**Lab 3 - Advanced launching of parallel tasks**

* **The goal** of this lab is to use more advanced mechanisms for launching parallel operations — the thread pool and the *future*.
* **The used mechanisms:**
  + ThreadPool in Java and C++
  + Tasks and Futures in Java
  + std::async and std::future in C++
* **We performed addition and multiplication** on a 50x50 matrix, having values between 100 and 500
* **We changed the number of threads** for the ThreadPool version and after that we compared the times (measured in seconds)
* **We compared the times** for the other version as well
* **The hardware platform** had the following specifications:
  + **MacBook Pro** (13-inch, 2017, Two Thunderbolt 3 ports)
  + **Processor:** 2,3 GHz Intel Core i5
  + **Memory:** 8 GB 2133 MHz LPDDR3
  + **Startup Disk:** Macintosh HD

**Tests:**

* **ThreadPool**
  + **Addition:**

|  |  |  |
| --- | --- | --- |
| **Threads Number** | **C++** | **Java** |
| 5 | 0.010507s | 0.08s |
| 10 | 0.0123974s | 0.044s |
| 20 | 0.00970581s | 0.048s |

* + **Multiplication:**

|  |  |  |
| --- | --- | --- |
| **Threads Number** | **C++** | **Java** |
| 5 | 0.359s | 0.056s |
| 10 | 0.405s | 0.06s |
| 20 | 0.339s | 0.156s |

* **Futures**(Tasks for Java and async for C++)
  + **Addition:**

|  |  |
| --- | --- |
| **C++** | **Java** |
| 0.0188s | 0.052s |

* + **Multiplication:**

|  |  |
| --- | --- |
| **C++** | **Java** |
| 0.841s | 0.06s |