Hw1-1

Homework Assignment #1_1

- Write a program that creates a 200MB file on your local disk and then measures the time to do each of four things by directly using **C library I/O interface**, e.g., fopen(), fread(), fwrite(), fseek(), and close().
- Sequential read： Read the file sequentially by reading the file from beginning to end, and you read 4KB of data at one time.
- Sequential write： Overwrite the file with 200MB of new data by writing the file from beginning to end, and you write 2KB of data in one time and then call fsync().
- Random read： Do the following 50,000 times: choose a 4KB-aligned offset in the file uniformly at random, seek to that location in the file, and read 4KB of data at that position.
- Random write_1：Do the following 50,000 times: choose a 4KB-aligned offset in the file uniformly at random, seek to that location in the file, and write 2KB of data at that position.
- Random write_2：Do the following 50,000 times: choose a 4KB-aligned offset in the file uniformly at random, seek to that location in the file, write 2KB of data at that position, and call fsync() after each write.

```
cs4108033007@cs4108033007-VirtualBox:~$ ./hw1_1
-seq read- the difference is 0.061367
-seq write- the difference is 47.262817
-ran read- the difference is 0.093134
-ran write1- the difference is 0.259198
-ran write2- the difference is 22.334618
```

Seq read 會比 random read 快許多

而 write 比 read 慢很多

Write1,Write2 比較之下，有加上 fsync 會明顯慢很多

Hw1-2

Homework Assignment #1_2

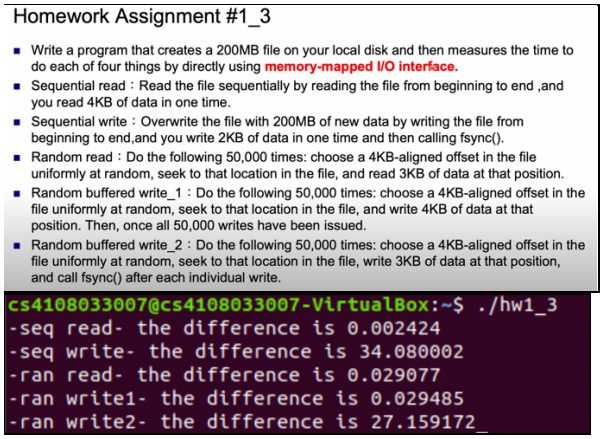
- Write a program that creates a 200MB file on your local disk and then measures the time to do each of four things by directly using **system call I/O interface**, e.g., open(), read(), write(), seek(), and close().
- Sequential read： Read the file sequentially by reading the file from beginning to end, and you read 4KB of data at one time.
- Sequential write： Overwrite the file with 200MB of new data by writing the file from beginning to end, and you write 2KB of data in one time and then call fsync().
- Random read： Do the following 50,000 times: choose a 4KB-aligned offset in the file uniformly at random, seek to that location in the file, and read 3KB of data at that position.
- Random buffered write_1：Do the following 50,000 times: choose a 4KB-aligned offset in the file uniformly at random, seek to that location in the file, and write 3KB of data at that position.
- Random buffered write_2：Do the following 50,000 times: choose a 4KB-aligned offset in the file uniformly at random, seek to that location in the file, write 3KB of data at that position, and call fsync() after each write.

```
cs4108033007@cs4108033007-VirtualBox:~$ ./hw1_2
-seq read- the difference is 0.063793
-seq write- the difference is 35.579666
-ran read- the difference is 0.120535
-ran write1- the difference is 0.131412
-ran write2- the difference is 23.671877
```

相比使用 c library 的 seq write 會比 system call 的 seq write 慢許多

Write1,Write2 比較之下，有加上 fsync 會明顯慢很多

Hw1-3



相比使用 c library 的 seq write 會比 mmap 的 seq write 慢許多

Seq read 會比 random read 快許多

而 write 比 read 慢很多

Write1,Write2 比較之下，有加上 fsync 會明顯慢很多