

Homework 1 Report – CSE344

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1 Composition

For this project, I used a separate c file for each question hw_1.c and hw1_2.c and one makefile for compile run and clean them for easy testability.

2 Program Logic

Q1) The main purpose of this question is to write a specific byte to a file in two different ways, and observe the differences when using the O_APPEND flag or manually using the lseek function. First, if there is no x argument, it means that we use the O_APPEND flag. This makes our job easier. We return as many for loops as the amount of bytes given by the user, and we write 1 byte with the write function in each loop. The second option is if the user has entered x arguments, we will not use the O_APPEND flag. That's why we take fd with lseek at the end of each loop to bring our file descriptor to the end before each loop.

Q2&3) The main purpose of this question is to implement the dup and dup2 functions using the fcntl function and then check the offsets of the duplicated file descriptors. For dup, I created new file descriptor and initialized it with fcntl function with F_DUPFD flag and checked if there is any error occur. For dup2, first checked whether oldfd and newfd are the same and equal to -1, if so, I set the value of errno to EBADF and terminate the function. If it is not equal to -1, I returned newfd. Then I closed newfd with the close function (in case it was already open). Finally, I opened a new file descriptor with the value of newfd and returned it.

3 Testing

Q1 results:

```
● mahir@DESKTOP-9RRECEV:~/CSE344/hw1$ ./appendMeMore f1 1000000 & ./appendMeMore f1 1000000
[1] 784
[1]+  Done                  ./appendMeMore f1 1000000
● mahir@DESKTOP-9RRECEV:~/CSE344/hw1$ ./appendMeMore f2 1000000 x & ./appendMeMore f2 1000000 x
[1] 837
[1]+  Done                  ./appendMeMore f2 1000000 x
● mahir@DESKTOP-9RRECEV:~/CSE344/hw1$ ls -l
total 2984
-rwxr-xr-x 1 mahir mahir 17008 Mar 30 14:37 appendMeMore
-rw-r--r-- 1 mahir mahir 2000000 Mar 30 14:37 f1
-rw-r--r-- 1 mahir mahir 1022865 Mar 30 14:38 f2
-rw-r--r-- 1 mahir mahir 732 Mar 27 16:21 hw1_1.c
-rw-r--r-- 1 mahir mahir 2143 Mar 30 13:33 hw1_2.c
○ mahir@DESKTOP-9RRECEV:~/CSE344/hw1$
```

Q2 results:

```
mahir@DESKTOP-9RRECEV:~/CSE344/hw1$ gcc hw1_2.c
mahir@DESKTOP-9RRECEV:~/CSE344/hw1$ ./a.out
created file descriptor1 (fd1) and wrote 'Mahir Kayadelen CSE344' via write()
fd1 read 5byte:Mahir
duplicate fd1 using my_dup() and read fd2 10 bytes: Kayadelen
duplicate fd2 using my_dup2() and read the next 7 characters of the file using fd3: CSE344
write to fd1 and read from fd2 to verify file offset sharing
write 12345 with fd1
fd2 read after write:12345
```