Mean Blur Filter Homework Assignment

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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 improve in performance in the multhread 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).

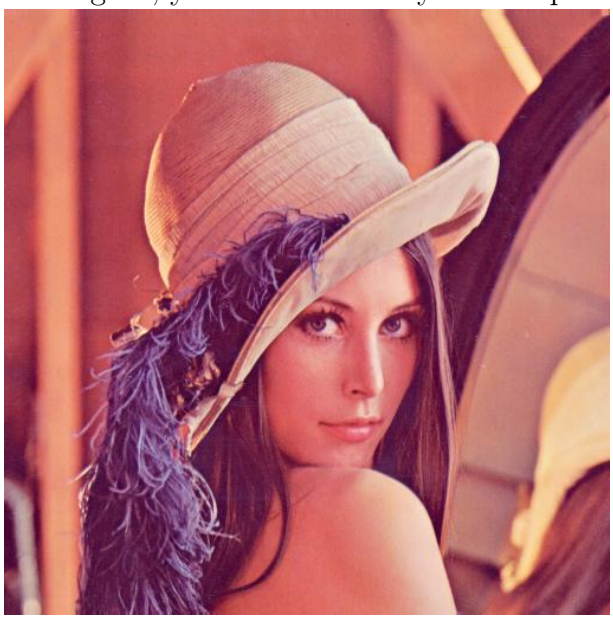
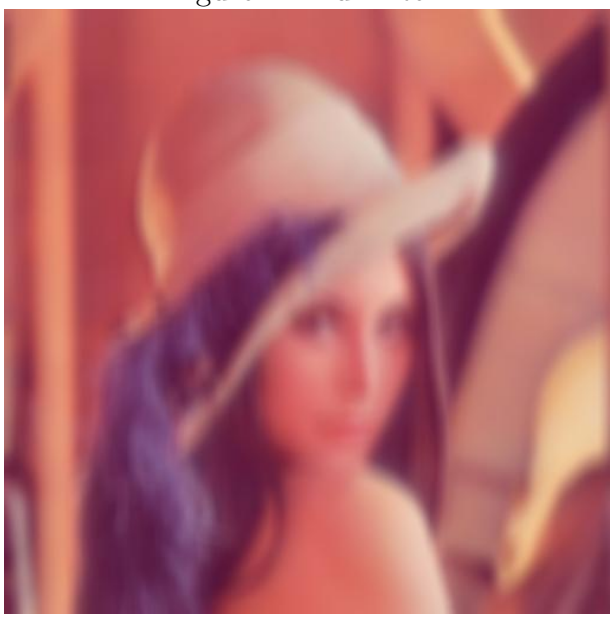
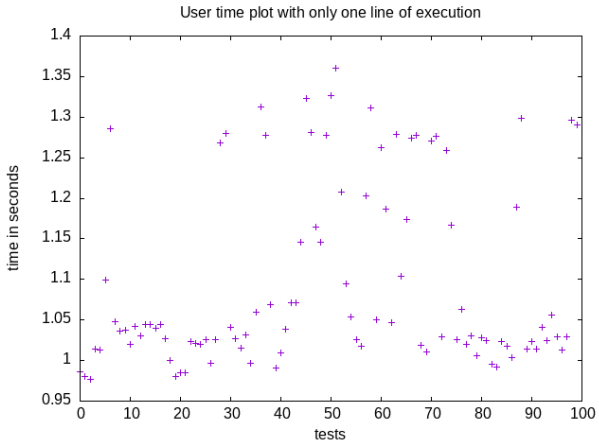


Figure 2: Blur filter.



2 User time

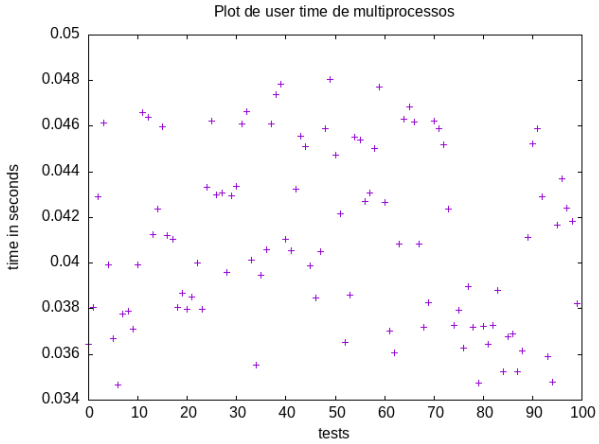
Figure 3: User time graphic with only one line of execution.



`data.txt`

```
Mean of user time with only one line of execution:
1.09565158
Standart deviation of user time with only one line of execution:
0.00789177430002392
```

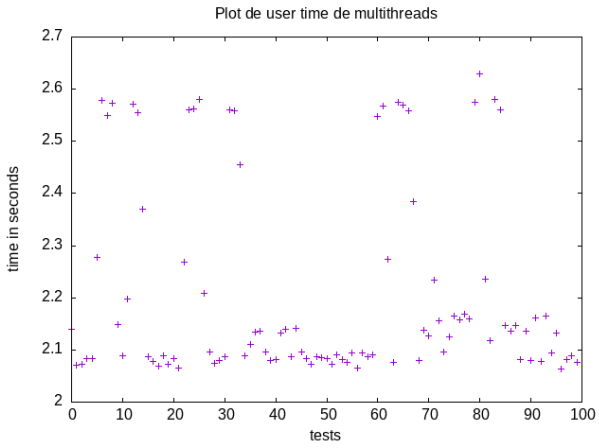
Figure 4: User time graphic for a multiprocess approach.



data.txt

```
Mean of user time in multiprocess:
0.04112982
Standard deviation of user time in multiprocess:
0.000268926667212458
```

Figure 5: User time graphic for a multithread approach.

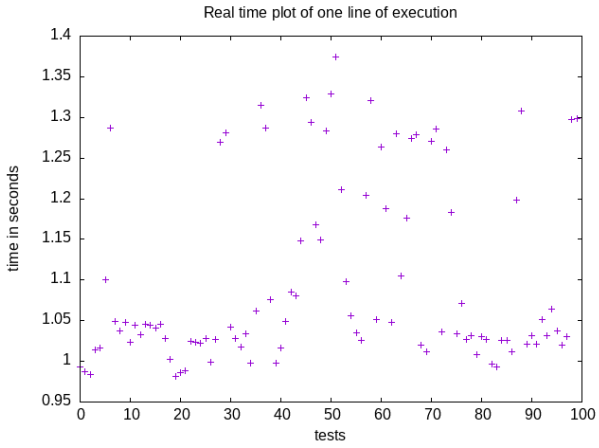


data.txt

```
Mean of user time in multithreads:
2.21002243
Standard deviation of user time in multithreads:
0.0131710727082127
```

3 Real Time

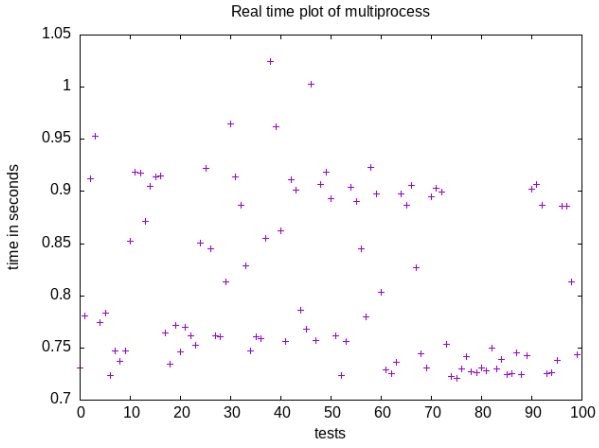
Figure 6: Real time graphic for only one main line of execution.



data.txt

```
Mean of real time with only one line of execution:
1.09993538
Standard deviation of real time with only one line of execution:
0.00791900145921681
```

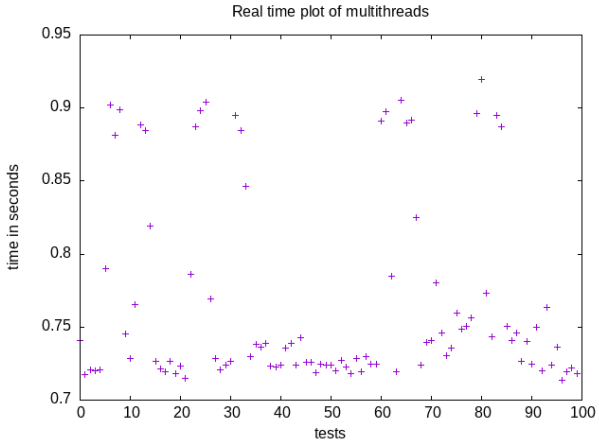
Figure 7: Real Time grpahic for a multiprocess approach.



data.txt

```
Mean of real time with multiprocess:
0.81446685
Standard deviation of real time with multiprocess:
0.00576093018432245
```

Figure 8: Multithread real time graphic.



data.txt

```
Mean of real time with multithreads:
0.76782569
Standard deviation of real time in multithreads:
0.00463840828832149
```

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 (for example ifit is waiting for I/O to complete).