Optimizations

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1 Optimization technique and time consuming

Technique	Original	Hand-optimized	Original w / -o3	Hand-optimized w/ -o3
Better algorithms	159	68	160	69
Unrolling loops	1222	985	1215	966
Eliminating the branches	915	869	911	864
Stop testing	474	314	489	326

2 Information about machine and command

- CPU: vendor id : GenuineIntel
  cpu family : 6
  model : 63
  model name : Intel(R) Xeon(R) CPU E5-2680 v3 @ 2.50GHz
  stepping : 2
  microcode : 0x2d
  cpu MHz : 1200.585
  cache size : 30720 KB
  The computer has 48 CPU command: cat /proc/cpuinfo

- Memory The total memory is 193734KB command free -m

3 Conclusion

If we use a small code for testing, the optimizations seems do not benefit more. But if we use a large data or deal with the complex problem that contains many step and operators. The optimizations is very useful. And for a small code, if we use the compiler, it seems cost more time than without using it. However, with the difficulties increasing, the compiler will be more and more useful and time-saving.

4 Time used in this programming

I spent 7 hours in this program.