

Benchmarking with Scripts

Introduction to Database Systems

DataLab

CS, NTHU

Why Do We Need Scripts?

1. To setup the system quickly.
2. To deploy and benchmark the system in different machines.
3. The environment may not have Eclipse!

Check Your Environment

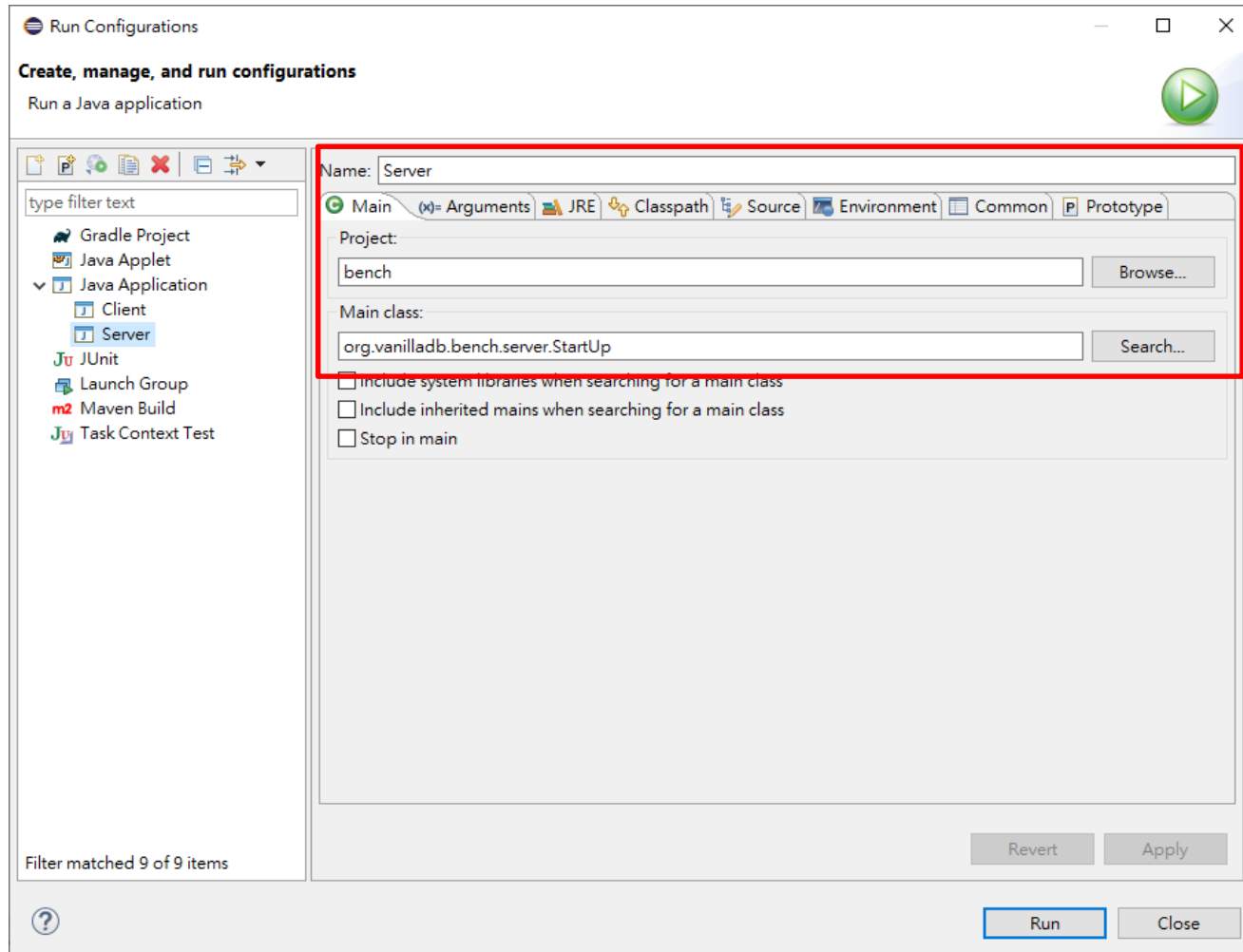
- Requirements
 - Bash
 - Which you may have had if you are using Unix, Unix-like systems or have installed Git on Windows.
 - Java in your system path

```
> java -version
```

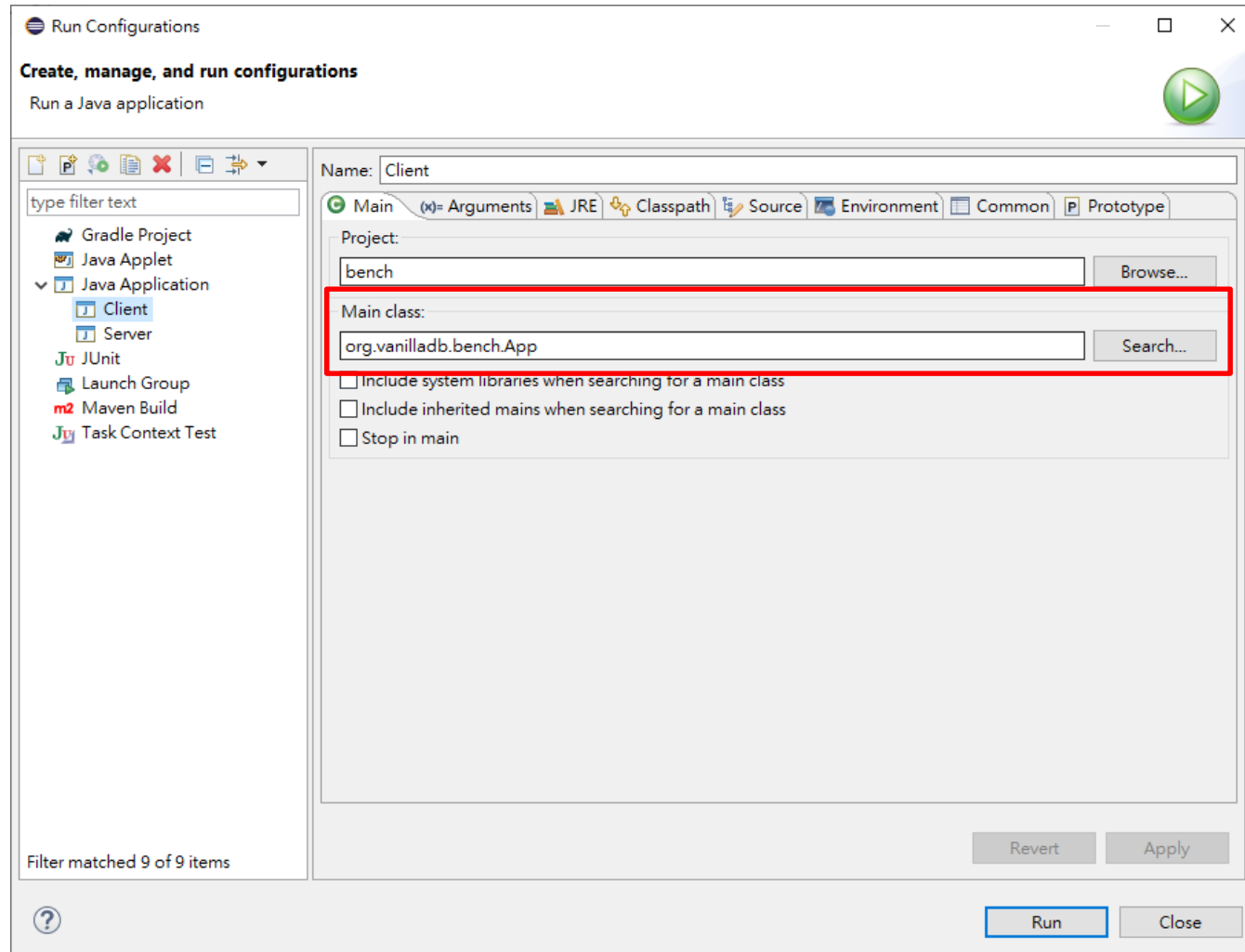
Package Your Code

- We use Eclipse built-in tools.
- Steps
 1. Setup run configurations for jars.
 2. Export the project.

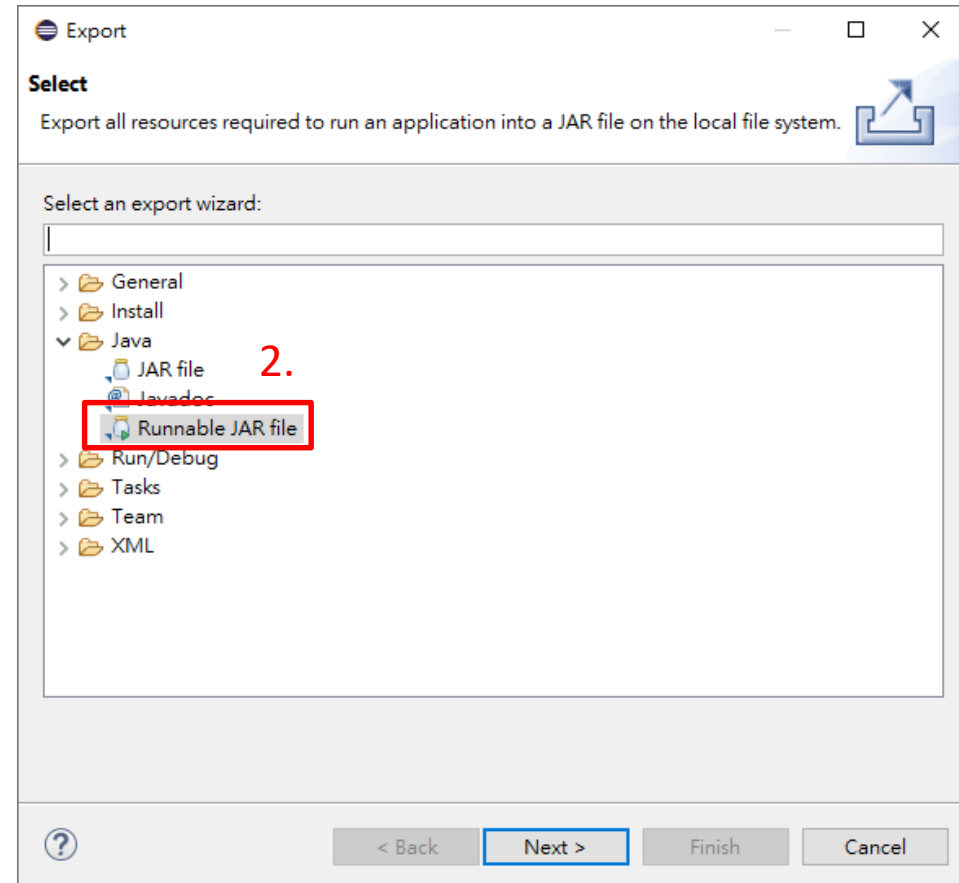
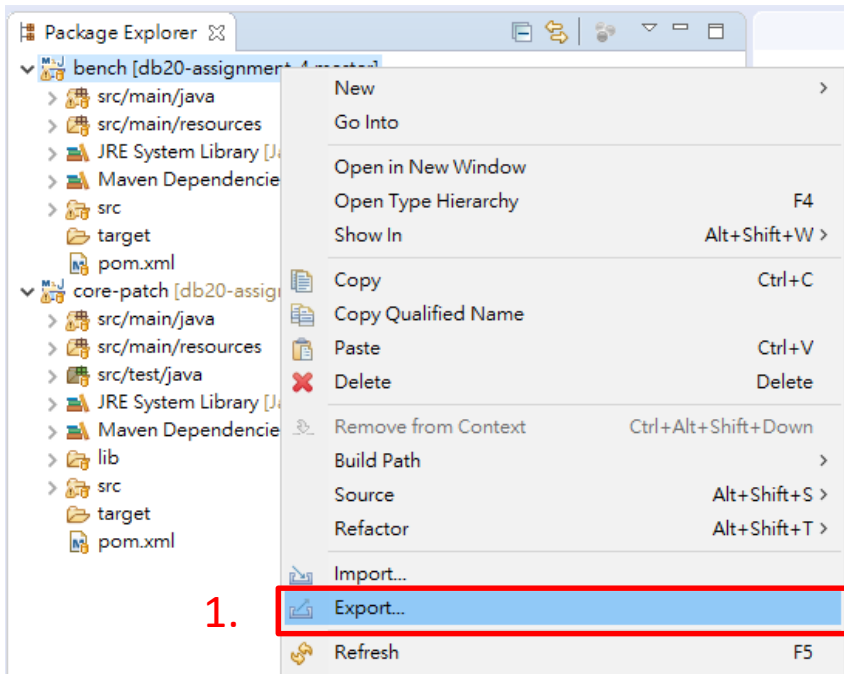
Setup Run Configurations - Server



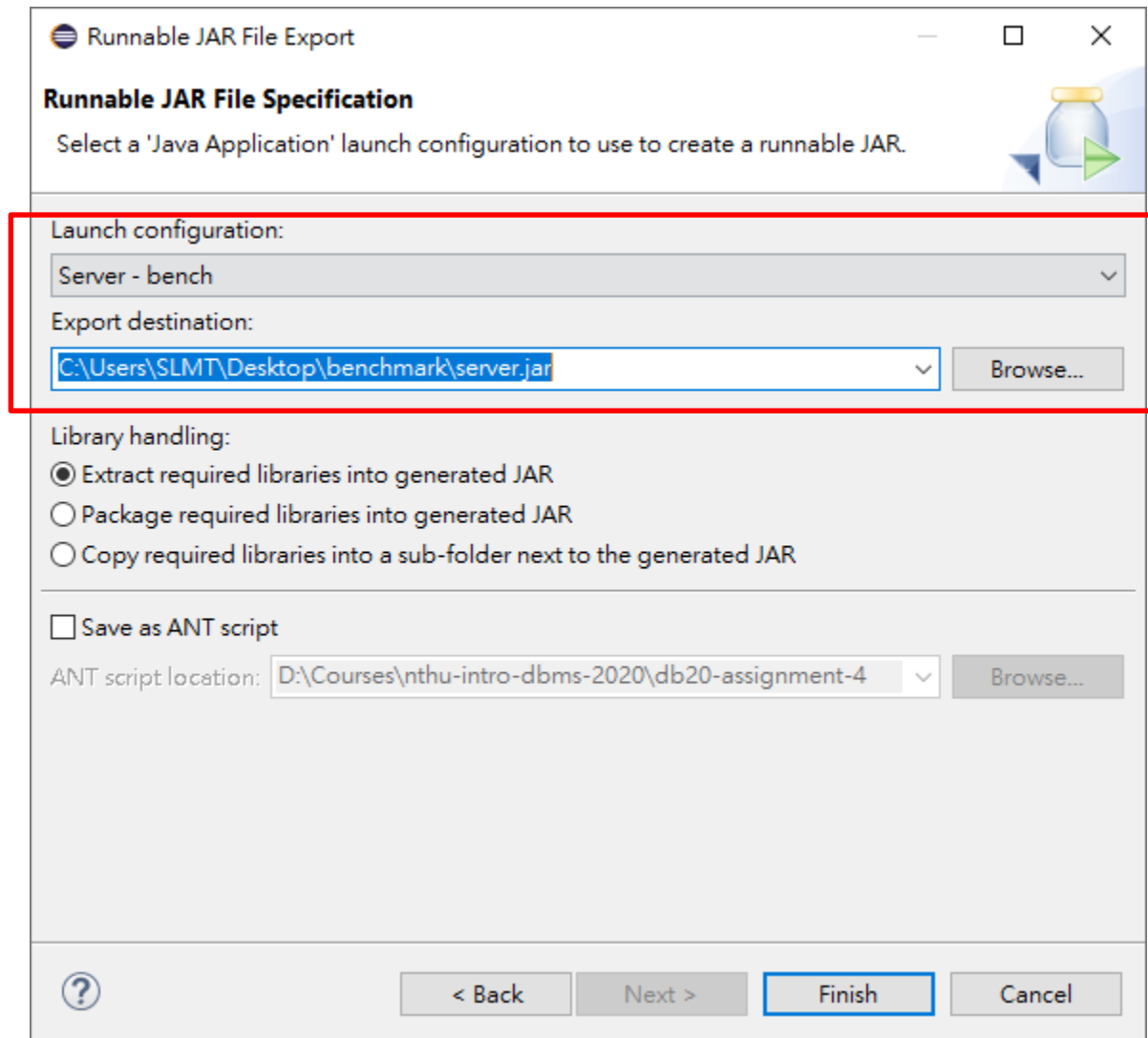
Setup Run Configurations - Client



Export Runnable Jars



Export Runnable Jars - Server



The image shows a 'Runnable JAR File Export' dialog box. The title bar says 'Runnable JAR File Export'. Below the title bar, there's a section titled 'Runnable JAR File Specification' with a subtitle 'Select a 'Java Application' launch configuration to use to create a runnable JAR.' To the right of this text is a small icon of a jar with a green arrow pointing right. Below this, there's a red rectangular box highlighting the 'Launch configuration:' dropdown (set to 'Server - bench') and the 'Export destination:' text field (containing 'C:\Users\SLMT\Desktop\benchmark\server.jar') with a 'Browse...' button to its right. Below the red box, there's a 'Library handling:' section with three radio buttons: 'Extract required libraries into generated JAR' (selected), 'Package required libraries into generated JAR', and 'Copy required libraries into a sub-folder next to the generated JAR'. Below that is a 'Save as ANT script' checkbox (unchecked) and an 'ANT script location:' text field (containing 'D:\Courses\nthu-intro-dbms-2020\db20-assignment-4') with a 'Browse...' button to its right. At the bottom, there's a row of buttons: a help button (question mark icon), '< Back', 'Next >', 'Finish' (highlighted with a blue border), and 'Cancel'.

Runnable JAR File Export

Runnable JAR File Specification
Select a 'Java Application' launch configuration to use to create a runnable JAR.

Launch configuration:
Server - bench

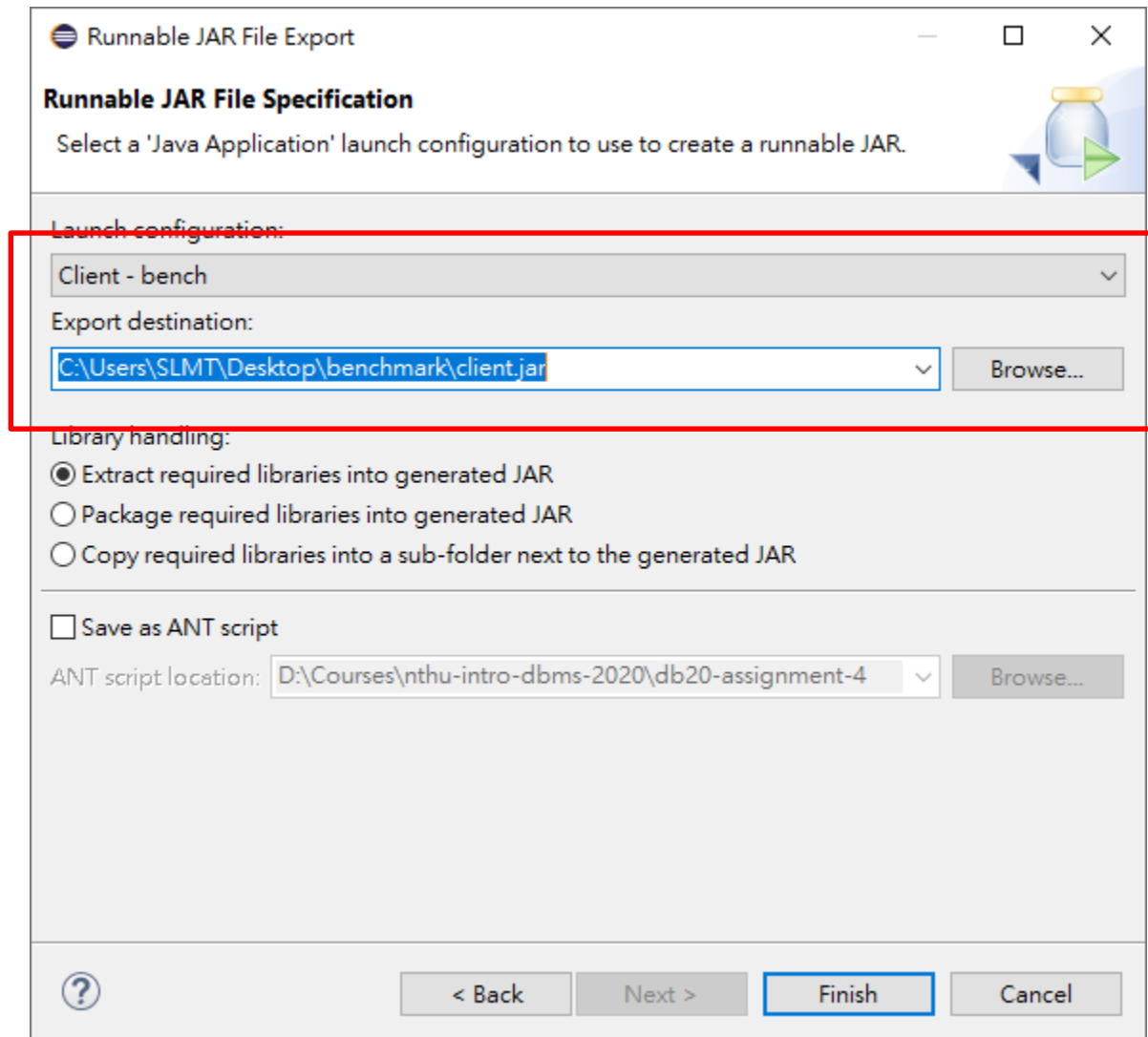
Export destination:
C:\Users\SLMT\Desktop\benchmark\server.jar

Library handling:
☒ Extract required libraries into generated JAR
☐ Package required libraries into generated JAR
☐ Copy required libraries into a sub-folder next to the generated JAR

☐ Save as ANT script
ANT script location: D:\Courses\nthu-intro-dbms-2020\db20-assignment-4

? < Back Next > Finish Cancel

Export Runnable Jars - Client



The image shows a 'Runnable JAR File Export' dialog box. A red rectangle highlights the 'Launch configuration' dropdown (set to 'Client - bench') and the 'Export destination' text field (containing 'C:\Users\SLMT\Desktop\benchmark\client.jar').

Runnable JAR File Export

Runnable JAR File Specification

Select a 'Java Application' launch configuration to use to create a runnable JAR.

Launch configuration:

Client - bench

Export destination:

C:\Users\SLMT\Desktop\benchmark\client.jar

Library handling:

- ☒ Extract required libraries into generated JAR
- ☐ Package required libraries into generated JAR
- ☐ Copy required libraries into a sub-folder next to the generated JAR

☐ Save as ANT script

ANT script location: D:\Courses\nthu-intro-dbms-2020\db20-assignment-4

Buttons: < Back, Next >, Finish, Cancel

Setup Working Directory

- The next step is to setup you working directory.
- Contents

— Server

- server.jar
- Properties
- Scripts

benchmark > server

名稱	修改日期	類型	大小
logging.properties	2020/5/2 下午 03:45	PROPERTIES 檔案	3 KB
server.jar	2020/5/2 下午 03:49	Executable Jar File	1,932 KB
vanillabench.properties	2020/5/2 下午 03:45	PROPERTIES 檔案	4 KB
vanilladb.properties	2020/5/2 下午 03:45	PROPERTIES 檔案	7 KB

— Client

- client.jar
- Properties
- Scripts

benchmark > client

名稱	修改日期	類型	大小
client.jar	2020/5/2 下午 03:49	Executable Jar File	1,932 KB
logging.properties	2020/5/2 下午 03:45	PROPERTIES 檔案	3 KB
vanillabench.properties	2020/5/2 下午 03:45	PROPERTIES 檔案	4 KB
vanilladb.properties	2020/5/2 下午 03:45	PROPERTIES 檔案	7 KB

Scripts

- Now we are going to write scripts for running client and servers
- Scripts
 - Server
 - server.sh
 - copy-db.sh/reset-db.sh
 - Client
 - client-load.sh
 - client-bench.sh

Execution Scripts

- server.sh

```
java -Djava.util.logging.config.file=logging.properties -  
Dorg.vanilladb.bench.config.file=vanillabench.properties -  
Dorg.vanilladb.core.config.file=vanilladb.properties -jar server.jar [DB Name]
```

- client-load.sh

```
java -Djava.util.logging.config.file=logging.properties -  
Dorg.vanilladb.bench.config.file=vanillabench.properties -  
Dorg.vanilladb.core.config.file=vanilladb.properties -jar client.jar 1
```

- client-bench.sh

```
java -Djava.util.logging.config.file=logging.properties -  
Dorg.vanilladb.bench.config.file=vanillabench.properties -  
Dorg.vanilladb.core.config.file=vanilladb.properties -jar client.jar 2
```

Backup Databases

- To ensure the consistency of experiments, we usually backup the database and reset it before each experiment.
- copy-db.sh

```
DB_DIR="[DB Path]"  
cp -r $DB_DIR $DB_DIR-backup
```

- reset-db.sh

```
DB_DIR="[DB Path]"  
rm -r $DB_DIR  
cp -r $DB_DIR-backup $DB_DIR
```

The Workflow of Benchmarking (1/2)

1. Load DB

1. Setup properties
2. Run `server.sh`
3. Run `client-load.sh`
4. Wait for loading
5. Shut down the server (by stopping the script)
6. Run `copy-db.sh`

The Workflow of Benchmarking (2/2)

2. Benchmark

1. Setup properties
2. Run `reset-db.sh`
3. Run `server.sh`
4. Run `client-bench.sh`
5. Wait for benchmarking
6. Shut down the server (by stopping the script)



That's it! Enjoy your assignment!