Lab 8 Daniel Hjelm:

Task 1:

When I let the thread have more work than the main it finished later, and when I let the main have more work it finished later. So the thread and main are really working in parallel.

When I added another thread it also run I parallel. This one can see by changing the work for each thread.

Task -2:

We don’t have to use two different functions that almost do the same thing, we can actually have the same function and let the argument to that function tell the thread what to do. This is explained well by the code in task-2.

Task-3:

Here we investigate how splitting the work evenly can reduce the time spent doing a calculation. When N1 = 7….and N2 = 1…. The work is badly divided.

time = 0.000154

When we divide it N1 = 4… and N2 = 4…

time = 0.000077

It did go faster, but we need to know what we are measuring. The user time will be the same since that is measured in CPU-time, but the real time will be lower!

Since threading do not reduce the amount of work the CPU does the user time should be the same, but the real time should be lower.

Task-4:

Here I let the main take 2-N/2 and then the thread take N/2-N.

This is not splitting the workload by half since calculating for N/2-N is harder, but at least I split it a bit. We can see that the time was less for the threaded version.

Serial for n = 100000:

real 0m1.005s

user 0m1.065s

sys 0m0.004s

Threaded for n = 100000:

real 0m0.812s

user 0m1.074s

sys 0m0.006s

Task-5:

When we do this we need to make sure to not overlap the memory and thus we need an array for every thread\_data, but we don’t need to have an array that points to the actual threads, only the data struct we send in to it.

Something interesting is that they will not print out in order, some are faster than others and the order will be random.

Task-6:

One thread: 0m1.070s

Two threads: 0m0.801s

Three threads: 0m0.621s

Four threads: 0m0.563s

Five threads: 0m0.507s

Ten threads: 0m0.472s

Task-7:

Check code!

Task-8:

https://www.thegeekstuff.com/2012/05/c-mutex-examples/