Assignment 3 : Dynamic Loop Scheduling

Q. Compare performance at 16 threads across the different synchronization modes. Why are the speedup this way?

It can be observed that performance decreases as granularity increases. Less granularity meaning less work which causes less computational time for each processors. This leads to more overhead as every thread accesses mutex for a short period of time so as the number of thread increase, so does the overhead. That's the reason for low speedup. Whereas more granularity could lead to better computational time for each processors but performance decreases as more threads are involved for every iteration and each of them use mutexes. The speedup is high because it is inversely proportional to parallel time.

Q. For thread level synchronization, compare the performance at 16 threads of different n and intensity. Why are the plots this way?

In the thread level synchronization, as the intensity increases, the cost of function also increases. Which means the work increases leading to more computational time for each thread. To achieve maximum speedup, the granularity should decrease in equal proportion. This also indicates that as the granularity decreases in gradual proportions, the speedup increases. This is to maintain load balancing between threads.