

# Programming Tutorial (Advanced)

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## Task 1

Create a method which computes the sum of all elements in a 2D integer array. For better Performance use at least 2 Threads or Runnables in parallel. (*Hint: Have a look on how the `join()`-Method is working*)

## Task 2

Task synchronization is especially important for banking systems. Implement a class **BankAccount**. A **BankAccount** should consist of the current balance, a String representing the IBAN and a limit. It should also consist of methods to withdraw, deposit and transfer money

Now think of a Bank with several employees. Each employee can execute the following operations: withdraw, deposit and transfer. They can all work in parallel. Represent the employees as Threads, Runnables or Callables.

Now think about the following situation:

- BankAccounts A, B and C all have a balance of 300 Euro.
- Employee X wants to transfer 20 Euro from A to B.
- Employee Y wants to transfer 20 Euro from B to C.
- Employee Z wants to transfer 20 Euro from C to A.

Implement the presented banking system and think about proper synchronization such that the above situation will not lead to problems.