Programming Assignment 2

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# The idea of your program

Please include:

1. The concept of the algorithm (2-opt)
2. How you divide the algorithm/data into different threads

# Performance analysis with 1, 2, 4, 8, 16 thread(s)

How may 2-opt comparison do you perform within 30 seconds?

Observe the results and discuss if the performance improves as the number of threads increases. Try to justify your answer.

(Please use “time” to measure the time, **DO NOT USE “clock”**)

# Compare your results with the un-parallel version of your code (with test8)

Do you use any random functions in your code?

If yes, is the function you use thread-safe? And it is normal that your results might be different.

If not, then your answer should be equal. Otherwise, there are **race condition** unhandled in your code.

Please set a break point (ex. After each edges are visited twice) in your code, and observe if the parallel & un-parallel results(distance) are the same.

|  |  |
| --- | --- |
| test8 | |
| Parallel | Without Parallel |
| (Your distance) | (Your distance) |

# Record your distance every 30 seconds with **test11**

Please observe if the distance improves within 10 minute.

|  |  |
| --- | --- |
| Time | Distance |
| 0m 30s |  |
| 1m 00s |  |
| 1m 30s |  |
| 2m 00s |  |
| 2m 30s |  |
| 3m 00s |  |
| 3m 30s |  |
| 4m 00s |  |
| 4m 30s |  |
| 5m 00s |  |
| 5m 30s |  |
| 6m 00s |  |
| 6m 30s |  |
| 7m 00s |  |
| 7m 30s |  |
| 8m 00s |  |
| 8m 30s |  |
| 9m 00s |  |
| 9m 30s |  |
| 10m 00s |  |

# Discussion

If there’s any race condition in your code, please describe how you handle them?

What is the most difficult part of this assignment?

What is the bottle neck of your program? Do you think that it can be improved?

Can the number of thread be more than the number of core, please justify your answer?

Which do you prefer, pthread or OpenMP, why? What are their pros and cons?

Please describe your findings in this assignment and discuss them.

# Feedback

Feel free to fill in this section.

Additional reference

If you want to see threads: <http://ask.xmodulo.com/view-threads-process-linux.html>

Processes v.s. Threads in linux: <http://www.thegeekstuff.com/2013/11/linux-process-and-threads>

Clone(): <http://man7.org/linux/man-pages/man2/clone.2.html>