Final Project Milestone Report

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Project Webpage (GitHub) with updated schedule + copy of milestone report in README: https://github.com/ryalin/clique

One to two paragraphs, summarize the work that you have completed so far. (This should be easy if you have been maintaining this information on your project page.)

In week 1, we researched and found an np-complete problem (clique decision) to solve. The week ended with the completion of a project proposal. In the subsequent weeks up until now, we set up a codebase, wrote scripts to generate testing files, wrote the sequential algorithm in multiple ways to find the best one in terms of speed, and started parallelizing using OpenMP. We also introduced some bug fixes to our existing code this week and are wrapping up this milestone report (inception).

Describe how you are doing with respect to the goals and deliverables stated in your proposal. Do you still believe you will be able to produce all your deliverables? If not, why? What about the ”nice to haves”? In your milestone writeup we want a new list of goals that you plan to hit for the poster session.

The goals and deliverables stated in the proposal still seem very much doable and achievable, but we are currently slightly behind schedule due to the nature of how we initially planned our work. Our original plan was to parallelizing the clique decision algorithm using OpenMP and CUDA, achieving at least ½ * core_count speedup, and we seem to be on track.

In the original plan, we listed the “nice to haves”/“hope to achieve” as parallelizing the algorithm like above, with at least 0.75 * core_count speedup, the development of a comprehensive testing suite for all edge cases, and a MPI parallelization. We hope to improve the speedup and testing suite, with our current optimization, but do not believe there is time left in the schedule to explore possible parallelization with MPI.

New Goals: The new goals are largely the same as the old ones, except with the removal of parallelization with MPI, because that introduces an entirely new category of project work.

- At least a ½ * core_count speedup with both OpenMP and CUDA, with hopefully a 0.75 * core_count speedup.

- A larger testing suite than currently (currently there are 3 types of graphs with 3 different sizes each to test with)

What do you plan to show at the poster session? Will it be a demo? Will it be a graph?

At the poster session, we plan to show graphs denoting the benchmark results obtained from parallelization with OpenMP and CUDA. If time allows, we may also develop a demo to show, where the audience can give us a clique size they want to search for in our graphs.

Do you have preliminary results at this time? If so, it would be great to include them in your milestone write-up.

We currently do not have concrete preliminary results. We do have some initial speedups calculated from our OpenMP parallel implementation but we still have to verify correctness.

List the issues that concern you the most. Are there any remaining unknowns (things you simply don't know how to solve, or resources you don't know how to get) or is it just a matter of coding and doing the work? If you do not wish to put this information on a public web site you are welcome to email the staff directly.

It seems to be just a matter of coding and doing the work, in the face of a busy schedule. We still are thinking of ways to parallelize our code the best way possible, but that will take some trial and error which takes lots of time.