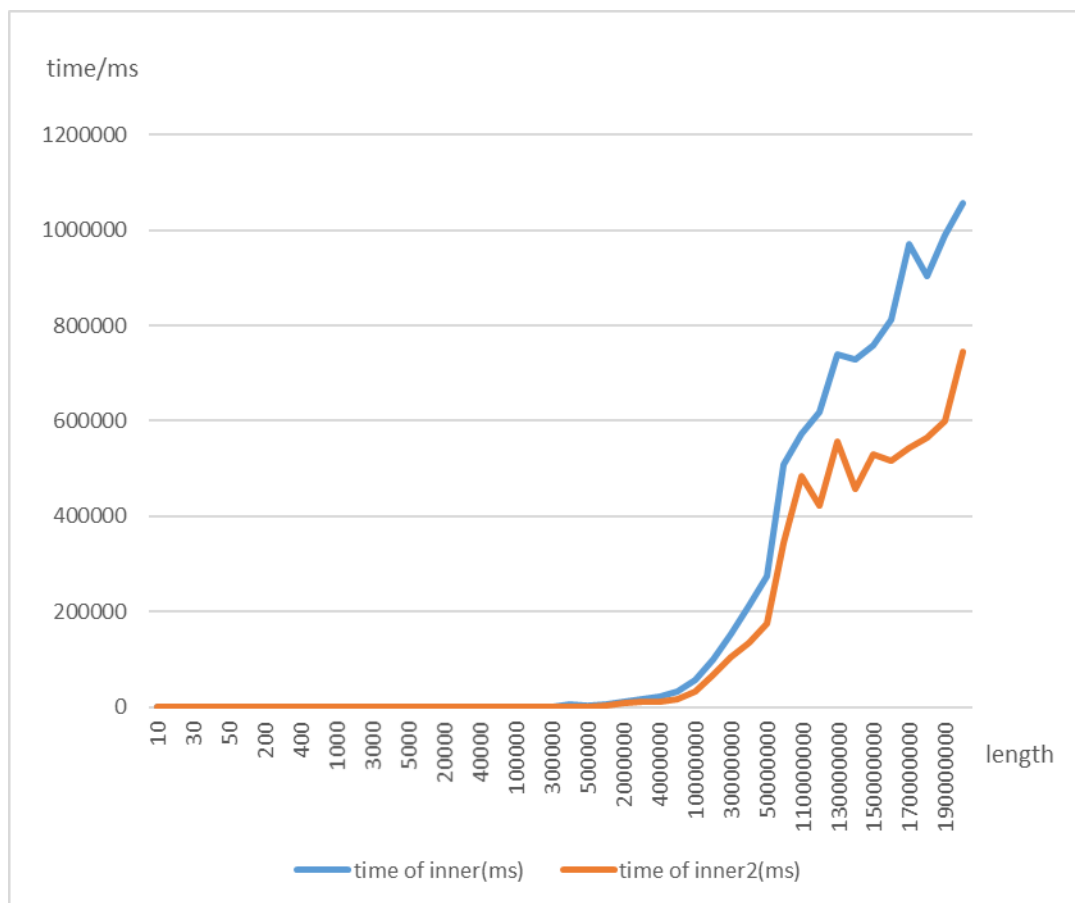1. See the file 6-1.c

2.
   a) adds %xmm0, %xmm1
      addq $1, %rdx
   b) a latency of 3 cycles.
   c) See the file 6-2c.c
   d) As the length value increases, the difference between the execution time of inner
      and inner2 increases, and the performance of inner2 is better than that of inner.



(original data: See the appendix)

3.

```
root@ubuntu:/my_dir/0deliverable/20191120# gcc --std=c99 6-3.c
root@ubuntu:/my_dir/0deliverable/20191120# ./a.out
f(a) = 0.000018, time: 127 ms
g(b) = 0.000018, time: 53 ms
g(c) = 0.000018, time: 132 ms
root@ubuntu:/my_dir/0deliverable/20191120# ./a.out
f(a) = 0.000018, time: 106 ms
g(b) = 0.000018, time: 46 ms
g(c) = 0.000018, time: 24 ms
root@ubuntu:/my_dir/0deliverable/20191120# ./a.out
f(a) = 0.000018, time: 105 ms
g(b) = 0.000018, time: 45 ms
g(c) = 0.000018, time: 23 ms
root@ubuntu:/my_dir/0deliverable/20191120# ./a.out
f(a) = 0.000018, time: 124 ms
g(b) = 0.000018, time: 53 ms
g(c) = 0.000018, time: 27 ms
root@ubuntu:/my_dir/0deliverable/20191120# ./a.out
f(a) = 0.000018, time: 124 ms
g(b) = 0.000018, time: 96 ms
g(c) = 0.000018, time: 27 ms
root@ubuntu:/my_dir/0deliverable/20191120#
```

## Appendix:

original data of 6-2c:

| length | time of inner(ms) | time of inner2(ms) |
|--------|-------------------|--------------------|
| 10     | 1                 | 0                  |
| 20     | 2                 | 1                  |
| 30     | 1                 | 1                  |
| 40     | 2                 | 1                  |
| 50     | 2                 | 0                  |
| 100    | 2                 | 1                  |
| 200    | 3                 | 1                  |
| 300    | 4                 | 1                  |
| 400    | 3                 | 2                  |
| 500    | 4                 | 5                  |
| 1000   | 7                 | 4                  |
| 2000   | 10                | 6                  |
| 3000   | 15                | 9                  |
| 4000   | 87                | 17                 |
| 5000   | 75                | 22                 |
| 10000  | 51                | 35                 |
| 20000  | 88                | 127                |
| 30000  | 140               | 94                 |
| 40000  | 175               | 107                |
| 50000  | 246               | 208                |
| 100000 | 609               | 318                |

| | | |
|---|---|---|
| 200000 | 897 | 556 |
| 300000 | 1456 | 836 |
| 400000 | 4486 | 1415 |
| 500000 | 2300 | 1383 |
| 1000000 | 5463 | 2855 |
| 2000000 | 10585 | 6969 |
| 3000000 | 15538 | 9556 |
| 4000000 | 21800 | 12152 |
| 5000000 | 31476 | 17295 |
| 10000000 | 56330 | 31693 |
| 20000000 | 98537 | 68698 |
| 30000000 | 153270 | 103939 |
| 40000000 | 213056 | 133455 |
| 50000000 | 273346 | 176121 |
| 100000000 | 507182 | 345610 |
| 110000000 | 572264 | 484273 |
| 120000000 | 618044 | 422214 |
| 130000000 | 738741 | 556804 |
| 140000000 | 729301 | 457149 |
| 150000000 | 757992 | 529818 |
| 160000000 | 811166 | 516175 |
| 170000000 | 971540 | 543718 |
| 180000000 | 903588 | 565574 |
| 190000000 | 991311 | 598760 |
| 200000000 | 1057302 | 744754 |