Using VanillaDB

Database Systems
DataLab, CS, NTHU
Spring, 2019

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
- We only use the former two projects in this course.

Outline

- VanillaCore
    - Prepare Everything You Need
    - Server Properties
    - Starting Up VanillaCore
    - Console SQL Interpreter

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Setting Up Environment

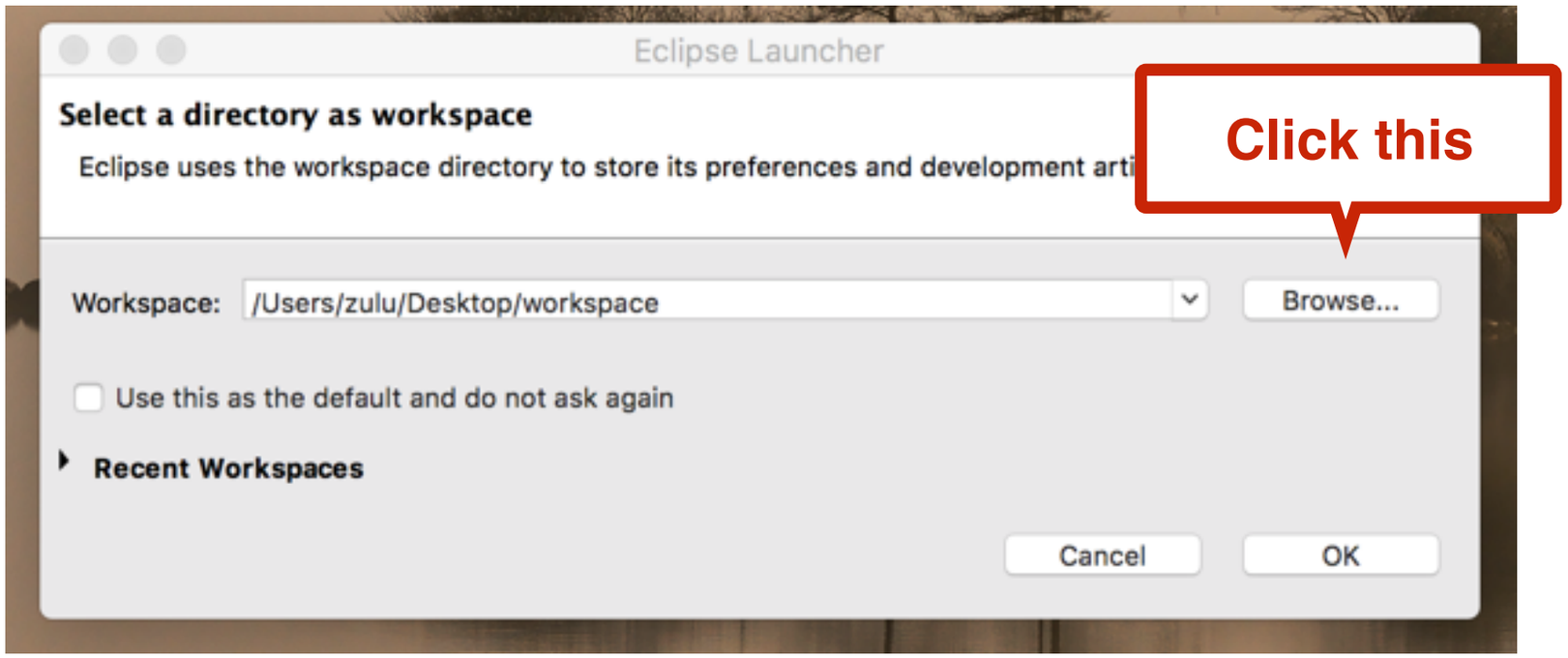
- JDK 8
  - http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html
- Eclipse
  - https://www.eclipse.org/downloads/packages/installer

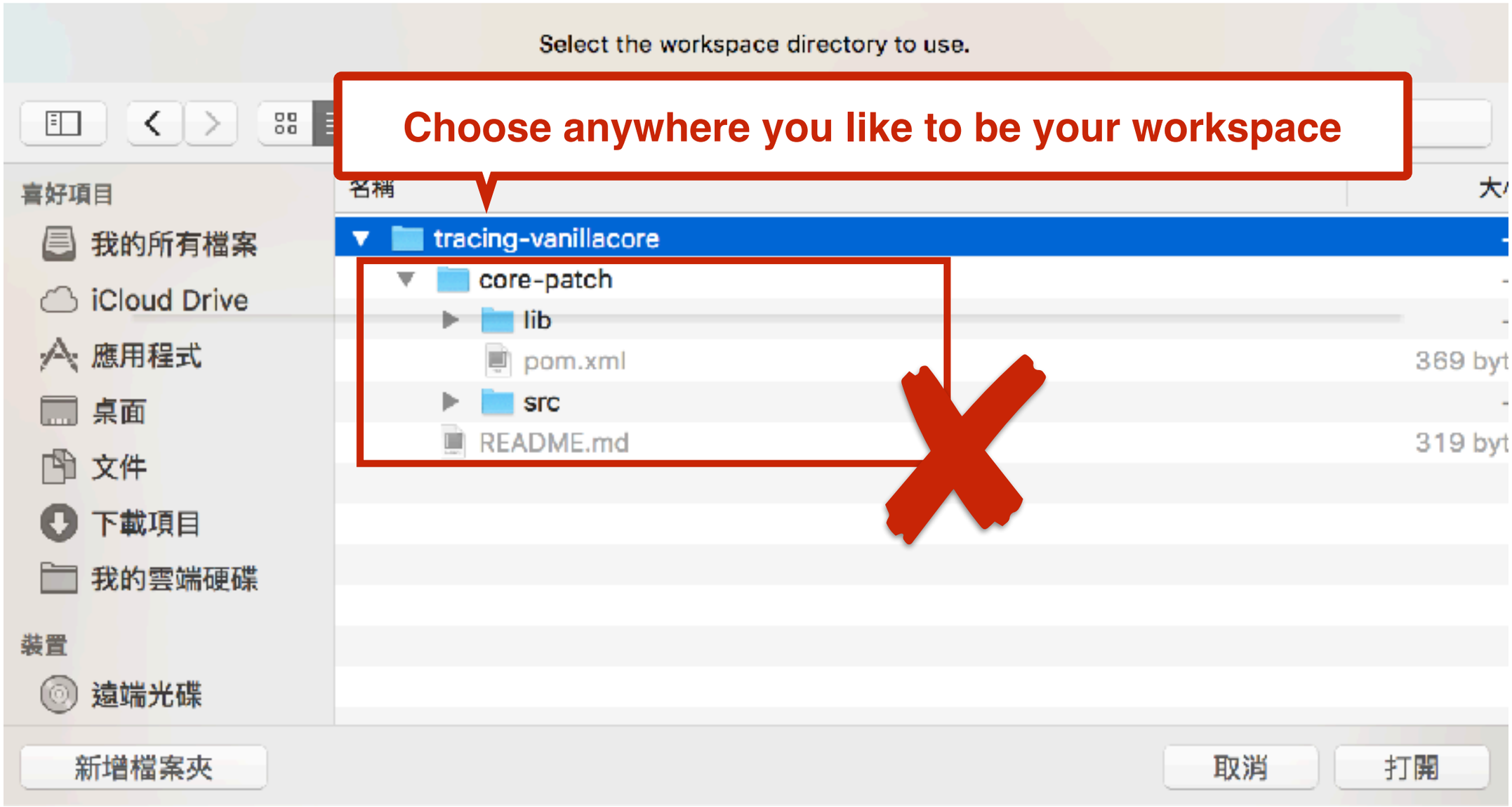
Downloading The Project

- Clone VanillaDB here

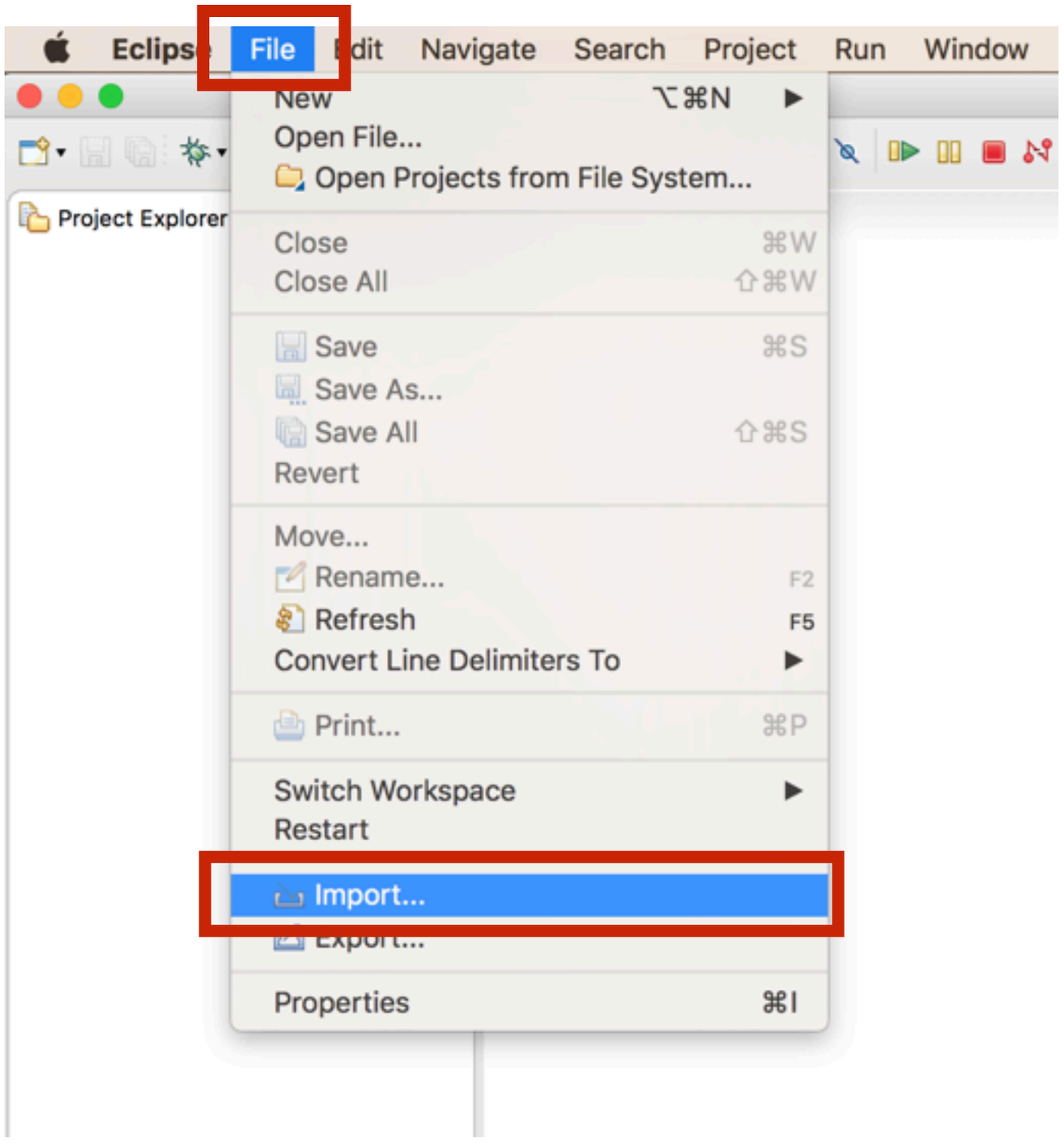
- https://shwu10.cs.nthu.edu.tw/courses/databases/2019-spring/vanilladb

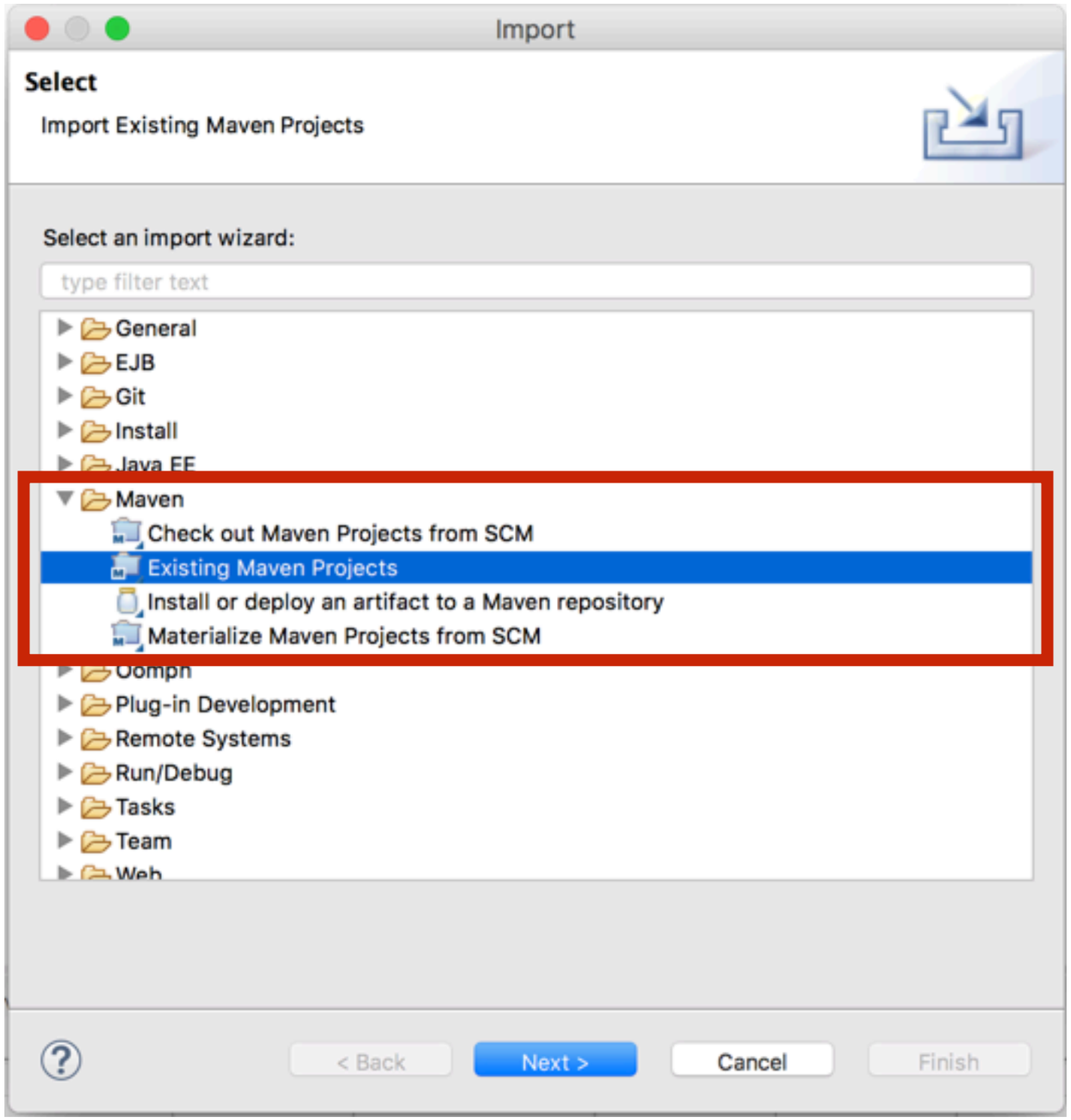
How to Import VanillaCore

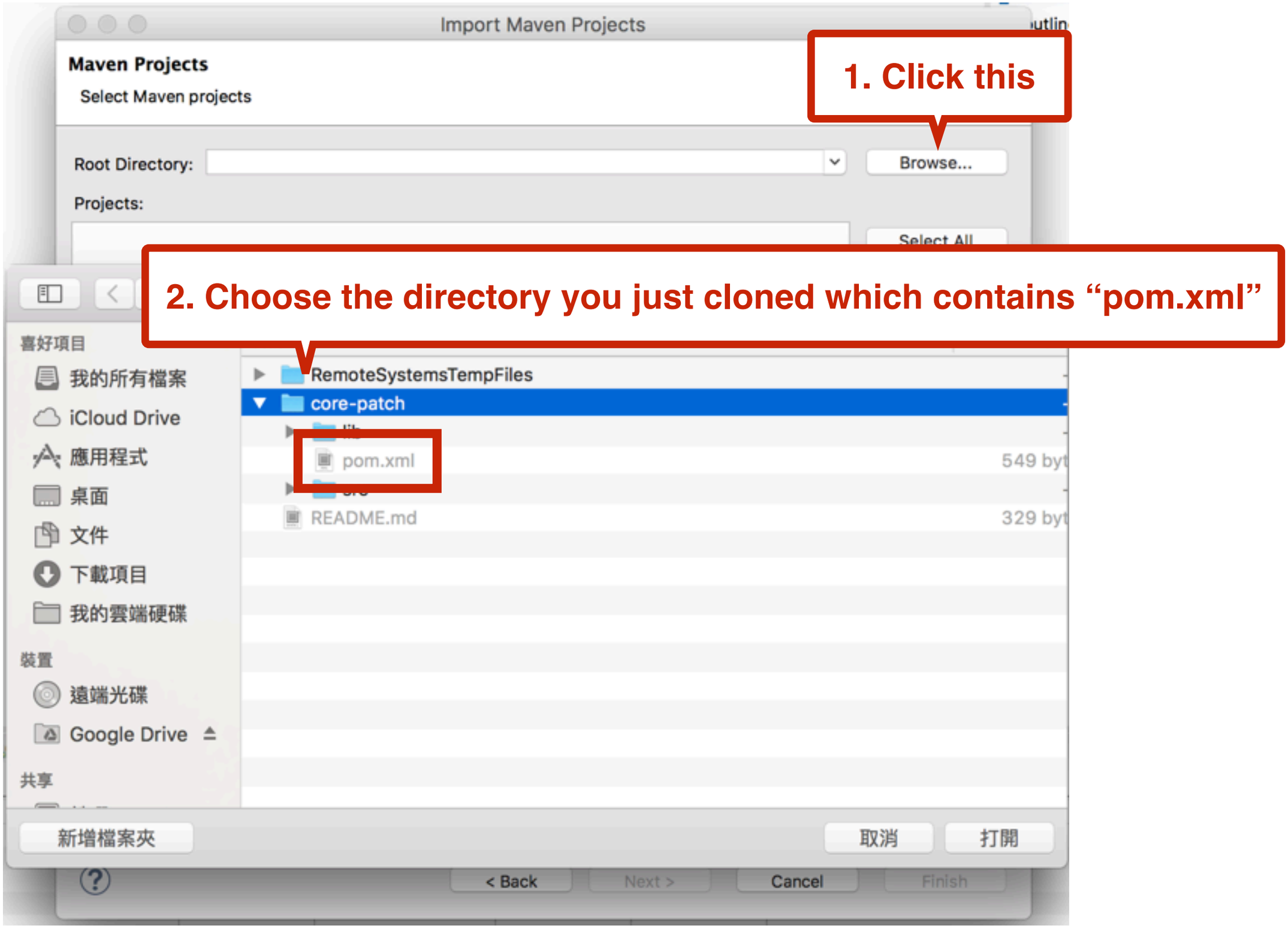


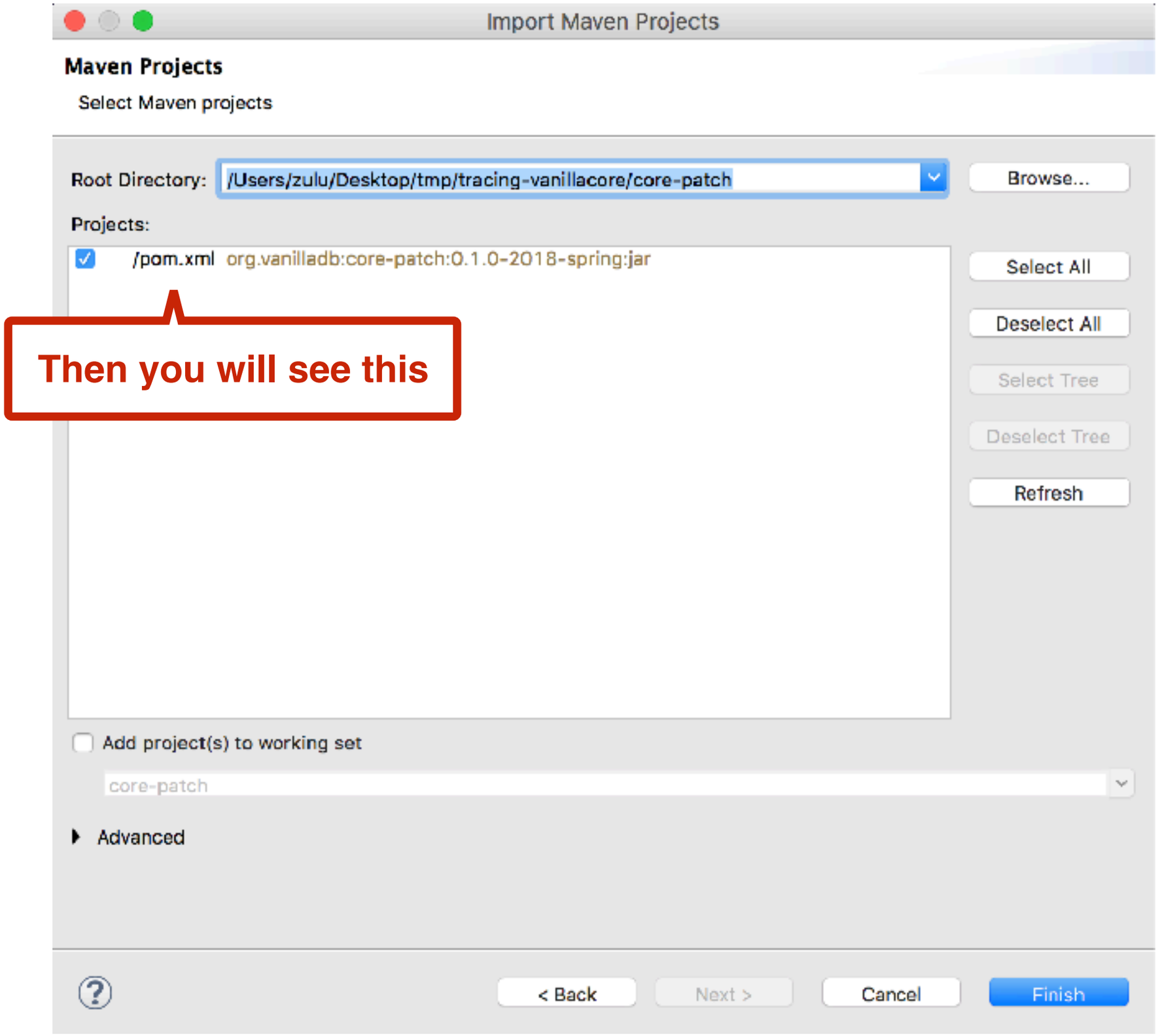


But be careful not choose the directory which contains “pom.xml” !!


Eclipse
File
Edit
Navigate
Search
Project
Run
Window
New ⌥⌘N
Open File...
Open Projects from File System...
Project Explorer
Close ⌘W
Close All ⇧⌘W
Save ⌘S
Save As...
Save All ⇧⌘S
Revert
Move...
Rename... F2
Refresh F5
Convert Line Delimiters To
Print... ⌘P
Switch Workspace
Restart
Import...
Properties ⌘I

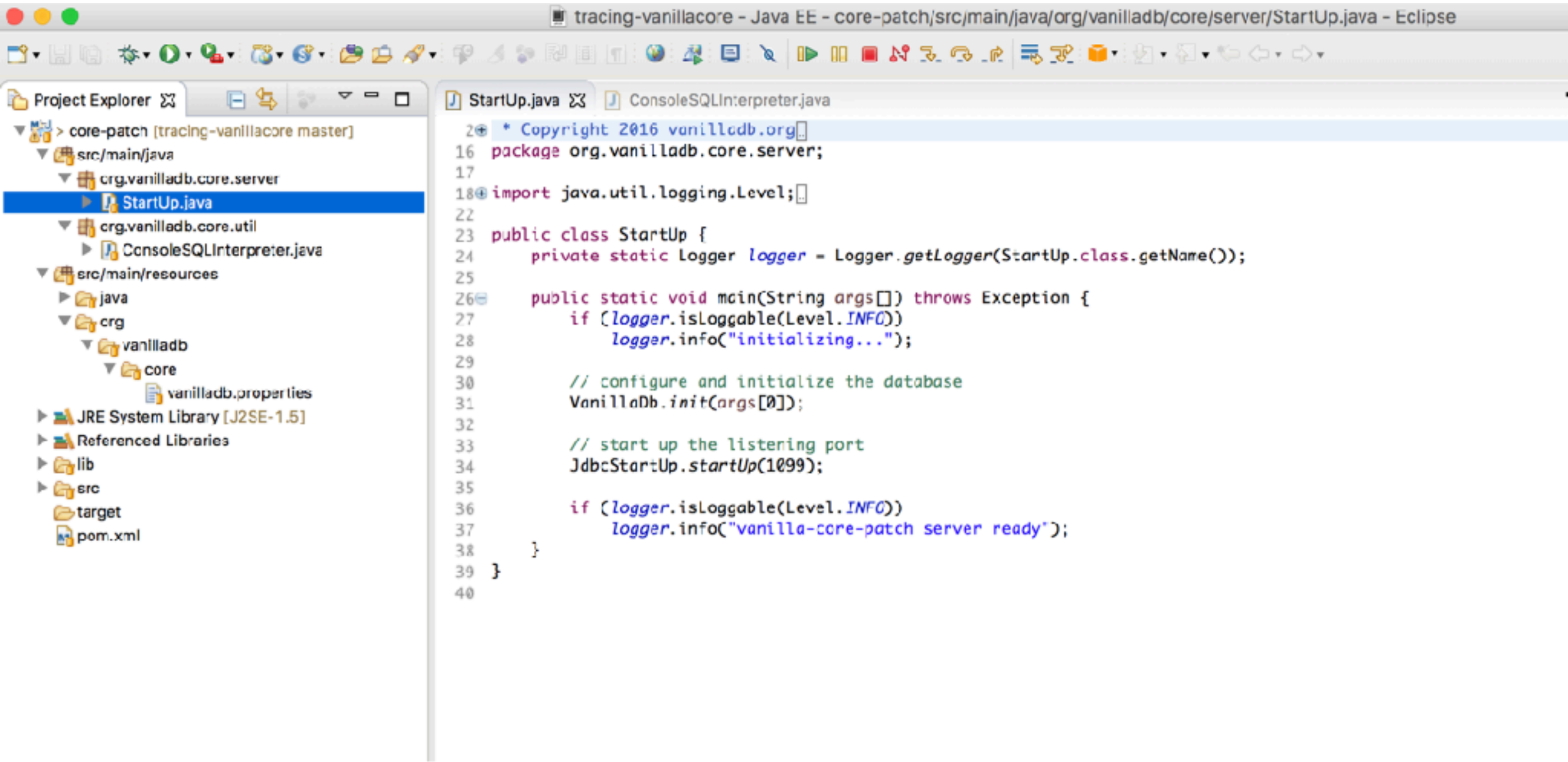

Import
Select
Import Existing Maven Projects
Select an import wizard:
type filter text
General
EJB
Git
Install
Java EE
Maven
Check out Maven Projects from SCM
Existing Maven Projects
Install or deploy an artifact to a Maven repository
Materialize Maven Projects from SCM
Oomph
Plug-in Development
Remote Systems
Run/Debug
Tasks
Team
Web
< Back
Next >
Cancel
Finish


Import Maven Projects
Maven Projects
Select Maven projects
Root Directory:
Browse...
Projects:
Select All
1. Click this
2. Choose the directory you just cloned which contains “pom.xml”
喜好項目
我的所有檔案
iCloud Drive
應用程式
桌面
文件
下載項目
我的雲端硬碟
裝置
遠端光碟
Google Drive
共享
RemoteSystemsTempFiles
core-patch
pom.xml
549 byt
README.md
329 byt
新增檔案夾
取消
打開
< Back
Next >
Cancel
Finish



Then you will see this

Done


tracing-vanillacore - Java EE - core-patch/src/main/java/org/vanilladb/core/server/StartUp.java - Eclipse
Project Explorer
core-patch [tracing-vanillacore master]
src/main/java
org.vanilladb.core.server
StartUp.java
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
StartUp.java
ConsoleSQLInterpreter.java
* Copyright 2016 vanilladb.org
package org.vanilladb.core.server;
import java.util.logging.Level;
public class StartUp {
private static Logger logger = Logger.getLogger(StartUp.class.getName());
public static void main(String args[]) throws Exception {
if (logger.isLoggable(Level.INFO))
logger.info("initializing...");
// configure and initialize the database
VanillaDb.init(args[0]);
// start up the listening port
JdbcStartUp.startUp(1099);
if (logger.isLoggable(Level.INFO))
logger.info("vanilla-core-patch server ready");
}
}

Outline

- VanillaCore
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  - Server Properties
  - Starting Up VanillaCore
  - Console SQL Interpreter

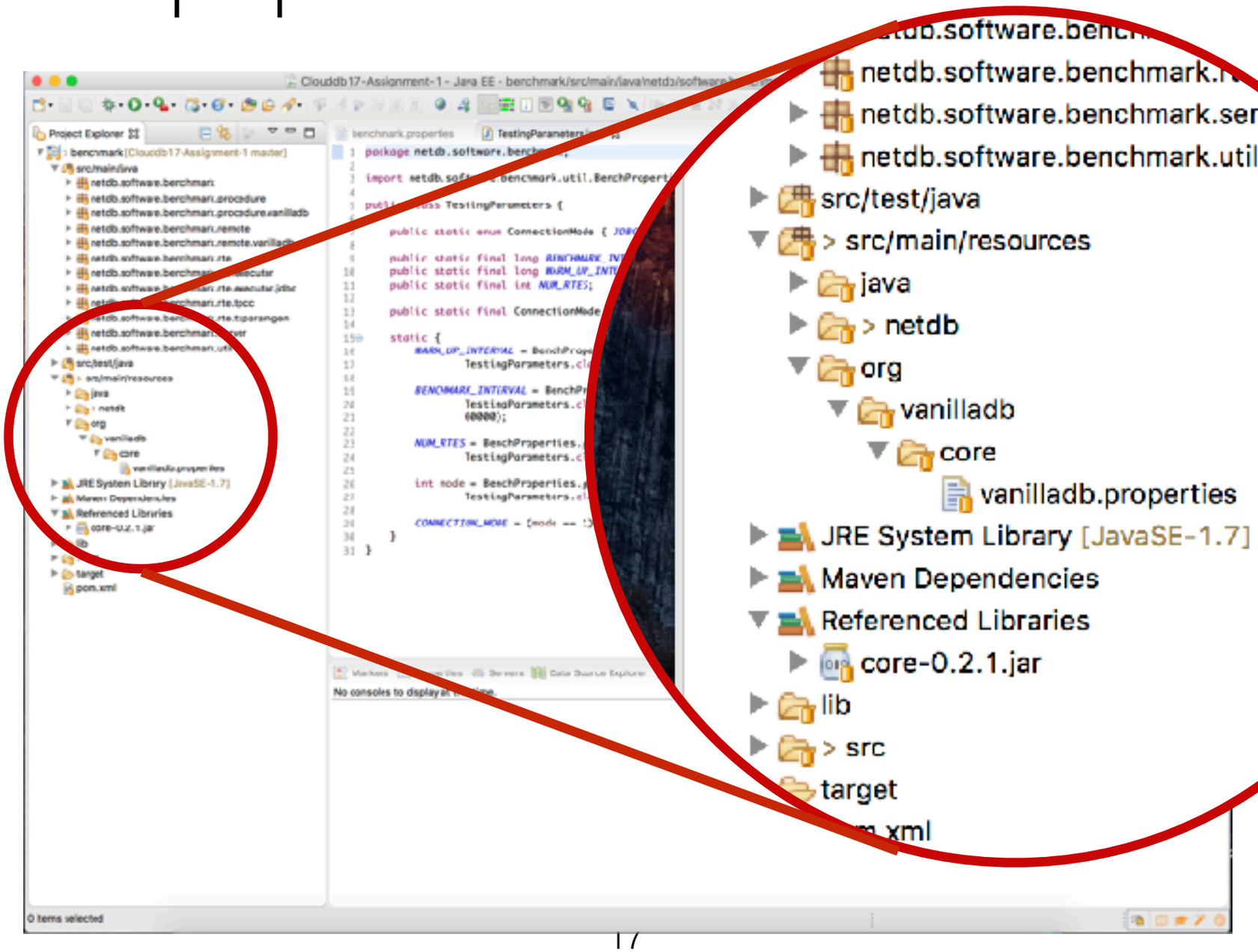
VanillaCore Properties File

- Configurations for VanillaCore are all stored in a properties file

[Icon Source]

VanillaCore Properties File

- vanilladb.properties



vanilladb.properties

benchmark.properties | TestingParameters.java | vanilladb.properties

```
#
# VanillaDB configuration file
#
# This file is a single place for controlling all constant fields defined in
# VanillaDB classes. The path of this file should be set as a system property
# keyed "org.vanilladb.core.config.file" so the content will to be
# processed during VanillaDB initiation.
#


#
# 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


#
# Buffer package settings
#

# The maximum waiting time for pinning a buffer. Original value is 10 seconds.
org.vanilladb.core.storage.buffer.BufferMgr.MAX_TIME=10000
# The epsilon value for tuning waiting time.
org.vanilladb.core.storage.buffer.BufferMgr.EPSILON=50
# The size of buffer pool.
org.vanilladb.core.storage.buffer.BufferMgr.BUFFER_POOL_SIZE=102400


#
```

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
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
```

- 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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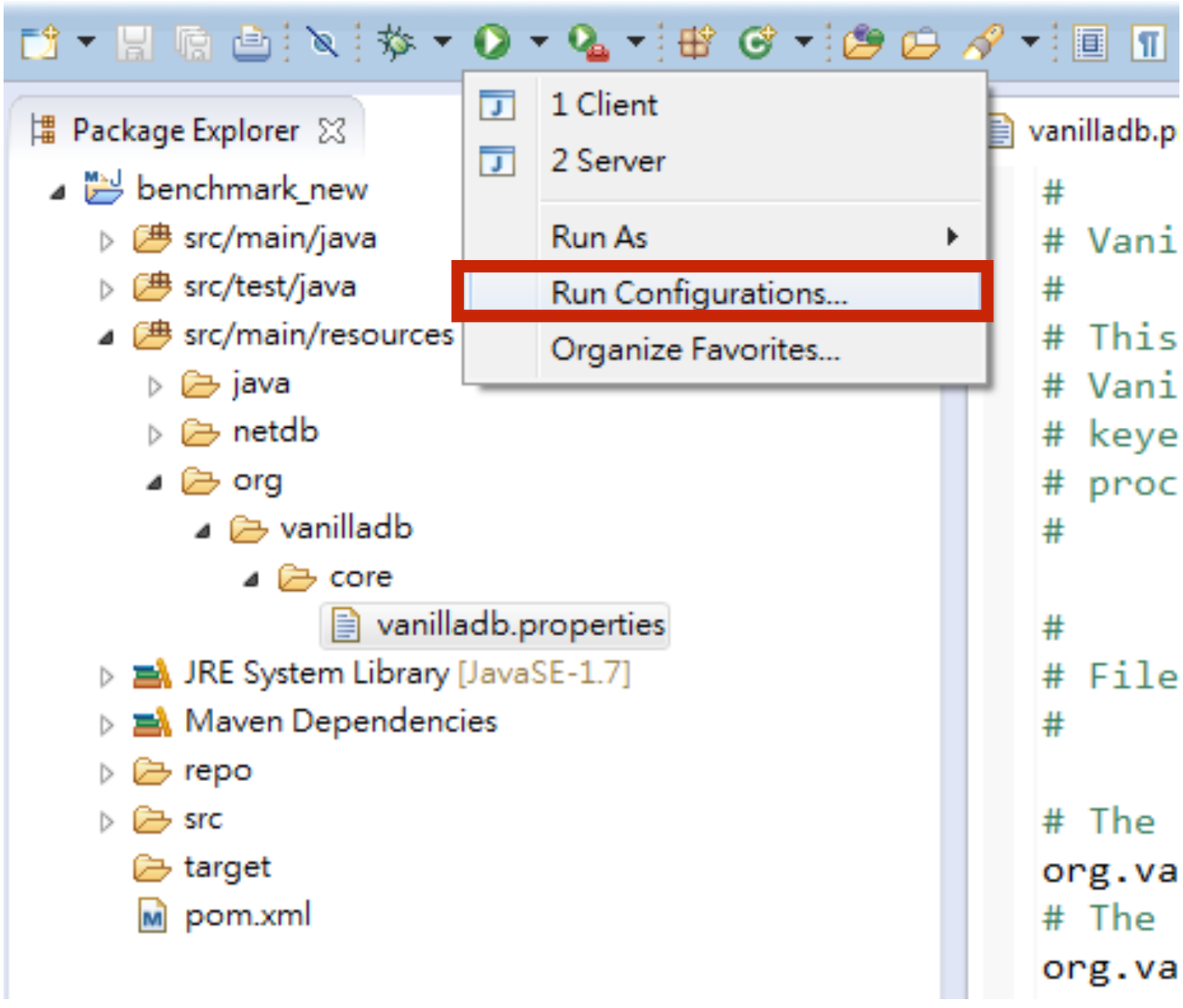
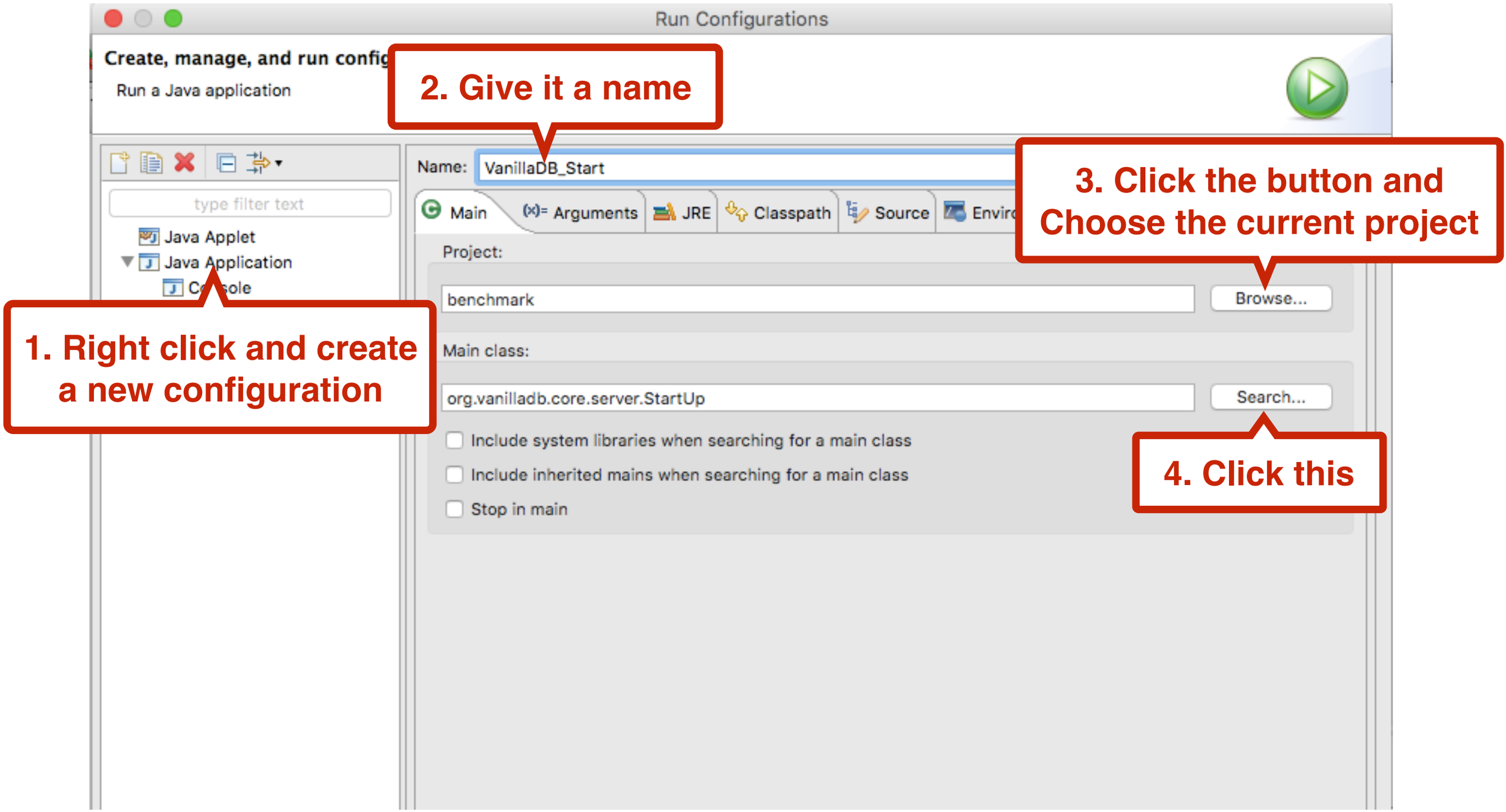
Starting Up VanillaCore

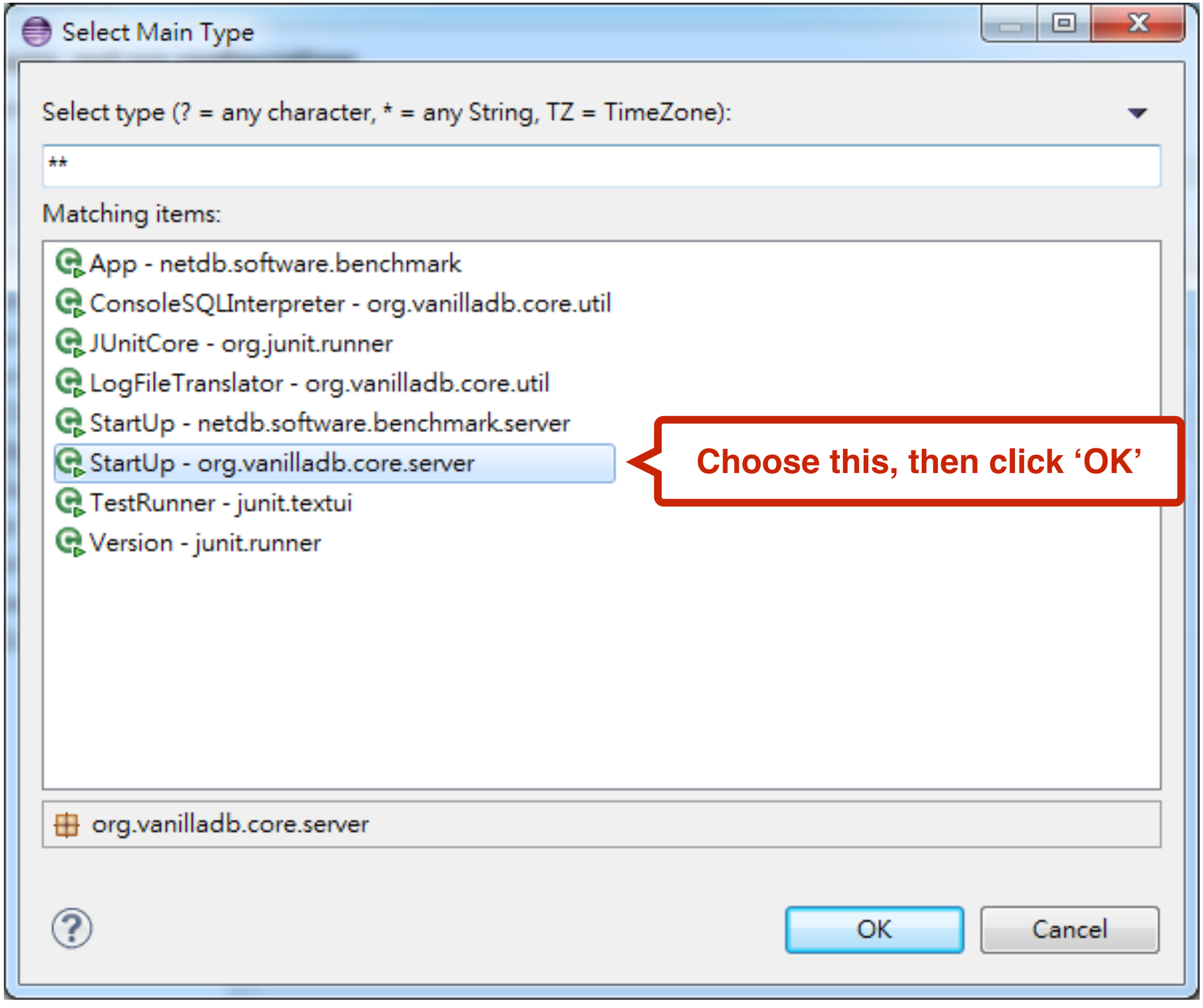
- To start up a VanillaCore server, we have to give it the following arguments
  - Database Directory Name
  - The locations of properties files

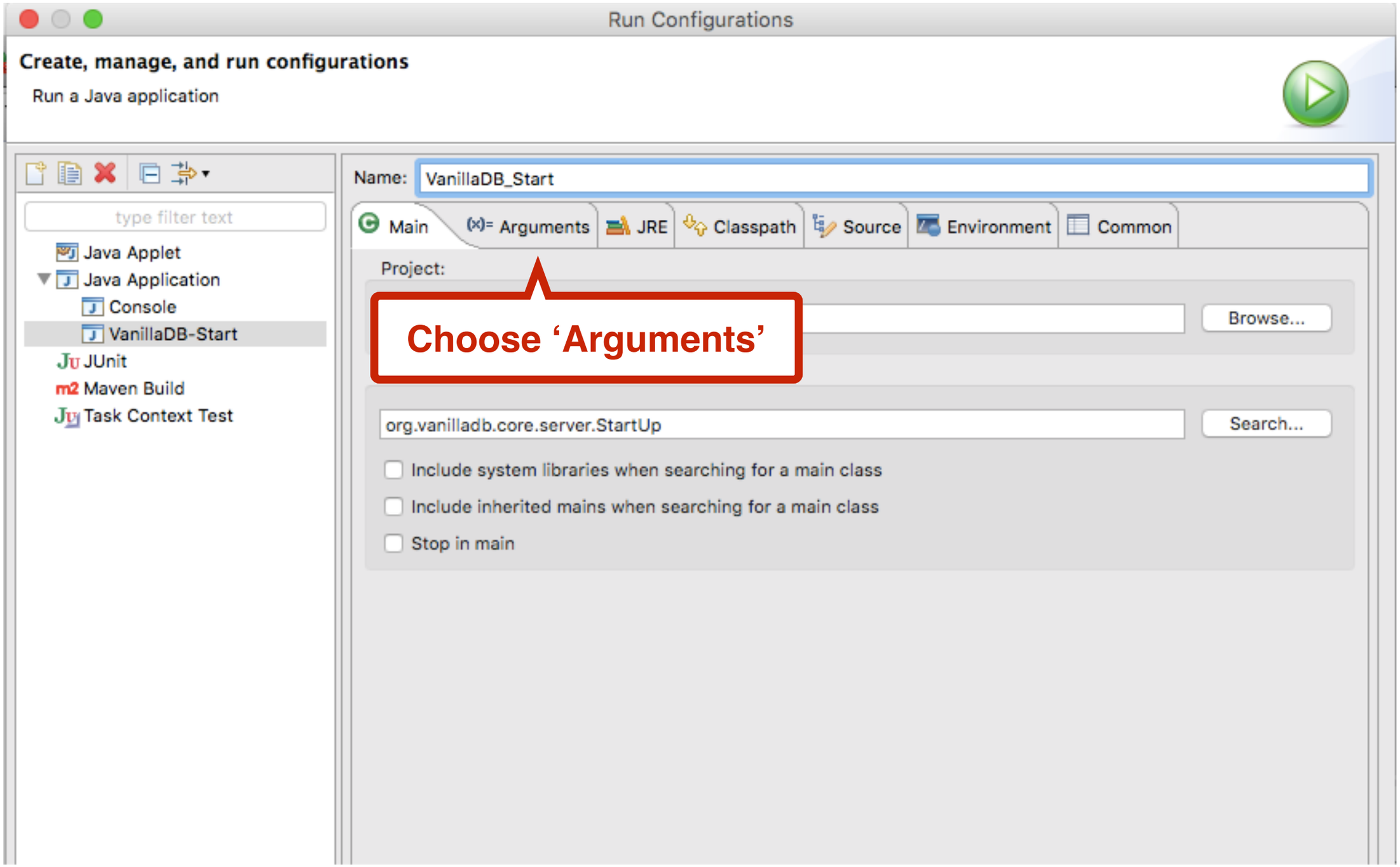
[Icon Source]

Setting Run Configuration




Run Configurations
Create, manage, and run config
Run a Java application
2. Give it a name
Name: VanillaDB_Start
type filter text
Java Applet
Java Application
Main
Arguments
JRE
Classpath
Source
Project:
benchmark
Browse...
Main class:
org.vanilladb.core.server.StartUp
Search...
Include system libraries when searching for a main class
Include inherited mains when searching for a main class
Stop in main
3. Click the button and Choose the current project
4. Click this
1. Right click and create a new configuration


Select Main Type
Select type (? = any character, * = any String, TZ = TimeZone):
**
Matching items:
App - netdb.software.benchmark
ConsoleSQLInterpreter - org.vanilladb.core.util
JUnitCore - org.junit.runner
LogFileTranslator - org.vanilladb.core.util
StartUp - netdb.software.benchmark.server
StartUp - org.vanilladb.core.server
TestRunner - junit.textui
Version - junit.runner
Choose this, then click ‘OK’
org.vanilladb.core.server
OK
Cancel


Run Configurations
Create, manage, and run configurations
Run a Java application
type filter text
Java Applet
Java Application
Console
VanillaDB-Start
JUnit
Maven Build
Task Context Test
Name:
VanillaDB_Start
Main
Arguments
JRE
Classpath
Source
Environment
Common
Project:
Browse...
Choose ‘Arguments’
org.vanilladb.core.server.StartUp
Search...
Include system libraries when searching for a main class
Include inherited mains when searching for a main class
Stop in main

Arguments (1/2)

- Program Arguments
  - Format

```
[Database Directory Name]
```

- Example

```
student-db
```

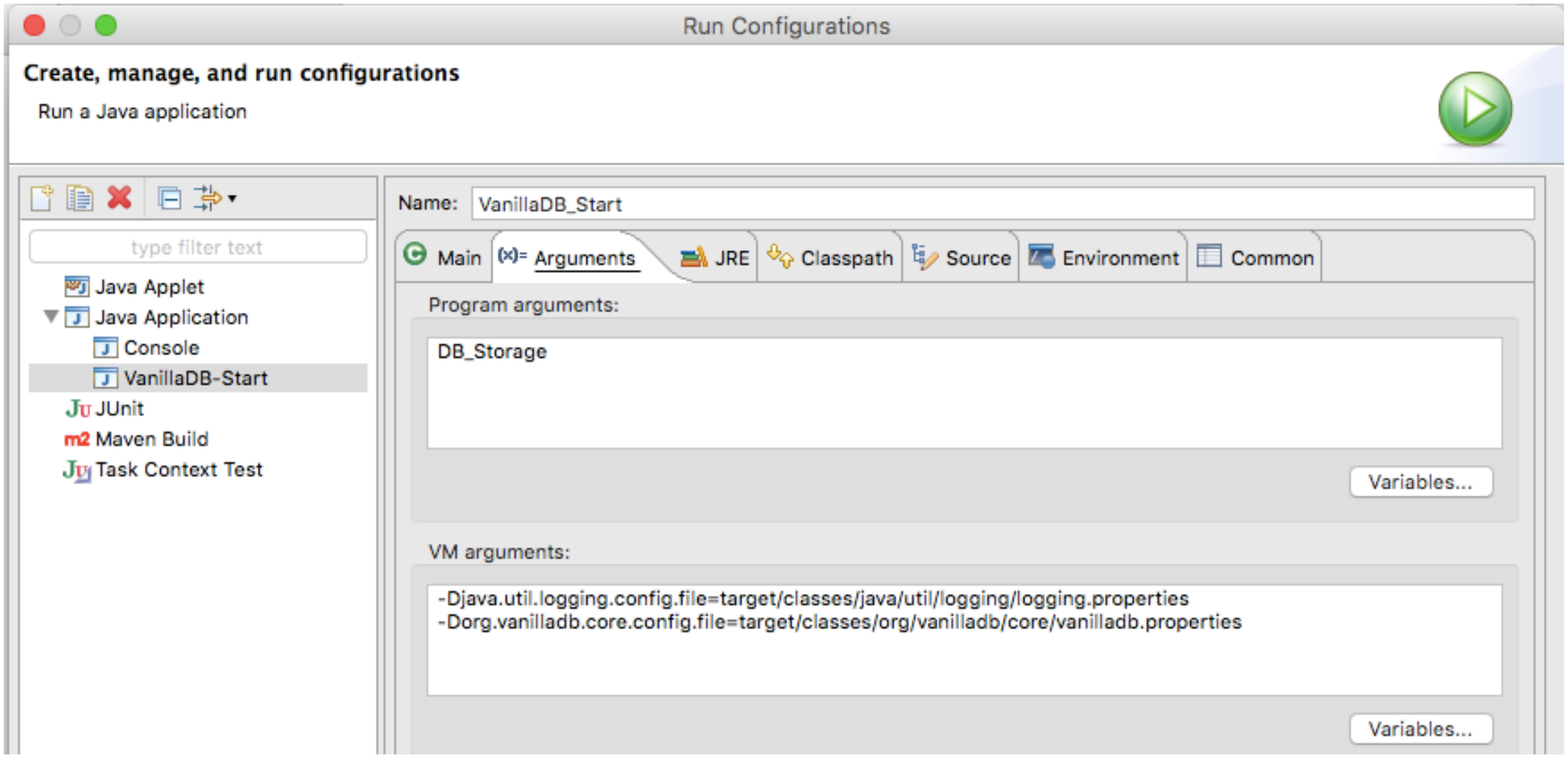
Arguments (2/2)

- VM Arguments
  - For logging properties

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

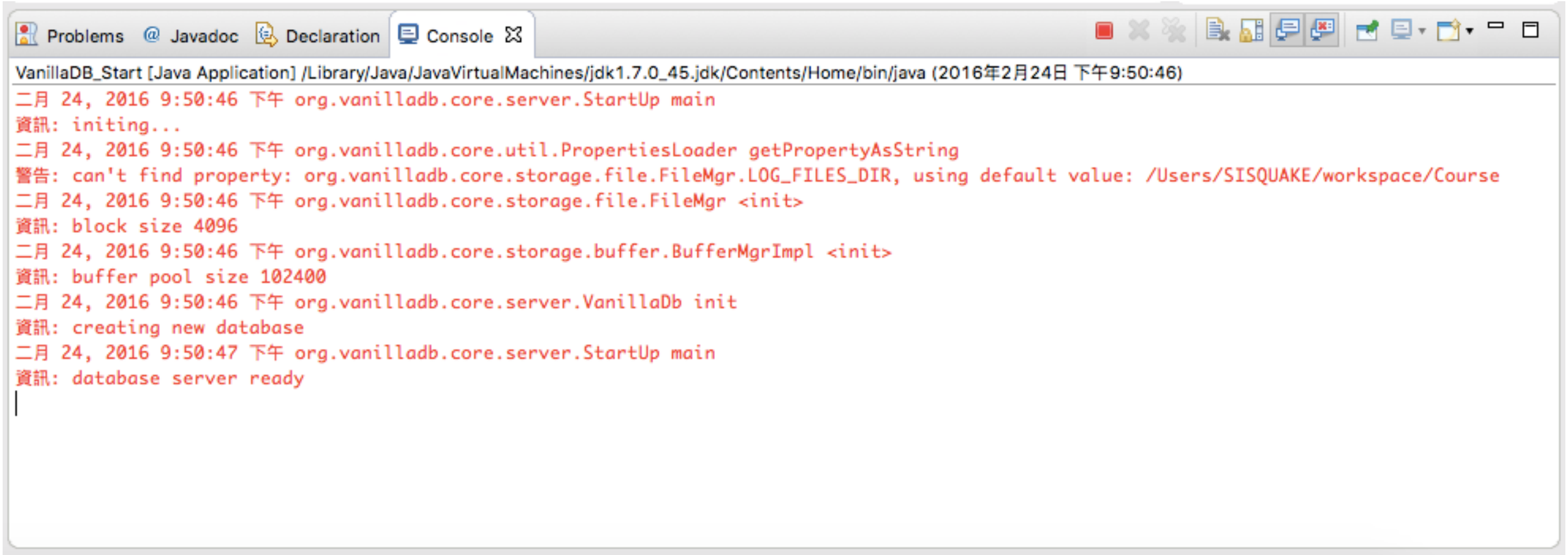
- For VanillaCore properties

```
-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)



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 properties file
- "can't find property: ….., using default: …"
  - It means that there is a property missing in your properties file

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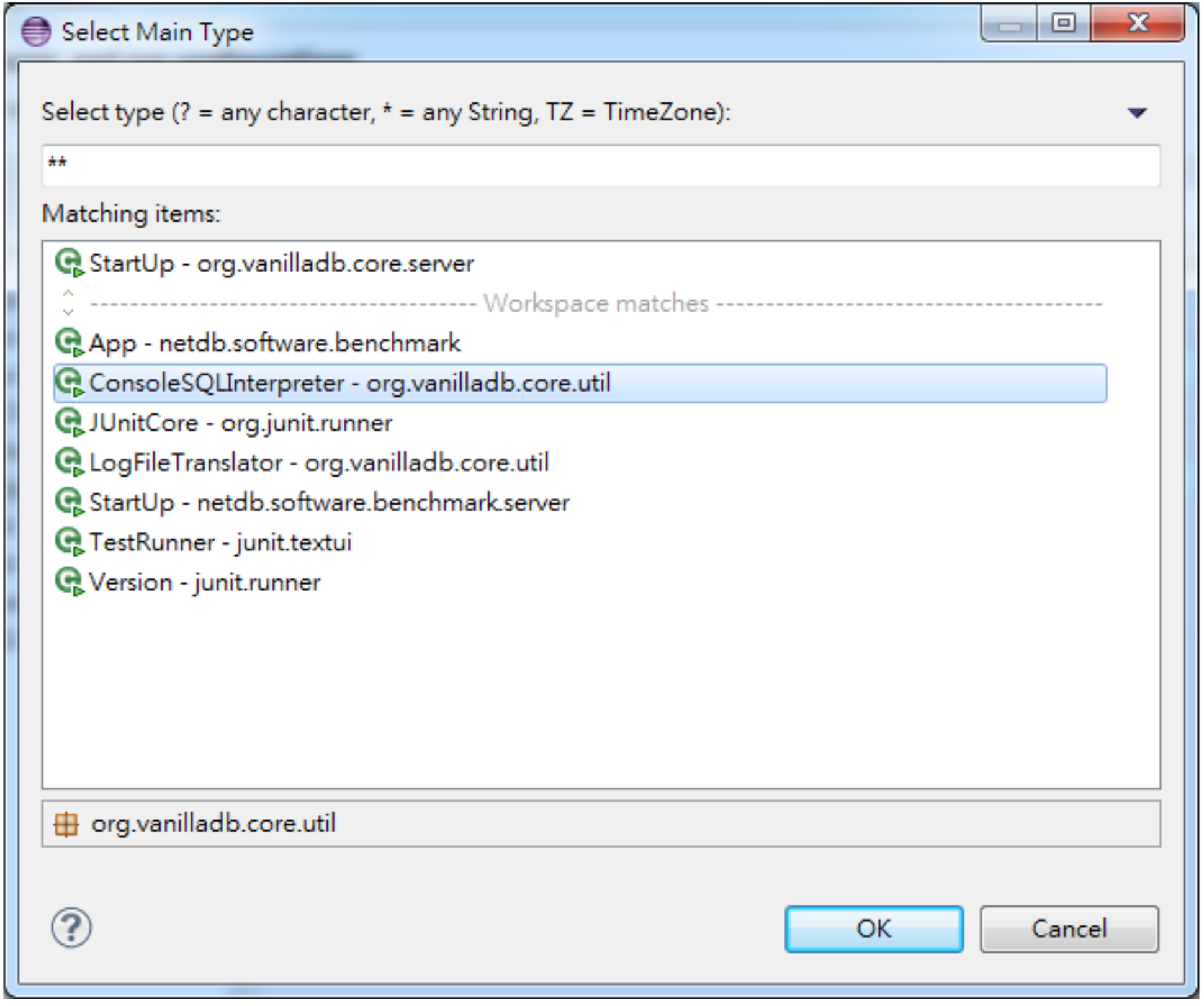
Console SQL Interpreter

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

[Icon Source]

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


Select Main Type
Select type (? = any character, * = any String, TZ = TimeZone):
**
Matching items:
StartUp - org.vanilladb.core.server
---------- Workspace matches ----------
App - netdb.software.benchmark
ConsoleSQLInterpreter - org.vanilladb.core.util
JUnitCore - org.junit.runner
LogFileTranslator - org.vanilladb.core.util
StartUp - netdb.software.benchmark.server
TestRunner - junit.textui
Version - junit.runner
org.vanilladb.core.util
OK
Cancel

Try it !

Problems @ Javadoc Declaration Console

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/2019-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/2019-spring/faq
- If your problem was very unique, just send a email let us know