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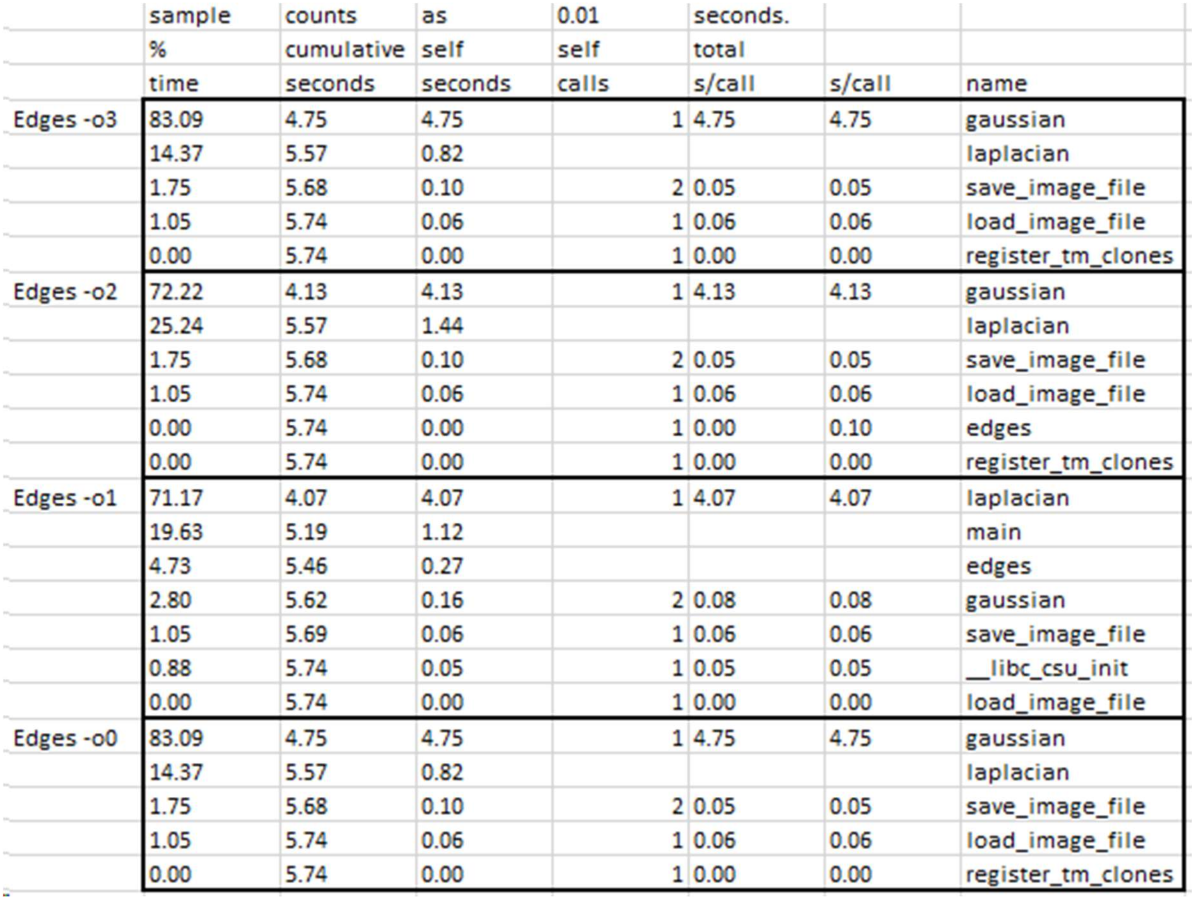
**GCC**



| | sample | counts | as | 0.01 | seconds. | | |
|---|---|---|---|---|---|---|---|
| | % | cumulative | self | self | total | | |
| | time | seconds | seconds | calls | s/call | s/call | name |
| Edges -o3 | 83.09 | 4.75 | 4.75 | 1 | 4.75 | 4.75 | gaussian |
| | 14.37 | 5.57 | 0.82 | | | | laplacian |
| | 1.75 | 5.68 | 0.10 | 2 | 0.05 | 0.05 | save_image_file |
| | 1.05 | 5.74 | 0.06 | 1 | 0.06 | 0.06 | load_image_file |
| | 0.00 | 5.74 | 0.00 | 1 | 0.00 | 0.00 | register_tm_clones |
| Edges -o2 | 72.22 | 4.13 | 4.13 | 1 | 4.13 | 4.13 | gaussian |
| | 25.24 | 5.57 | 1.44 | | | | laplacian |
| | 1.75 | 5.68 | 0.10 | 2 | 0.05 | 0.05 | save_image_file |
| | 1.05 | 5.74 | 0.06 | 1 | 0.06 | 0.06 | load_image_file |
| | 0.00 | 5.74 | 0.00 | 1 | 0.00 | 0.10 | edges |
| | 0.00 | 5.74 | 0.00 | 1 | 0.00 | 0.00 | register_tm_clones |
| Edges -o1 | 71.17 | 4.07 | 4.07 | 1 | 4.07 | 4.07 | laplacian |
| | 19.63 | 5.19 | 1.12 | | | | main |
| | 4.73 | 5.46 | 0.27 | | | | edges |
| | 2.80 | 5.62 | 0.16 | 2 | 0.08 | 0.08 | gaussian |
| | 1.05 | 5.69 | 0.06 | 1 | 0.06 | 0.06 | save_image_file |
| | 0.88 | 5.74 | 0.05 | 1 | 0.05 | 0.05 | __libc_csu_init |
| | 0.00 | 5.74 | 0.00 | 1 | 0.00 | 0.00 | load_image_file |
| Edges -o0 | 83.09 | 4.75 | 4.75 | 1 | 4.75 | 4.75 | gaussian |
| | 14.37 | 5.57 | 0.82 | | | | laplacian |
| | 1.75 | 5.68 | 0.10 | 2 | 0.05 | 0.05 | save_image_file |
| | 1.05 | 5.74 | 0.06 | 1 | 0.06 | 0.06 | load_image_file |
| | 0.00 | 5.74 | 0.00 | 1 | 0.00 | 0.00 | register_tm_clones |

Observamos que los tiempos son los mismos para los niveles 0 y 3 , y que si que hay una mejora en cuanto a las mejoras 1 y 2.

Con optimización

```
usuario@debian:~/Escritorio/Code$ gcc -fprofile-use -o edges edges.c
usuario@debian:~/Escritorio/Code$ time ./edges img.pgm out.pgm

real    0m6.836s
user    0m6.736s
sys     0m0.056s
```

Sin optimización

```
usuario@debian:~/Escritorio/Code$ time ./edges img.pgm out.pgm
profiling:/home/usuario/Escritorio/Code/edges.gcda:Cannot open

real    0m5.705s
user    0m5.660s
sys     0m0.024s
```

Hemos observado que tarda más con optimización que sin ella.

**GPROF**

**¿Qué función intentarías mejorar primero?**

La que más porcentaje de tiempo utiliza que es la función gaussiana

**¿Cuánto tardaría en ejecutarse el programa si consiguieras mejorar esa función en un 15%?**

<u>Datos</u>

K = 1.15

f = 0.8309

Ley Amdahl

$$A = \frac{1}{(1-f)+\left(\frac{f}{k}\right)}$$

Tsm/TM = A

A = 1/[(1-0,83) +(0.83/1.15)] = 1.12

Es decir, se mejoraría una mejora del 12%

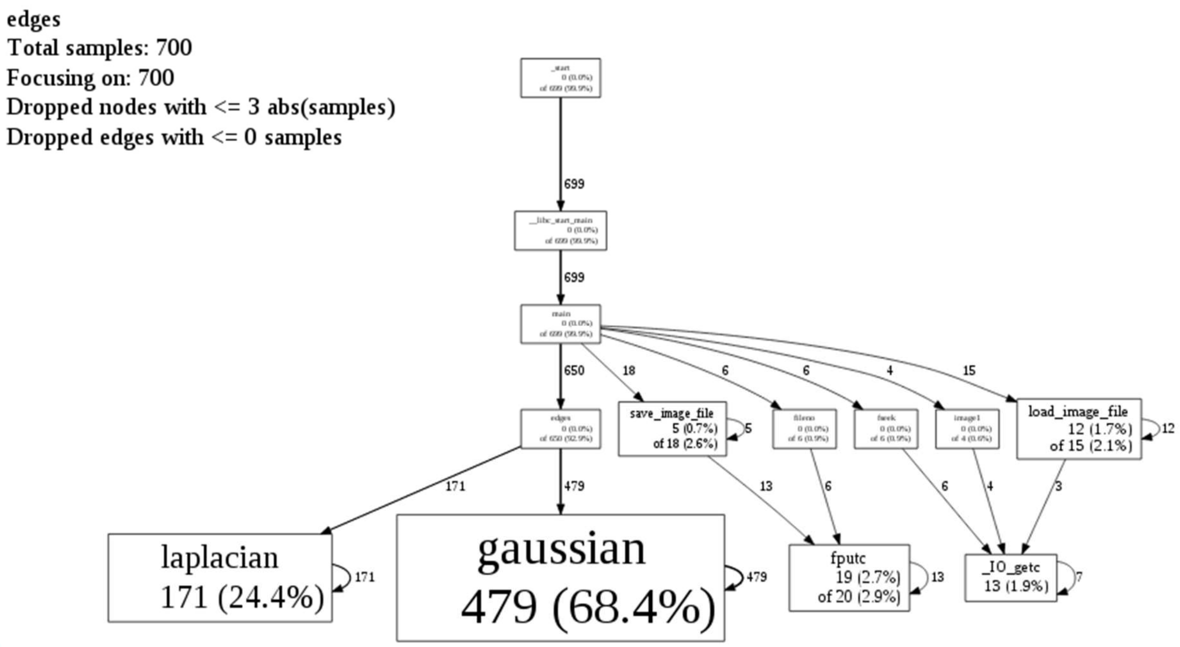
**¿Cuál sería la máxima mejora que podrías obtener mejorando solamente esa función?**

A = 1/(1-0,83) = 5.88

Es decir un 488%

**Google-prof**

```
usuario@debian:~/Escritorio/Code$ gcc -o edges edges.c -lprofiler
usuario@debian:~/Escritorio/Code$ CPUPROFILE=/tmp/edges.prof ./edges img.pgm
out.pgm
PROFILE: interrupts/evictions/bytes = 700/451/33880
usuario@debian:~/Escritorio/Code$ google-pprof –text edges /tmp/edges.prof
Using local file edges.
Using local file /tmp/edges.prof.
Removing killpg from all stack traces.
Total: 700 samples
     479  68.4%  68.4%      479  68.4% gaussian
     171  24.4%  92.9%      171  24.4% laplacian
      19   2.7%  95.6%       20   2.9% fputc
      13   1.9%  97.4%       13   1.9% _IO_getc
      12   1.7%  99.1%       15   2.1% load_image_file
       5   0.7%  99.9%       18   2.6% save_image_file
       1   0.1% 100.0%        1   0.1% __write
       0   0.0% 100.0%        1   0.1% _IO_do_write
       0   0.0% 100.0%          1   0.1% _IO_file_overflow
       0   0.0% 100.0%          1   0.1% _IO_file_seek
       0   0.0% 100.0%          1   0.1% _IO_file_write
       0   0.0% 100.0%          699  99.9% __libc_start_main
       0   0.0% 100.0%          699  99.9% _start
       0   0.0% 100.0%          650  92.9% edges
       0   0.0% 100.0%          6   0.9% fileno
       0   0.0% 100.0%          6   0.9% fseek
       0   0.0% 100.0%          4   0.6% image1
       0   0.0% 100.0%          699  99.9% main
usuario@debian:~/Escritorio/Code$ google-pprof –svg edges /tmp/edges.prof > edges.svg
Using local file edges.
Using local file /tmp/edges.prof.
Removing killpg from all stack traces.
Dropping nodes with <= 3 samples; edges with <= 0 abs(samples)
usuario@debian:~/Escritorio/Code$ xdg-open edges.svg
```



edges
Total samples: 700
Focusing on: 700
Dropped nodes with <= 3 abs(samples)
Dropped edges with <= 0 samples

<u>Datos</u>

Tmuestreo = 4.84
Tsmuestreo = 4.6
SobreCarga = Tejecucion/intervalo =
Sobrecarga1(Sin muestreo) = (1/100)/4.6 = 0.002
Sobrecarga2(Con muestreo) =(1/1000)/4.84 = 0.0002