CSE231 - Operating Systems

Assignment-5.2

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Description and Logic:

I have built a rudimentary text editor that uses POSIX flocks and reads the file and edits the text within the file. The editing is handled by appending user input to the end of the file. The filename is taken as a command line argument. The program opens the file in “+a” mode and attempts to put a file lock on it by calling **flock()**. If the function call returns 0, the lock has been acquired successfully. If it returns -1, then errno is checked. In case it’s set to **EWOULDBLOCK**, a warning message is thrown saying that the file is already locked. The contents of the file are displayed after this. Then the user is prompted to enter some text to append to the file and press Ctrl+D to save the changes.

Functions used:

- **fopen()**
- **fgets()**
- **fputs()**
- **fclose()**
- **flock(fd, LOCK_EX | LOCK_NB)**: To place a file lock on the file pointed to by fd. The flag **LOCK_EX** places an exclusive lock and **LOCK_NB** specifies that the lock is non-blocking.

Shell Script:

The following script was used to demonstrate the file locks:

```
command="./main test_file.txt < input.txt; exec zsh"
gnome-terminal -- /bin/sh -c "$command" & gnome-terminal -- /bin/sh -c
"$command"
```

This script opens two terminal windows and runs the program simultaneously on both. It is observed that one of the programs acquired the lock successfully and the other raises a warning. Both the programs write the text contained in input.txt to the test file.

Note: The shell script is written to run on the zsh shell in Ubuntu.