Build Instructions

To build the code run cmd ‘make’

Note:

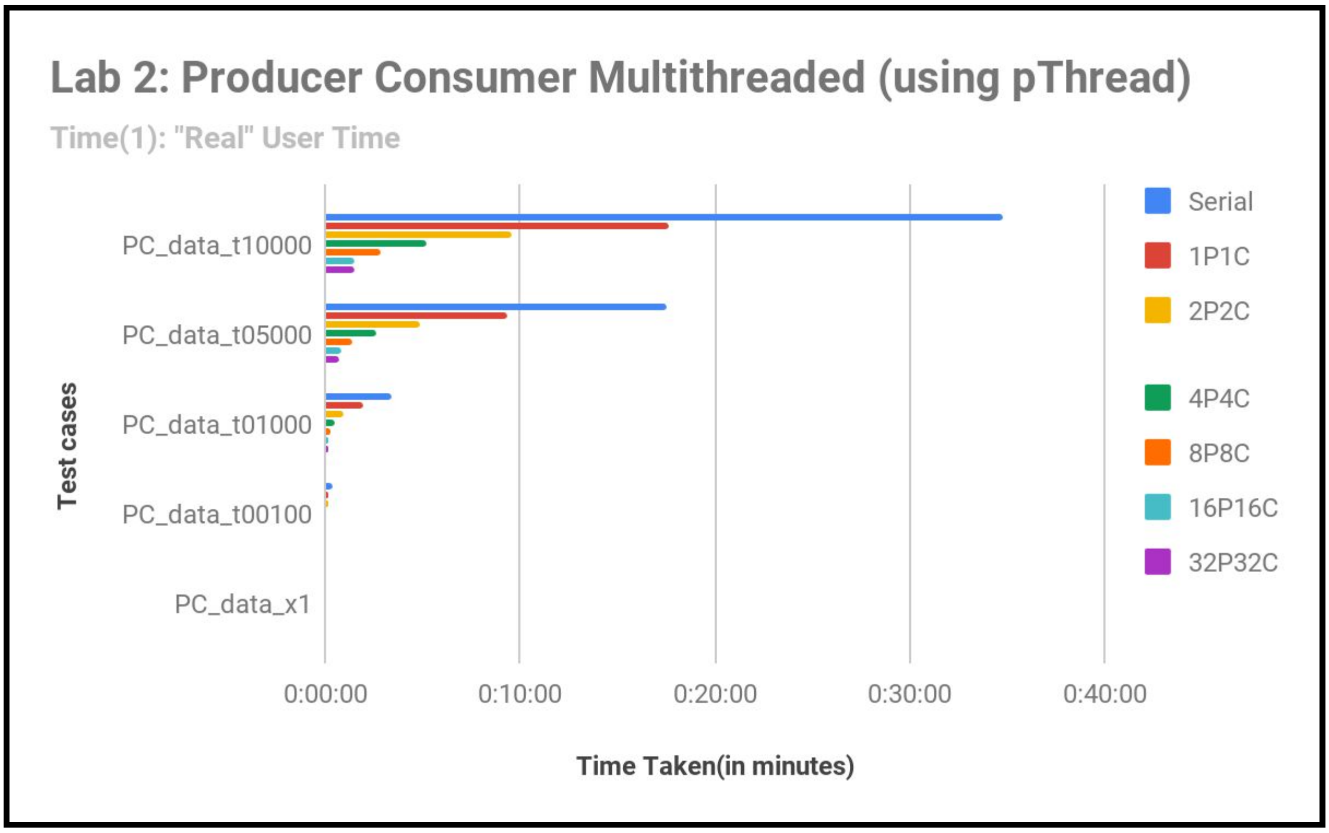
- makefile uses the icc (icc 18.0.3) compiler.
- makefile uses -pthread flag while compiling the file.
- makefile uses absolute path ‘*/fs/project/PAS1653/transform.o*’ to link the obj file.
- The generated output file is called ‘*lab2_pthreads’.*

Running Times

	Lab 2				**Lab 1**			
	Time(2)		**Time(1)**		**Time(2)**		**Time(1)**	
	P	**C**	**Real**	**User**	**P**	**C**	**Real**	**User**
PC_data_x1	3	32	0:00:02	0:4.192	2	1	0:03.585	0:03.513
PC_data_t00100	15	32	0:00:02	0:27.158	10	12	0:22.411	0:22.341
PC_data_t01000	143	160	0:00:11	4:1.991	110	95	3:26.070s	3:25.995
PC_data_t05000	736	750	0:00:47	20:27.571	518	535	17:33.385	17:33.147
PC_data_t10000	1456	1470	0:01:32	40:30.495	1045	1043	34:48.672	34:48.429s

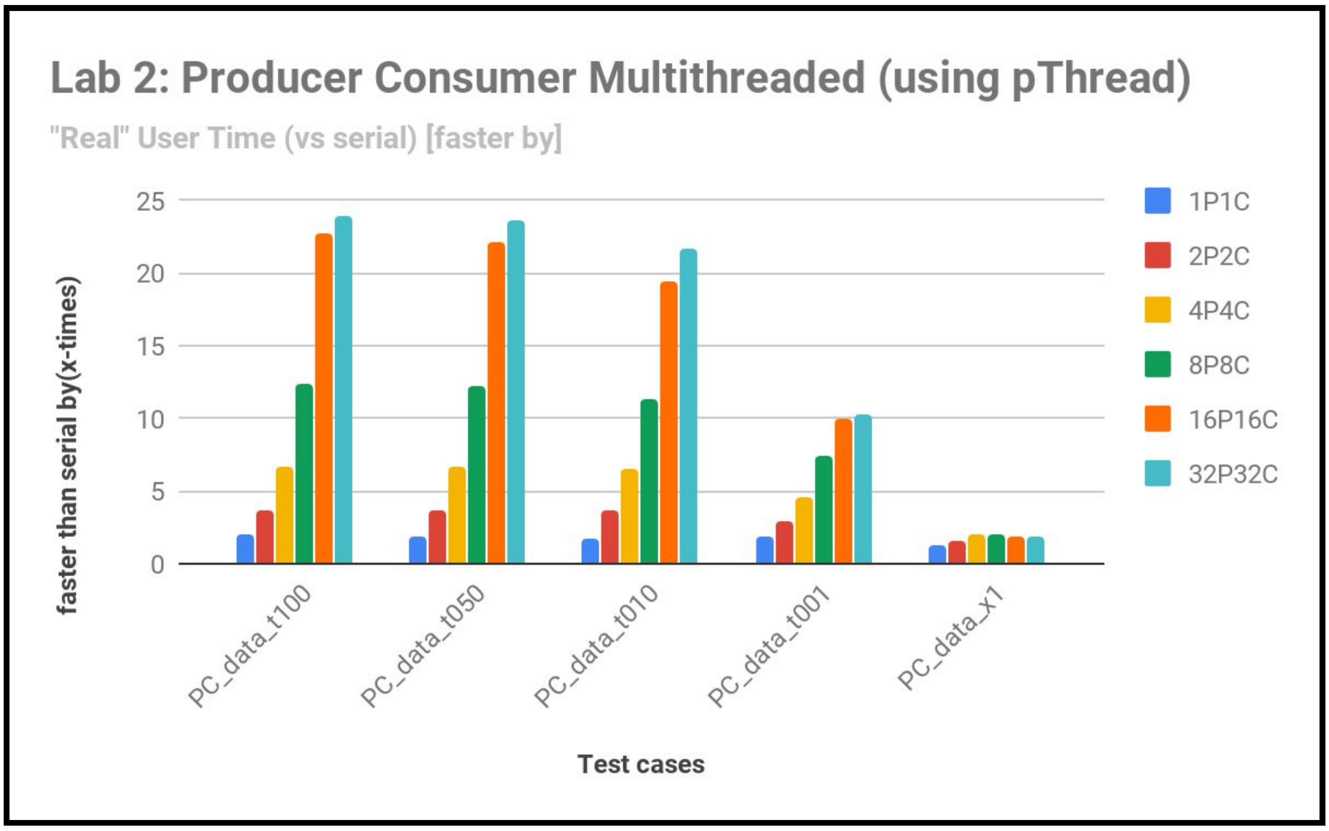
NOTE: Producer/Consumer time is in seconds and Real/User time is in mm:ss.ms format.

Scalability



	Serial	**1P1C**	**2P2C**	**4P4C**	**8P8C**	**16P16C**	**32P32C**
PC_data_t10000	0:34:49	0:17:40	0:09:37	0:05:13	0:02:50	0:01:32	0:01:27
PC_data_t05000	0:17:33	0:09:18	0:04:50	0:02:38	0:01:26	0:00:47	0:00:45
PC_data_t01000	0:03:26	0:01:59	0:00:57	0:00:32	0:00:18	0:00:11	0:00:10
PC_data_t00100	0:00:22	0:00:12	0:00:08	0:00:05	0:00:03	0:00:02	0:00:02
PC_data_x1	0:00:04	0:00:03	0:00:02	0:00:02	0:00:02	0:00:02	0:00:02

NOTE: The above data is of Real time returned by Time(1) and is in mm:ss.ms format.



Reason for selecting current number of threads?

I am using 16 producer threads and 16 consumer threads based on the performance observed above. 16P16C thread provided almost the same performance with half the number of threads.
This can be seen in the above tables.

Unexpected Results

- For testcase 'PC_data_x1', 3 Producers threads are more than enough to read all input and due to this i was expecting an increased execution time (due to thread creation overhead and lock contention) as the number of threads increased. But, the execution time only started increasing (very minor degradation in performance) after 8P8C configuration.