

Multicore Project #3 - Problem01

Environment

208 Building 6th floor laboratory PC

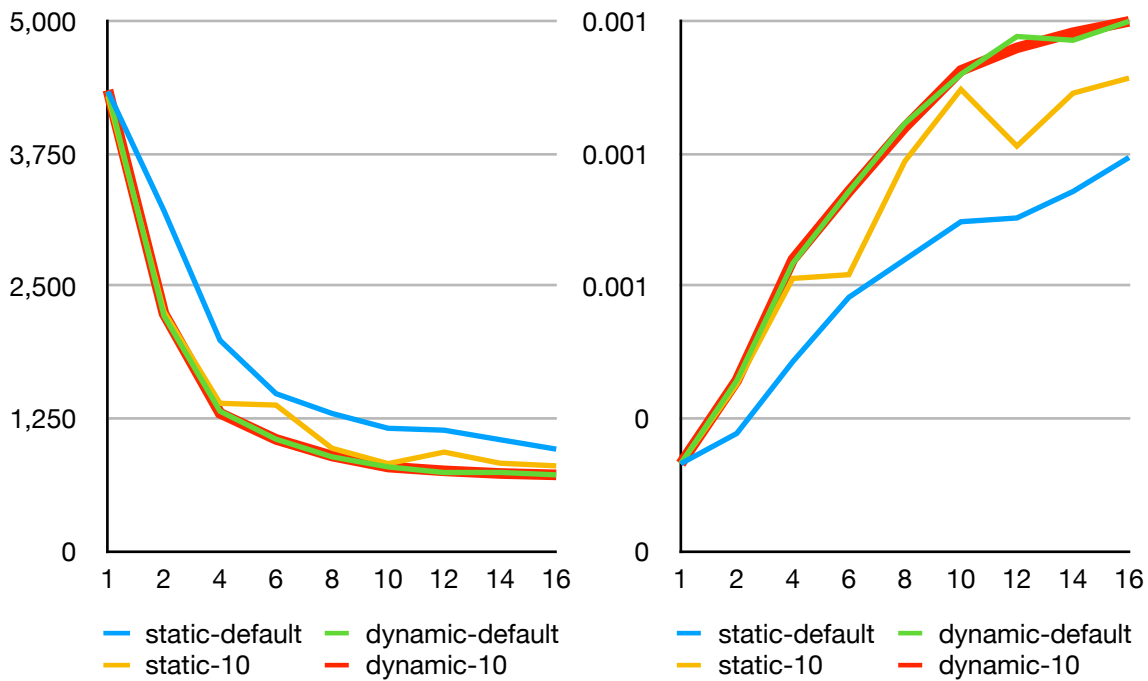
CPU : Intel Core i7-8700 (# of cores : 12)

Memory : 16GB

OS : Windows 10

IDE : Visual Studio 2019

Execution Result



(unit : ms)

exec_time	chunc size	1	2	4	6	8	10	12	14	16
static	default	4338	3211	1987	1483	1296	1156	1138	1048	959
dynamic	default	4336	2219	1317	1053	886	791	738	739	716
static	10	4295	2258	1392	1375	967	822	931	826	801
dynamic	10	4351	2239	1298	1051	894	790	754	729	716

performance = 1/exec_time

performance	chunc size	1	2	4	6	8	10	12	14	16
static	default	0.00023	0.00031	0.00050	0.00067	0.00077	0.00087	0.00088	0.00095	0.00104
dynamic	default	0.00023	0.00045	0.00076	0.00095	0.00113	0.00126	0.00136	0.00135	0.00140
static	10	0.00023	0.00044	0.00072	0.00073	0.00103	0.00122	0.00107	0.00121	0.00125
dynamic	10	0.00023	0.00045	0.00077	0.00095	0.00112	0.00127	0.00133	0.00137	0.00140

Analysis

The size of default chunk is 1.

I could see the performance is like :

static-default < static-10 < dynamic-default =< dynamic-10

If other conditions are the same,

- Chunk size 10 was faster than default size
 - As chunk size gets smaller, overhead increases and it leads to decrease of performance.
- Dynamic scheduling was faster than static scheduling
 - Because of the load-balance problem, some threads may work much longer than the other threads in static scheduling. In contrast, dynamic scheduling allocates tasks evenly to threads.