

CS3221.3

Assignment 3.

Memory.

Due Date: Thu. July 5 at 12:00noon.

1. Dynamic Libraries

In this assignment you have to write a little program in a file called `nlcnt.c` and two library functions. The two library functions should have the same name `my_cnt` but be in two different `.c` files: `mapping.c` and `reading.c`. They count the (non-new-line) characters in a file, accept one argument which is a null terminated string representing a file name and return an integer. The `.c` files will be compiled to shared objects `mapping.so` and `reading.so` respectively and `nlcnt.c` should be compiled as a stand alone program called `nlcnt`.

Program `nlcnt` should accept two command line arguments. The first has to be either the word `reading` or the word `mapping` or any leading substring. The second argument will be the string argument for the function `my_cnt`. After parsing the command line arguments, your program should `dlopen` the corresponding shared object, `dlsym` the function, invoke it with the proper argument and print the result.

The two versions of function `my_cnt` both count the number of characters in the file excluding the new lines. The one in file `mapping.so` does it by `mmap`ing the file to memory and operating on the resulting array and the one in file `reading.so` does it by reading multiple `pagesize` chunks and counting the new-lines in them. The `pagesize` should be determined through a system call (`sysconf`).

You have to hand in the three `.c` files and the `Makefile` with at least an `all` target that compiles everything and a `clean` target that removes all the useless files. No manual page required.

To start, have a look into the manual pages of `mmap`, `dlopen`, `fstat`, `open`, `getpagesize` and `ld`