Cihodaru Alexandru
Grupa 932/1

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.

Description

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

Classes:

Product:
It is used to describe a product… Will be used in Inventory class:

Inventory:
It has a map of Product, integer … This map is used to store information about quantity of a certain product.

Bill:
It has a map of Product, integer … This map is used to store information about bought quantity of a certain product in this transaction.

Supermarket:
It has two members of type Inventory used to store information about existing product and sold ones.. it also has an array of bill that will be used to check the inventory.
In this class are 2 mutexes that will be used to synchronize informations.

Computer specifications:
Processor: 2.8 GHz quad-core core i7
OS: Windows 10 RS5
OS type: 64 bit

Data

Data Amount	Number of threads	Execution time per test
200	1	0.364789s
200	3	0.412561s
200	5	0.413209s
200	30	0.56235 s
200	100	1.27683 s
200	200	2.44088 s