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Lab 1

1. Supermarket inventory:

There are several types of products, each having a known, constant, unit price. In the beginning, we know the quantity of each product.

We must keep track of the quantity of each product, the amount of money (initially zero), and the list of bills, corresponding to sales. Each bill is a list of items and quantities sold in a single operation, and their total price.

We have sale operations running concurrently, on several threads. Each sale decreases the amounts of available products (corresponding to the sold items), increases the amount of money, and adds a bill to a record of all sales.

From time to time, as well as at the end, an inventory check operation shall be run. It shall check that all the sold products and all the money are justified by the recorded bills.

Computer specifications:
Processor: 2,9 GHz Quad Core i7
Memory: 16GB 2133 MHz LPDDR3
OS: macOS Mojave, Version 19.14.1 Beta
OS type: 64 bit

Data

Data Amount	Number of threads	Execution time per test
3450	10	2.050s
3450	5	6.050s
3450	2	16.050s

Description

Algorithm was implemented in C# using task classes & lock in order to synchronize the operations so that the item inventory is not accessed by a more than one thread at a time.