**Project 3 – Map Reduce Assignment using MPI**

**Problems encountered when completing the assignment and how I overcame them.**

The main problems encountered in this lab was the use of different threads and the testing of the program itself; MPI is a little difficult to understand, but thanks to the example I could create a working version of the program. The main issue is in the logic, since I get struck into an infinite loop due to the threads, this could be solved with time spent in debugging; however, due to time constraints I can no longer spend time on this. Another problem isthe computer I am using for the VMs behaves erratically with technical issues which consumes most of the time rather than the implementation, as I mentioned in the other labs.

**Any problems I was not able to overcome.**

In this case, the infinite loop due to threads was the problems I was not able to overcome.

**About how long it took me to complete the assignment.**

Implementation took me around ~2-3 hours since most of the logic was done on the previous assignment. It took me around another hour to access the VM on the computer and 30 minutes to be able to run it due to the slow computer.

**Performance Measurements for 1, 2, 4, and 8 threads.**

Output from cmd (got rid of some print statements to avoid clutter in report. Those statements are present in actual cmd and code):

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'henry': 0, 'hamlet': 4211, 'you': 4210, 'my': 4210, 'blood': 4210, 'poison': 4210, 'mac  
beth': 0, 'king': 4210, 'heart': 4210, 'honest': 4210}   
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'henry': 0, 'hamlet': 4211, 'you': 4211, 'my': 4210, 'blood': 4210, 'poison': 4210, 'mac  
beth': 0, 'king': 4210, 'heart': 4210, 'honest': 4210}   
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beth': 0, 'king': 4210, 'heart': 4210, 'honest': 4210}   
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beth': 0, 'king': 4210, 'heart': 4210, 'honest': 4210}   
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beth': 0, 'king': 4211, 'heart': 4210, 'honest': 4210}   
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beth': 0, 'king': 4211, 'heart': 4211, 'honest': 4211}   
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beth': 0, 'king': 4211, 'heart': 4211, 'honest': 4211}   
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beth': 0, 'king': 4211, 'heart': 4211, 'honest': 4211}   
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beth': 0, 'king': 4211, 'heart': 4211, 'honest': 4211}   
{'hate': 4212, 'love': 4212, 'death': 4212, 'night': 4212, 'sleep': 4211, 'time': 4211,   
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'henry': 0, 'hamlet': 4211, 'you': 4211, 'my': 4211, 'blood': 4211, 'poison': 4211, 'mac  
beth': 0, 'king': 4211, 'heart': 4211, 'honest': 4211}*

As it can be seen, there is a working version; however there is this bug that never exits from this loop that keeps re-adding every iteration.

**Output from the cpuInfoDump.sh**

model name : Intel(R) Core(TM) i5-8300H CPU @ 2.30GHz

8 72 432