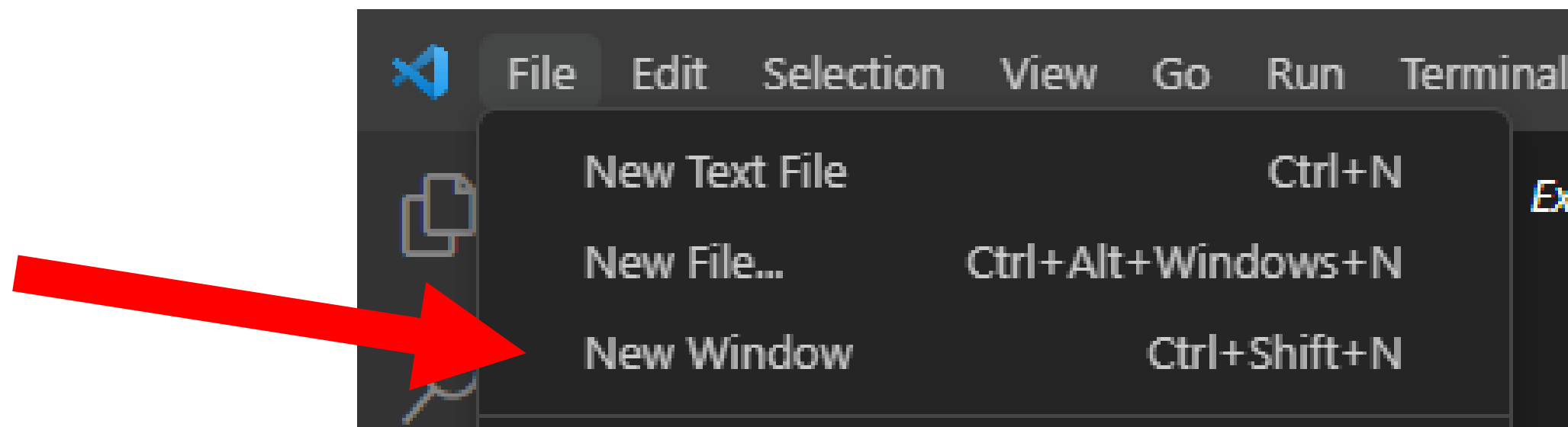
- VS Code
 - search for java

install all of these



Setting Up Environment

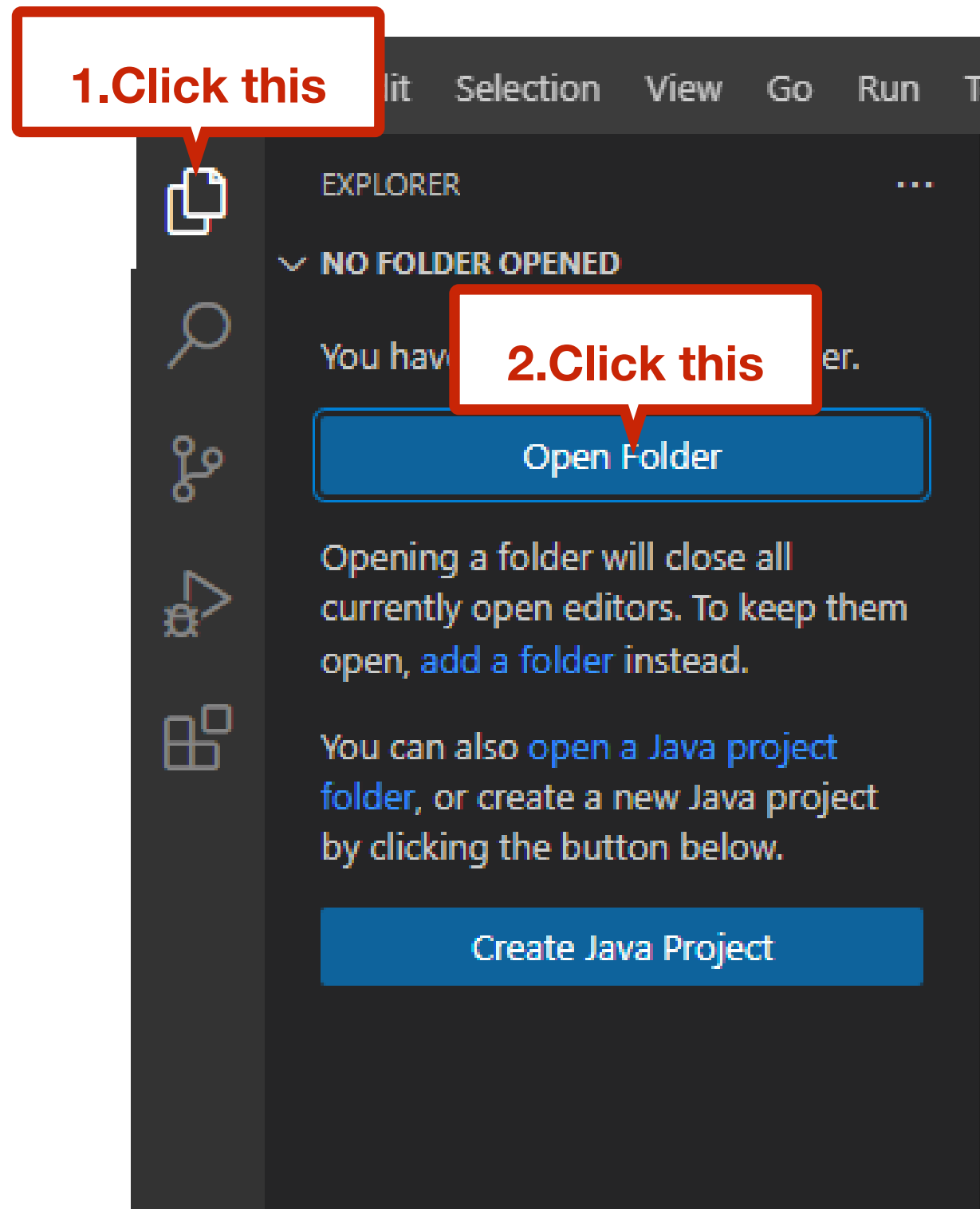
- VS Code
- when installation completed, open a new window and stand by.



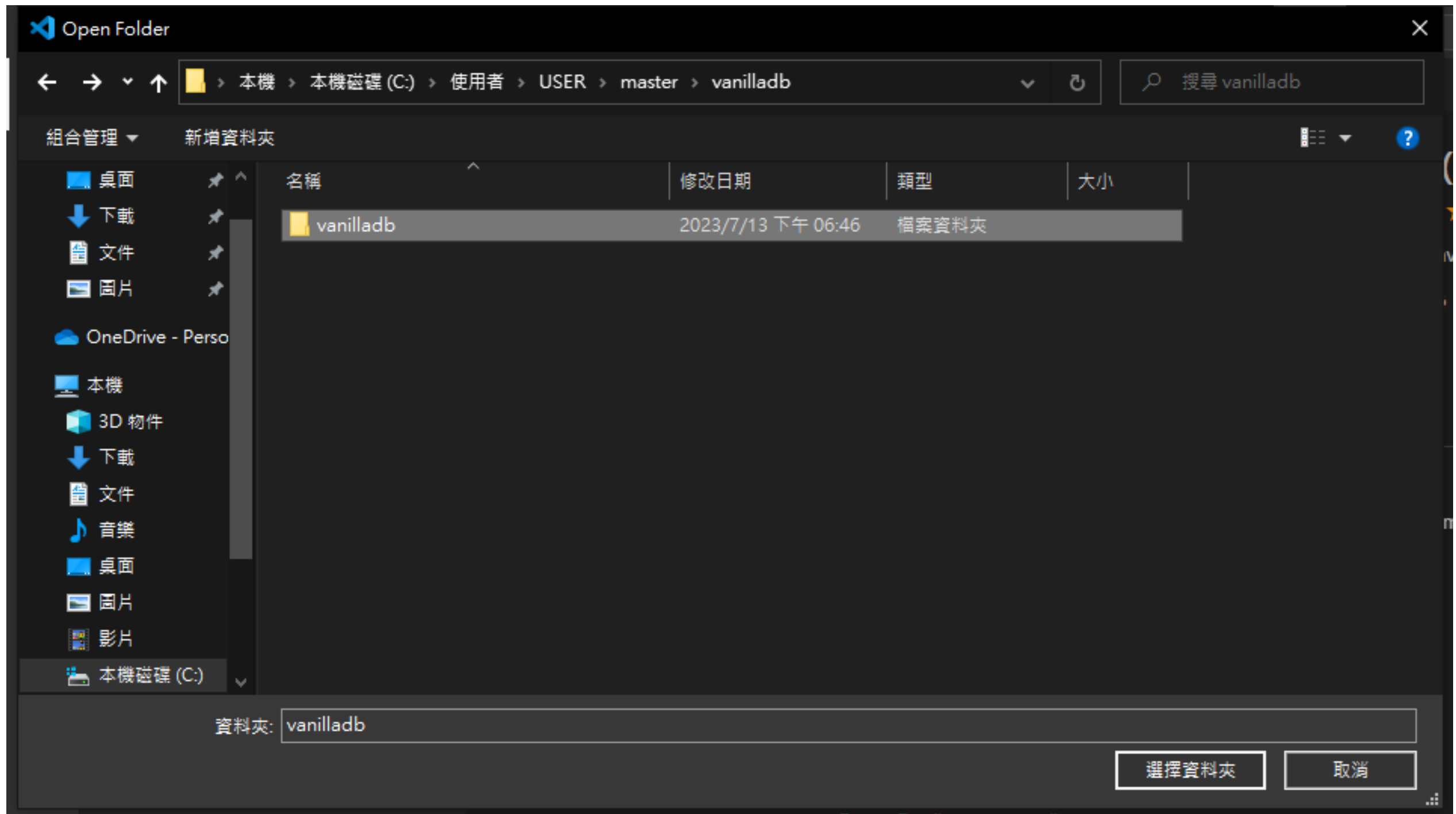
Downloading The Project

- Clone VanillaDB here
- <https://shwu10.cs.nthu.edu.tw/courses/databases/2025-spring/vanilladb>

How to Import VanillaCore



Choose vanilladb to be your workspace



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

Done

```
> .metadata  
> bench  
> core-patch  
❖ .gitignore  
{ } launch.json
```

Outline

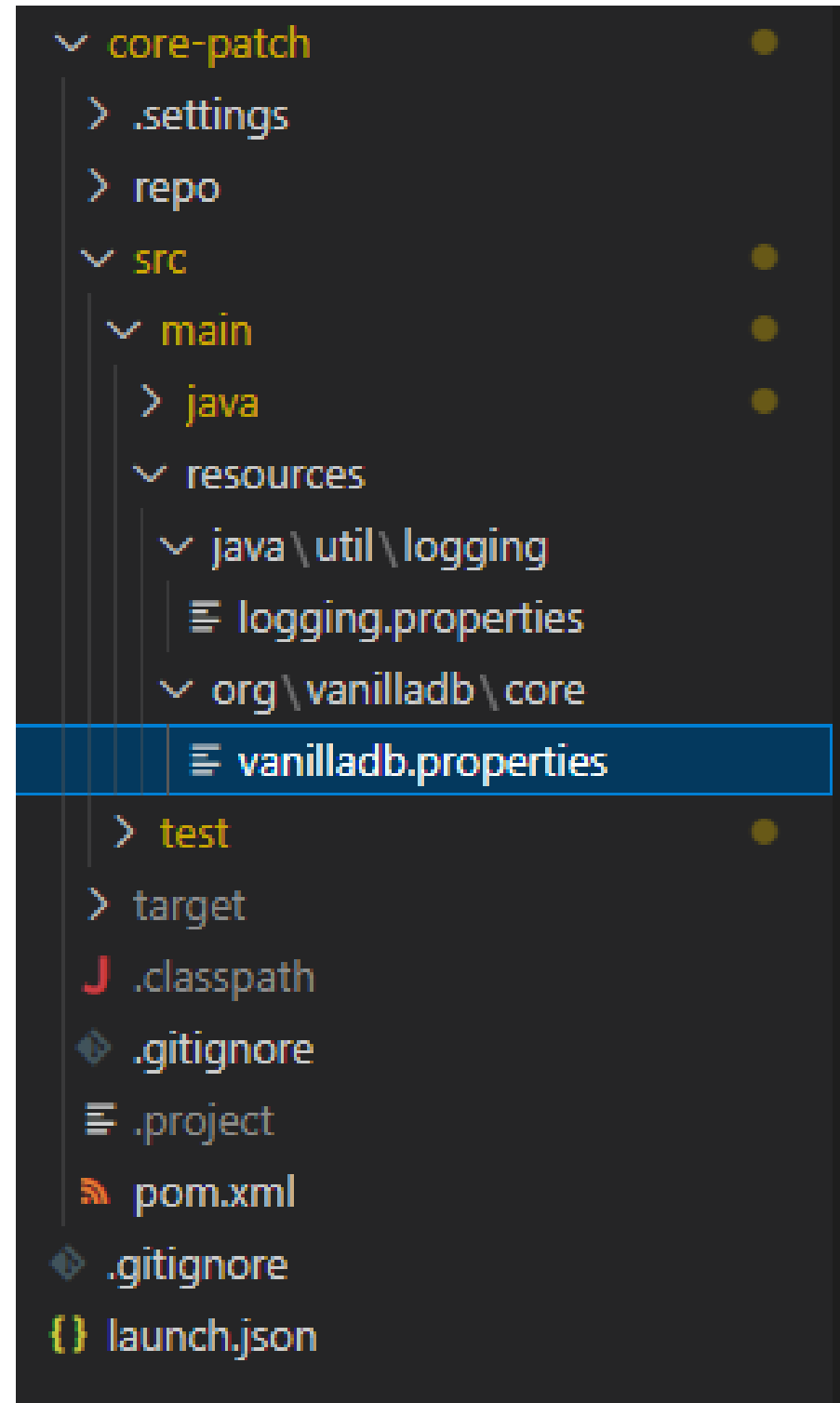
- VanillaCore
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VanillaCore Properties File



- Configurations for VanillaCore are all stored in a properties file

VanillaCore Properties



vanilladb.properties

```
vanilladb.properties X
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

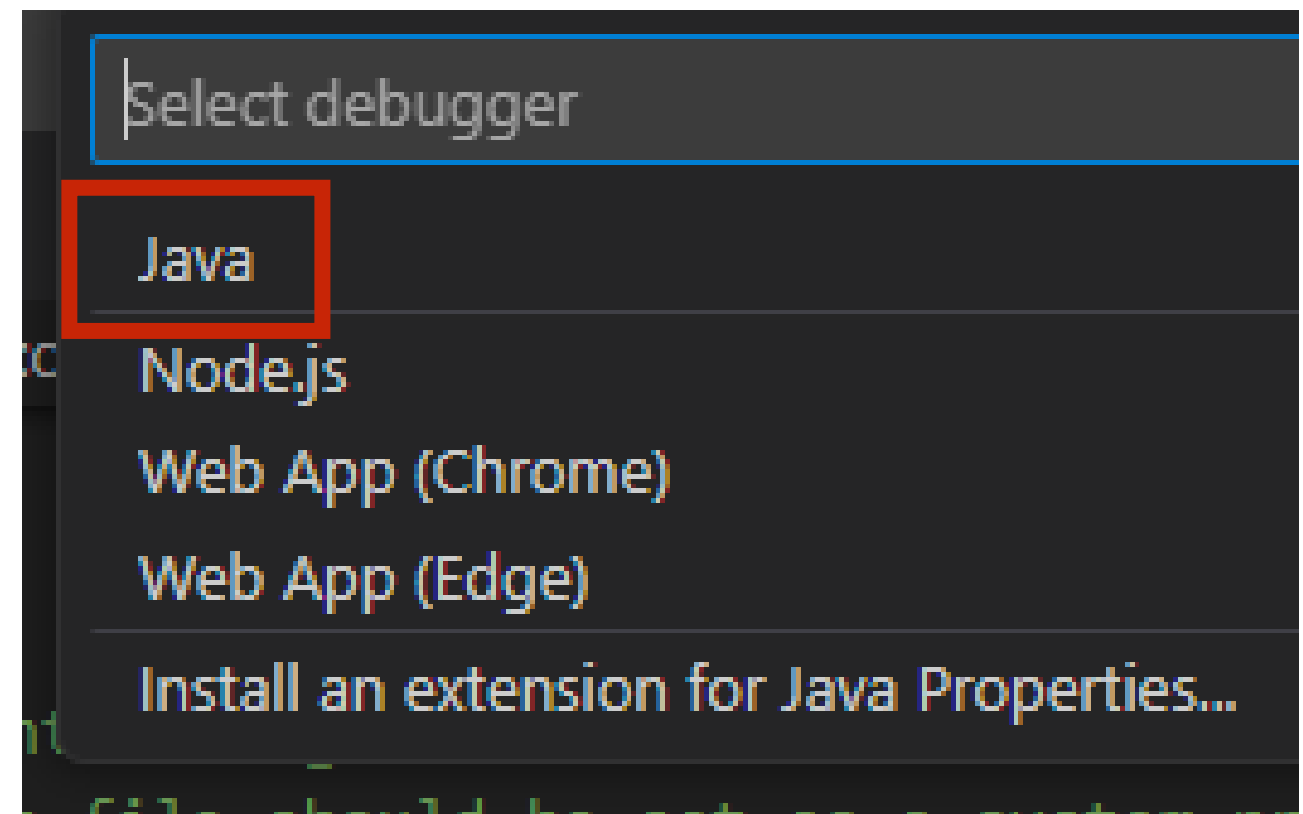
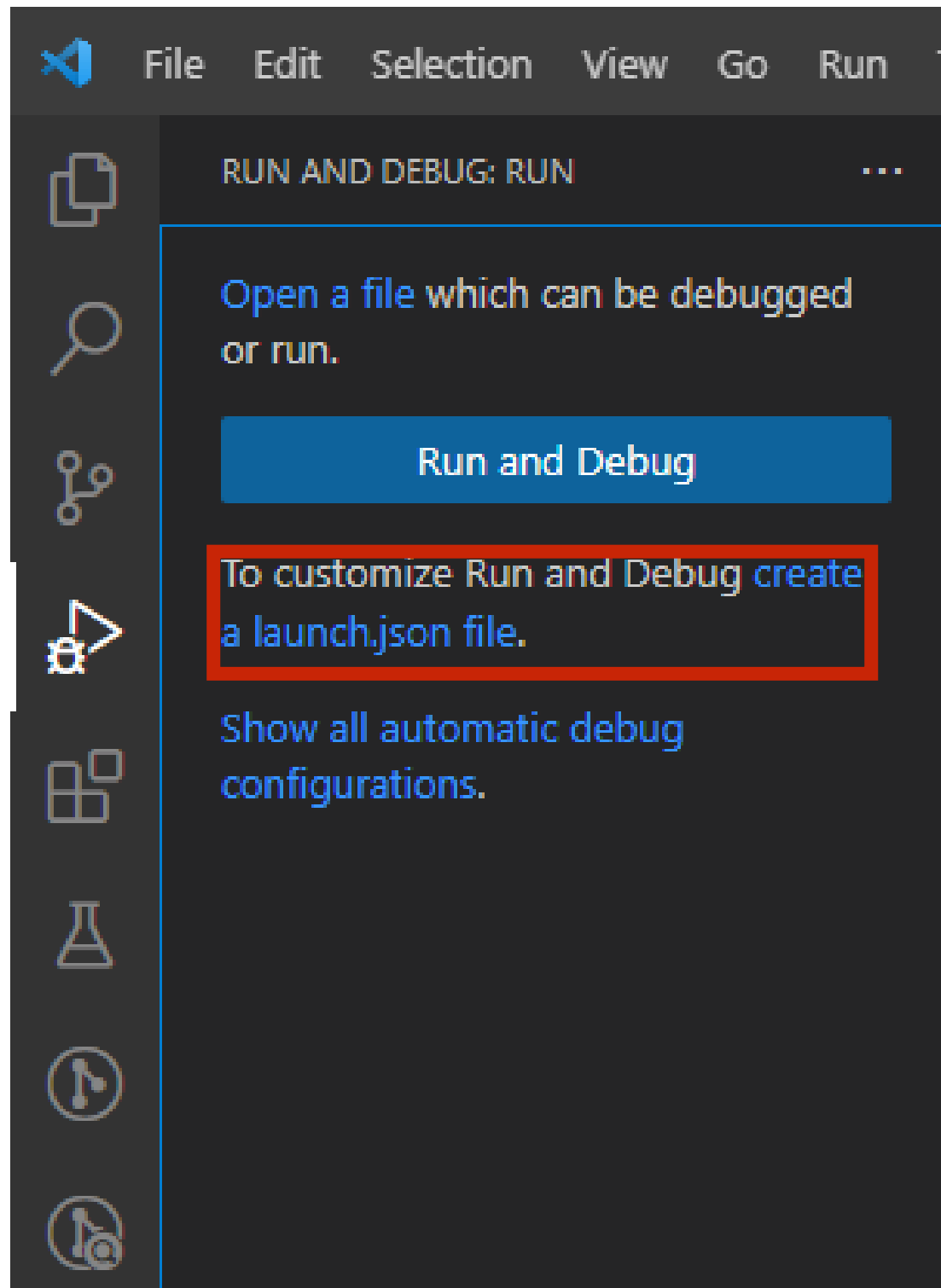
- **VanillaCore**
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Starting Up VanillaCore



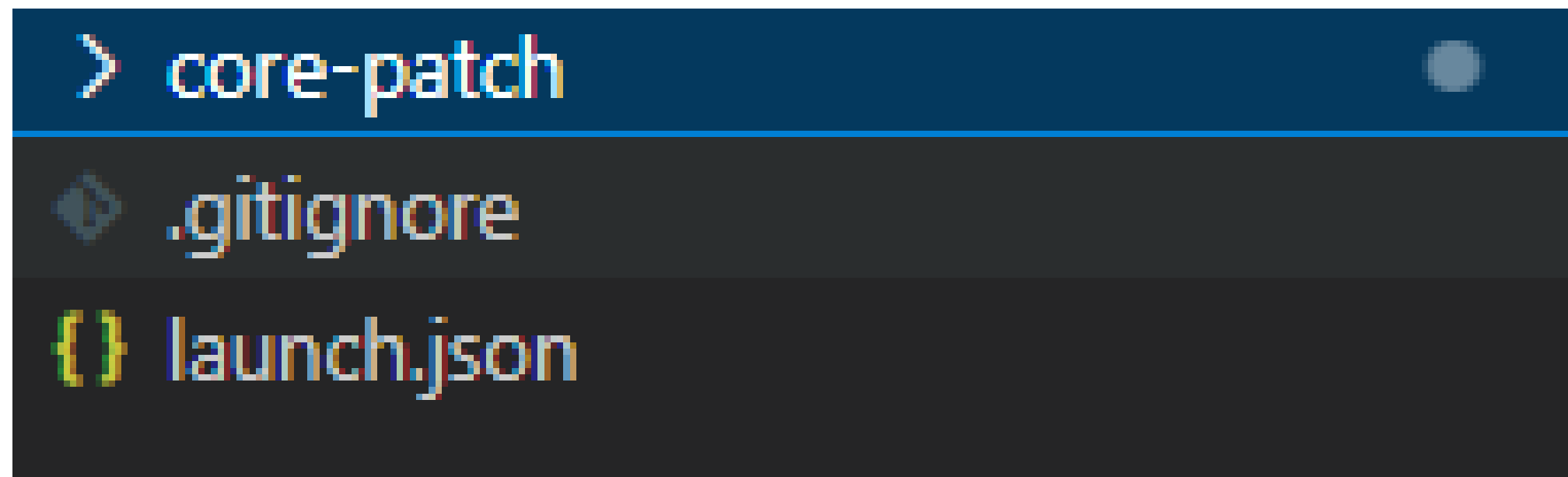
- To start up a VanillaCore server, we have to give it the following arguments
 - Database Directory Name
 - The locations of properties files

Setting Run Configuration

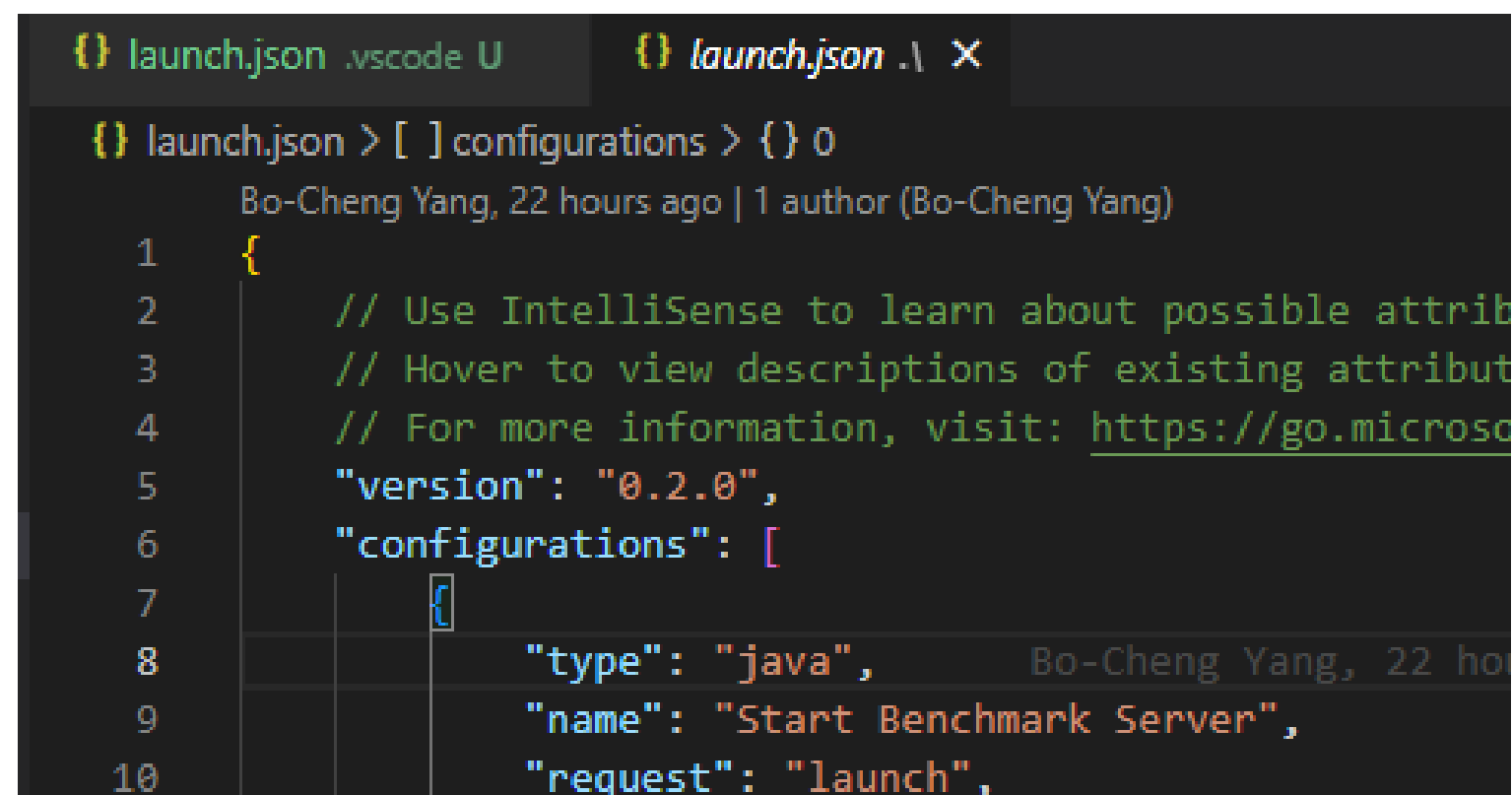


```
.vscode > {} launch.json > [ ] configurations > {} 0
1  {
2      // Use IntelliSense to learn about possible attributes.
3      // Hover to view descriptions of existing attributes.
4      // For more information, visit: https://go.microsoft.com/fwlink/?linkid=830387
5      "version": "0.2.0",
6      "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     ]
21 }
```

auto generated content



open our launch.json



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

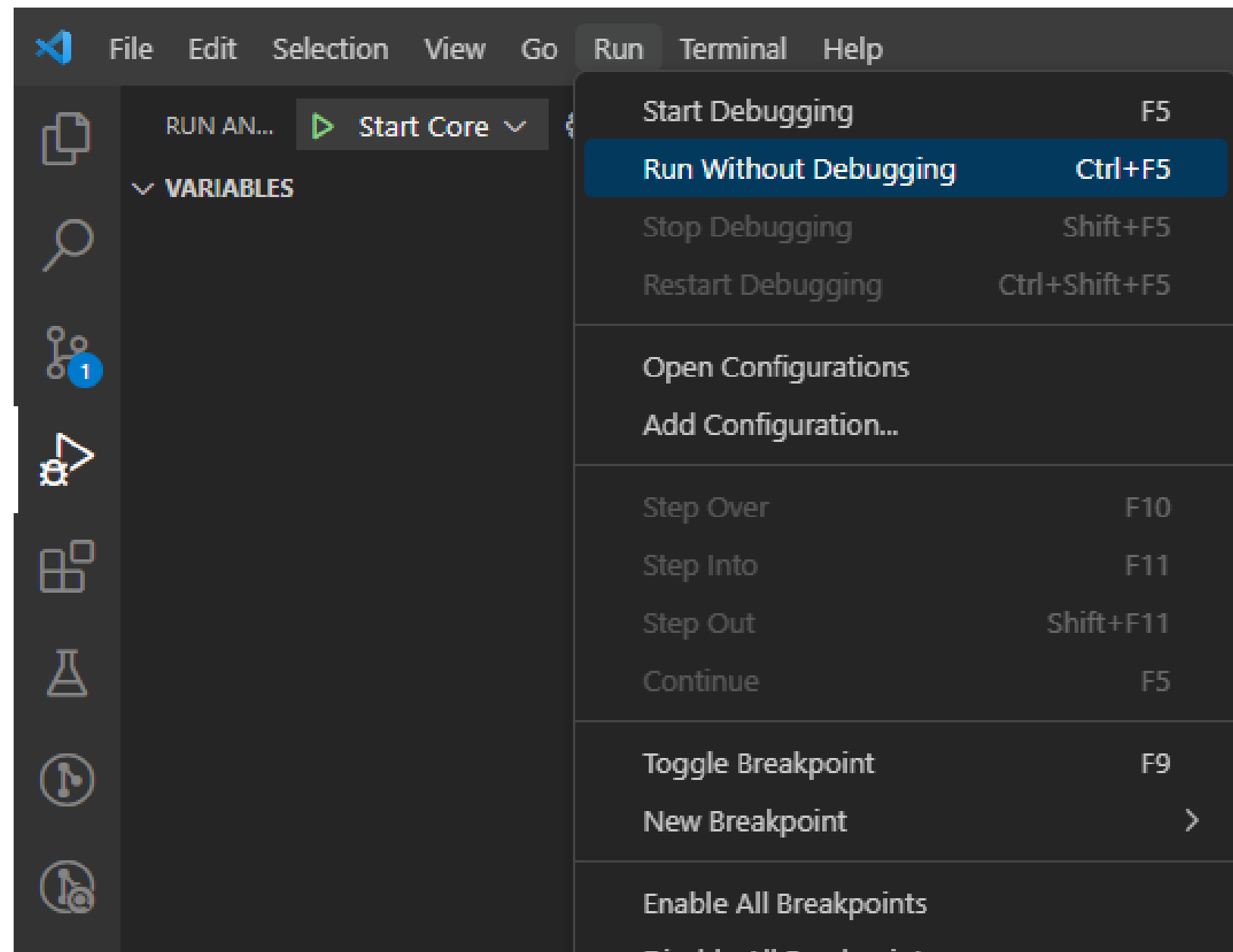
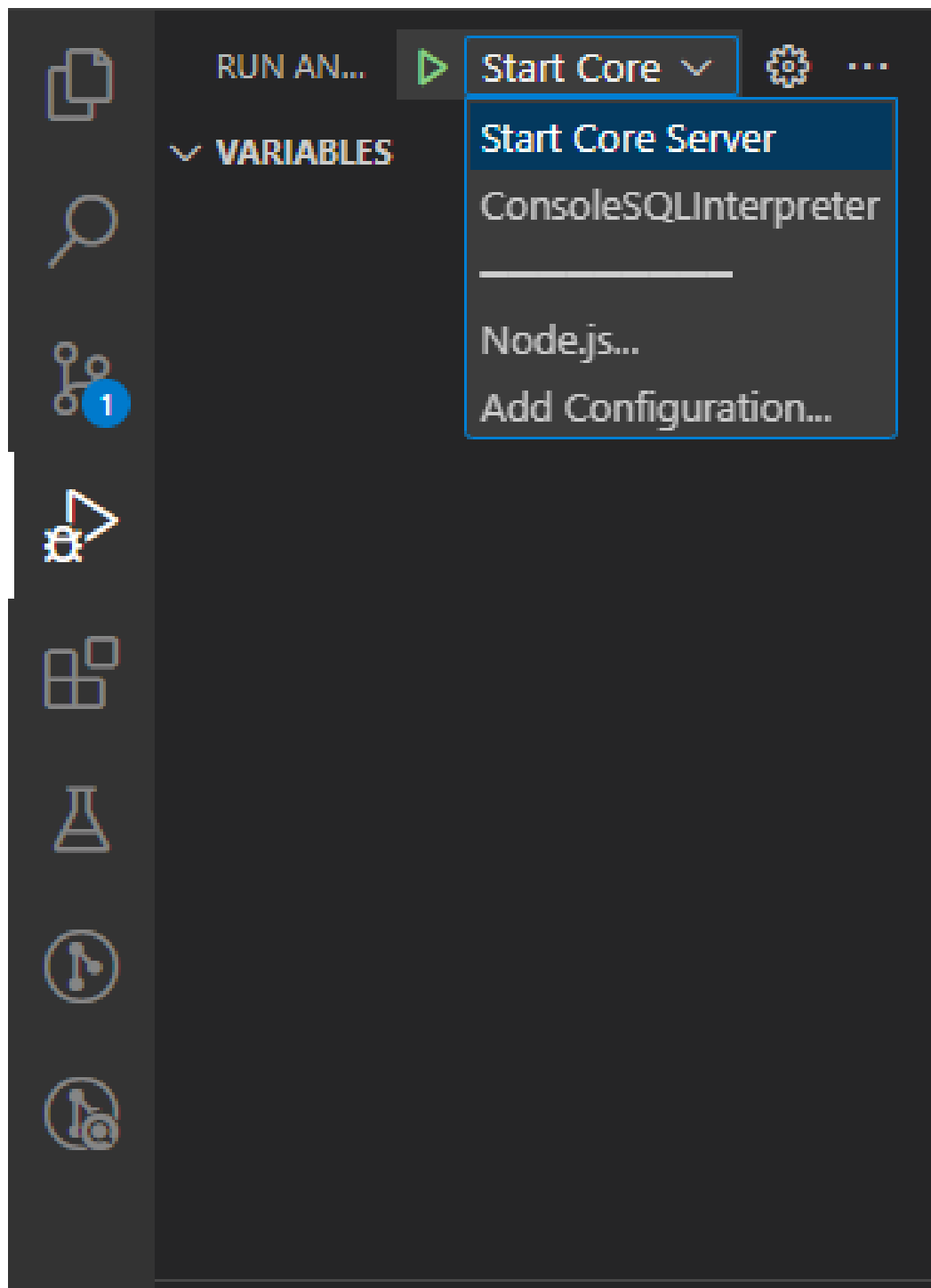
```
-Dorg.vanilladb.core.config.file=target/classes/org/vanilladb/core/vanilladb.properties
```

```
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 these arguments from

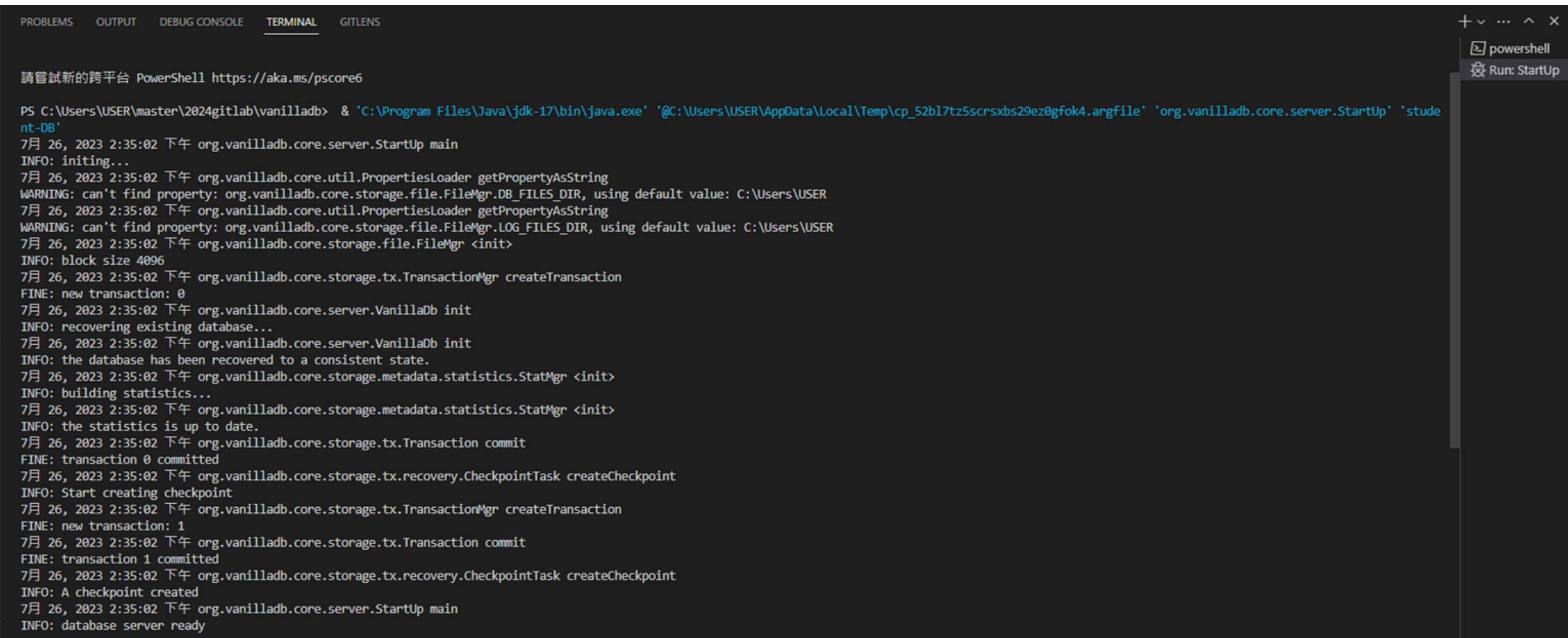
[here](#),

then hit 'Apply' and 'Run'



select startup and run without debugging!

Server Messages (1/3)

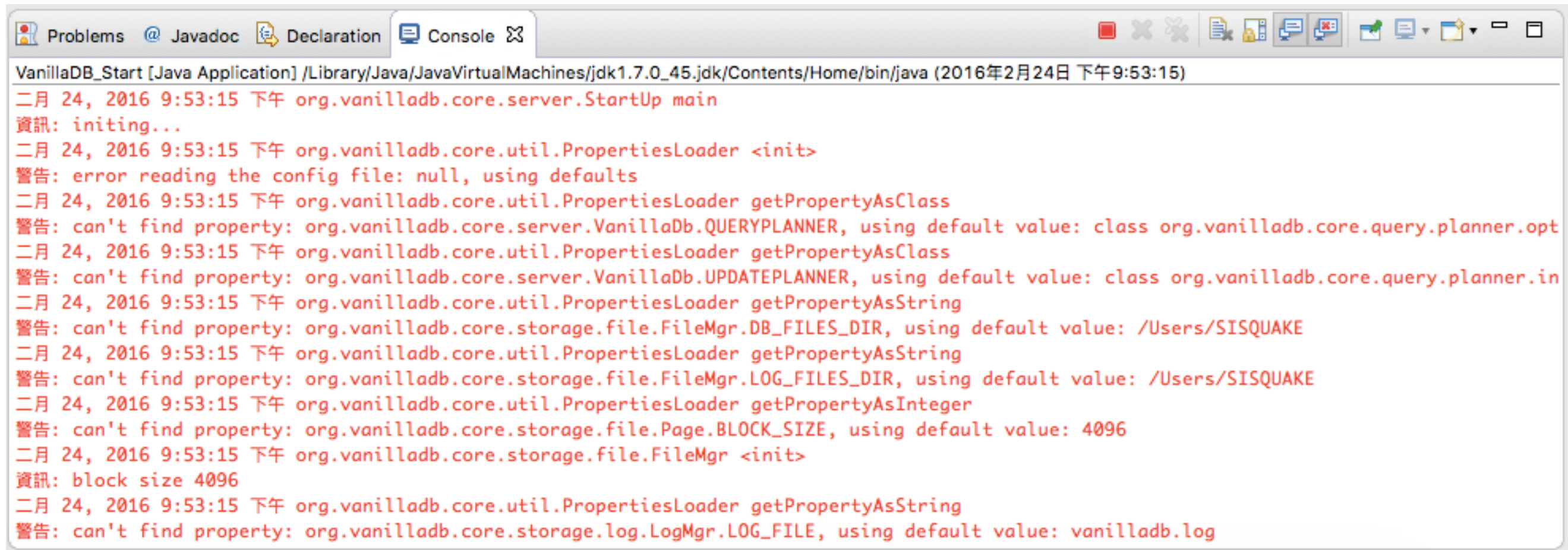


```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL GITLENS
請嘗試新的跨平台 PowerShell https://aka.ms/pscore6

PS C:\Users\USER\master\2024gitlab\vanilladb> & 'C:\Program Files\Java\jdk-17\bin\java.exe' '@C:\Users\USER\AppData\Local\Temp\cp_52bl7tz5scrsxbs29ez0gfok4.argfile' 'org.vanilladb.core.server.StartUp' 'student-DB'
7月 26, 2023 2:35:02 下午 org.vanilladb.core.server.StartUp main
INFO: initing...
7月 26, 2023 2:35:02 下午 org.vanilladb.core.util.PropertiesLoader getPropertyAsString
WARNING: can't find property: org.vanilladb.core.storage.file.FileMgr.DB_FILES_DIR, using default value: C:\Users\USER
7月 26, 2023 2:35:02 下午 org.vanilladb.core.util.PropertiesLoader getPropertyAsString
WARNING: can't find property: org.vanilladb.core.storage.file.FileMgr.LOG_FILES_DIR, using default value: C:\Users\USER
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.file.FileMgr <init>
INFO: block size 4096
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.tx.TransactionMgr createTransaction
FINE: new transaction: 0
7月 26, 2023 2:35:02 下午 org.vanilladb.core.server.VanillaDb init
INFO: recovering existing database...
7月 26, 2023 2:35:02 下午 org.vanilladb.core.server.VanillaDb init
INFO: the database has been recovered to a consistent state.
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.metadata.statistics.StatMgr <init>
INFO: building statistics...
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.metadata.statistics.StatMgr <init>
INFO: the statistics is up to date.
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.tx.Transaction commit
FINE: transaction 0 committed
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.tx.recovery.CheckpointTask createCheckpoint
INFO: Start creating checkpoint
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.tx.TransactionMgr createTransaction
FINE: new transaction: 1
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.tx.Transaction commit
FINE: transaction 1 committed
7月 26, 2023 2:35:02 下午 org.vanilladb.core.storage.tx.recovery.CheckpointTask createCheckpoint
INFO: A checkpoint created
7月 26, 2023 2:35:02 下午 org.vanilladb.core.server.StartUp main
INFO: database server ready
```

You should see this if there is nothing wrong.

Server Messages (2/3)



The screenshot shows an IDE console window with the following content:

```
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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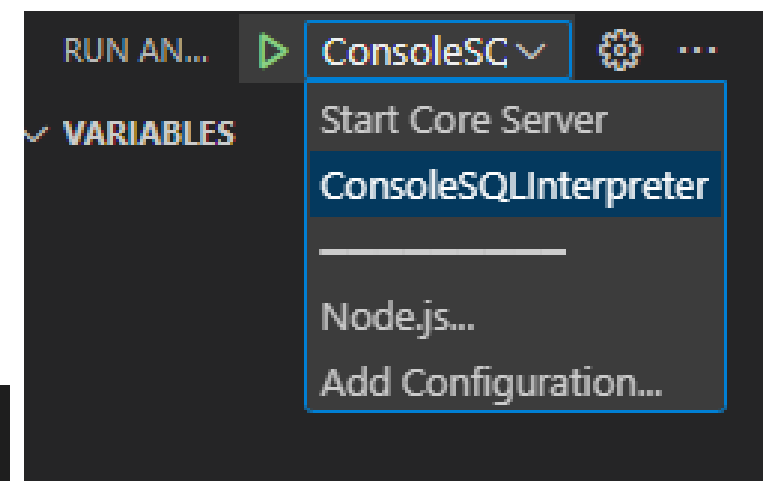
Console SQL Interpreter



- 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



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL GITLENS

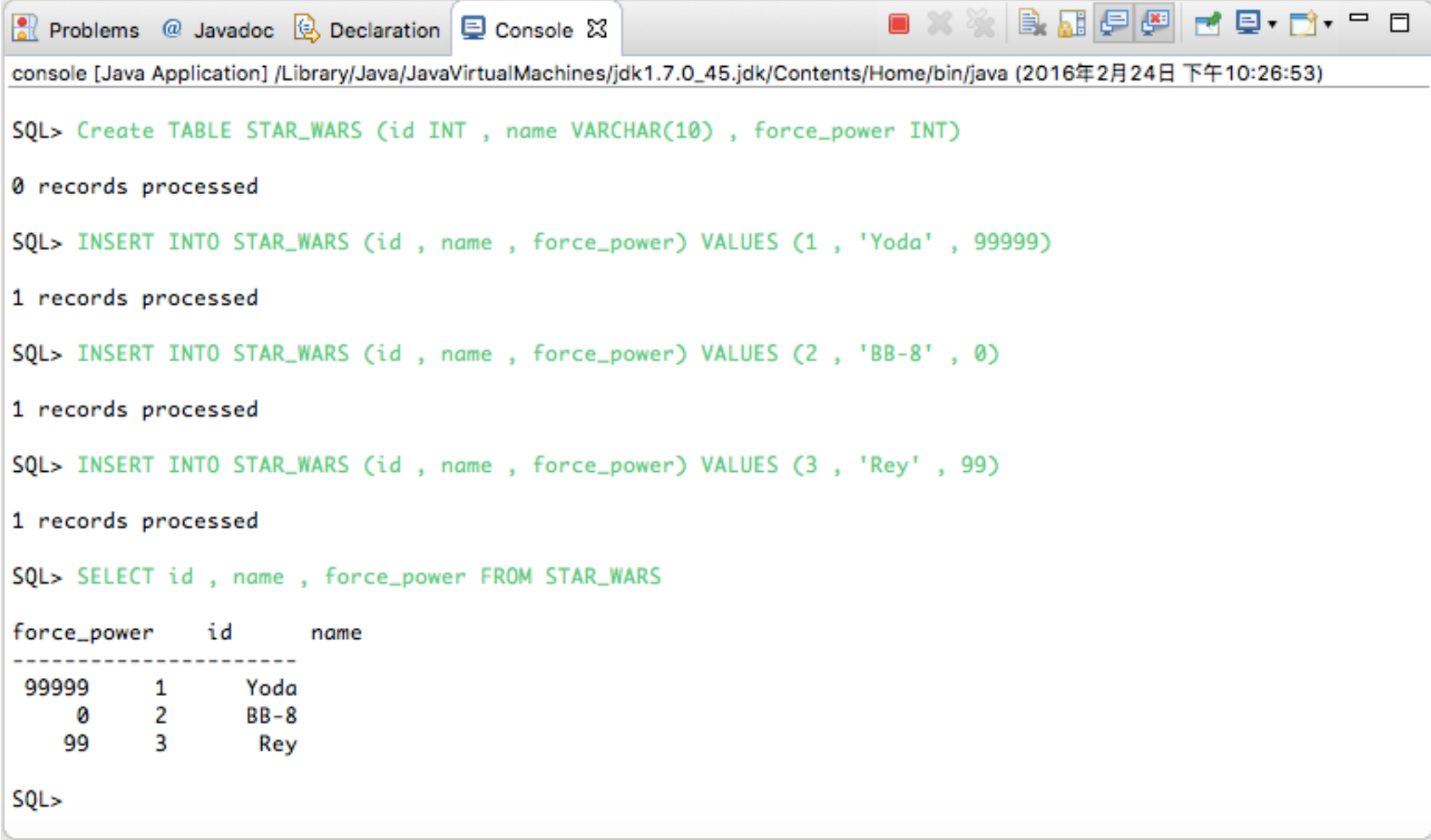
Windows PowerShell
Copyright (C) Microsoft Corporation. 著作權所有，並保留一切權利。

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.exe'
SQL>
```

write some sql here!

Try it !



The screenshot shows an IDE console window with the following content:

```
console [Java Application] /Library/Java/JavaVirtualMachines/jdk1.7.0_45.jdk/Contents/Home/bin/java (2016年2月24日 下午10:26:53)
```

```
SQL> Create TABLE STAR_WARS (id INT , name VARCHAR(10) , force_power INT)
```

0 records processed

```
SQL> INSERT INTO STAR_WARS (id , name , force_power) VALUES (1 , 'Yoda' , 99999)
```

1 records processed

```
SQL> INSERT INTO STAR_WARS (id , name , force_power) VALUES (2 , 'BB-8' , 0)
```

1 records processed

```
SQL> INSERT INTO STAR_WARS (id , name , force_power) VALUES (3 , 'Rey' , 99)
```

1 records processed

```
SQL> SELECT id , name , force_power FROM STAR_WARS
```

force_power	id	name
99999	1	Yoda
0	2	BB-8
99	3	Rey

```
SQL>
```

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