

## 作業 2

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-利用 myHole 來測試複製的時間

測試 mmap\_cp2 複製內容的時間：

```
aqua@aqua-ubuntu:~/system-programming/ch04$ time ./mmap_cp2 myHole myHole2
real    0m0.006s
user    0m0.000s
sys     0m0.006s
aqua@aqua-ubuntu:~/system-programming/ch04$ time ./mmap_cp2 myHole myHole2
real    0m0.004s
user    0m0.000s
sys     0m0.004s
aqua@aqua-ubuntu:~/system-programming/ch04$ time ./mmap_cp2 myHole myHole2
real    0m0.005s
user    0m0.000s
sys     0m0.005s
aqua@aqua-ubuntu:~/system-programming/ch04$ time ./mmap_cp2 myHole myHole2
real    0m0.007s
user    0m0.001s
sys     0m0.006s
aqua@aqua-ubuntu:~/system-programming/ch04$ time ./mmap_cp2 myHole myHole2
real    0m0.005s
user    0m0.003s
sys     0m0.003s
aqua@aqua-ubuntu:~/system-programming/ch04$ time ./mmap_cp2 myHole myHole2
real    0m0.006s
user    0m0.000s
sys     0m0.006s
aqua@aqua-ubuntu:~/system-programming/ch04$ time ./mmap_cp2 myHole myHole2
real    0m0.005s
user    0m0.000s
sys     0m0.005s
aqua@aqua-ubuntu:~/system-programming/ch04$
```

測試 mycp2 複製內容的時間：

```
aqua@aqua-ubuntu:~/system-programming/ch04$ time ./mycp2 myHole myHole4
real    0m0.005s
user    0m0.000s
sys     0m0.005s
aqua@aqua-ubuntu:~/system-programming/ch04$ time ./mycp2 myHole myHole4
real    0m0.001s
user    0m0.001s
sys     0m0.000s
aqua@aqua-ubuntu:~/system-programming/ch04$ time ./mycp2 myHole myHole4
real    0m0.002s
user    0m0.000s
sys     0m0.002s
aqua@aqua-ubuntu:~/system-programming/ch04$ time ./mycp2 myHole myHole4
real    0m0.002s
user    0m0.001s
sys     0m0.000s
aqua@aqua-ubuntu:~/system-programming/ch04$ time ./mycp2 myHole myHole4
real    0m0.005s
user    0m0.000s
sys     0m0.005s
aqua@aqua-ubuntu:~/system-programming/ch04$ time ./mycp2 myHole myHole4
real    0m0.004s
user    0m0.000s
sys     0m0.005s
aqua@aqua-ubuntu:~/system-programming/ch04$ time ./mycp2 myHole myHole4
real    0m0.005s
user    0m0.000s
sys     0m0.005s
aqua@aqua-ubuntu:~/system-programming/ch04$
```

七次測量 mmap\_cp2 平均 0.005 秒, mycp2 平均 0.003 秒左右  
兩者所花的時間差不多

-改變檔案大小，再重新測量一次

修改 hole.c 的程式碼，來改變 myHole 的檔案大小

```
8
9  int main() {
10     int fd;
11     const int G=1000000000;
12     const int M=1000000;
13
14     printf("這個程式會在當前的目錄下，製造檔案myHole\n");
15     fd = open("./myHole", O_RDWR | O_CREAT | O_TRUNC, S_IRUSR | S_IWUSR);
16     if (fd < 0)
17         perror("無法製造myHole");
18     //lseek將『檔案指標』由開始位置向後移動100G，lseek比較可能出錯，用assert檢查一下
19     assert(lseek(fd, 10*M, SEEK_SET) != -1);
20     //寫入"1"，很少出錯，懶得檢查
21     write(fd, "1", sizeof("1"));
22     //lseek將『檔案指標』由『目前』位置向後移動100G，lseek比較可能出錯，用assert檢查一下
23     assert(lseek(fd, 10*M, SEEK_CUR) != -1);
24     write(fd, "2", sizeof("2"));
25     assert(lseek(fd, 10*M, SEEK_CUR) != -1);
26
27     //修改部份
28     for(int i=0;i<100000000;i++)
29         write(fd, "0123456789", sizeof("0123456789"));
30
31     close(fd);
32     system("ls myHole -alhs");
33     return 0;
34 }
```

```
aqua@aqua-ubuntu:~/system-programming/ch04$ make
gcc -g -pthread hole.c -o hole
aqua@aqua-ubuntu:~/system-programming/ch04$ ./hole
這個程式會在當前的目錄下，製造檔案myHole
105M -rw----- 1 aqua aqua 134M  3月 20 20:49 myHole
aqua@aqua-ubuntu:~/system-programming/ch04$
```

-重新測量 mmap\_cp2 與 mycp2 的執行時間

mmap\_cp2 :

```
aqua@aqu-a-ubuntu:~/system-programming/ch04$ time ./mmap_cp2 myHole myHole2
real    0m0.232s
user    0m0.032s
sys     0m0.198s
aqua@aqu-a-ubuntu:~/system-programming/ch04$ time ./mmap_cp2 myHole myHole2
real    0m0.239s
user    0m0.024s
sys     0m0.212s
aqua@aqu-a-ubuntu:~/system-programming/ch04$ time ./mmap_cp2 myHole myHole2
real    0m0.252s
user    0m0.036s
sys     0m0.216s
aqua@aqu-a-ubuntu:~/system-programming/ch04$ time ./mmap_cp2 myHole myHole2
real    0m0.225s
user    0m0.020s
sys     0m0.186s
aqua@aqu-a-ubuntu:~/system-programming/ch04$ time ./mmap_cp2 myHole myHole2
real    0m0.240s
user    0m0.020s
sys     0m0.207s
aqua@aqu-a-ubuntu:~/system-programming/ch04$ time ./mmap_cp2 myHole myHole2
real    0m0.208s
user    0m0.035s
sys     0m0.158s
aqua@aqu-a-ubuntu:~/system-programming/ch04$ time ./mmap_cp2 myHole myHole2
real    0m0.235s
user    0m0.024s
sys     0m0.198s
aqua@aqu-a-ubuntu:~/system-programming/ch04$
```

mycp2 :

```
aqua@aqu-a-ubuntu:~/system-programming/ch04$ time ./mycp2 myHole myHole4
real    0m0.256s
user    0m0.016s
sys     0m0.238s
aqua@aqu-a-ubuntu:~/system-programming/ch04$ time ./mycp2 myHole myHole4
real    0m0.253s
user    0m0.037s
sys     0m0.213s
aqua@aqu-a-ubuntu:~/system-programming/ch04$ time ./mycp2 myHole myHole4
real    0m0.227s
user    0m0.004s
sys     0m0.219s
aqua@aqu-a-ubuntu:~/system-programming/ch04$ time ./mycp2 myHole myHole4
real    0m0.232s
user    0m0.034s
sys     0m0.186s
aqua@aqu-a-ubuntu:~/system-programming/ch04$ time ./mycp2 myHole myHole4
real    0m0.245s
user    0m0.016s
sys     0m0.220s
aqua@aqu-a-ubuntu:~/system-programming/ch04$ time ./mycp2 myHole myHole4
real    0m0.239s
user    0m0.032s
sys     0m0.204s
aqua@aqu-a-ubuntu:~/system-programming/ch04$ time ./mycp2 myHole myHole4
real    0m0.201s
user    0m0.024s
sys     0m0.175s
aqua@aqu-a-ubuntu:~/system-programming/ch04$
```

mmap\_cp2 平均花 0.233 秒

mycp2 平均花 0.236 秒

兩者所花的時間差不多

-結論

測試 mmap\_cp 的速度比 mycp1 快很多,

但是我不知道為甚麼 mmap\_cp2 跟 mycp2 的時間差不多,

可能是我實作 mmap\_cp2 的方式有問題。