1DL590 Lab2

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Note: All the experiments in this lab are done on Linus server `barany.it.uu.se`***.***

Task 1: Fine-grained synchronization

The concurrent list-based set with Fine-Grained synchronization is in the file named `Sets/FineList.cpp`.

Task 2: Optimistic synchronization

The concurrent list-based set with Optimistic synchronization is in the file named `Sets/OptimisticList.cpp`.

Task 3: Experiment

Compile and execute `T3Ex.cpp` on Linus server `barany.it.uu.se`.

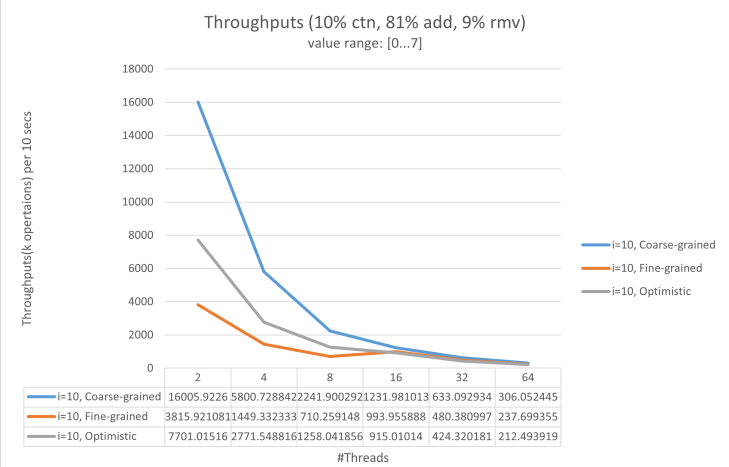
Compile: `g++ T3Ex.cpp -lpthread -o t3.out`

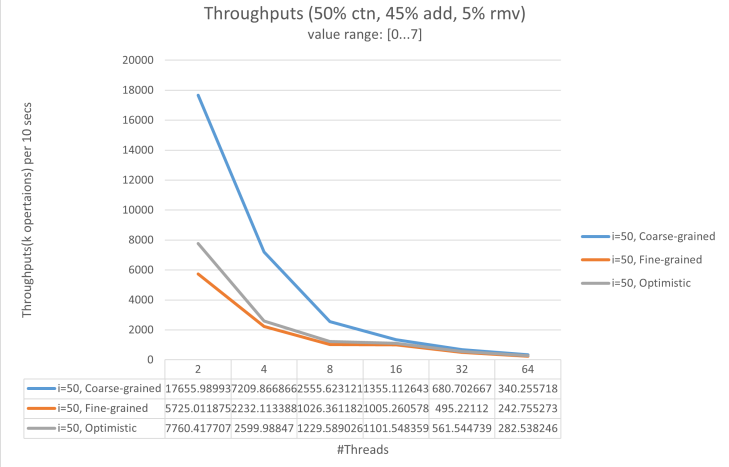
Execute: `./t3.out`

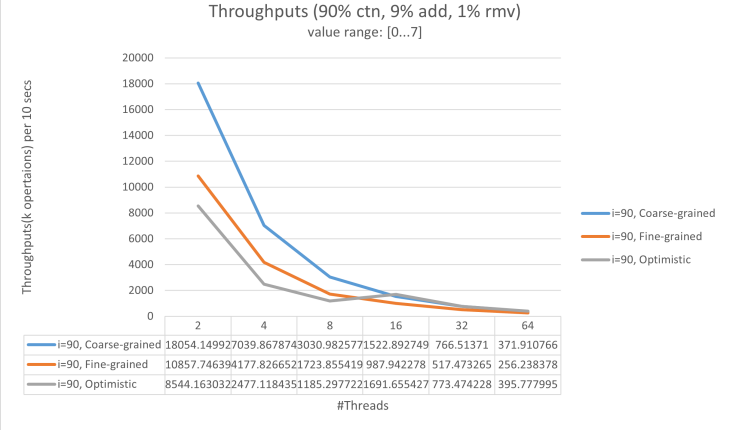
Results

The tables and curves can be found in the folder `Images`.

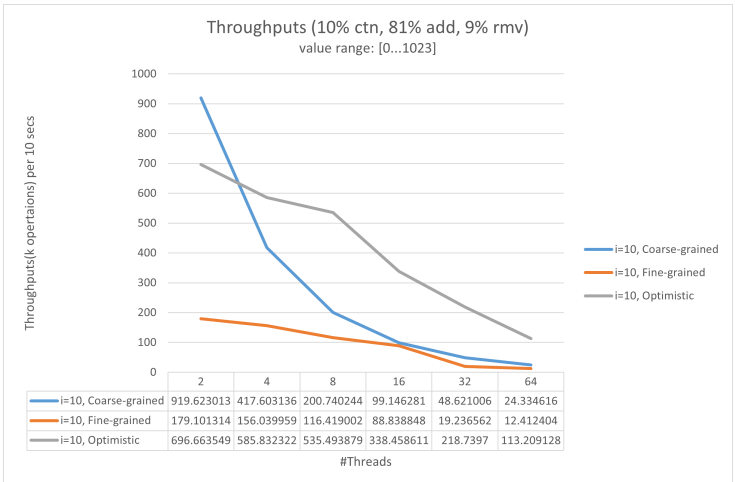
- When the values range from 0 to 7, we can see that the trends with different values of `i` are similar: The throughputs of all the three lists decrease with the threads increases. The Fine-grained List has the worst performance among the 3 lists with any tested number of threads. The Coarse-grained List is the best option in most cases.



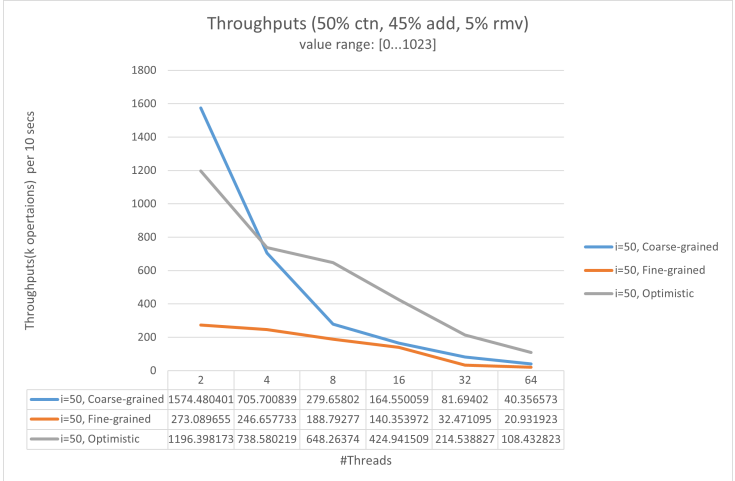




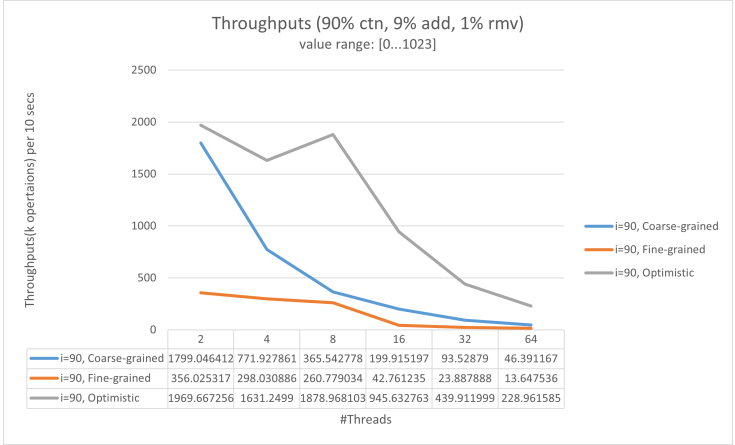
- When the values range from 0 to 1023, we can see that the trends with different values of `i` are similar: The throughputs of all the three lists decrease with the threads increases. However, the Optimistic List gets better performance than the other 2 lists with more than 4 threads. The Fine-grained List has the worst performance among the 3 lists with any tested number of threads.



	2	4	8	16	32	64
i=10, Coarse-grained	919.623013	417.603136	200.740244	99.146281	48.621006	24.334616
i=10, Fine-grained	179.101314	156.039959	116.419002	88.838848	19.236562	12.412404
i=10, Optimistic	696.663549	585.832322	535.493879	338.458611	218.7397	113.209128



	2	4	8	16	32	64
i=50, Coarse-grained	1574.480401	705.700839	279.65802	164.550059	81.69402	40.356573
i=50, Fine-grained	273.089655	246.657733	188.79277	140.353972	32.471095	20.931923
i=50, Optimistic	1196.398173	738.580219	648.26374	424.941509	214.538827	108.432823



	2	4	8	16	32	64
i=90, Coarse-grained	1799.046412	771.927861	365.542778	199.915197	93.52879	46.391167
i=90, Fine-grained	356.025317	298.030886	260.779034	42.761235	23.887888	13.647536
i=90, Optimistic	1969.667256	1631.2499	1878.968103	945.632763	439.911999	228.961585

- The throughputs decrease remarkably if we add the range of inputs values from [0...7] to [0...1024]. The Optimistic List is the best choice when we have a large range of input values and considerable threads.

Task 4: Multisets

The implemented multiset is in the file named `Sets/Multiset.cpp`. The process of the experiment is in the file named `T4Ex.cpp`.

Compile and execute `T4Ex.cpp` on Linus server `barany.it.uu.se`.

Compile: `g++ T4Ex.cpp -lpthread -o t4.out`

Execute: `./t4.out`