Project 2-2

CSC333 7/31/15

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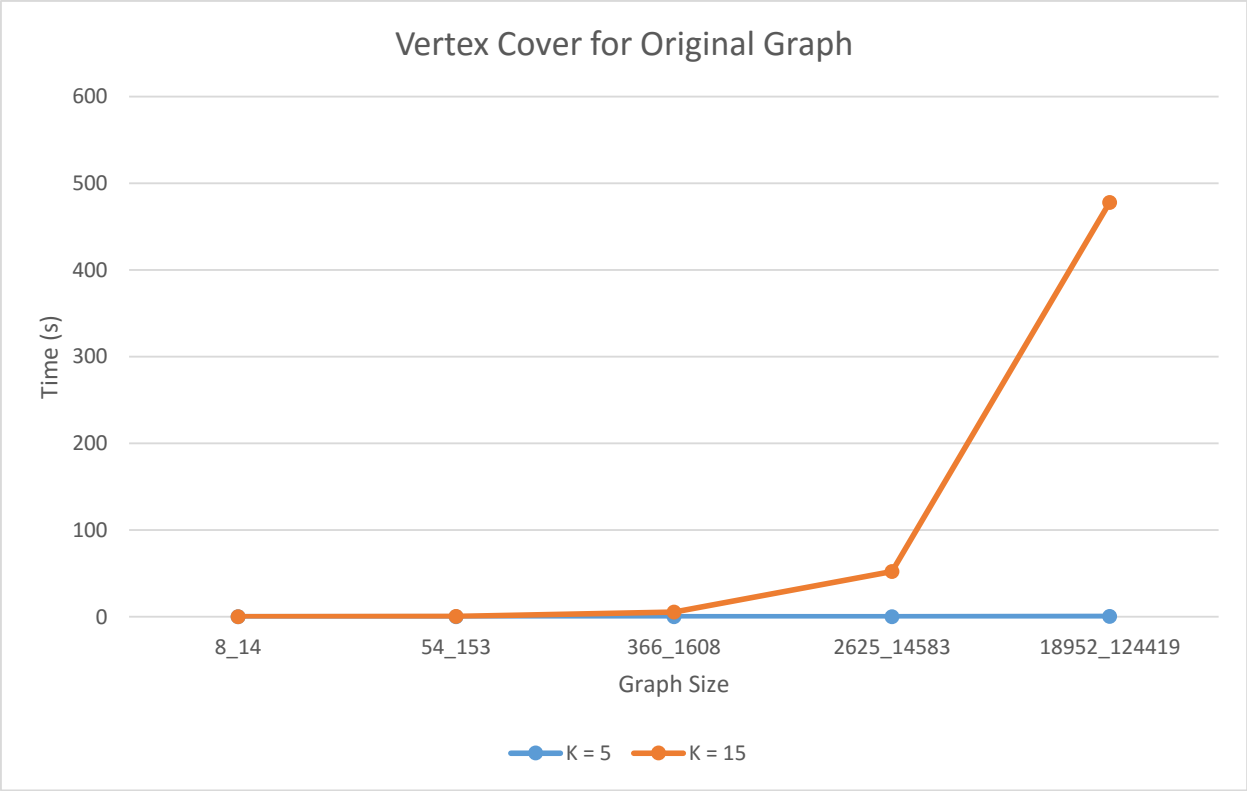

Figure 1. Cover Vertex vs Graph Size for the original sized graphs

For all of the data I gathered I used the real time output from the bash command for time. For the original sized graphs the output of the data is pretty straight forward. Time to run increased as graph size increased. Increasing k had an enormous effect on the run time as can be seen in the larger graphs. This is due to the time complexity being polynomial.

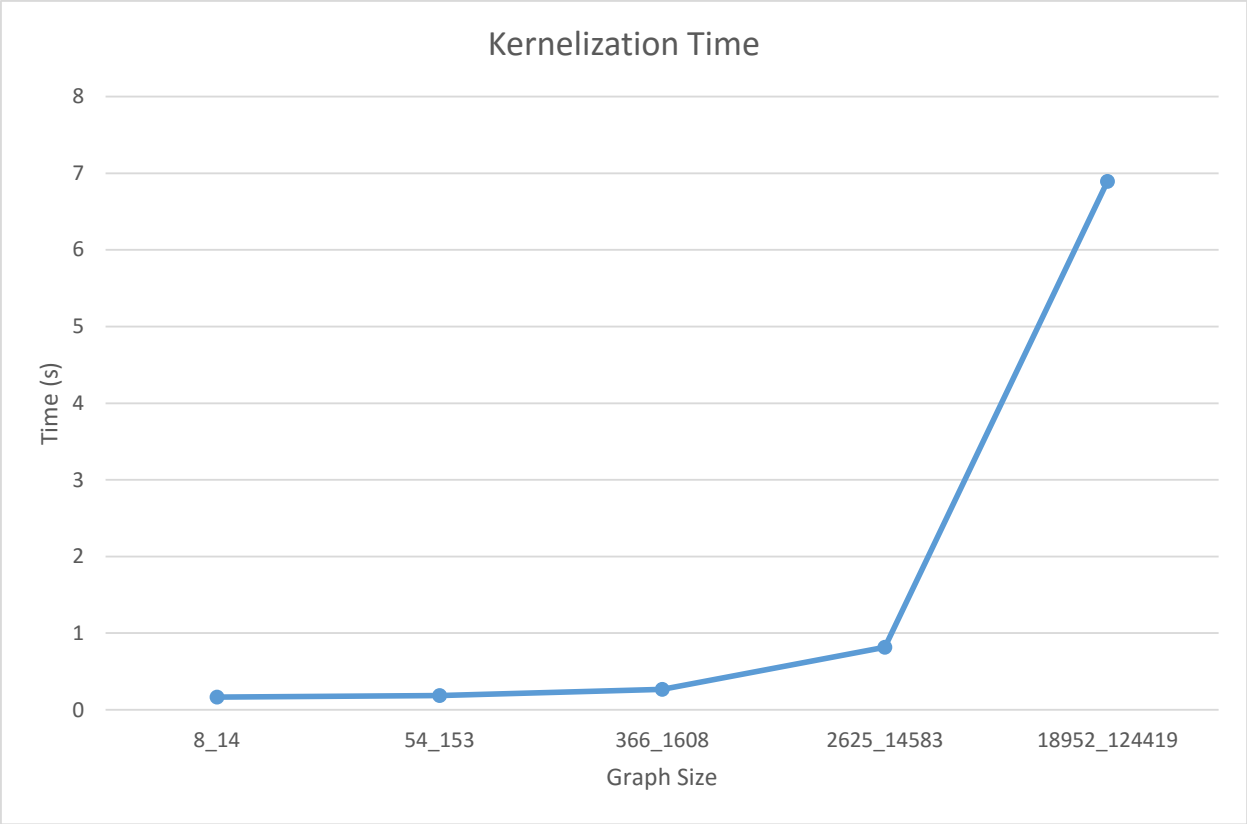

Figure 2. Kernelization time vs Graph Size

Kernelization time was completely dependent on the size of the graph as expected.

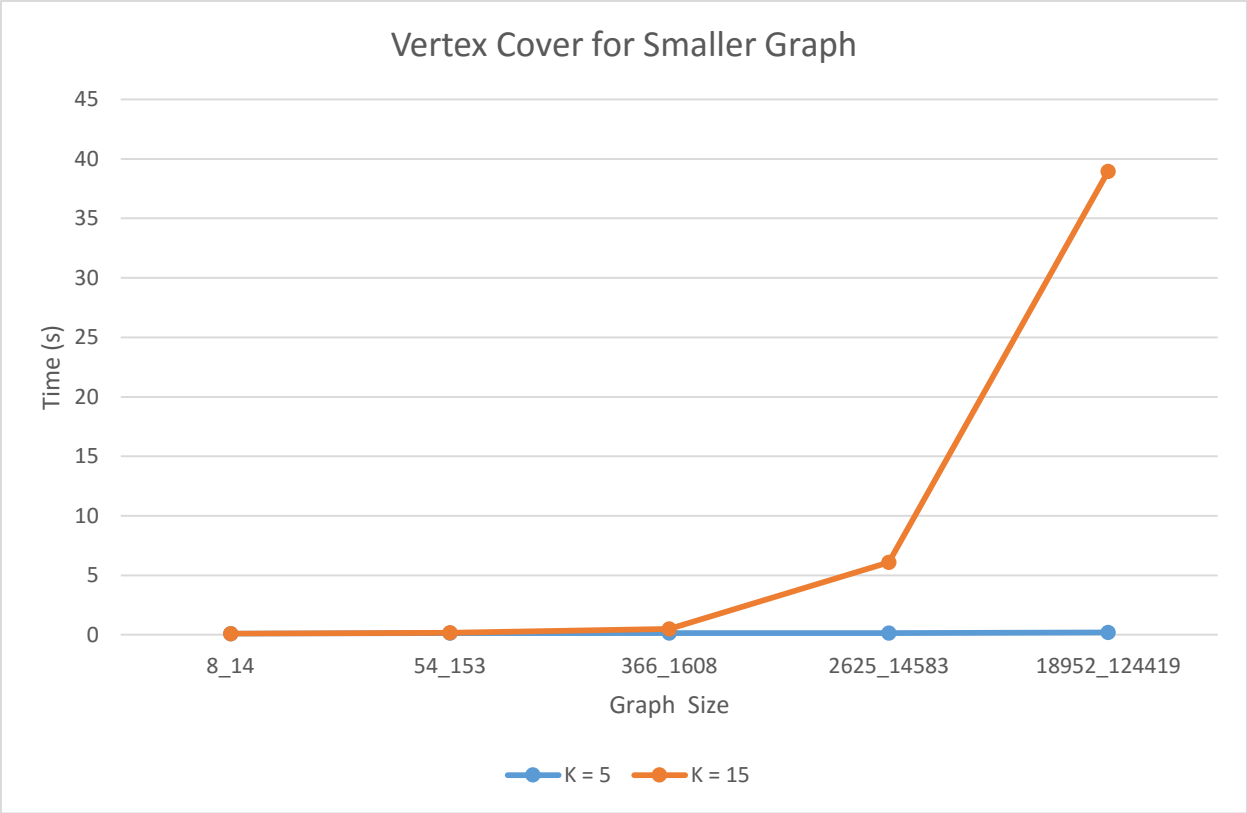

Figure 3. Vertex Cover vs Graph Size for the smaller sized graphs

The end result is that reducing the graph by kernelization before finding the vertex cover is very significant. Adding the kernalization time to the vertex cover for the smaller graphs for a reasonably sized k resulted in a much smaller value than that of its original sized counterpart. This can especially be seen for 18952_124419 going from 478 seconds to 46 seconds for k = 15.