Operating Systems

Programming Assignment:

1. The Fibonacci sequence is the series of numbers 0, 1, 1, 2, 3, 5, 8, ... Formally, it can be expressed as:

***fib_0* = 0**
***fib_1* = 1**
fib_n = fib_n−1 + fib_n−2

Write a multithreaded program that generates the Fibonacci sequence. This program should work as follows: On the command line, the user will enter the number of Fibonacci numbers that the program is to generate. The program will then create a separate thread that will generate the Fibonacci numbers, placing the sequence in data that can be shared by the threads (an array is probably the most convenient data structure). When the thread fnishes execution, the parent thread will output the sequence generated by the child thread. Because the parent thread cannot begin outputting the Fibonacci sequence until the child thread fnishes, the parent thread will have to wait for the child thread to finish. Use the techniques described in **Section 4.4 (from the text book)** to meet this requirement.

Reference: https://github.com/greggagne/osc10e/blob/master/ch4/thrd-posix.c

2. Write code to mimic the linux 'ls' command. Know about ls command:

1. https://www.geeksforgeeks.org/practical-applications-ls-command-linux/
2. https://man7.org/linux/man-pages/man1/ls.1.html

Make the code work for the following commands and give a name to your program, for example 'myls':

1. **myls -l** similar to ls -l
2. **myls -a** similar to ls -a
3. **myls -t** similar to ls -t

*** **Don't use './myls -l'** to run the program. You should configure the OS in such a way that you can run the command like **'myls -l'** without **'./'.**

*** **Output** must be shown in a **shell program running on a linux** environment.

Reference:

1. https://en.wikibooks.org/wiki/C_Programming/POSIX_Reference/dirent.h
2. https://c-for-dummies.com/blog/?p=3246
3. https://stackoverflow.com/questions/503878/how-to-know-what-the-errno-means
4. https://askubuntu.com/questions/656303/how-to-run-an-executable-without-prepending