

## OPERATING SYSTEMS

Sudoku Validation Solution using Pthreads and OpenMP :

### REPORT:

- I. Comparison of Pthreads and OpenMP, varying sudoku order with no. of Threads as 16.

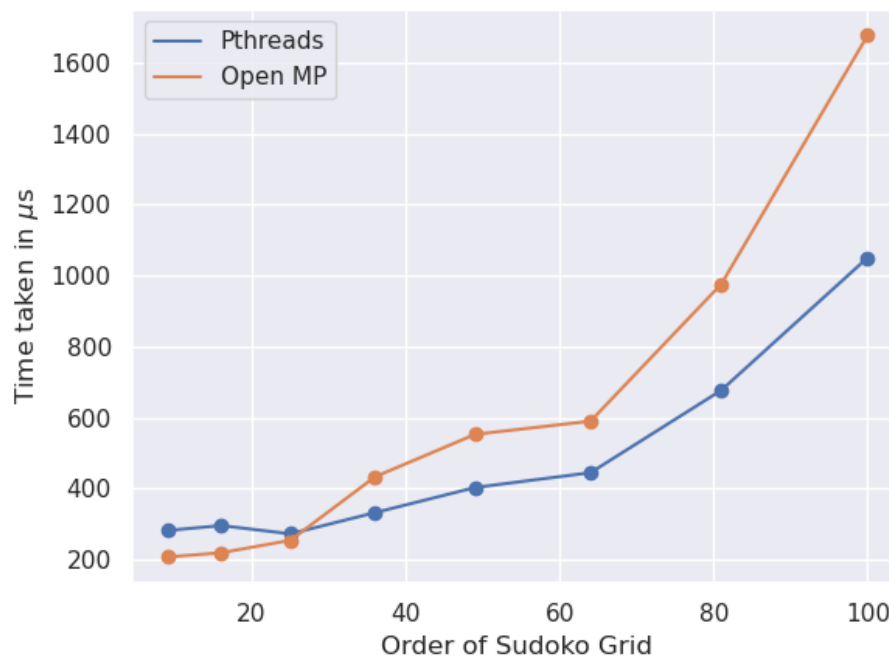


Fig2. Time vs Order of Grid  
No.of Threads = 16.

#### Observations:

- With increase of Order of grid for given number of threads, Time taken gradually increases
- This is because, Higher the order implies greater number of operations/computation to be done which implies greater time of execution
- For greater value of size of sudoku grid, we could see significant difference in time consumed
- As in code, we are accessing data Sequentially.

- II. Pthreads is performing better than OpenMP for more number of threads  
Comparison of Pthreads and OpenMP, varying number of Threads with order of Sudoku as 25x25.

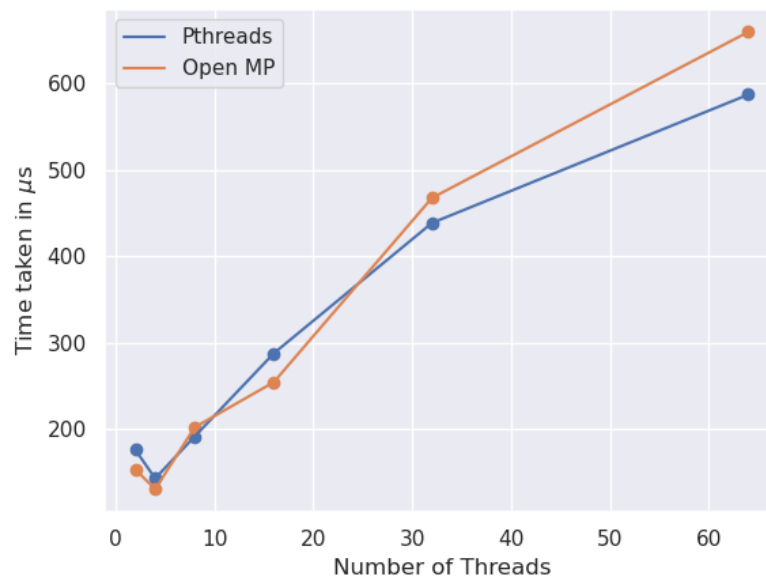


Fig1. Time vs no.of Threads  
Sudoku Size: 25x25.

Observations:

- With Increase of number of threads, time taken increases. This could be because, we are working on less number of operations ( $3 \times 25$ ) and we could observe great difference when working on number size in Millions.
- Thus, creation of threads takes more time and is dominating
- For Lower value of number of threads, both Open MP and Pthreads have taken similar(same) time to compute
- For Higher number of threads, from graph we could say Pthreads is more efficient than Open MP.
- The reason why Pthreads are more efficient is, it allows programmers to implement code at very low where as OpenMP does most of the things automatically