Laboratory Assignment #5

Part 1: Super Store and Per Product Sale Statistics with using Locks

The new versions of the Super Store and Per Product Sale Statistics applications require the following features to be implemented.

As usual, there must be a thread for each file that is passed as a parameter. Today, instead of using the `synchronized` keyword, implement the new versions by using `Locks`. The application will have two shared data structures: one for the super store and one for per product sale statistics. They will be updated at the same time: when new sales data of a month or product is read from the file in the thread, the thread will lock both shared data structures and once their update is completed, will unlock both.

Once the implementation is complete, try locking one data structure at a time: that is, don't lock two data structures at the same time, but lock one of them first, then, when you are done, unlock it, and lock the other one.

Run both versions 100 times, find the average running time for each and report them in the comments of your code. You can use the given code fragment to measure the running times.

```
long startTime = System.nanoTime();
// The operation
long endTime = System.nanoTime();
long elapsedTime = endTime - startTime;
```

You are free to use other Java constructs as you like as long as you use `Locks`.