Problems I faced during project 2 are given below:

1. First problem I faced some issue about multi-threading that when I tried to calculate the collatz-sequence numbers I was getting some problem on the output. I was writing the output file and then I wrote another output file with the same value of N & T to see if those values are same or not. But at first the two files output was different. The problem was that when I was increasing the value COUNTER then another thread was already calculating the collatz-sequence for another number. I’ve to check if the value has reached to N or not even I’m increasing the COUNTER value. But this problem is now fixed with the help of Dr. Reiccherzer. Right now, there’s no race condition if I’m running the problem with mutex lock. Writing the output two times (with the same number of maximum number and number of threads) to different files gives no difference using “diff” UNIX command.
2. This is the problem with the time required to calculate the full program to calculate collatz-sequence till a given number from 2. For me, when I’m using less number of threads the time required for that is less than the time required to calculate the problem with more numbers of threads and of course with a constant number of N. I tried many things to solve the problem. I checked if right numbers of threads are creating or not and if the thread\_join is working or not. I checked if the mutex\_lock is working or not. I also checked the output file (histogram array) to see if the sum of the value is matching with the given value of N or not. At first I was trying to solve the problem with two different locks, one when I was increasing the value of global COUNTER variable and then another when I was increasing the histogram array with the the value of stepsNeeded to calculate the collatz sequence for a number. After that I converted into one lock to see if the problem has been solved or not. But I’m still getting the similar graph for the time required with the increasing number of threads. My observation for this problem may be the context switch for multiple thread is causing it. The graph for the time required to calculate the collatz-sequence for a fixed number with different number of threads is given in the Analysis.docx file.