Implementation decisions

When selecting different implementations of how to read / write to files using Java, we found BufferedReader() and Files.write() methods. We figured that using a buffered reader would be slower than the files method because it would have extra overhead and they would be good choices for the comparison that we would need to make in the end.

In the output file, we have the program write to the file as it is running. The format that it outputs is the following:   
“Thread ID, Iteration number, Value within the thread”  
This will continue like this until the pass is finished where it will print:  
“Result from pass “pass#” = value obtained”  
This was our decision to be able to tell where the passes have ended if there are more that run after it to be able to find the result for each.

The format of the input file that we found to be the easiest was the following:  
“The first line is the name of the file to be used for output.”  
Each line following will have the 3 parameters needed for each pass, in this format:  
“Solution Type (Either 1 or 2), # of threads to be used, # of elements to be used”  
We found that this format worked well and was an easy way to implement the requirements

Challenges

Finding different ways to read and write files in Java was the first challenge that we faced. It was easily solved with some minor research and implementation testing.

The biggest challenge we faced during this part was figuring out the best way to time the implementations to be able to compare them and see which has better performance. When initially timing, the times would be inconsistent and there was no clear winner. We then ran each of them 10 times and averaged the times to get a better result. This resulted in the buffered writer solution being around 10% faster than the files.read/write solution. (Times in nanoseconds were Buffered: 5579732063 Files.: 6125330845).

Compilation Instructions

1. Open root directory (“Group\_1\_Part\_3”) in a terminal.
2. Run the following commands to compile and run the program.
   1. javac src/\*.java -d compiled
   2. cd compiled
   3. java Main ((1 or 2) Select desired write mode) (Input File Path)