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Parallel Computing  
MW 4:30PM – 5:50PM

## Lab 4: Floyd-Warshall

### Description

The following lab takes a matrix and finds the shortest path by using the Floyd-Warshall algorithm.

### Challenges

At some point during the implementation of the program, the resultant matrix would be full of zeroes. This happened because I wasn't truncating some of the formulas. Once I truncated them, the program was able to run successfully.

### Bugs

The program does not run with 8 threads. It goes onto an infinite loop.

### Time Completion

Overall, the implementation and testing of the program took around three to four hours as I was trying to debug it and correctly implement the parallel region.

### Performance Measurements

Thread 1 Runtime: 0.831 s  
Thread 2 Runtime: 0.566 s  
Thread 4 Runtime: 0.559 s

### Analysis

At first, the program runs half the time when the number of threads is increased to two. However, once four threads are introduced, the runtime does not significantly decrease. Overall, the decrease of time is due to the dividing of work through threads; however, this is not always true since at after some number of threads, the runtime will not significantly change.

### Execution

For default run: `mpirun -n # python3 fw_Galvan_Stephanie.py`

In which # represents any positive number bigger than 0 (for number of threads)

### Output from the dumpCPUInfo.sh program

Intel 4 Core i7-6500U CPU @ 2.50GHz