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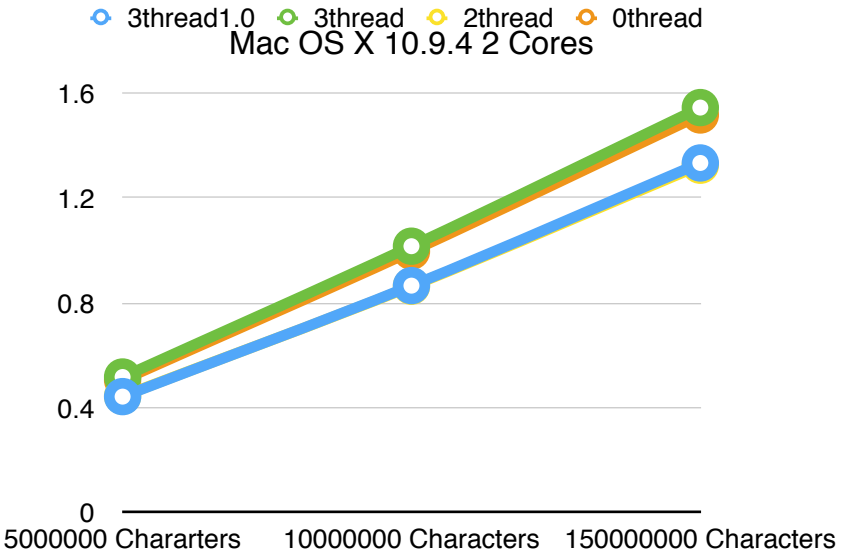
Assignment 3 Report

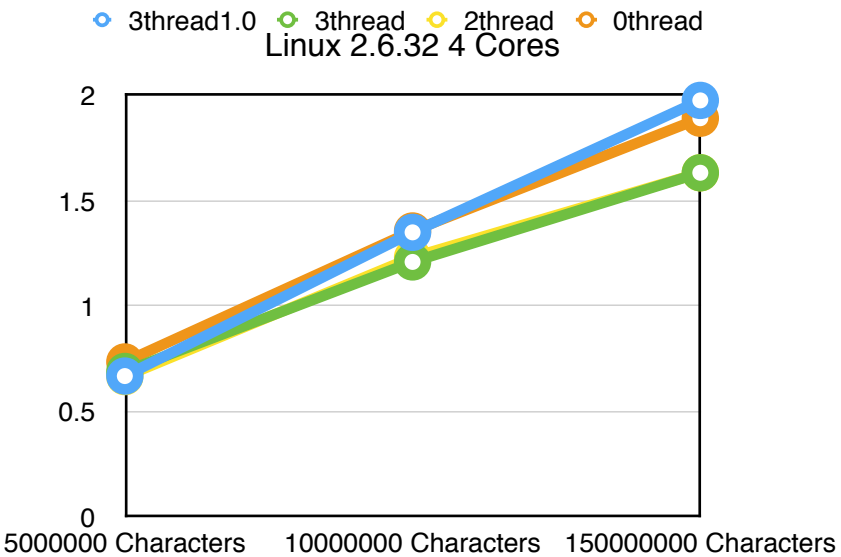
This report entails the results found from running different versions of a program that decompressed, modified and then compressed gz formatted text files. The objected of the experiment was to find if there is a execution time increase in the versions of the program that used threads compared to the version that did not.

To get the execution time of each version of the program they were run 5 times with the command line option ‘time’ and the average real time was taken as the result. Each version was run on 3 different sized gz tile files that were 5,000,000, 10,000,000 and 15,000,000 characters long. The



experiment was done on to different machines, a Mac with 2 cores and a Linux machine with 4 cores.

As expected the 2 thread program had the quickest execution time on the 2 cored machine. The 3 thread program didn’t perform as well on this machine probably due to the extra overhead added in switching threads. After changing the source code in the 3 thread program so the modifying thread unlocked the mutex from the read thread before locking the mutex of the writing thread to allow either thread to continue execution while the text was been modified. A faster version of the 3 thread program (3thread1.0) was created.



When the programs were tested on a 4 cored Linux machine the 3 thread version was found to run a lot faster then all other version of the program. The worst performing versions on this machine were the unthreaded and 3thread1.0 versions. The reasons for the increase in the execution time of the 3thread1.0 program are unexplained but most likely due to Linux's general poor performance with threaded programs.

Over all the largest increase in performance between the unthreaded version and the 3 threaded version was found on the Linux machine with an overall 14% increase in execution time. The largest performance increase in Mac machine running 2 cores was 13% with the 3thread1.0 version of the program.

These results are a lot lower increase in performance than was expected. On multi cored machines the increase in execution time should be around 25% or more but due to a lack of access to machines with better threading performance a lower increase in execution was all that could be measured.