

Java Assignment 2

This assignment is about making a particular Java class, called Bank, thread-safe and as performant as possible.

You will need the following files:

- 1) Account.java
- 2) Bank.java
- 3) Operation.java
- 4) Transaction.java

The zip file JavaAssignment2Code.zip includes the files above, and can be downloaded from iLearn.

The class Account represents a bank account,
the class Bank represents a list of bank accounts,
the class Operation represents a single operation of changing the balance of one bank account,
the class Transaction represents a transaction including a number of operations.

In general, either all operations of a transaction or none of its operations should succeed. Regarding locking this means that no operation in a transaction should be executed before all necessary locks for all operations in the transaction have been taken. It is outside the scope of this assignment to implement any other transaction functionality such as rollback.

Your task is to modify the classes to make them thread-safe but also to keep them performant. You should in your code write clear comments describing the modifications you have done.

Basic task (grade C/D/E/F)

Your task is to modify the classes Account, Bank and Operation (not the class Transaction), in such a way that:

- a) they are thread-safe, by using locks;
- b) they are performant, when accessed from multiple concurrent threads;
- c) there is no risk for deadlock.

Advanced task (grade A/B/C/D/E/F)

Your task is to modify all the classes Account, Bank, Operation and Transaction, in such a way that:

- a) they are thread-safe by using appropriate locks;
- b) they are as performant as possible, when accessed from multiple concurrent threads;
- c) there is no risk for deadlock.

To be able to get grade A or B you should submit your solution before the first deadline.

Submission

Your submission should be a **zip file** including your modified versions of the files Account.java, Bank.java, Operation.java and possibly Transaction.java, and it should be submitted to the appropriate place in NEXTiLearn.

The first line in the files should include the name of the author.

Good luck!