

Lab 5

Part I

Read, understand, and summarize lock and related materials in Lecture 5.

Put it as part of your Report I. Make use of lab to get feedback early.

Part II Add concurrency control to example3-IncrementTest

Code is given in Week 5 lecture folder.

(1) How can you put concurrency control to example3-IncrementTest example using **synchronized method(s)**? Test your output.

(2) How can you put concurrency control to example3-IncrementTest example using **synchronized statement(s)** to protect the critical section? Test your output.

After you test your output, you may find the first thread prints different values of instanceData and classData. However, you have tried to update them together, and made the updates protected. So why you got different values there? If you find this problem, please fix it. (Hint: Is the first printed classData always more than the first printed instanceData? Why?)

If you have used **this** object's intrinsic lock to control the concurrency, try to create another object (eg., `Object oneObject = new Object()`), and use the new object's intrinsic lock with **synchronized** keyword. Any differences you found?

(3) How can you put concurrency control to example3-IncrementTest example using **ReentrantLock** to protect the critical section? Test your output.

Remember to add the following to declare ReentrantLock class will be used;

```
import java.util.concurrent.locks.ReentrantLock;
```