

Github repository with your code (complete URL):

	<b>Optimization+platform dependent options for compilation and execution times for my_dgesv</b>	
	<b>icc (18.0.1)</b>	<b>gcc (8.1.0)</b>
No opt.	Options: -O0 Exec time (small): 394.40s Exec time (medium): 2508.16s Exec time (large): 20903.34s	Options: -O0 Exec time (small): 367.47s Exec time (medium): 4161.22s Exec time (large): 33065.97s
Opt level 1	Options: -O1 Exec time (small): 163.78s Exec time (medium): 4199.99s Exec time (large):	Options: -O1 Exec time (small): 162.29s Exec time (medium): 2507.33s Exec time (large):
Opt level 2 + <u>specific arch</u>	Options: -O2 -march=native Exec time (small): 109.06s Exec time (medium): 2509.37s Exec time (large):	Options: -O2 -march=native Exec time (small): 165.89s Exec time (medium): 2480.55s Exec time (large):
Opt level 3 + <u>specific arch</u>	Options: -O3 -march=native Exec time (small): 108.20s Exec time (medium): 2469.73 Exec time (large):	Options: -O3 -march=native Exec time (small): 167.08s Exec time (medium): 2486.19s Exec time (large):
Opt level fast + <u>specific arch</u>	Options: -Ofast -march=native Exec time (small): 111.35s Exec time (medium): 4190.56s Exec time (large):	Options: -Ofast -march=native Exec time (small): 165.44s Exec time (medium): 2485.96s Exec time (large):
Opt level fast + specific arch + <u>interproc opt/anal</u> [ipo (icc) / -fipa-pta (gcc)]	Options: -Ofast -march=native -ipo Exec time (small): 120.17s Exec time (medium): 2473.88s Exec time (large):	Options: Ofast -march=native -fipa-pta Exec time (small): 168.56s Exec time (medium): 2511.63s Exec time (large):
<u>All</u> previous opts + <u>pgo</u>	Options: -Ofast -march=native -ipo -prof-gen  Exec time (small): 202.55s Exec time (medium): 2500.70s Exec time (large):	Options: Ofast -march=native -fipa-pta -fprofile-generate  Exec time (small): 157.94s Exec time (medium): 2503.88s Exec time (large):
Others: autovectorizing? Autoparallelism?	Options: Exec time (small): Exec time (medium): Exec time (large):	Options: Exec time (small): Exec time (medium): Exec time (large):

Matrix A size for executions, according to Makefile:

- small size: 2048 x 2048 (execute as ./dgesv 2048)
- medium size: 4096 x 4096 (execute as ./dgesv 4096)
- large size: 8192 x 8192 (execute as ./dgesv 8192)

Execute at least 3 times per combination, taking the middle value (median). The relevant time is the execution time for your implementation of my\_dgesv (i.e. your solver!).

### **Description and relevant information extracted from the results:**

#### Small test:

We can see that without any option, the execution time with a gcc or icc compilation is similar, the execution after a gcc compilation is just a bit faster.

However, when we add options for compilation, the execution time after an icc compilation is better than with a gcc compilation. The time is better for all different options except for the level 1 which gets the same time as with a gcc compilation. Furthermore, when we add the pgo, for compilation with icc, the execution time increases compared to without options.

To conclude, the compilation with icc is globally more efficient than the compilation with gcc for the small test.

#### Medium test:

For the medium test, without option the icc compilation has a better execution time but when we use an option, the execution time for the gcc compilation is similar than the icc compilation. We can notice that it is not interesting to add options for the icc compilation because the execution time doesn't change or increases for the level 1 and the fast level.

To conclude, for this test, it is not necessary to use any option for the icc compilation but we should use any option (doesn't really matter which one) for the gcc compilation.

#### Large test:

The large test takes too much time for the execution so I wasn't able to test it for all the options. I just got the time for the compilation without option and I'm doing the same observation that for the medium test: the execution after an icc compilation is faster than after a gcc compilation. Then, I can't conclude anything else about options because I haven't got their execution time. However, I think that the observation would be the same as for the medium test.