

Mean Blur Filter Homework Assignment

Maruan Bakri Ottoni

RA: 222025

FEEC

UNICAMP

Campinas, Brazil

August 16, 2020

Abstract

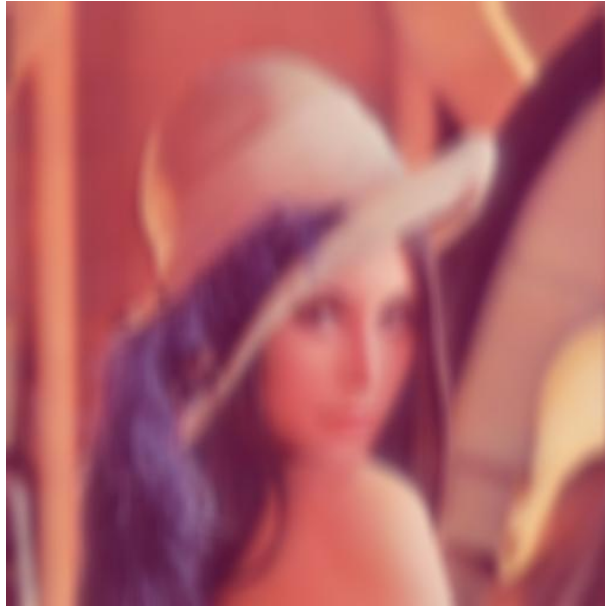
Here, on this homework assignment, the mainline of work was to test three different approaches in trying to implement a median blur filter: Only one line of execution of the main program, Multithread and Multiprocess. I tested a hundred times each one of those alternatives and the result was that the user time of a multiprocess solution was in general, faster. In the case of real time the multithread and the multiprocess where equally good with a slight improvement in performance on the multthread approach.

1 Images and the Final Result

Figure 1: Original image (Here will always appear the lena image. If you find necessary to change it, you have to modify the template.tex file).

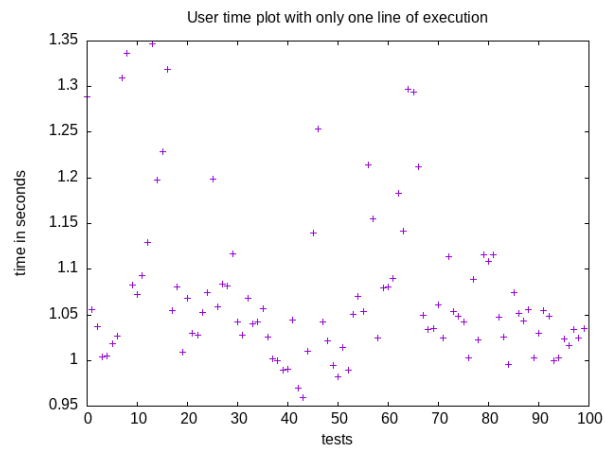


Figure 2: Blur filter.



2 User time

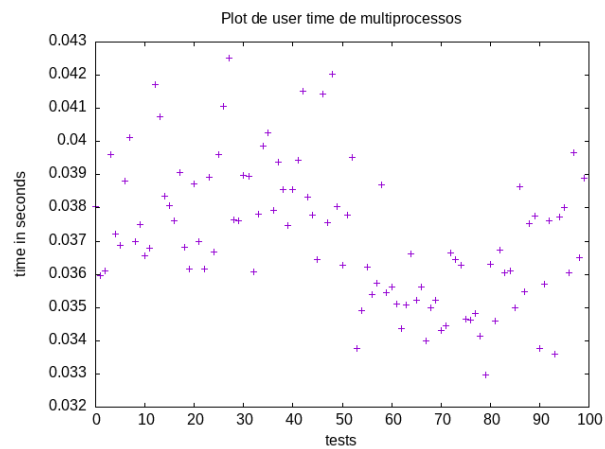
Figure 3: User time graphic with only one line of execution.



data.txt

Mean time of user time with only one line of execution:
1.07622754
Standart deviation of user time with only one line of execution:
0.00610579249043415

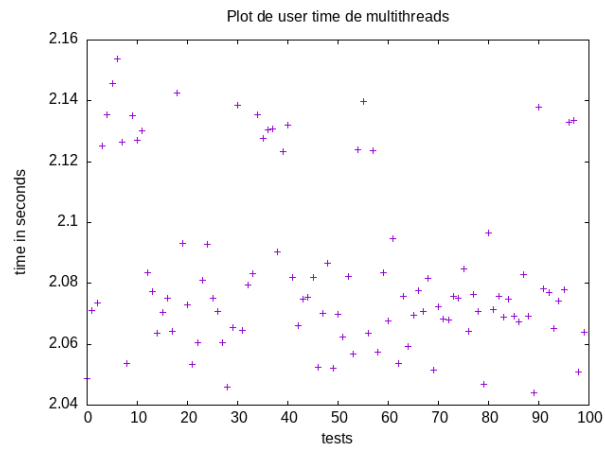
Figure 4: User time graphic for a multiprocess approach.



data.txt

Mean time of user time in multiprocess:
0.03718046
Standard deviation of user time in multiprocess:
0.000145418066422298

Figure 5: User time graphic for a multithread approach.



data.txt

Mean time of user time in multithreads:

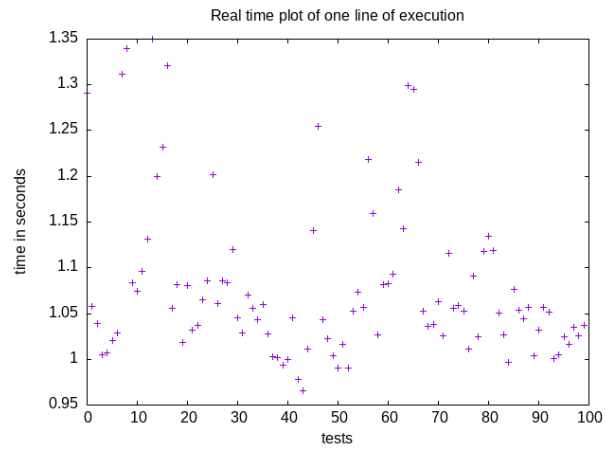
2.08431451

Standard deviation of user time in multithreads:

0.00199332281230349

3 Real Time

Figure 6: Real time graphic for only one main line of execution.



data.txt

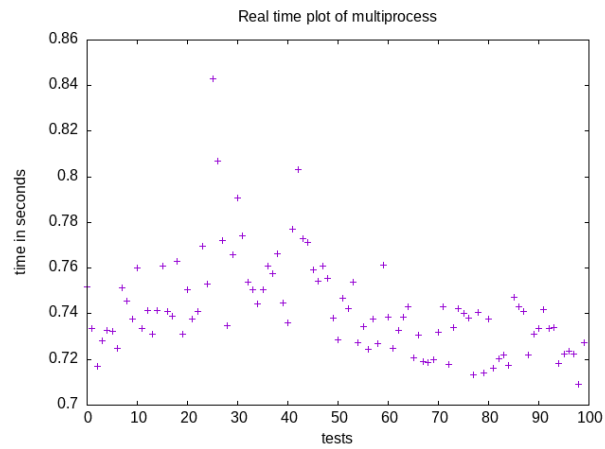
Mean time of real time with only one line of execution:

1.07959542

Standard deviation of real time with only one line of execution:

0.00608602471993156

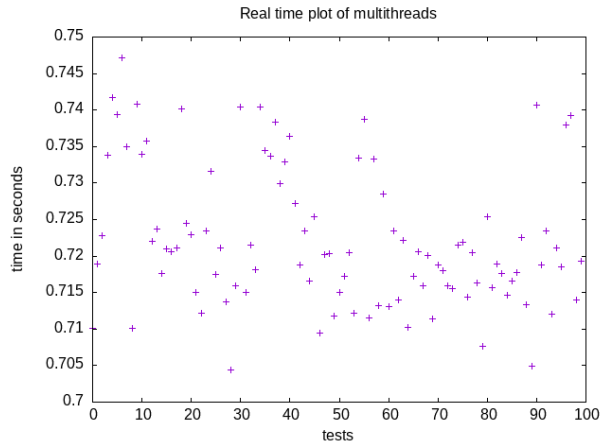
Figure 7: Real time graphic for a multiprocessing approach.



data.txt

Mean time of real time with multiprocessing:
0.74245343
Standard deviation of real time with multiprocessing:
0.00150026645347602

Figure 8: Multithread real time graphic.



data.txt

Mean time of real time with multithreads:
0.72226754
Standard deviation of real time in multithreads:
0.000675405577147539

4 Observation on the Real and User Time:

4.1 User Time

User time is the amount of CPU time spent in user-mode code (outside the kernel) within the process. This is only actual CPU time used in executing

the process. Other processes and time the process spends blocked do not count towards this figure.

4.2 Real Time

Real time is wall clock time - time from start to finish of the call. This is all elapsed time including time slices used by other processes and time the process spends blocked.