

# Using VanillaDB

Database Systems  
DataLab, CS, NTHU  
Spring, 2023



**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

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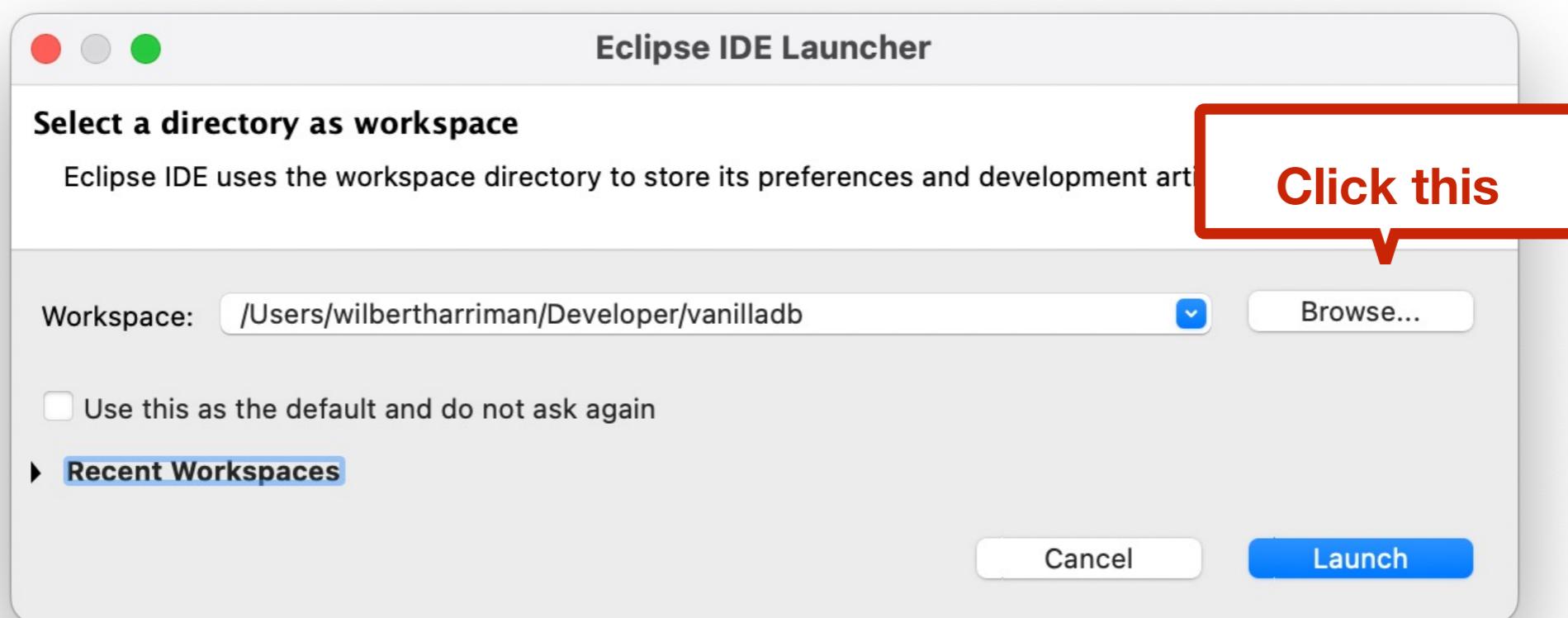
# Setting Up Environment

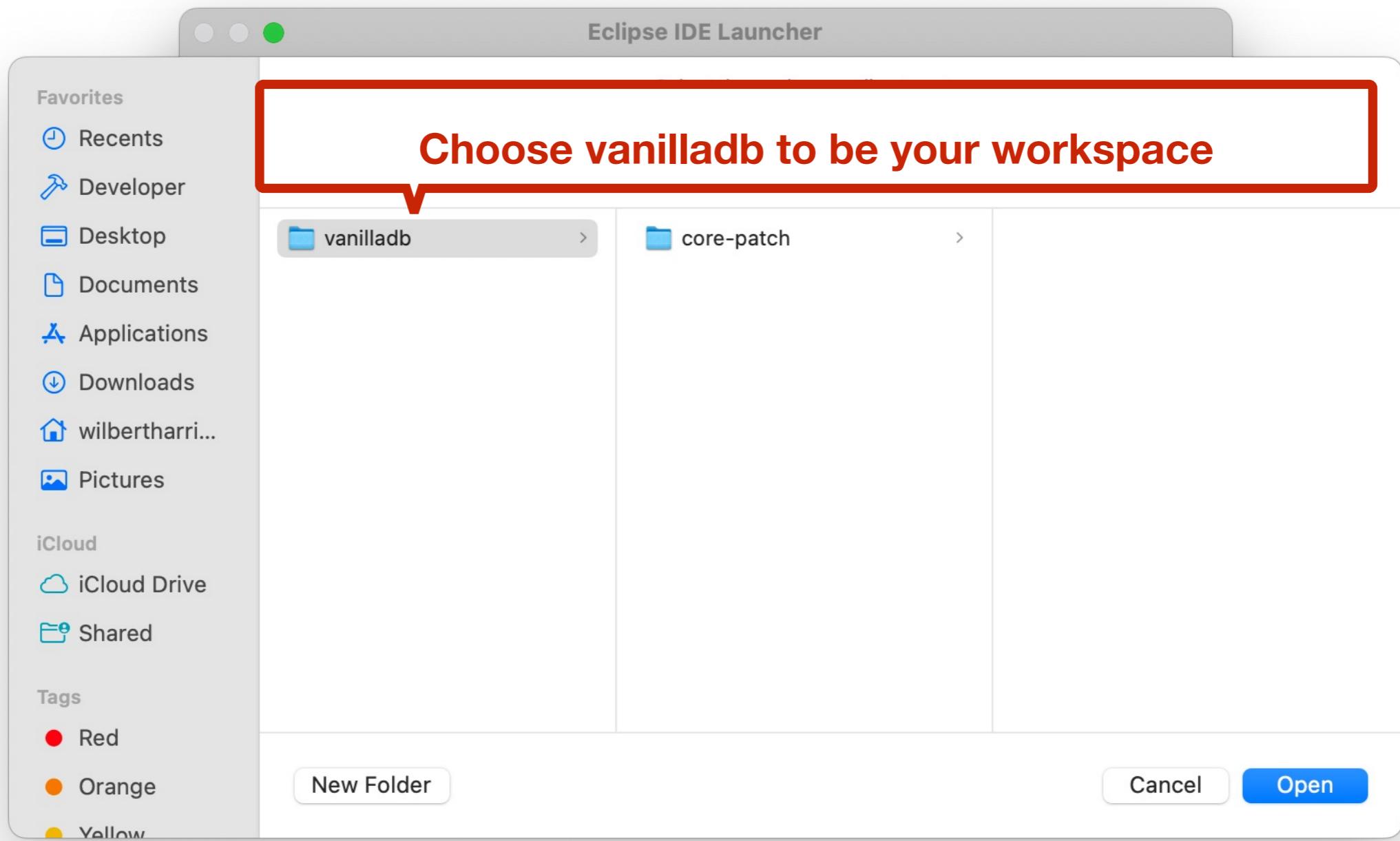
- JDK 8
  - [https://www.oracle.com/tw/java/technologies/java\\_se/javase8u211-later-archive-downloads.html](https://www.oracle.com/tw/java/technologies/java_se/javase8u211-later-archive-downloads.html)
- Eclipse (latest version: 2022-12)
  - <https://www.eclipse.org/downloads/packages/installer>

# Downloading The Project

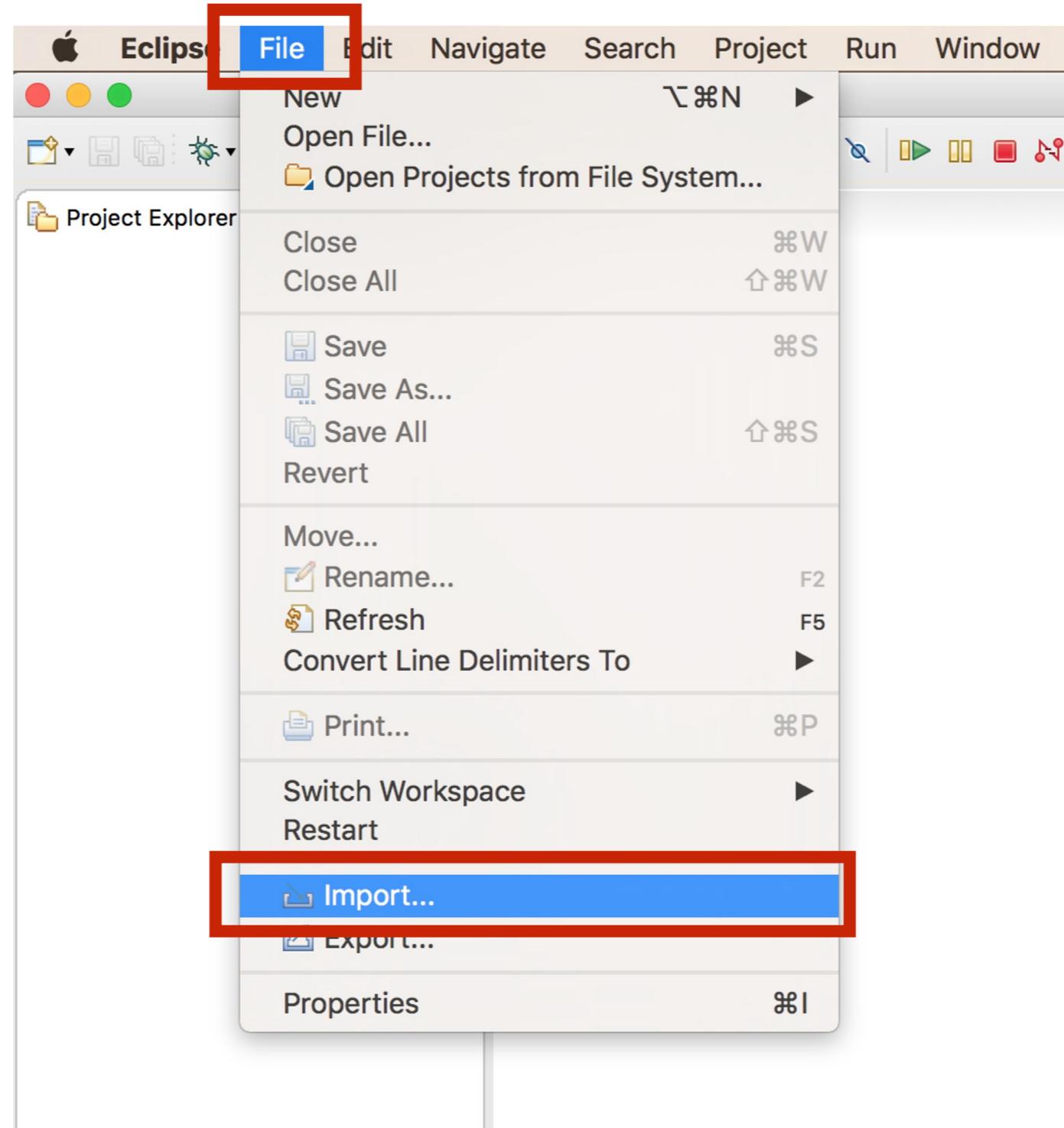
- Clone VanillaDB here
  - <https://shwu10.cs.nthu.edu.tw/courses/databases/2023-spring/vanilladb>

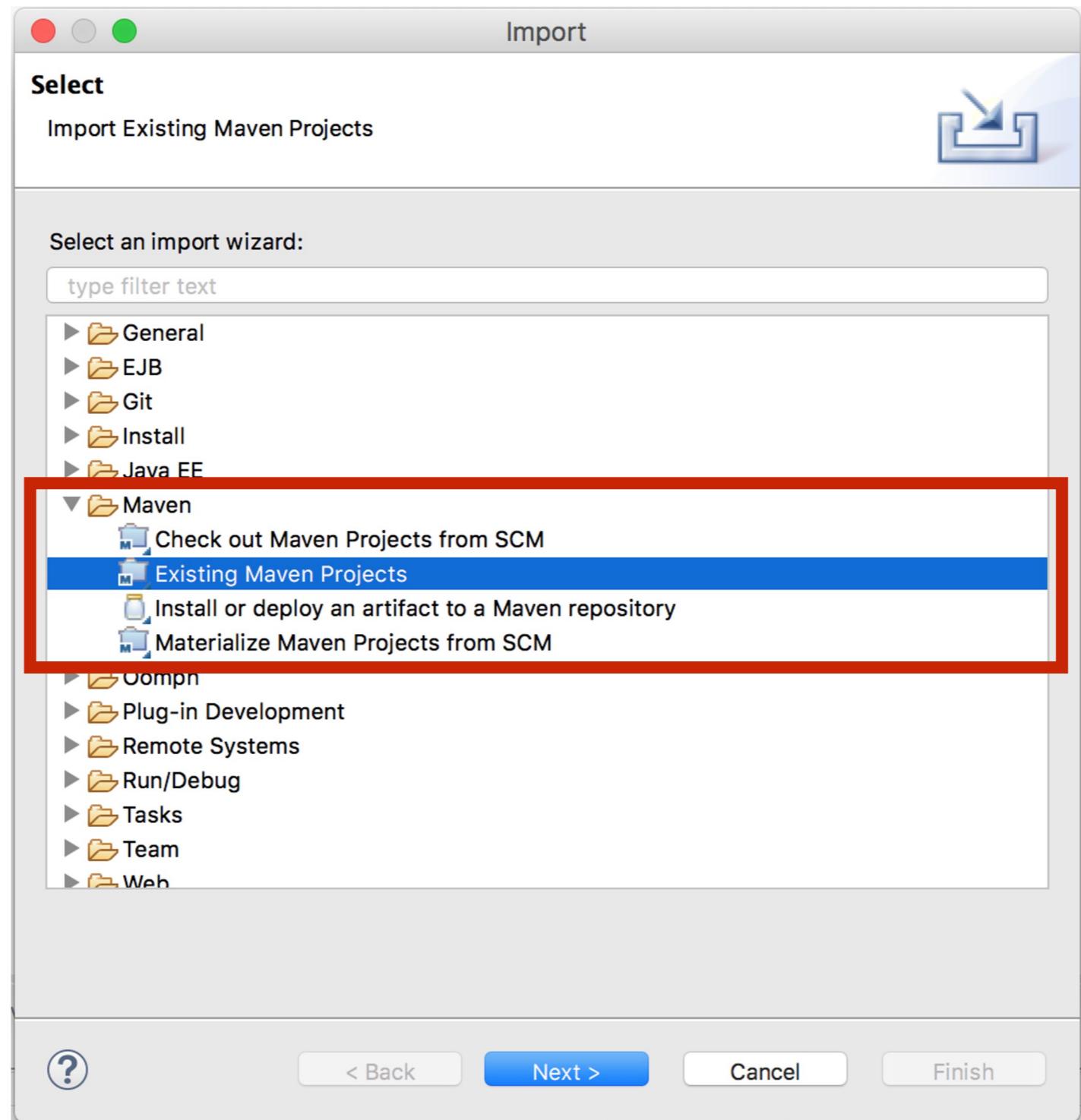
# How to Import VanillaCore

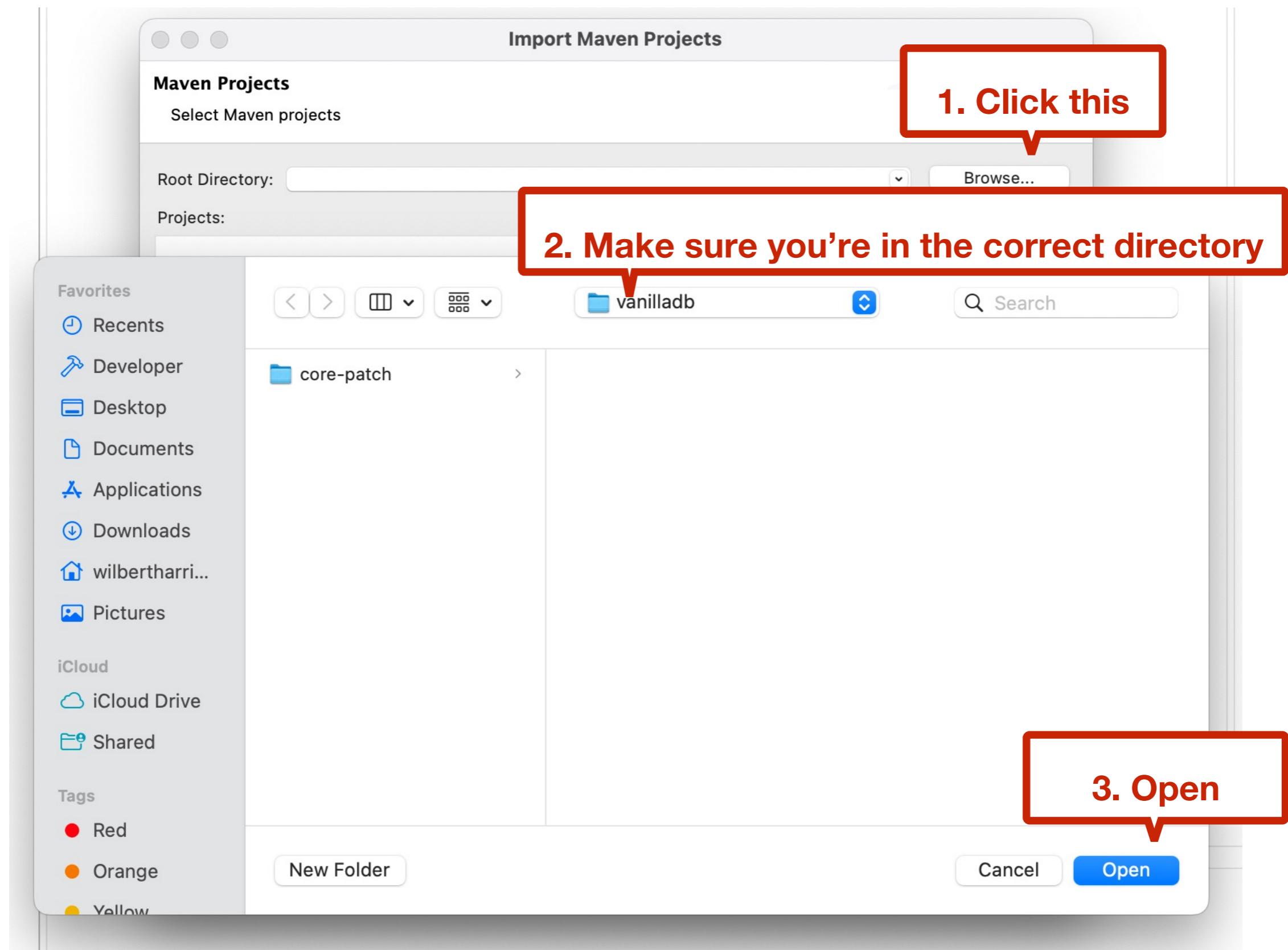


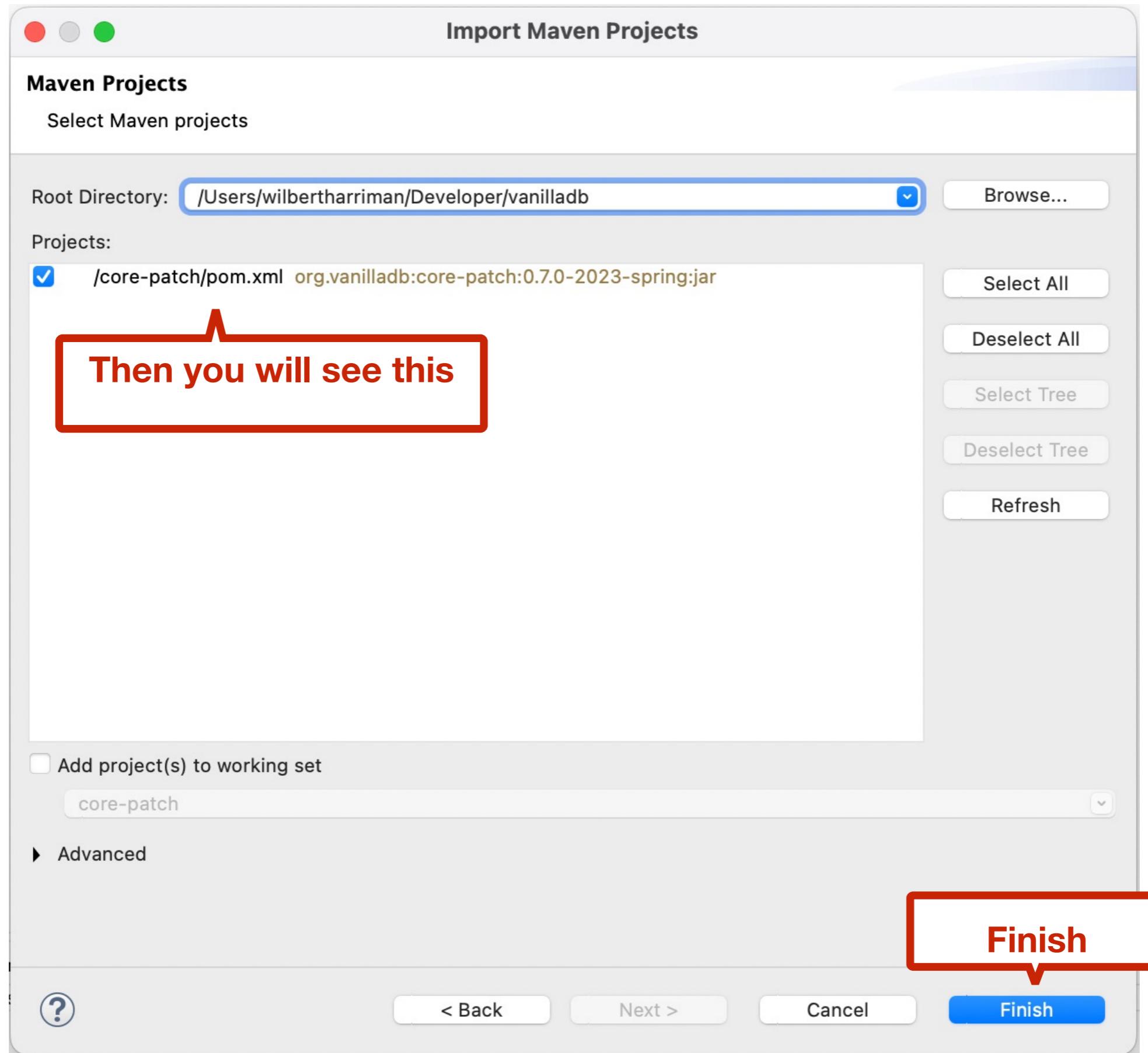


**Do not select 'core-patch' as the workspace!**









# Done

The screenshot shows the Eclipse IDE interface with the following details:

- Title Bar:** tracing-vanillacore - Java EE - core-patch/src/main/java/org/vanilladb/core/server/StartUp.java - Eclipse
- Toolbar:** Standard Eclipse toolbar with various icons for file operations, search, and navigation.
- Project Explorer:** Shows the project structure under "core-patch [tracing-vanillacore master]".
  - src/main/java
    - org.vanilladb.core.server
      - StartUp.java (selected)
    - org.vanilladb.core.util
    - ConsoleSQLInterpreter.java
  - src/main/resources
    - java
    - org
      - vanilladb
        - core
    - vanilladb.properties
  - JRE System Library [J2SE-1.5]
  - Referenced Libraries
  - lib
  - src
  - target
  - pom.xml
- Editor Area:** Displays the content of StartUp.java.

```
2+ * Copyright 2016 vanilladb.org
16 package org.vanilladb.core.server;
17
18+ import java.util.logging.Level;
22
23 public class StartUp {
24     private static Logger logger = Logger.getLogger(StartUp.class.getName());
25
26+     public static void main(String args[]) throws Exception {
27         if (logger.isLoggable(Level.INFO))
28             logger.info("initializing...");
29
30         // configure and initialize the database
31         VanillaDb.init(args[0]);
32
33         // start up the listening port
34         JdbcStartUp.startUp(1099);
35
36         if (logger.isLoggable(Level.INFO))
37             logger.info("vanilla-core-patch server ready");
38     }
39 }
40 }
```

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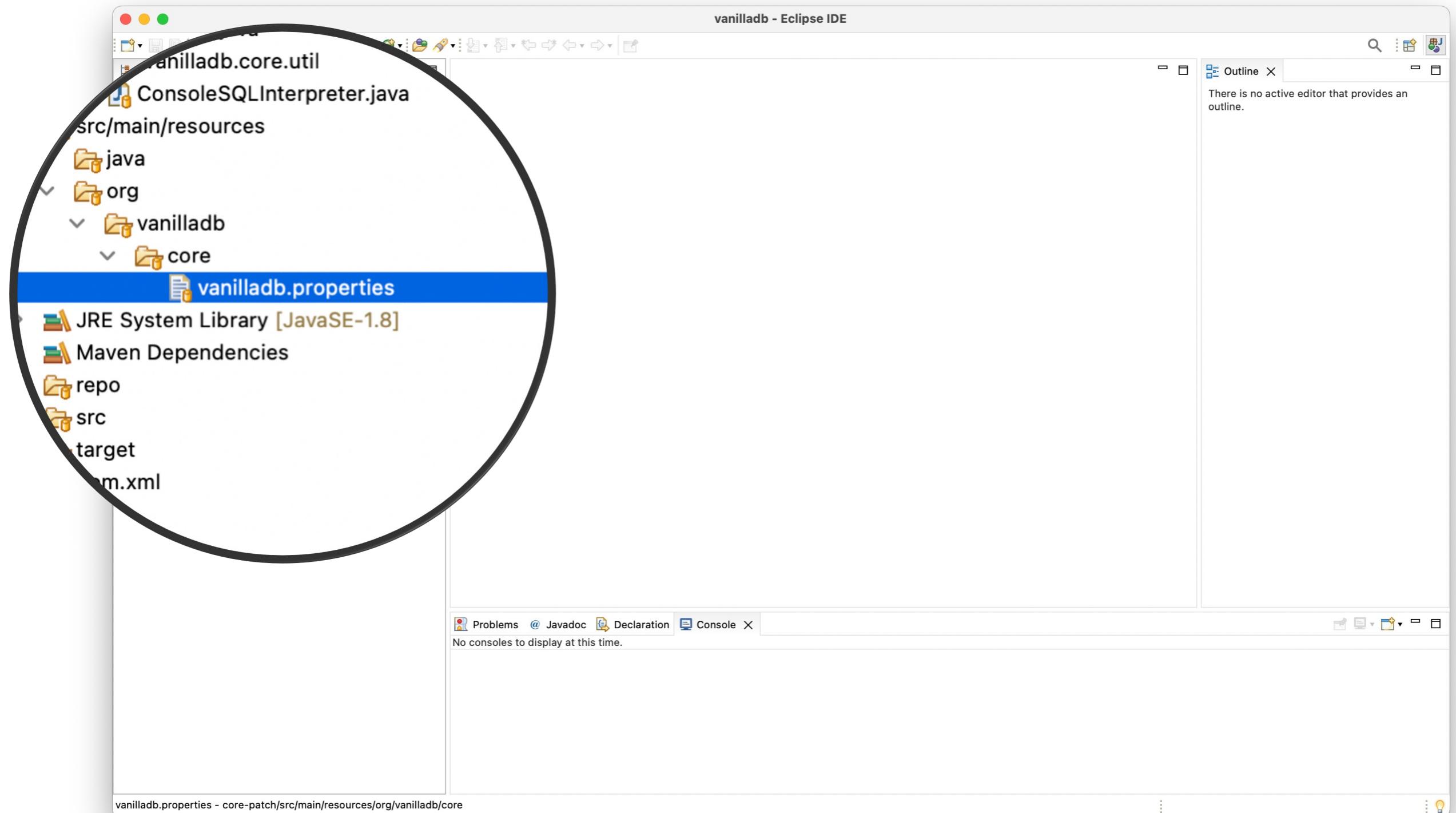
# VanillaCore Properties File



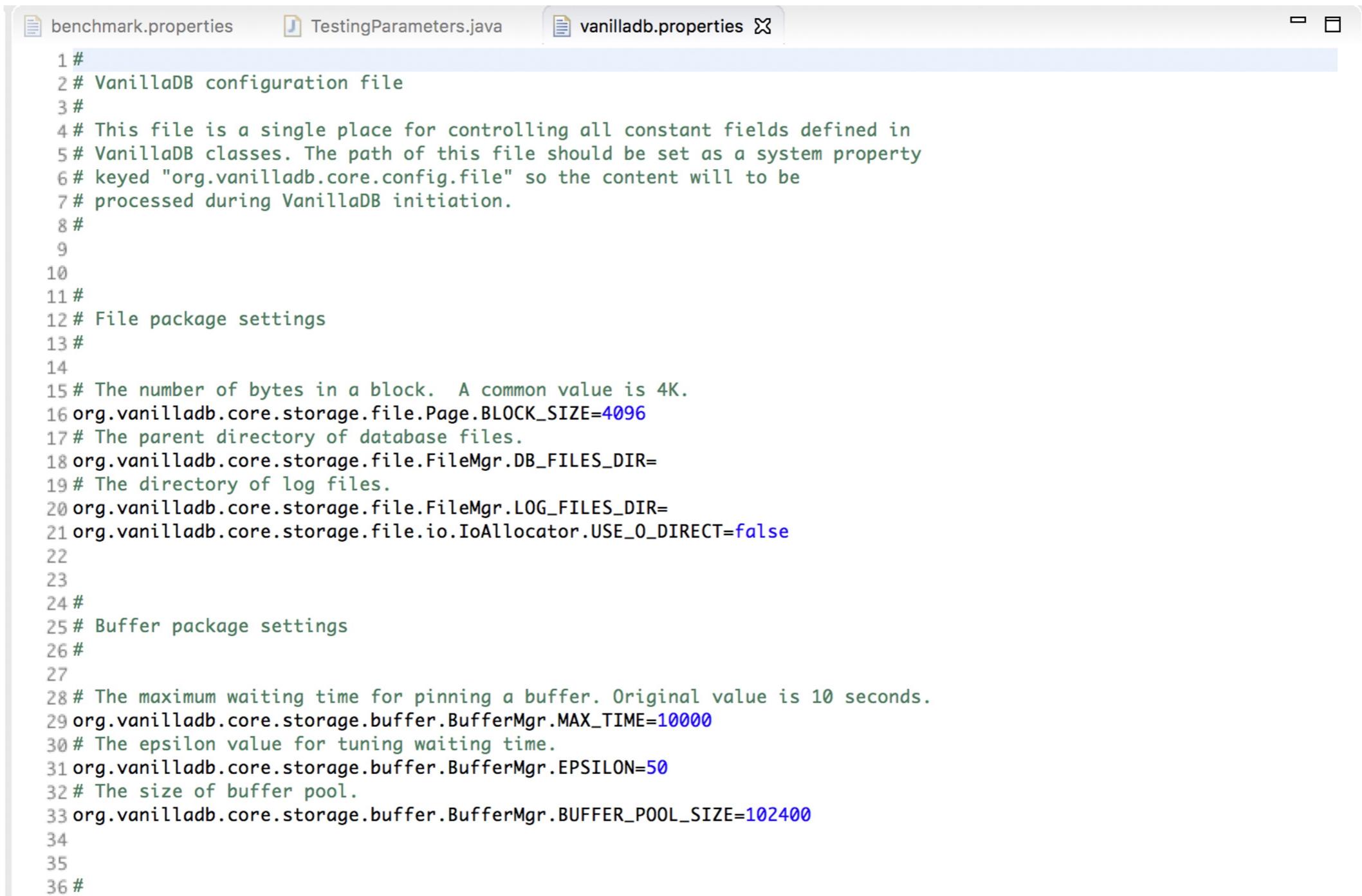
- Configurations for VanillaCore are all stored in a properties file

[\[Icon Source\]](#)

# VanillaCore Properties



# vanilladb.properties



```
1 #
2 # VanillaDB configuration file
3 #
4 # This file is a single place for controlling all constant fields defined in
5 # VanillaDB classes. The path of this file should be set as a system property
6 # keyed "org.vanilladb.core.config.file" so the content will be
7 # processed during VanillaDB initiation.
8 #
9
10
11 #
12 # File package settings
13 #
14
15 # The number of bytes in a block. A common value is 4K.
16 org.vanilladb.core.storage.file.Page.BLOCK_SIZE=4096
17 # The parent directory of database files.
18 org.vanilladb.core.storage.file.FileMgr.DB_FILES_DIR=
19 # The directory of log files.
20 org.vanilladb.core.storage.file.FileMgr.LOG_FILES_DIR=
21 org.vanilladb.core.storage.file.io.IoAllocator.USE_O_DIRECT=false
22
23
24 #
25 # Buffer package settings
26 #
27
28 # The maximum waiting time for pinning a buffer. Original value is 10 seconds.
29 org.vanilladb.core.storage.buffer.BufferMgr.MAX_TIME=10000
30 # The epsilon value for tuning waiting time.
31 org.vanilladb.core.storage.buffer.BufferMgr.EPSILON=50
32 # The size of buffer pool.
33 org.vanilladb.core.storage.buffer.BufferMgr.BUFFER_POOL_SIZE=102400
34
35
36 #
```

# vanilladb.properties

```
10
11 #
12 # File package settings
13 #
14
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21 org.vanilladb.core.storage.file.io.IoAllocator.USE_O_DIRECT=false
22
23
```

**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

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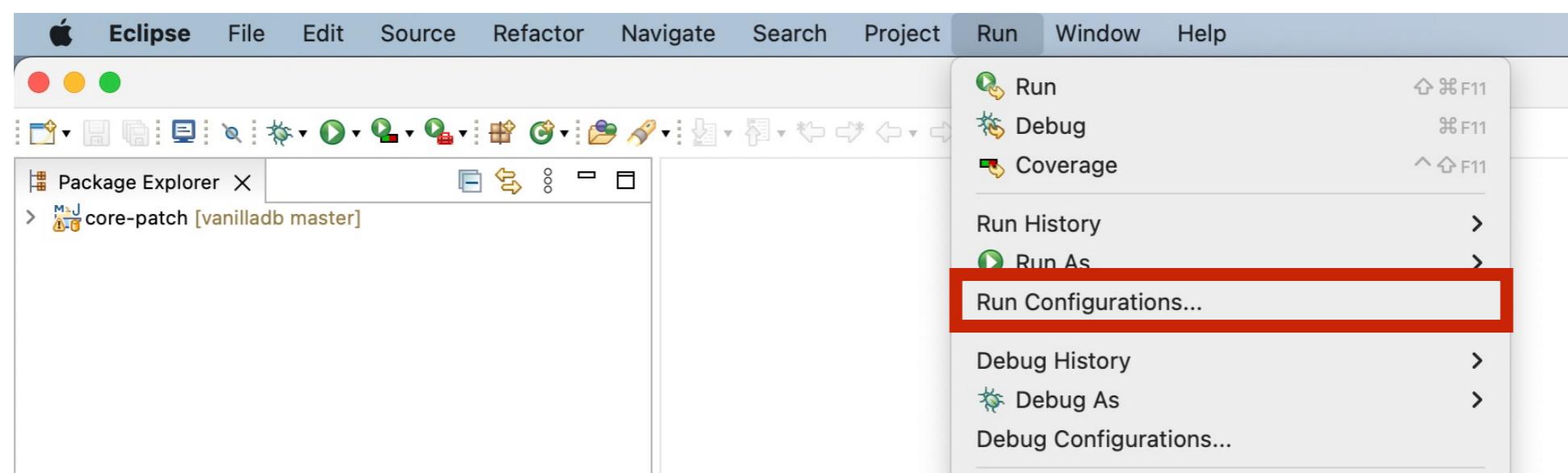
# Starting Up VanillaCore

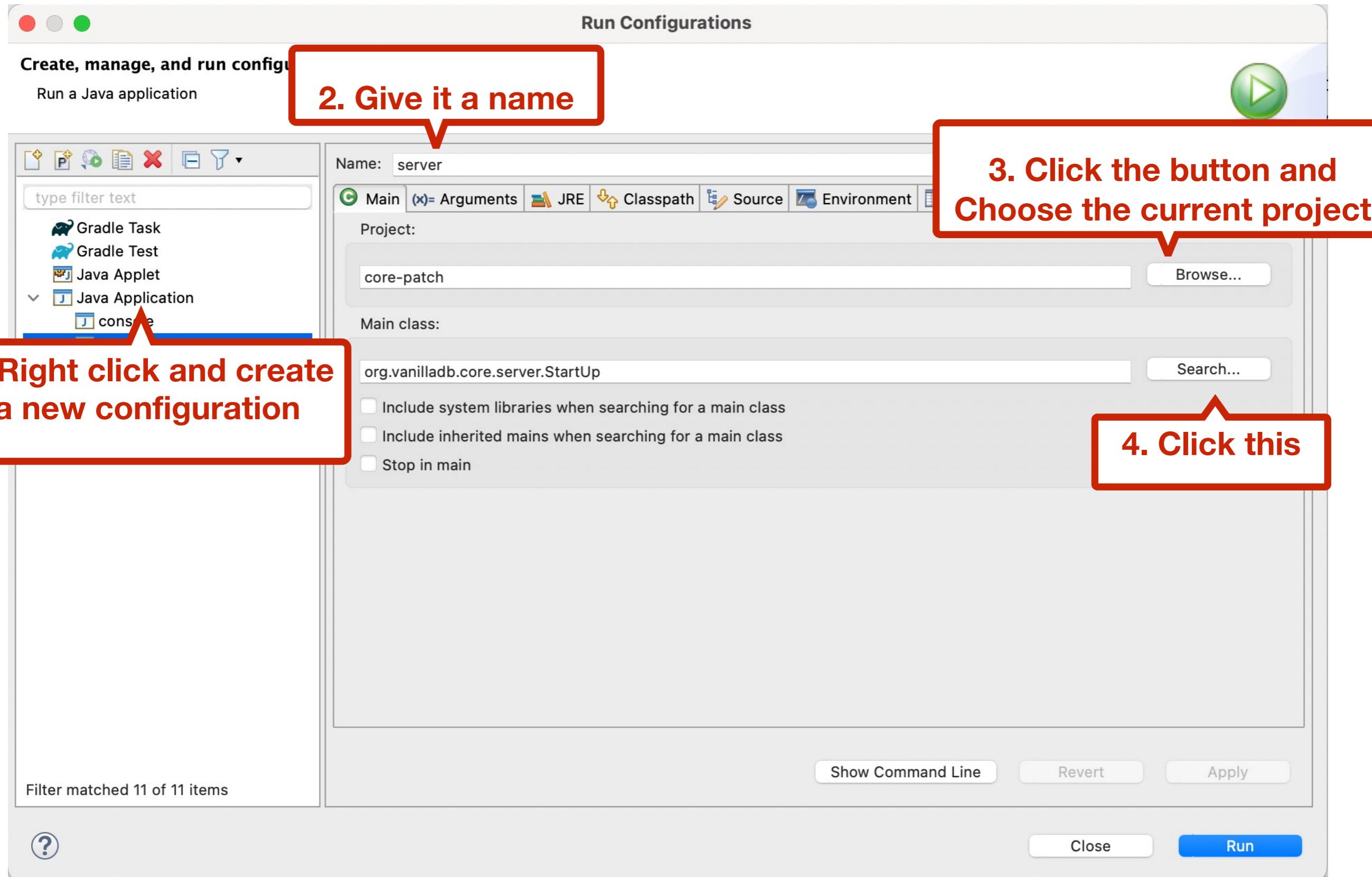


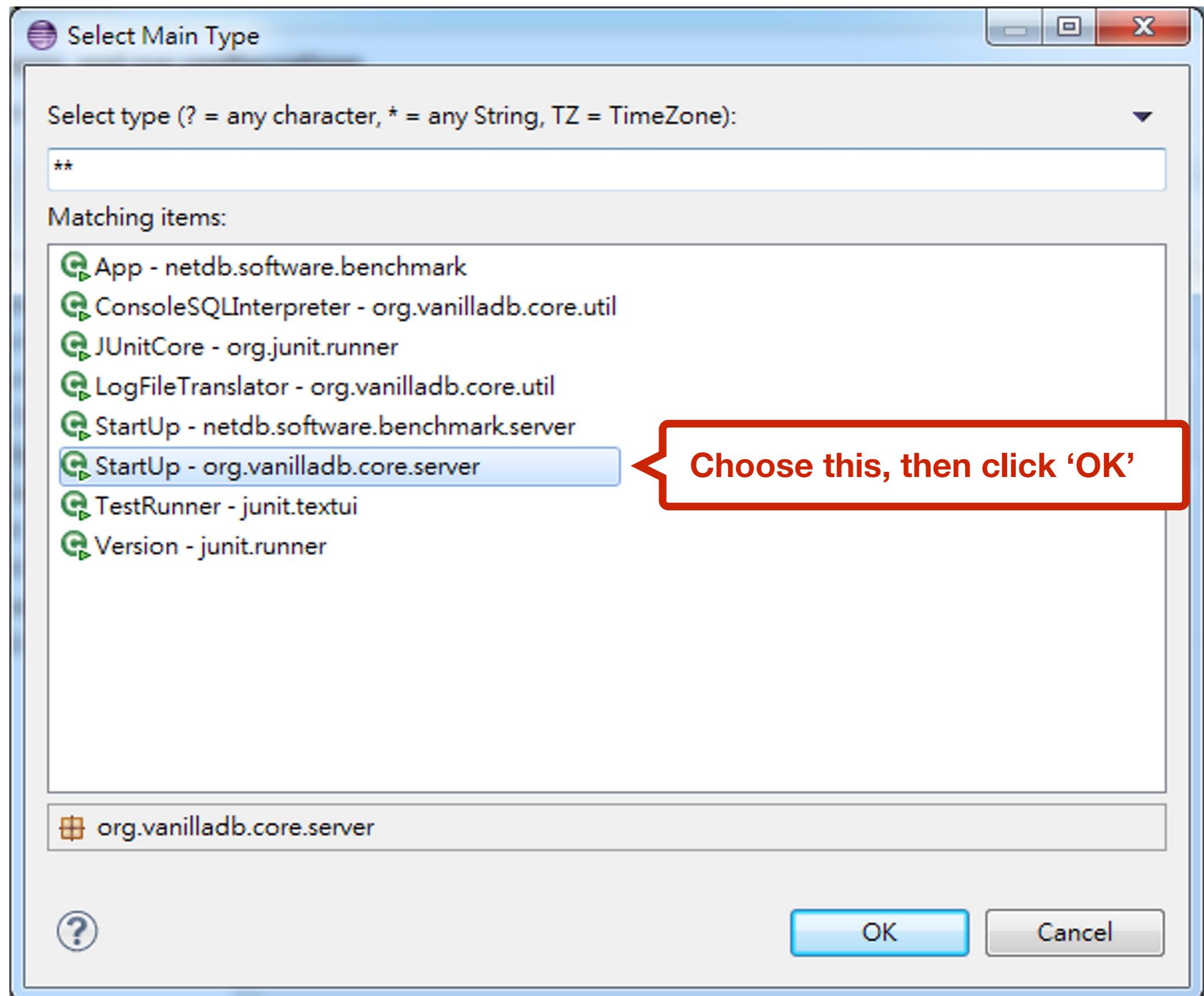
- To start up a VanillaCore server, we have to give it the following arguments
  - Database Directory Name
  - The locations of properties files

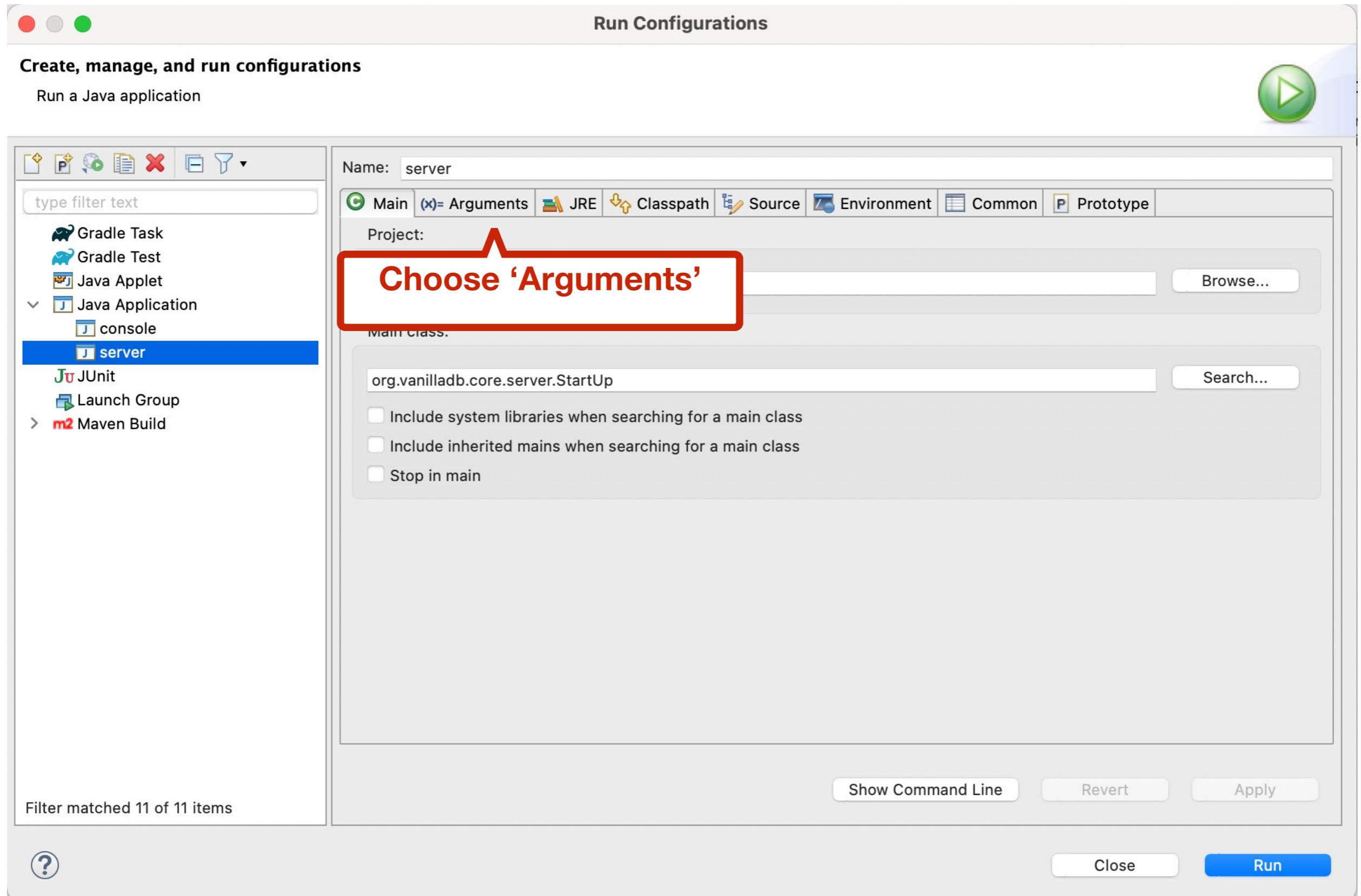
[\[Icon Source\]](#)

# Setting Run Configuration









# Arguments (1/2)

- Program Arguments

- Format

[Database Directory Name]

- Example

student-db

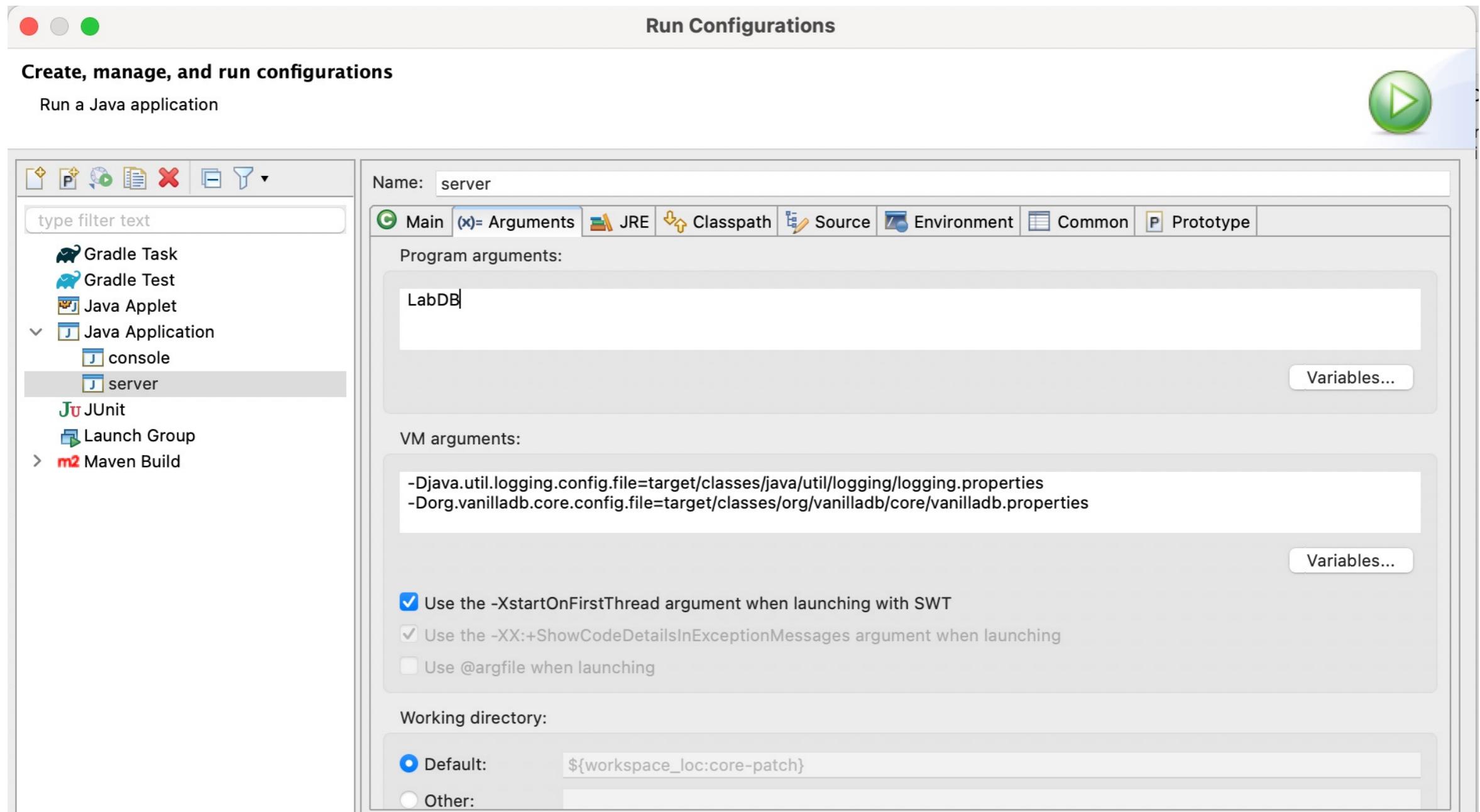
# Arguments (2/2)

- VM Arguments
  - For logging properties

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

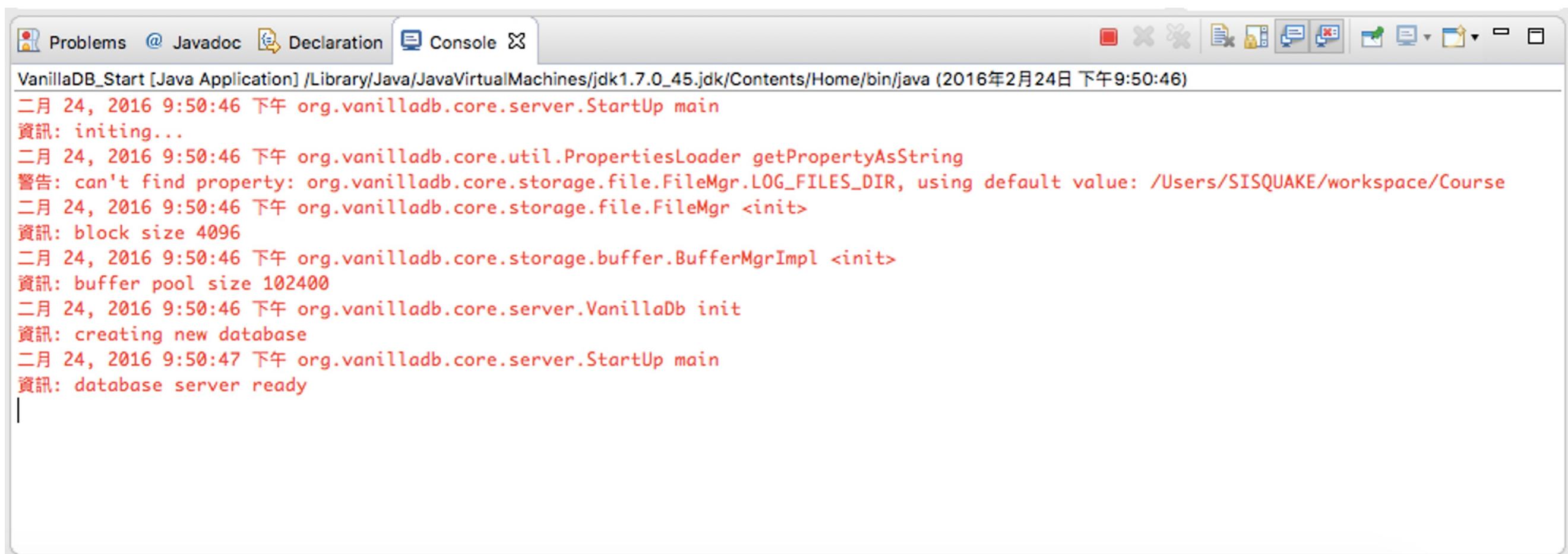
- For VanillaCore properties

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



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

# Server Messages (1/3)

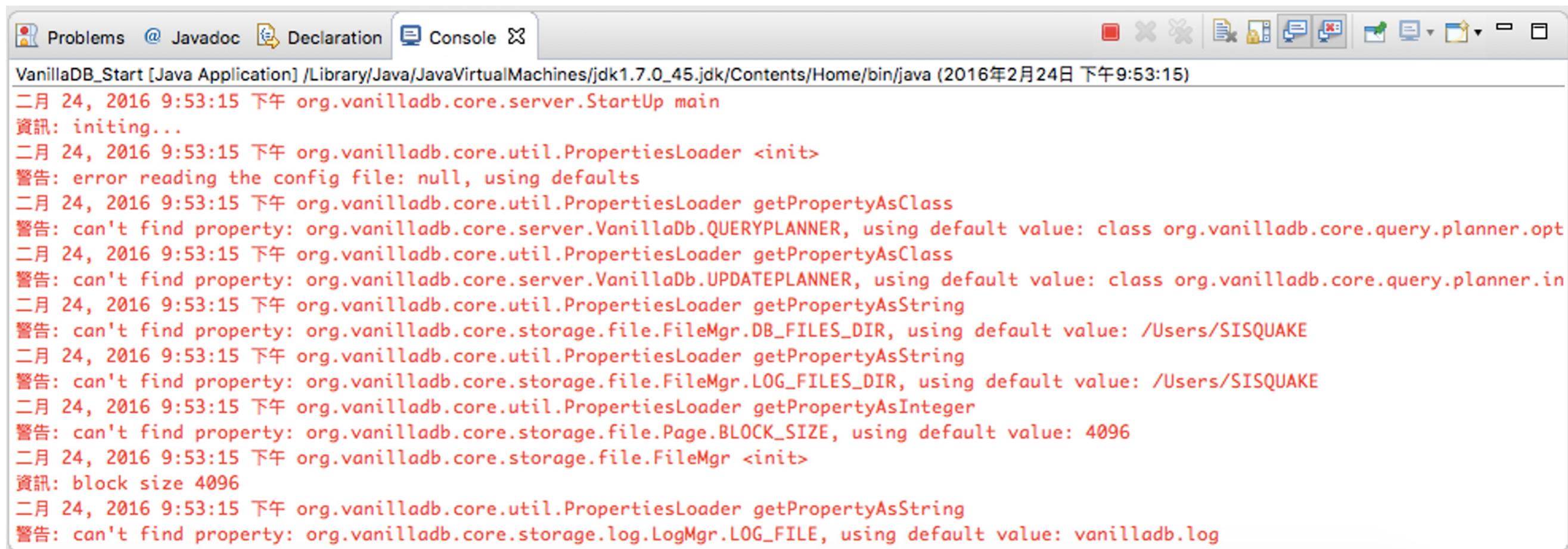


The screenshot shows a Java IDE's console tab with the title "VanillaDB\_Start [Java Application]". The log output is as follows:

```
二月 24, 2016 9:50:46 下午 org.vanilladb.core.server.StartUp main
資訊: initing...
二月 24, 2016 9:50:46 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/workspace/Course
二月 24, 2016 9:50:46 下午 org.vanilladb.core.storage.file.FileMgr <init>
資訊: block size 4096
二月 24, 2016 9:50:46 下午 org.vanilladb.core.storage.buffer.BufferMgrImpl <init>
資訊: buffer pool size 102400
二月 24, 2016 9:50:46 下午 org.vanilladb.core.server.VanillaDb init
資訊: creating new database
二月 24, 2016 9:50:47 下午 org.vanilladb.core.server.StartUp main
資訊: database server ready
```

You should see this if there is nothing wrong.

# Server Messages (2/3)



The screenshot shows a Java application named "VanillaDB\_Start" running in an IDE. The "Console" tab is selected, displaying the server's startup log. The log output is in red text, indicating various configuration errors and warnings during the startup process.

```
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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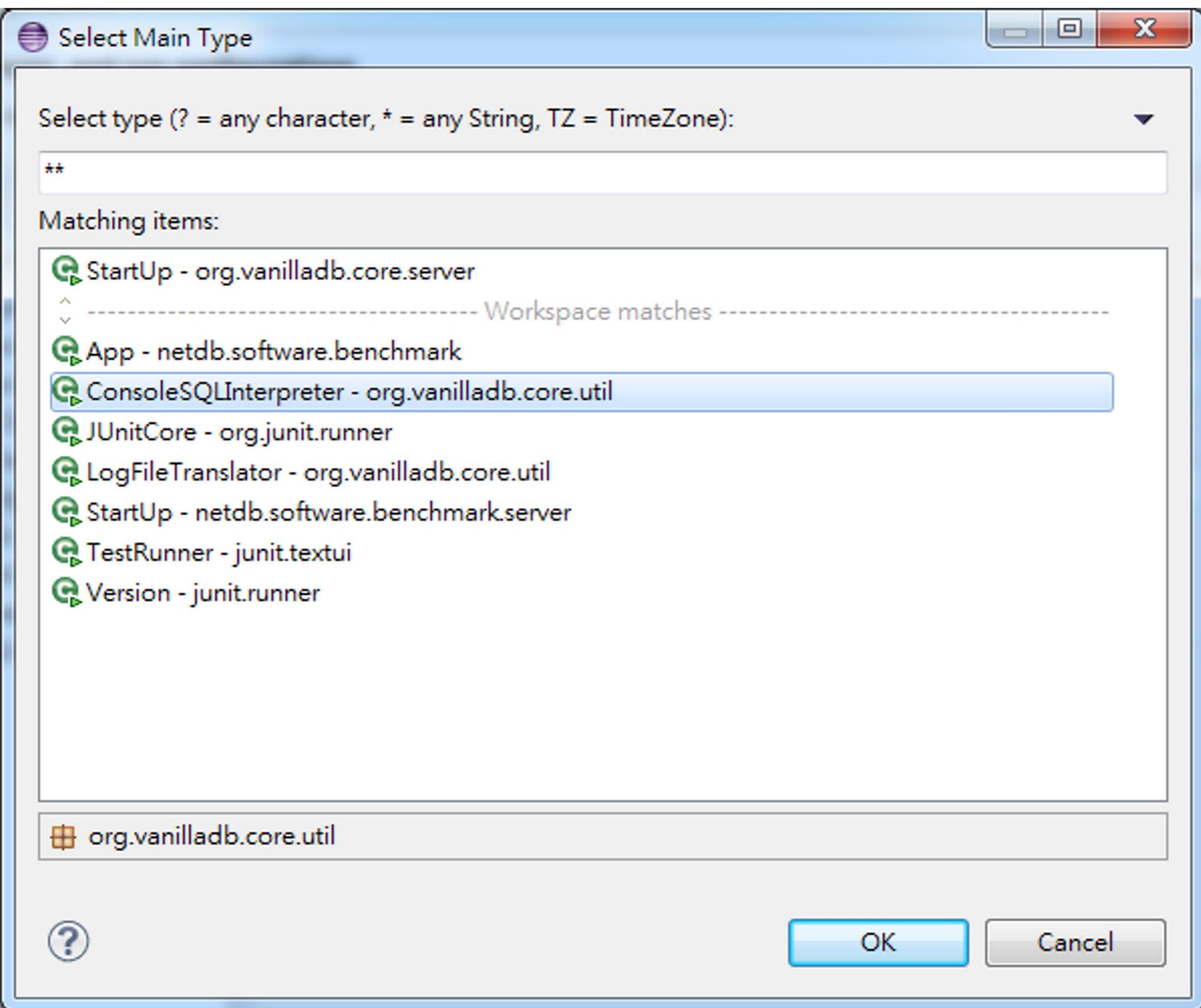
# Console SQL Interpreter



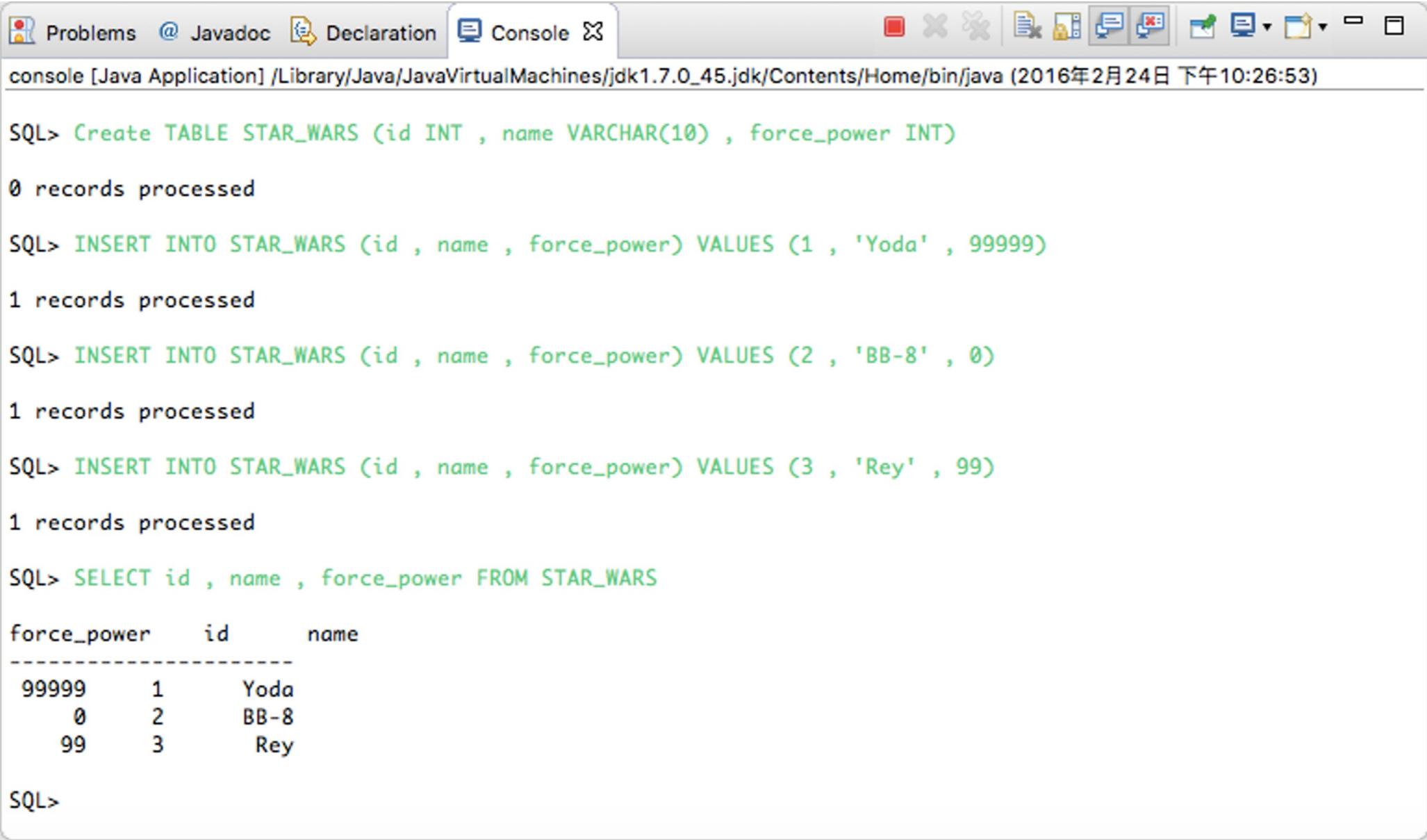
- You can use Console SQL Interpreter we provide in VanillaCore to connect with server

# Console SQL Interpreter

- To use Console SQL Interpreter, just follow these steps
  1. Create a new run configuration
  2. Give it a name and choose your project
  3. Choose “ConsoleSQLInterpreter” for “Main Class”
  4. No VM Argument is required
  5. Run it



# Try it !



The screenshot shows a Java application's console window with the following SQL session:

```
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/2023-spring/faq/-/blob/master/Vanilladb\\_Sql.md](https://shwu10.cs.nthu.edu.tw/courses/databases/2023-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/2023-spring/faq>
    - If your problem was very unique, just send a email let us know