

Using VanillaDB

Database Systems
DataLab, CS, NTHU
Spring, 2022



VanillaDB

Simple, fast, and extensible database system prototypes.

Projects

- There are 3 projects in VanillaDB
 - Single-node 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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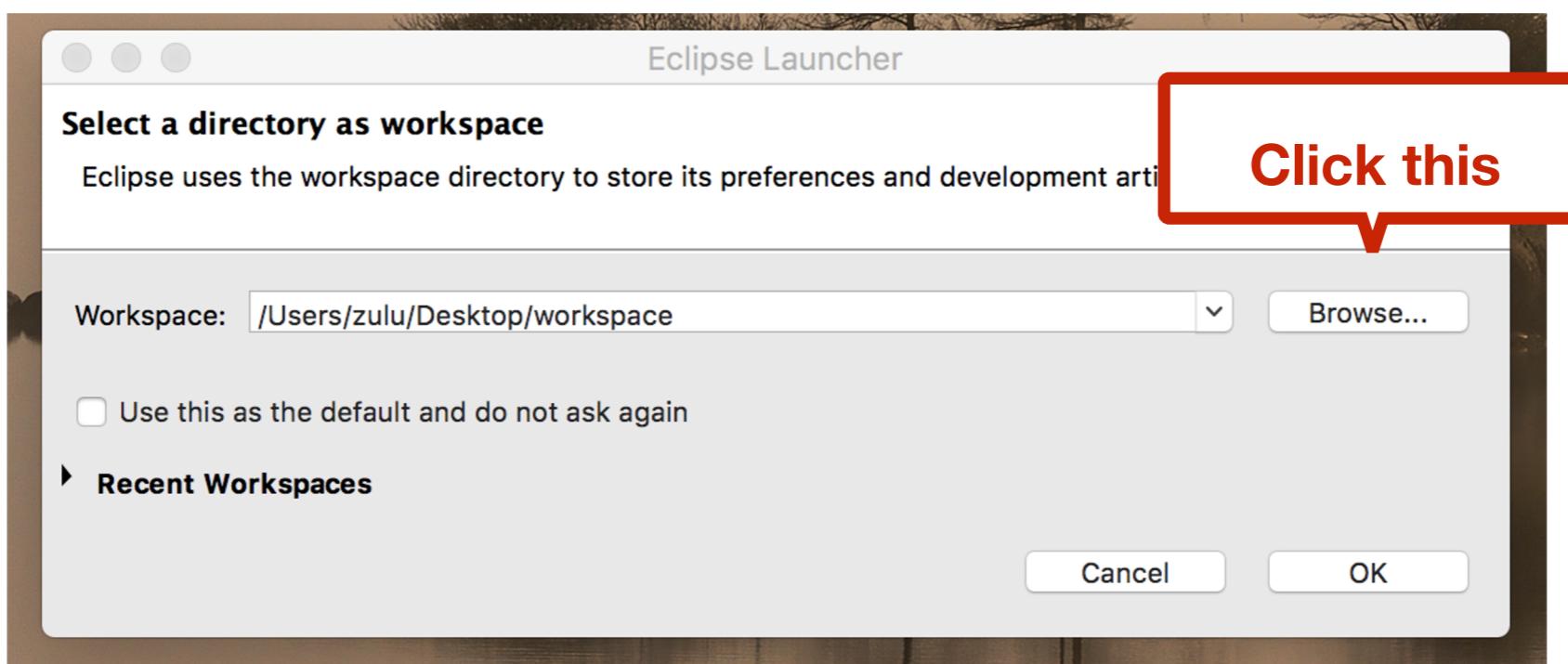
Setting Up Environment

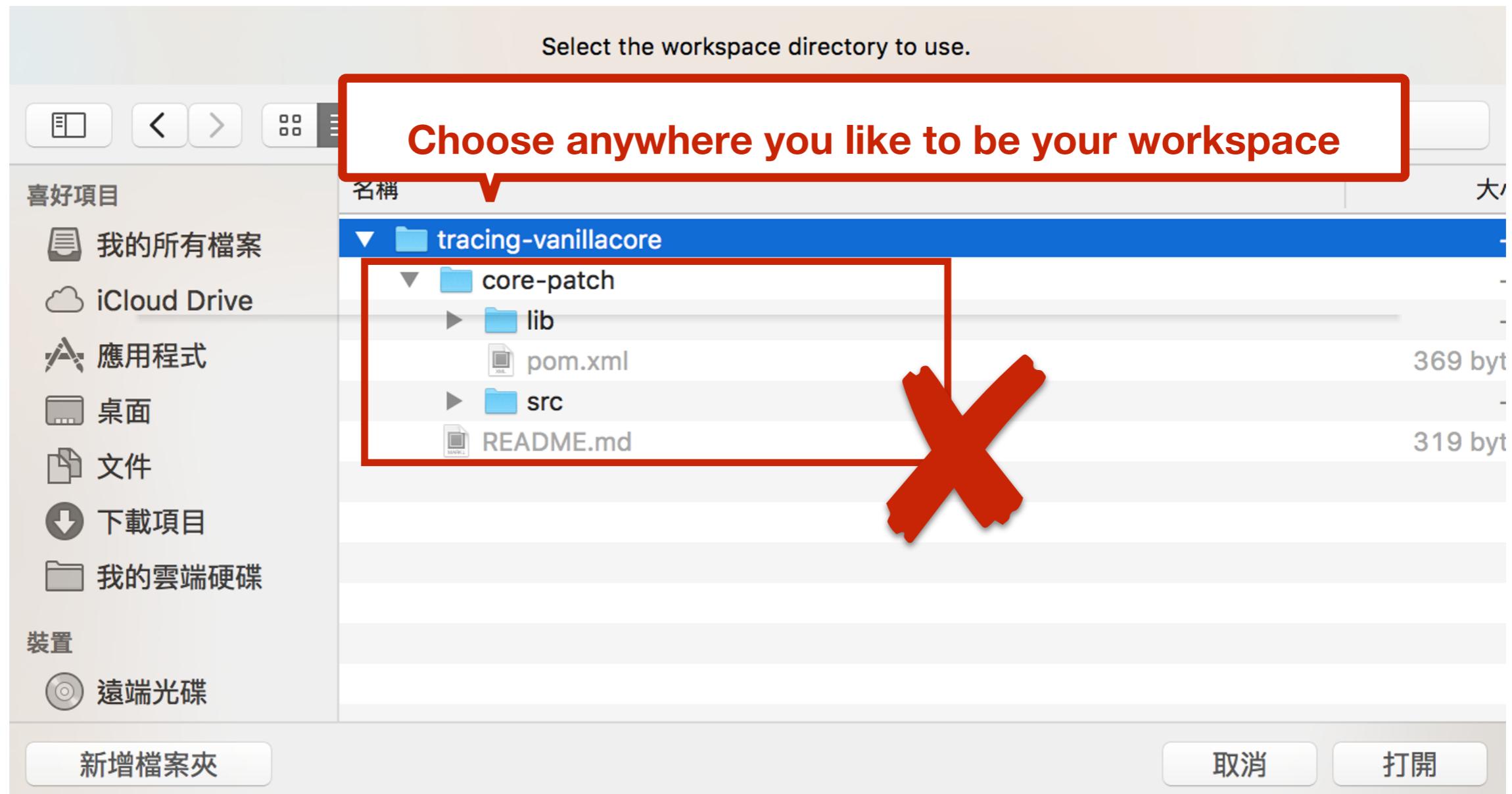
- JDK 8
 - <https://www.oracle.com/tw/java/technologies/java/javase/javase8-archive-downloads.html>
 - Eclipse (latest version: 2021-12)
 - <https://www.eclipse.org/downloads/packages/installer>

Downloading The Project

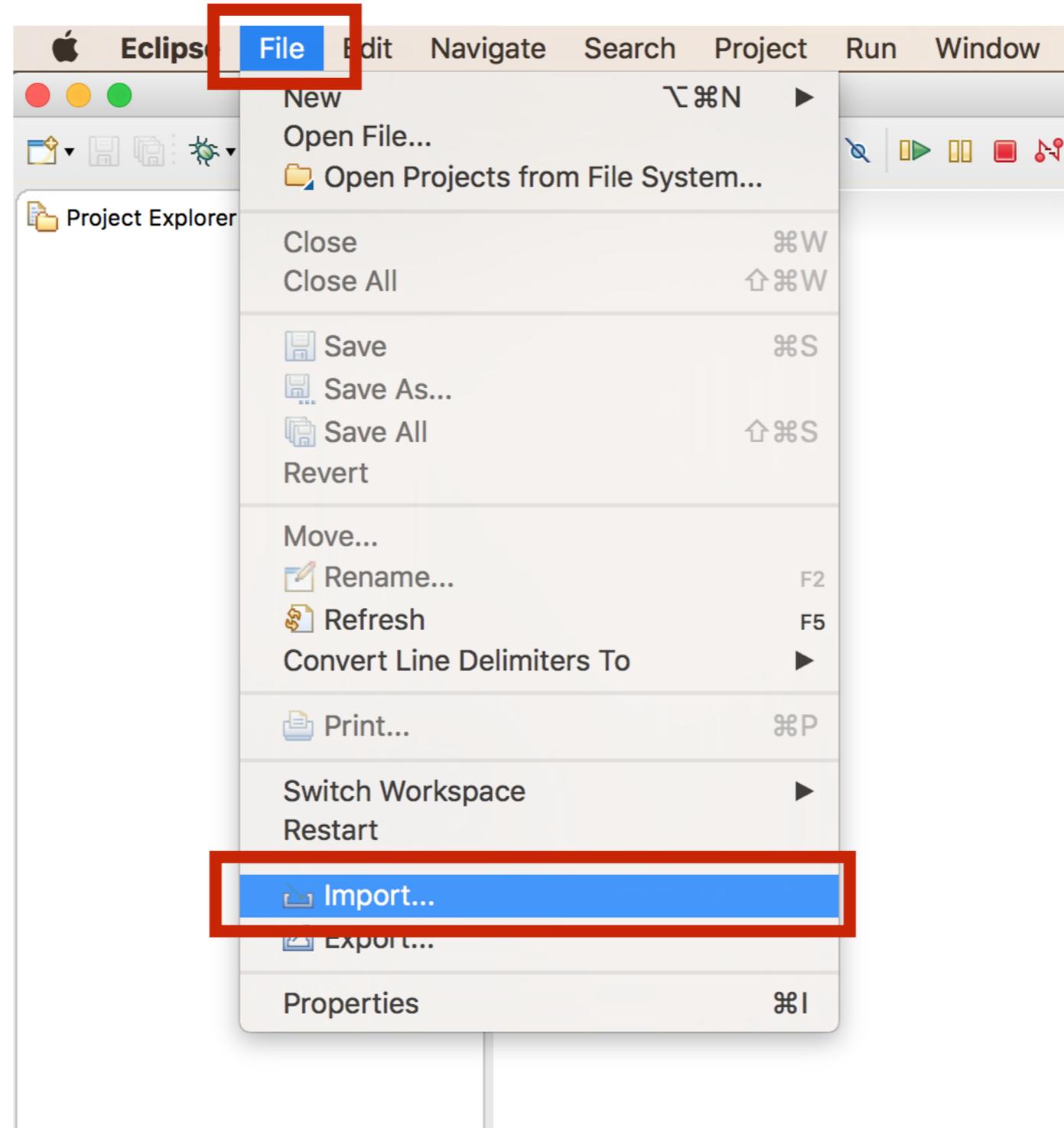
- Clone VanillaDB here
 - <https://shwu10.cs.nthu.edu.tw/courses/databases/2022-spring/vanilladb>

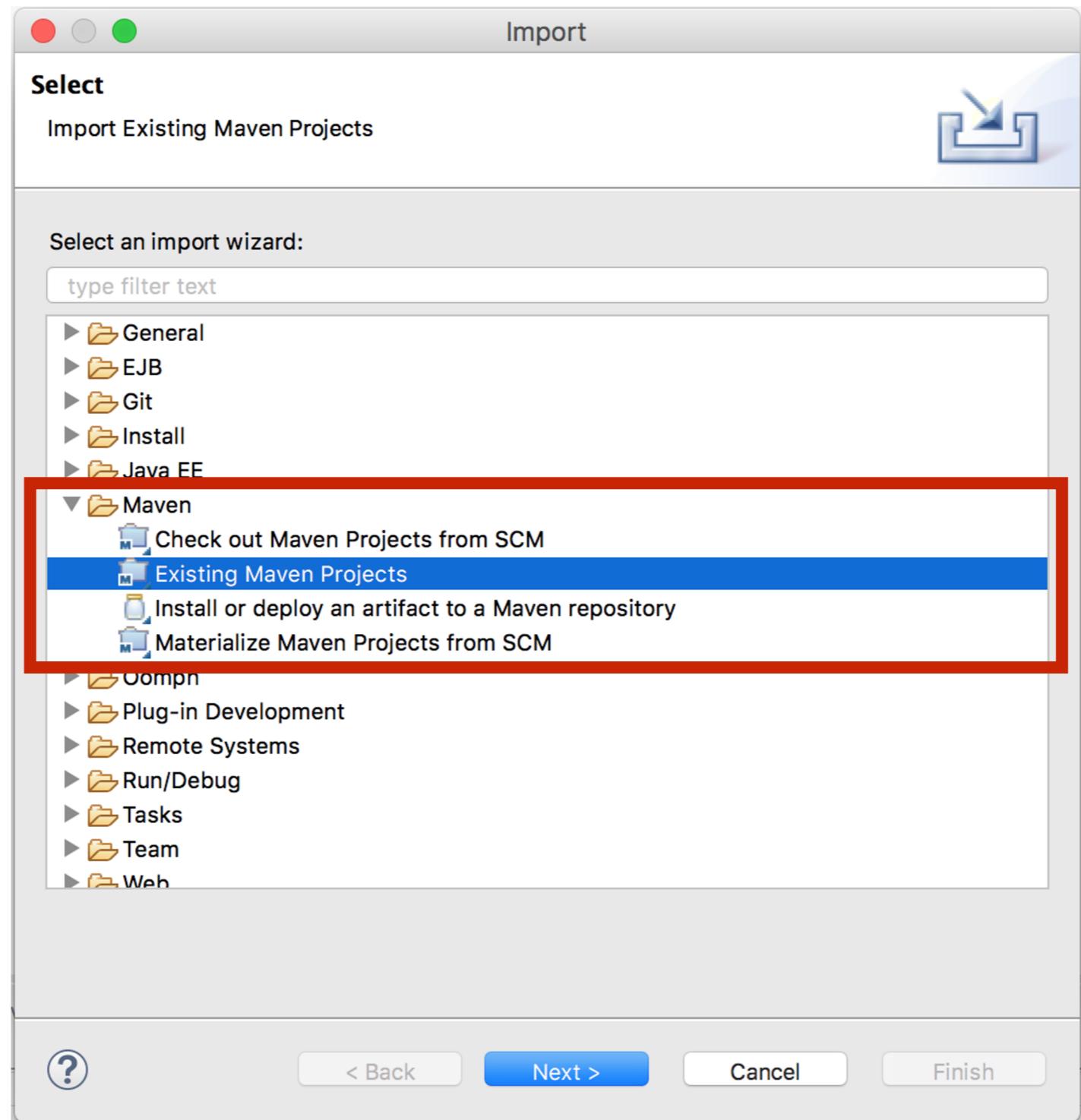
How to Import VanillaCore

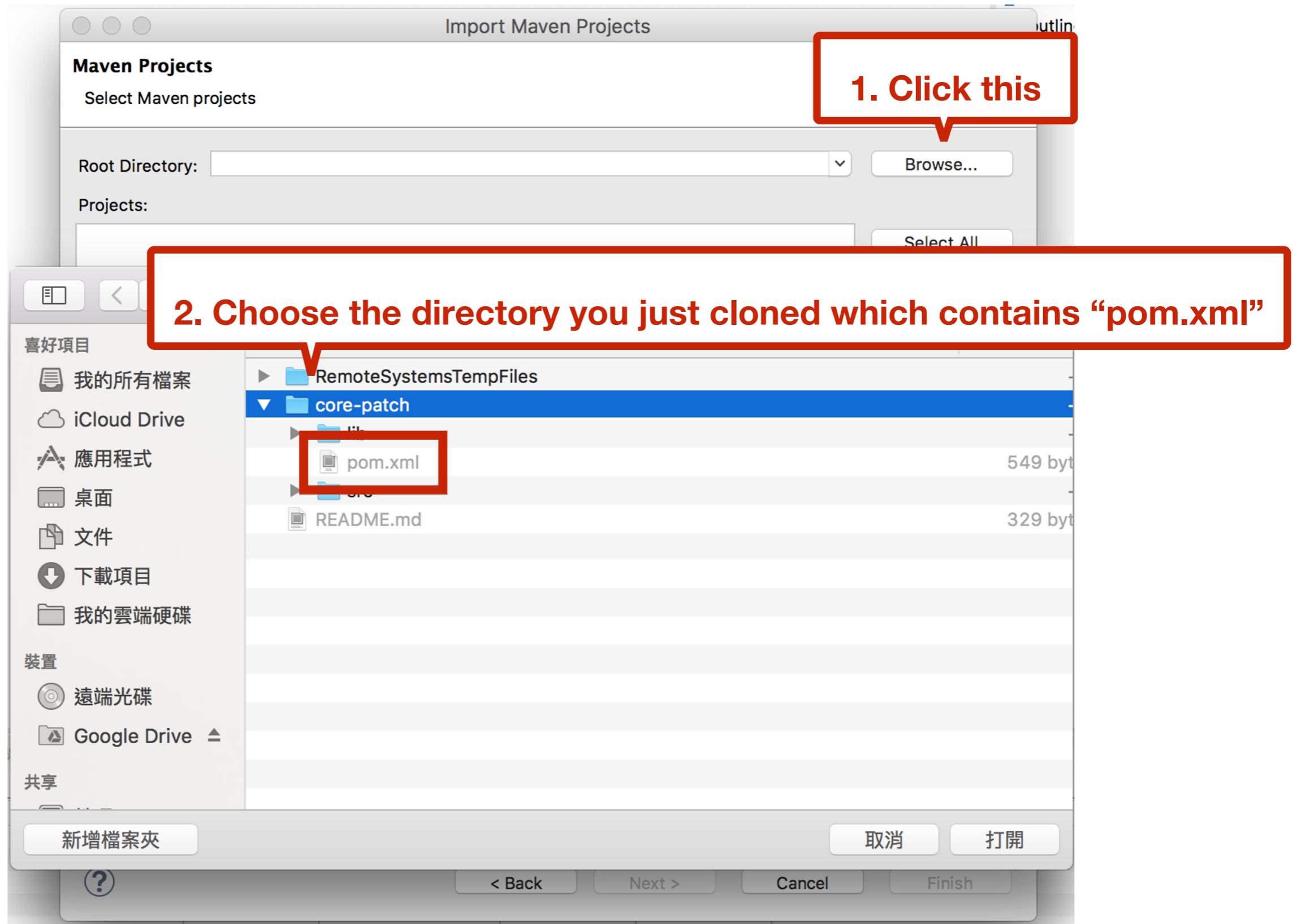


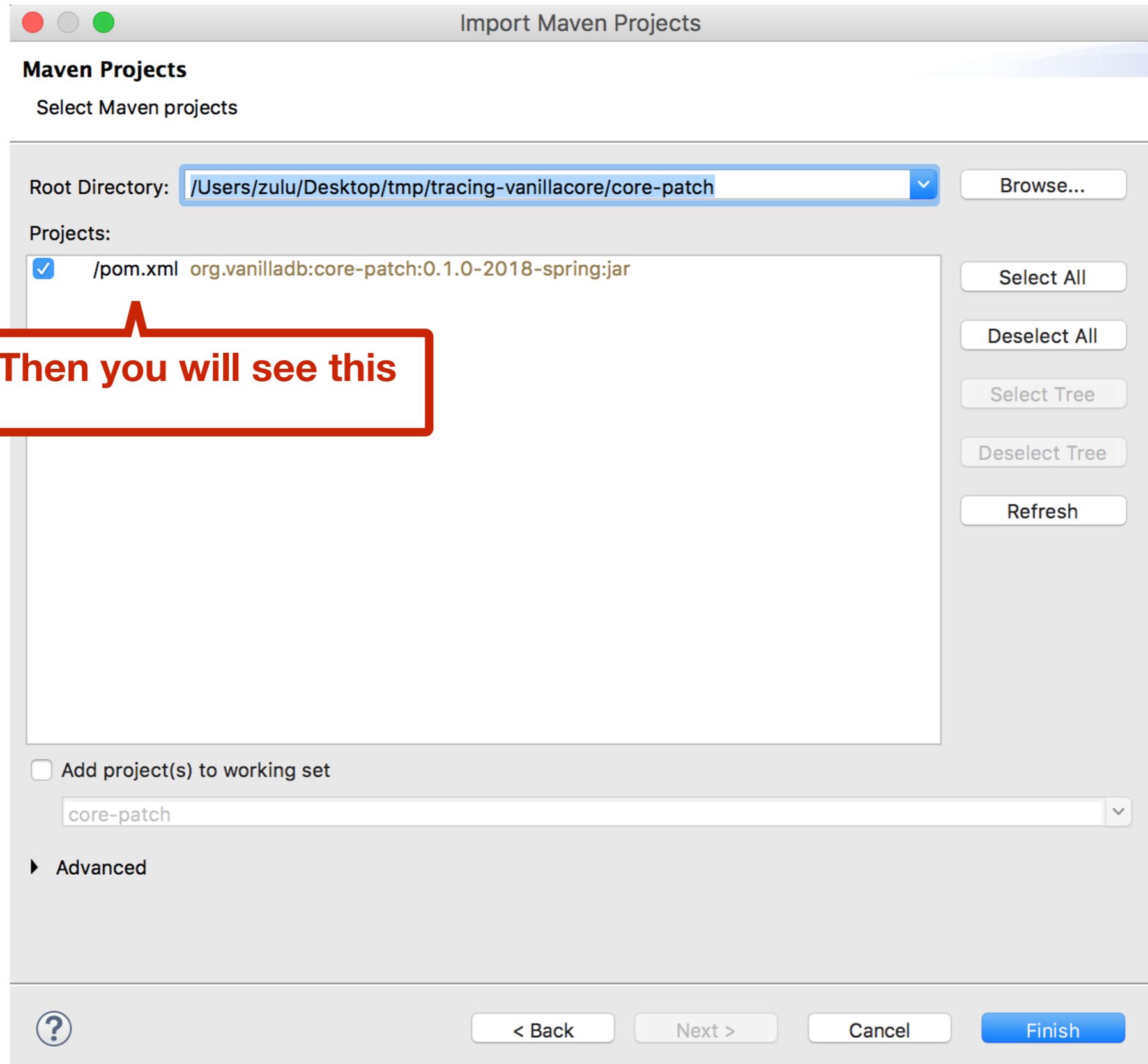


But be careful to not choose the directory which contains “pom.xml” !!

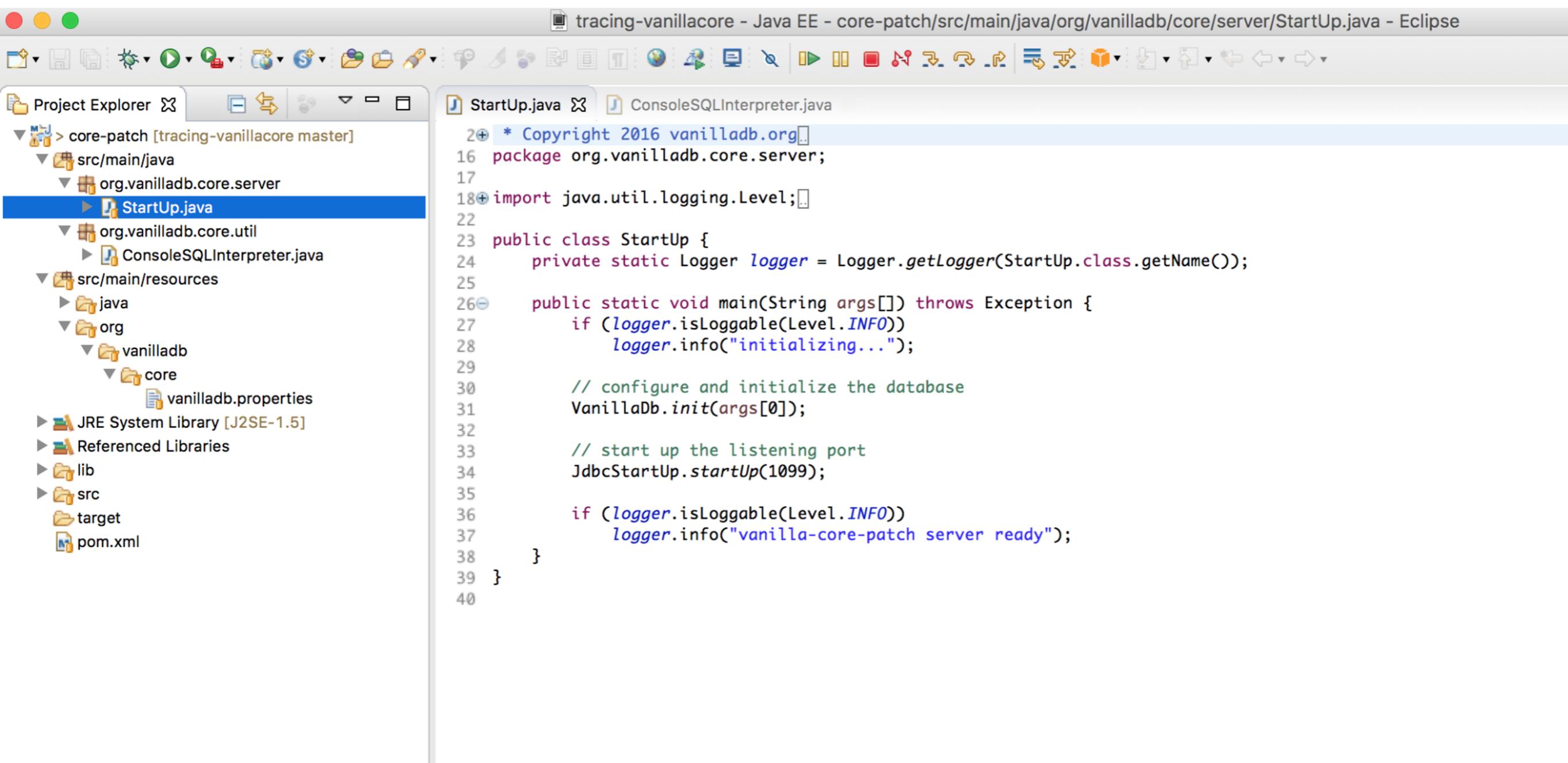








Done



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 icons.
- Project Explorer:** Shows the project structure:
 - core-patch [tracing-vanillacore master]
 - src/main/java
 - org.vanilladb.core.server (selected)
 - 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

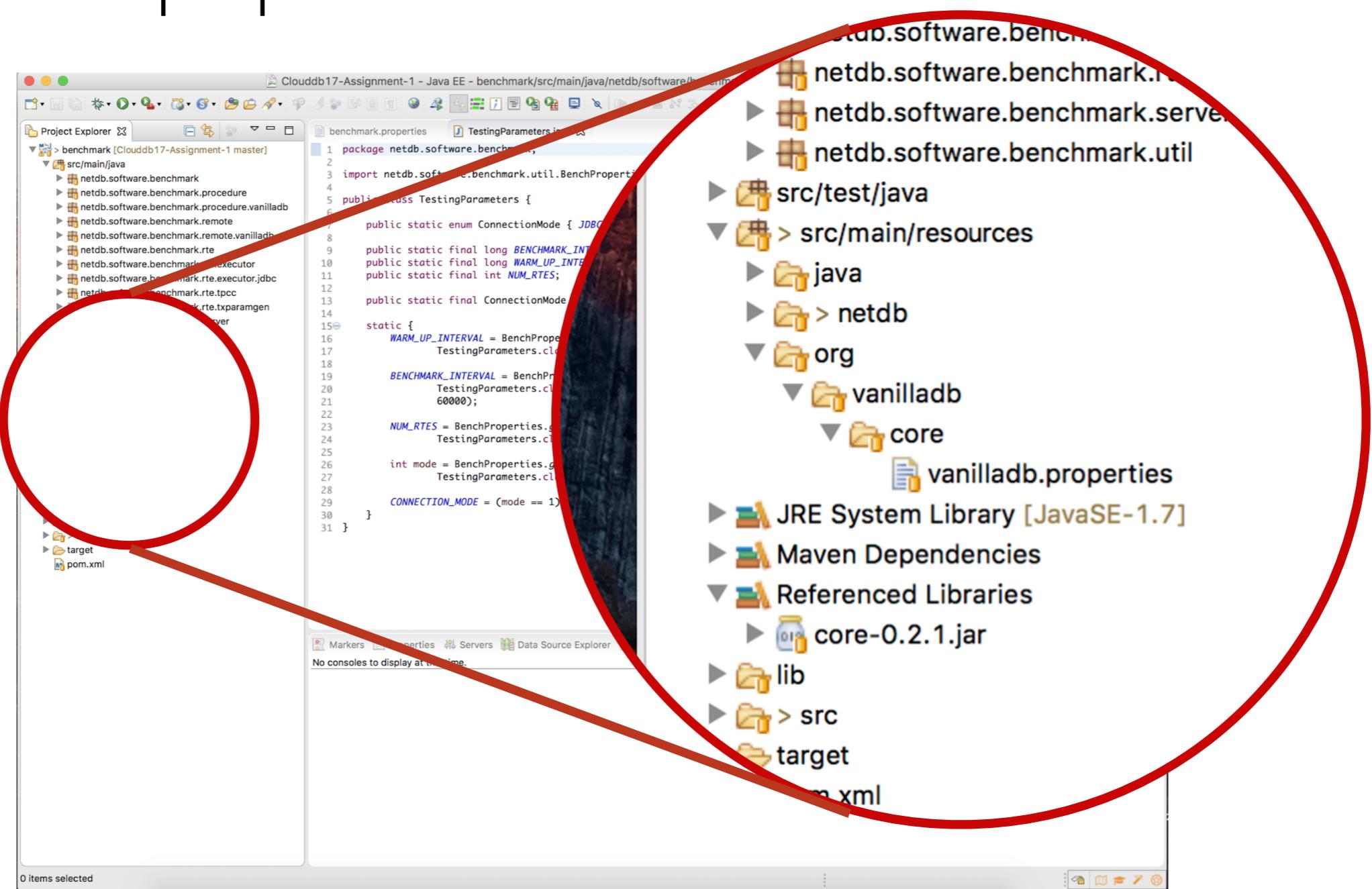


- Configurations for VanillaCore are all stored in a properties file

[\[Icon Source\]](#)

VanillaCore Properties File

- vanilladb.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
15 # The number of bytes in a block. A common value is 4K.
16 org.vanilladb.core.storage.file.Page.BLOCK_SIZE=4096
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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
```

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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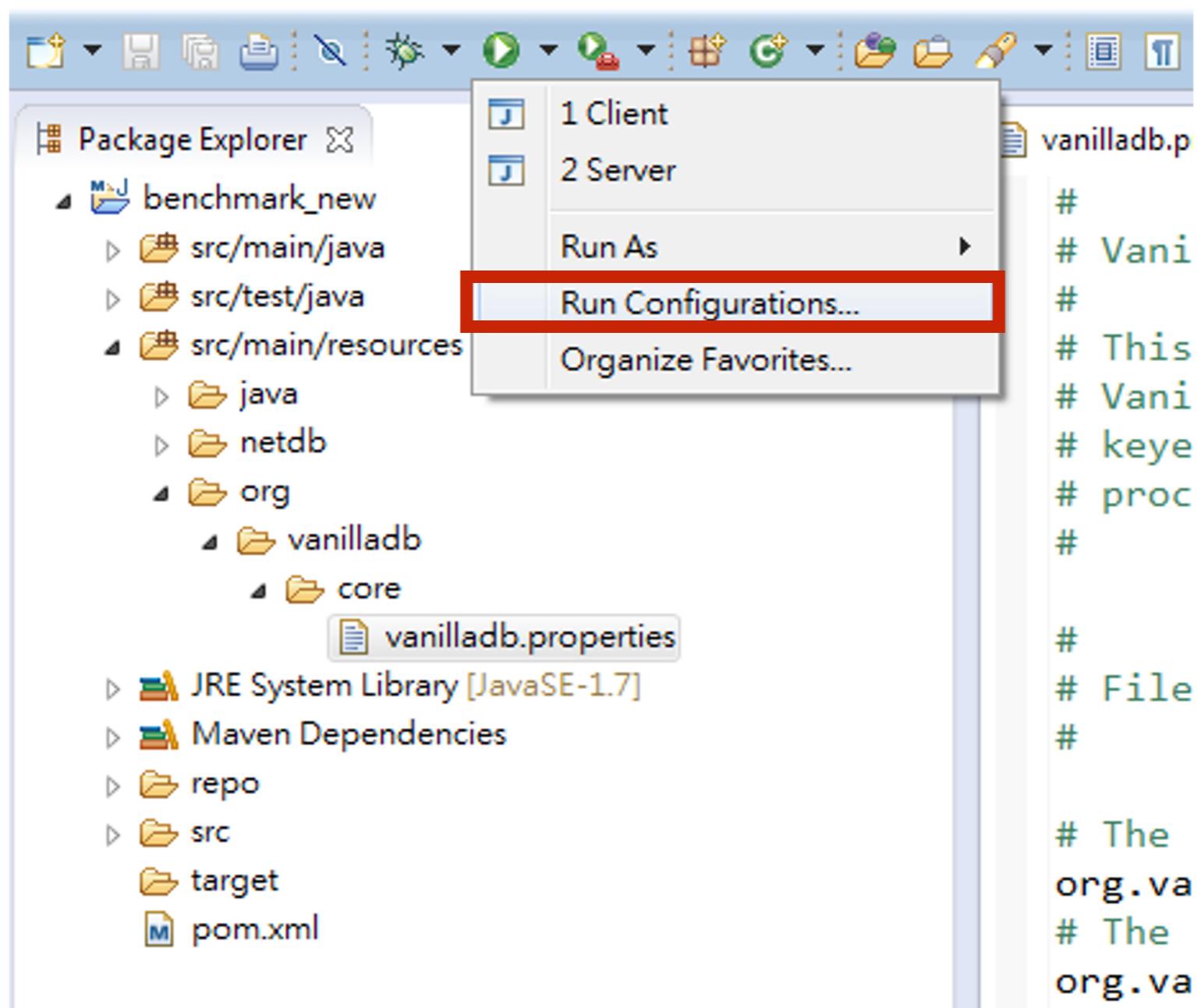
Starting Up VanillaCore

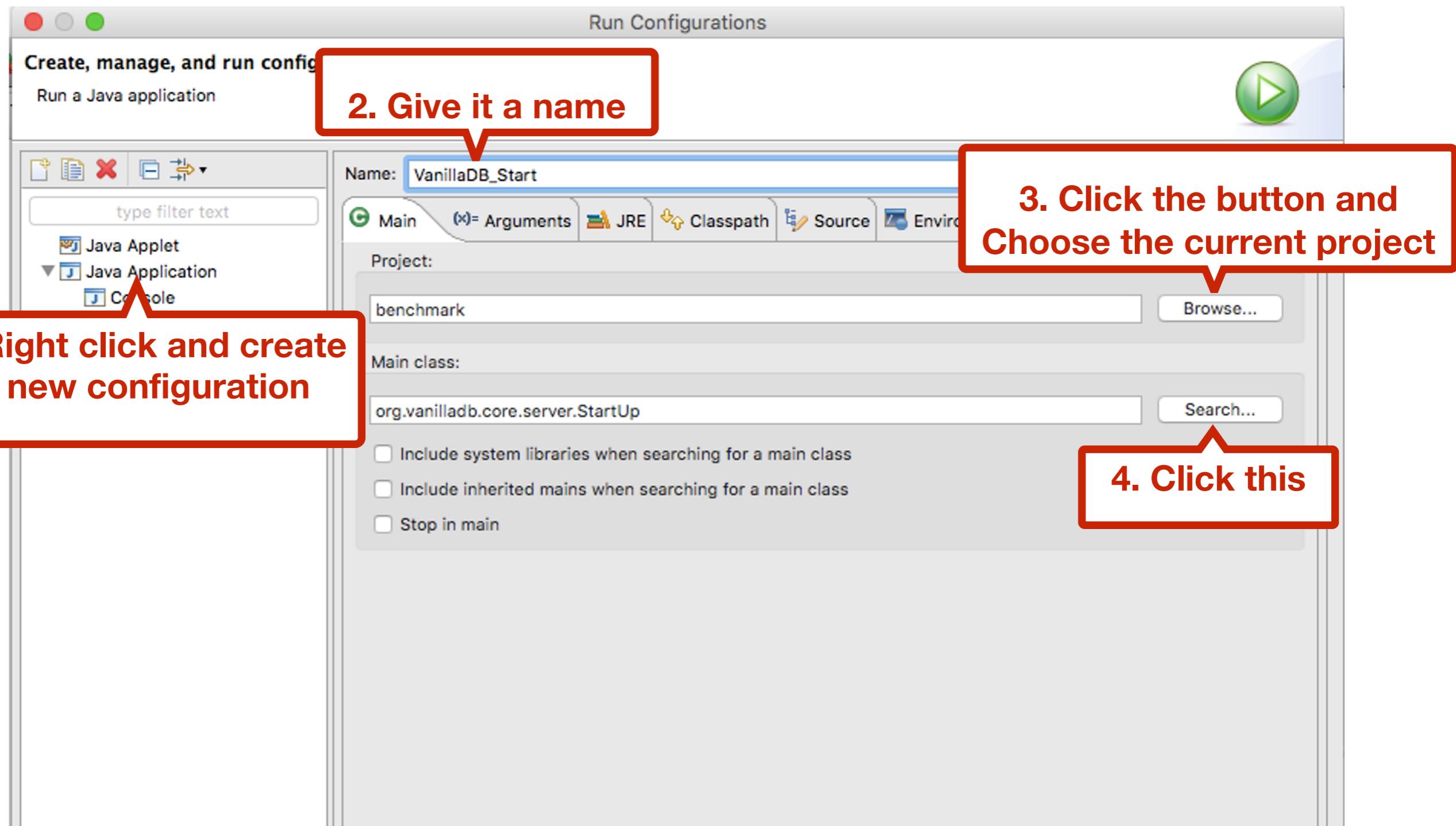


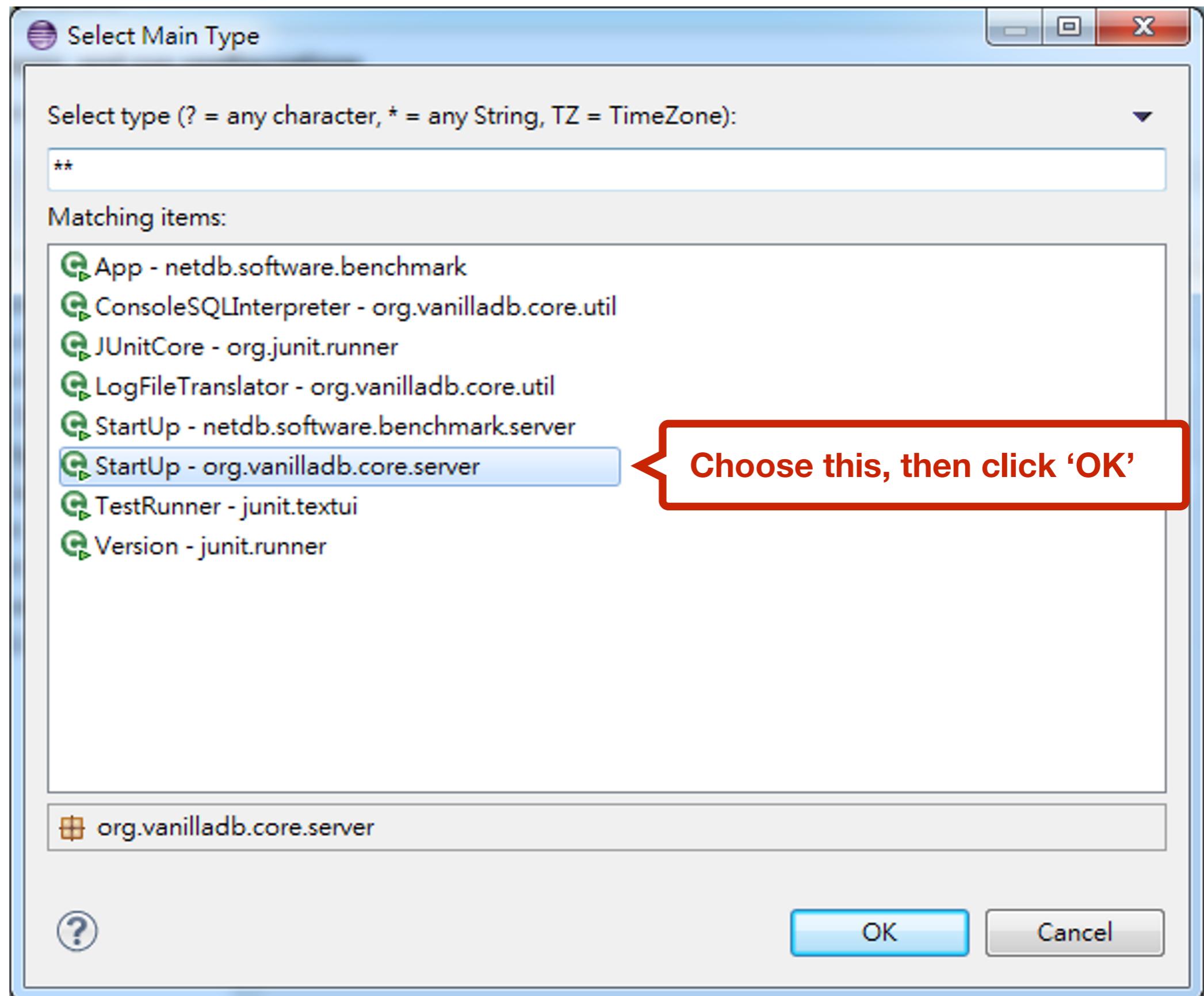
- To start up a VanillaCore server, we have to give it the following arguments
 - Database Directory Name
 - The locations of properties files

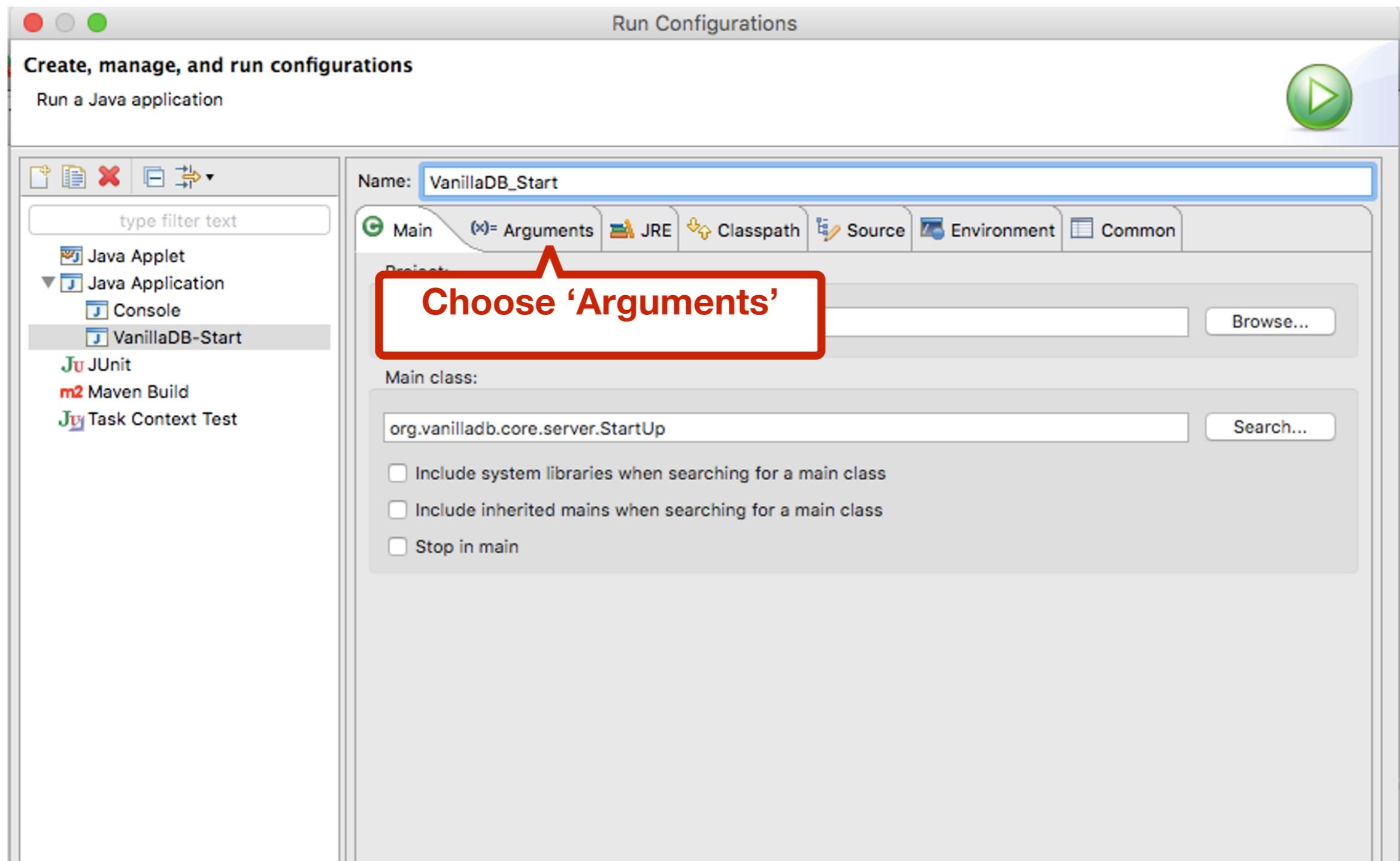
[\[Icon Source\]](#)

Setting Run Configuration









Arguments (1/2)

- Program Arguments

- Format

[Database Directory Name]

- Example

student-db

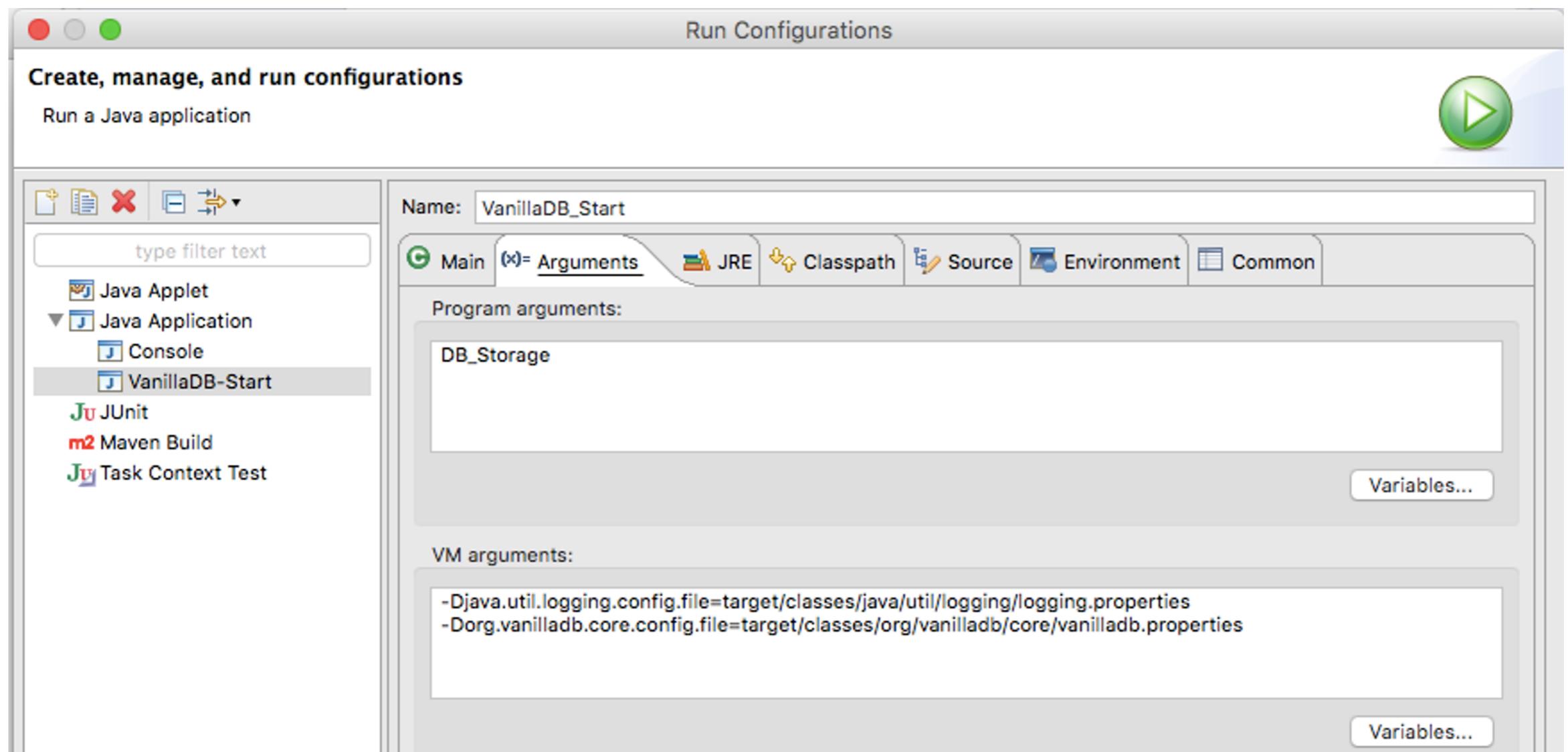
Arguments (2/2)

- VM Arguments
 - For logging properties

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

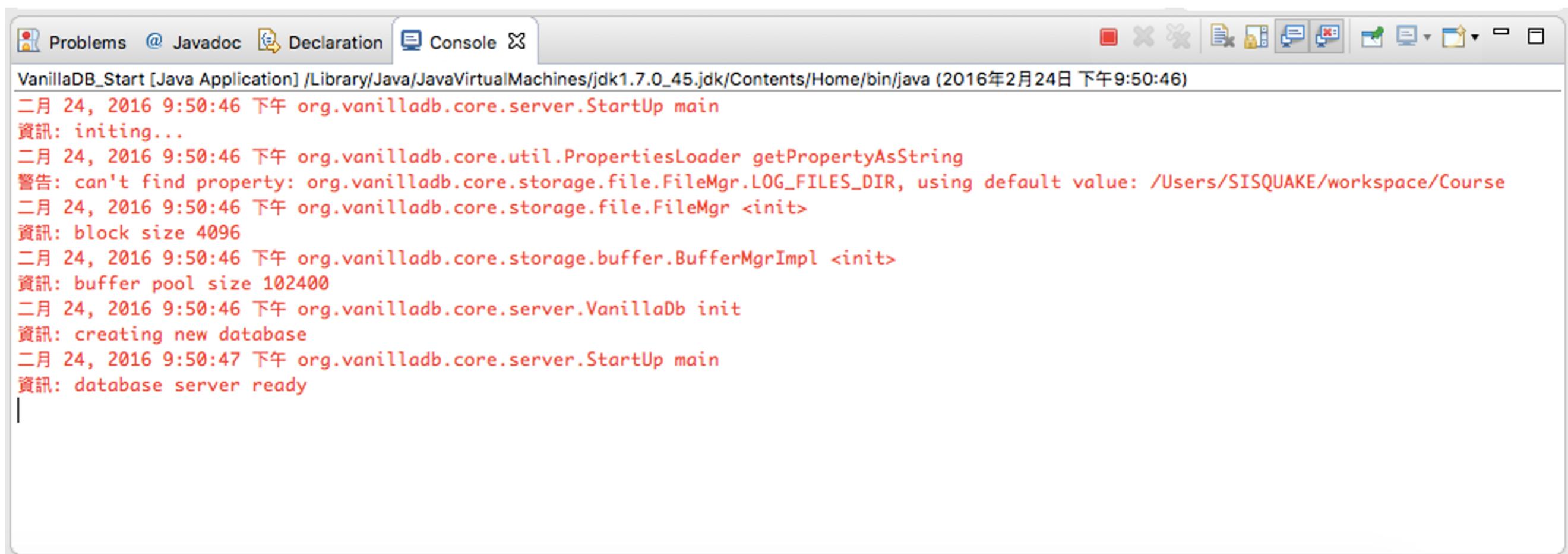
- For VanillaCore properties

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



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

Server Messages (1/3)

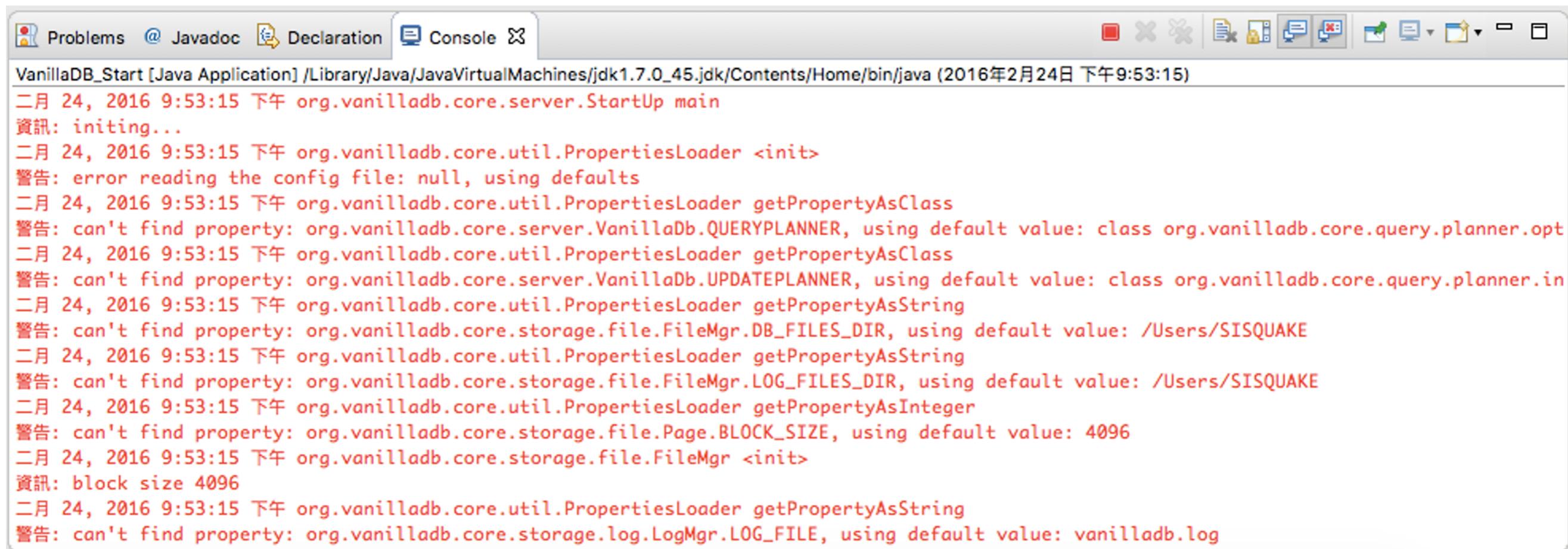


The screenshot shows a Java application named "VanillaDB_Start" running in an IDE. The console tab is active, displaying the following log output:

```
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 log messages from the application's startup. The messages are primarily in Chinese, with some English words like "warning" and "info". The log output includes several "warning" messages indicating that properties could not be found and are being set to default values. It also includes "info" messages about initializing and setting block sizes.

```
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 properties file
- “can’t find property:, using default: ...”
 - It means that there is a property missing in your properties file

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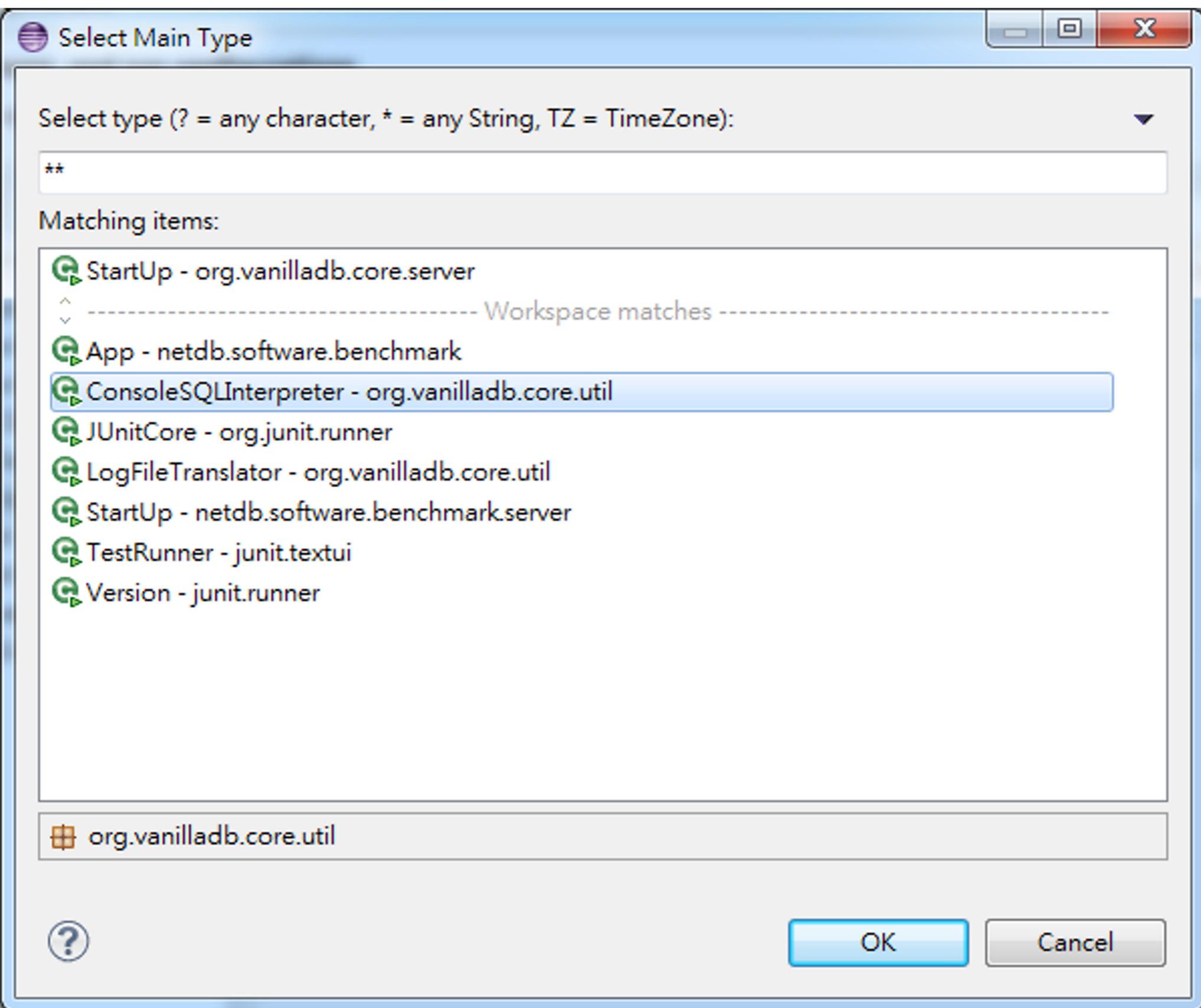
Console SQL Interpreter



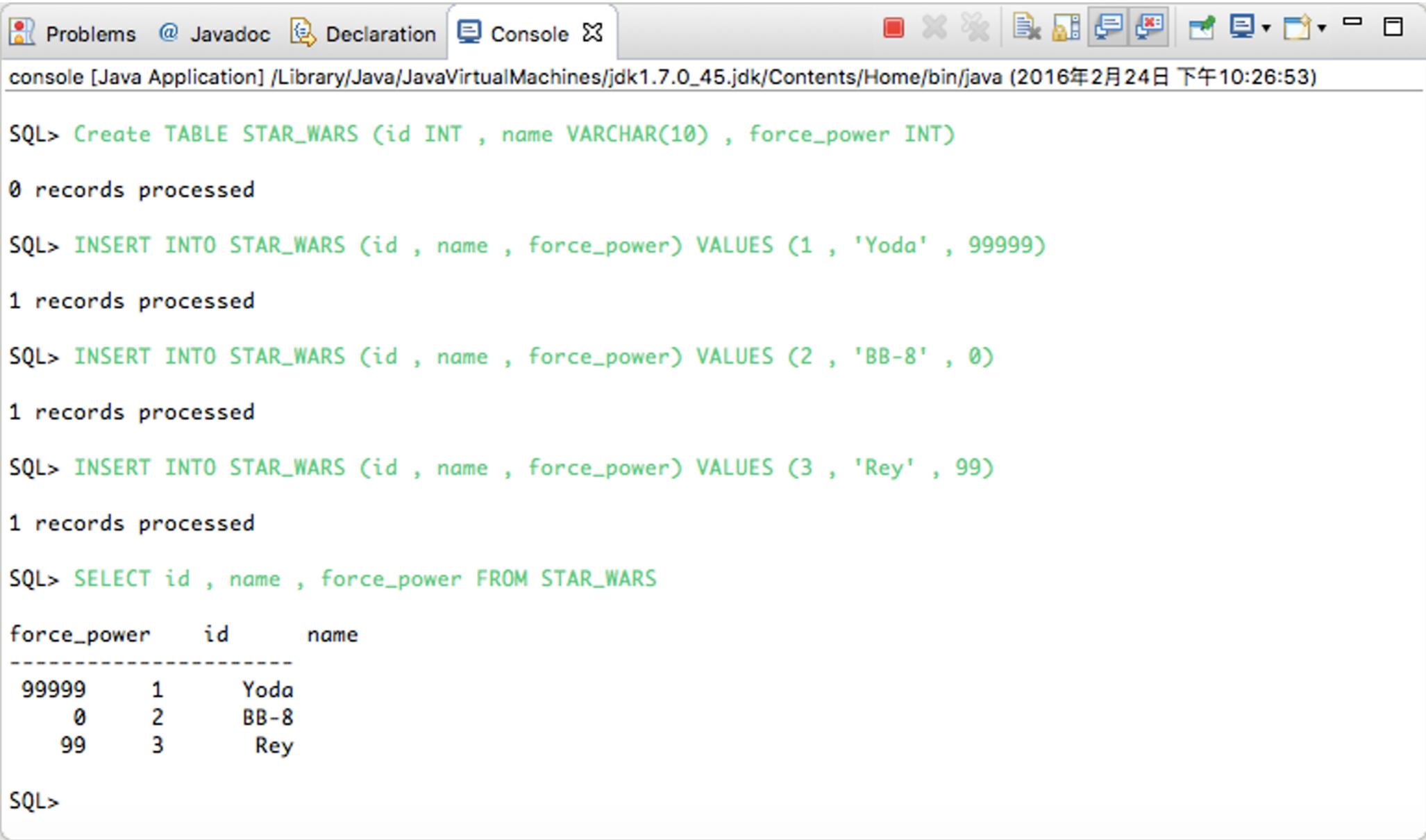
- You can use Console SQL Interpreter we provide in VanillaCore to connect with server

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 running in an IDE. The title bar indicates it's a Java Application. The console tab is active, displaying the following SQL commands and their results:

```
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/2022-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/2022-spring/faq>
 - If your problem was very unique, just send a email let us know