

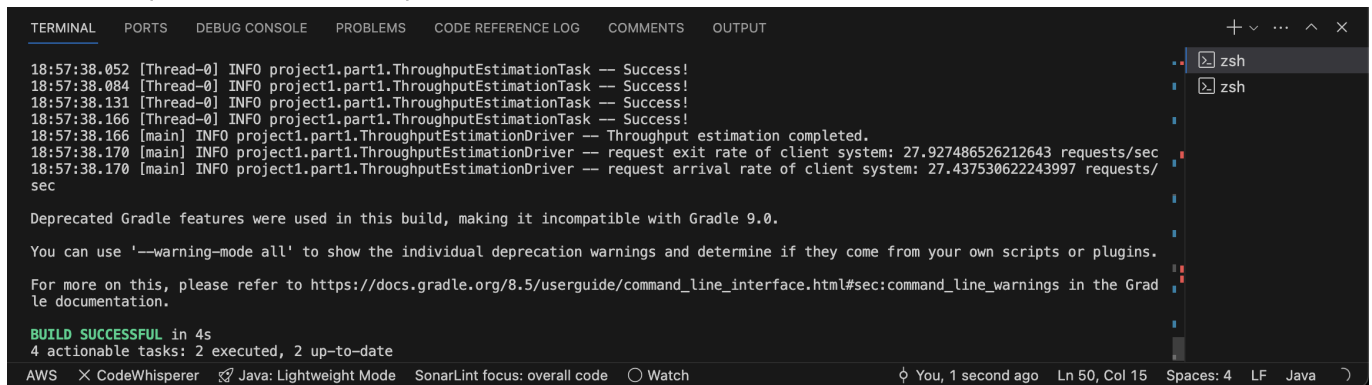
# git-repo-URL: <https://github.com/lyz-sys/neu-cs6650-projects-v2>

## client description:

### part1

Part one's client side code is located in `src/main/java/project1/part1`. Shared classes between part one and two's client are located in their parent folder. The Driver class is the entry point. It distributes tasks among threads, and starts the threads to visit the server on EC2. The configuration for first threads distribution is 32 threads in total, 1000 requests per thread. The configuration for second threads distribution is 1680 threads in total, 100 requests per thread. `SendPostRequestTask` handle the logic for individual thread's task. `ThroughputEstimationDriver` class is used for Little's law Prediction. The arrival rate of my system approximately equal to exit rate of my system, so the system is doing fine.

Little's law prediction driver output:

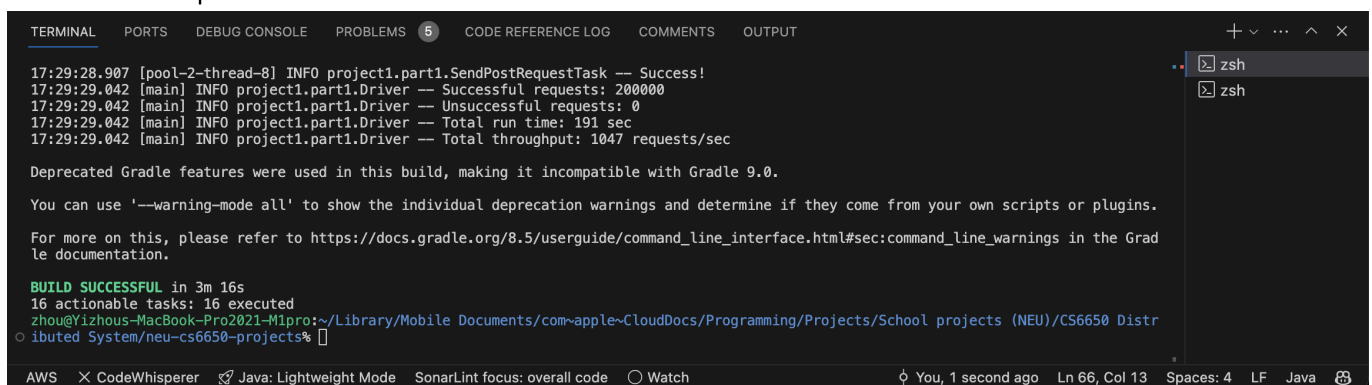


```
18:57:38.052 [Thread-0] INFO project1.part1.ThroughputEstimationTask -- Success!
18:57:38.084 [Thread-0] INFO project1.part1.ThroughputEstimationTask -- Success!
18:57:38.131 [Thread-0] INFO project1.part1.ThroughputEstimationTask -- Success!
18:57:38.166 [Thread-0] INFO project1.part1.ThroughputEstimationTask -- Success!
18:57:38.166 [main] INFO project1.part1.ThroughputEstimationDriver -- Throughput estimation completed.
18:57:38.170 [main] INFO project1.part1.ThroughputEstimationDriver -- request exit rate of client system: 27.927486526212643 requests/sec
18:57:38.170 [main] INFO project1.part1.ThroughputEstimationDriver -- request arrival rate of client system: 27.437530622243997 requests/sec

Deprecated Gradle features were used in this build, making it incompatible with Gradle 9.0.
You can use '--warning-mode all' to show the individual deprecation warnings and determine if they come from your own scripts or plugins.
For more on this, please refer to https://docs.gradle.org/8.5/userguide/command_line_interface.html#sec:command_line_warnings in the Gradle documentation.

BUILD SUCCESSFUL in 4s
4 actionable tasks: 2 executed, 2 up-to-date
```

Main driver output window:



```
17:29:28.907 [pool-2-thread-8] INFO project1.part1.SendPostRequestTask -- Success!
17:29:29.042 [main] INFO project1.part1.Driver -- Successful requests: 200000
17:29:29.042 [main] INFO project1.part1.Driver -- Unsuccessful requests: 0
17:29:29.042 [main] INFO project1.part1.Driver -- Total run time: 191 sec
17:29:29.042 [main] INFO project1.part1.Driver -- Total throughput: 1047 requests/sec

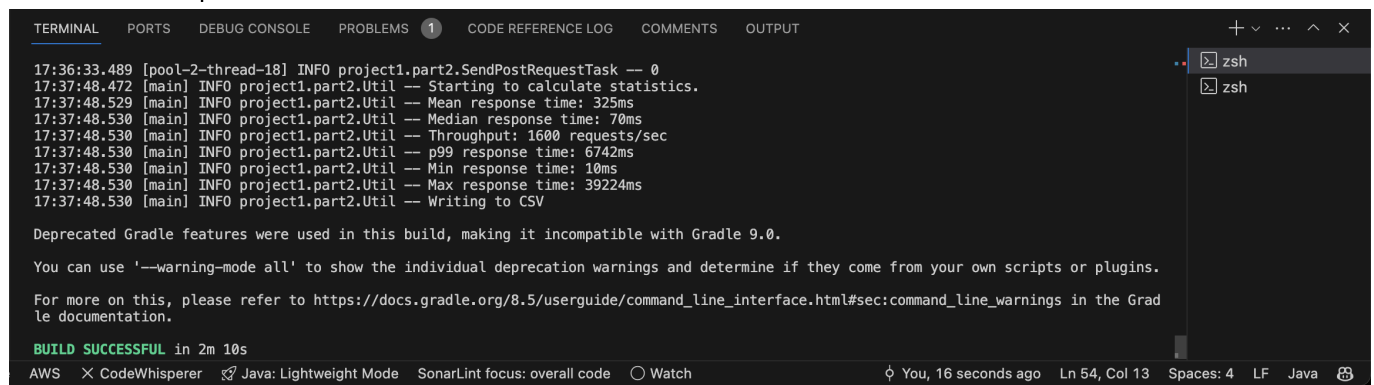
Deprecated Gradle features were used in this build, making it incompatible with Gradle 9.0.
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For more on this, please refer to https://docs.gradle.org/8.5/userguide/command_line_interface.html#sec:command_line_warnings in the Gradle documentation.

BUILD SUCCESSFUL in 3m 16s
16 actionable tasks: 16 executed
zhou@Yizhou-MacBook-Pro2021-M1pro:~/Library/Mobile Documents/com~apple~CloudDocs/Programming/Projects/School projects (NEU)/CS6650 Distr
ibuted System/neu-cs6650-projects% []
```

### part2

Part two's client side code is located in `src/main/java/project1/part2`. It sends the task in its driver class. Each thread's task logic is encapsulated in its `SendPostRequestTask` class. This time, we the `SendPostRequestTask` is slightly different than the one in part1. Since we need to record each request into csv, and calculate additional statistics based on the record. We create `RequestResult` class for each record, and `Util` class to calculate statistics and print the results in terminal. As the server is instable when I run this time, the throuput is little bit higher.

## Main driver output window:



```
17:36:33.489 [pool-2-thread-18] INFO project1.part2.SendPostRequestTask -- 0
17:37:48.472 [main] INFO project1.part2.Util -- Starting to calculate statistics.
17:37:48.529 [main] INFO project1.part2.Util -- Mean response time: 325ms
17:37:48.530 [main] INFO project1.part2.Util -- Median response time: 70ms
17:37:48.530 [main] INFO project1.part2.Util -- Throughput: 1600 requests/sec
17:37:48.530 [main] INFO project1.part2.Util -- p99 response time: 6742ms
17:37:48.530 [main] INFO project1.part2.Util -- Min response time: 10ms
17:37:48.530 [main] INFO project1.part2.Util -- Max response time: 39224ms
17:37:48.530 [main] INFO project1.part2.Util -- Writing to CSV

Deprecated Gradle features were used in this build, making it incompatible with Gradle 9.0.

You can use '--warning-mode all' to show the individual deprecation warnings and determine if they come from your own scripts or plugins.

For more on this, please refer to https://docs.gradle.org/8.5/userguide/command_line_interface.html#sec:command_line_warnings in the Gradle documentation.

BUILD SUCCESSFUL in 2m 10s

AWS  X CodeWhisperer  Java: Lightweight Mode  SonarLint focus: overall code  Watch  You, 16 seconds ago  Ln 54, Col 13  Spaces: 4  LF  Java
```

## bonus points

Below I configured normal tomcat servlet in my server at port 8080, and I also deployed Springboot's servlet at port 8081. Clearly, in terms of arrival and exit rate, the Springboot's version is quicker by at 3 more request per second. normal servlet scrpts are in `src/main/java/project1/webapp`, and Springboot's are in `src/main/java/project1/sbwebapp`.

src > main > resources > config.properties

You, 1 second ago | 1 author (You)

1

base.path=http://35.89.84.25:8080/project1

You, 1 second ago • Uncommitted changes

2

connection.timeout=60000

3

TERMINAL

PORTS

DEBUG CONSOLE

PROBLEMS

CODE REFERENCE LOG

COMMENTS

OUTPUT

20:02:46.945 [Thread-0] INFO project1.part1.ThroughputEstimationTask -- Success!  
20:02:47.501 [main] INFO project1.part1.ThroughputEstimationDriver -- Throughput estimation completed.  
20:02:47.508 [main] INFO project1.part1.ThroughputEstimationDriver -- request exit rate of client system: 24.73410833539451 requests/sec  
20:02:47.508 [main] INFO project1.part1.ThroughputEstimationDriver -- request arrival rate of client system: 24.73410833539451 requests/sec  
  
Deprecated Gradle features were used in this build, making it incompatible with Gradle 9.0.  
  
You can use '--warning-mode all' to show the individual deprecation warnings and determine if they come from your own scripts or plugins.  
  
For more on this, please refer to [https://docs.gradle.org/8.5/userguide/command\\_line\\_interface.html#sec:command\\_line\\_warnings](https://docs.gradle.org/8.5/userguide/command_line_interface.html#sec:command_line_warnings) in the Gradle documentation.  
  
**BUILD SUCCESSFUL** in 4s  
4 actionable tasks: 3 executed, 1 up-to-date  
zhou@Yizhou-MacBook-Pro2021-M1pro:~/Library/Mobile Documents/com~apple~CloudDocs/Programming/Projects/School projects (NEU)/CS6650 Distributed System/neu-cs6650-projects%

AWS

CodeWhisperer

Java: Lightweight Mode

SonarLint focus: overall code

Watch

You, 1 second ago

Ln 1, Col 34

Spaces: 4

LF

Java Properties

src > main > resources > config.properties

You, 1 second ago | 1 author (You)

1

base.path=http://35.89.84.25:8081/project1

You, 1 second ago • Uncommitted changes

2

connection.timeout=60000

3

TERMINAL

PORTS

DEBUG CONSOLE

PROBLEMS

CODE REFERENCE LOG

COMMENTS

OUTPUT

20:01:38.800 [Thread-0] INFO project1.part1.ThroughputEstimationTask -- Success!  
20:01:38.801 [main] INFO project1.part1.ThroughputEstimationDriver -- Throughput estimation completed.  
20:01:38.804 [main] INFO project1.part1.ThroughputEstimationDriver -- request exit rate of client system: 21.492094861660078 requests/sec  
20:01:38.804 [main] INFO project1.part1.ThroughputEstimationDriver -- request arrival rate of client system: 21.24505928853755 requests/sec  
  
Deprecated Gradle features were used in this build, making it incompatible with Gradle 9.0.  
  
You can use '--warning-mode all' to show the individual deprecation warnings and determine if they come from your own scripts or plugins.  
  
For more on this, please refer to [https://docs.gradle.org/8.5/userguide/command\\_line\\_interface.html#sec:command\\_line\\_warnings](https://docs.gradle.org/8.5/userguide/command_line_interface.html#sec:command_line_warnings) in the Gradle documentation.  
  
**BUILD SUCCESSFUL** in 5s  
4 actionable tasks: 3 executed, 1 up-to-date  
zhou@Yizhou-MacBook-Pro2021-M1pro:~/Library/Mobile Documents/com~apple~CloudDocs/Programming/Projects/School projects (NEU)/CS6650 Distributed System/neu-cs6650-projects%

AWS

CodeWhisperer

Java: Lightweight Mode

SonarLint focus: overall code

Watch

You, 1 second ago

Ln 1, Col 43

Spaces: 4

LF

Java Properties

plot

Throughput plots:

