

Practical Work #3: Files & Fifos

C. BARÈS

EXERCICE 1: FILE

1.1 stat

Use the system call `stat` to determine the size of the buffer to use when performing I/O operations on:

- the hard drive;
- the console.

1.2 my_cp

Create in C a program `my_cp` which takes as argument 2 file names:

```
$ my_cp file1 file2
```

and has the following behavior:

- `file1` must be an ordinary file;
- `file2` must not exist;
- if these 2 conditions are verified, then the `file1` is copied to `file2`;
- if `file2` is not given at the command line, then `file1` is displayed in the console.

EXERCICE 2: TIC & TAC

2.1 Tic

Create a program that takes a filename as an argument and displays its contents backwards on the screen, from the last byte to the first.

2.2 Tac

Create a program that takes a file name as its argument and displays its contents on the screen upside down, from the last line to the first. To optimize processing, you can perform a first pass to search for the position of each `'\n'`

EXERCICE 3: FIFO 22

3.1 With bash

Create a fifo file from the bash. Using the `ls` or `stat` commands, take a look at its characteristics.

Then, using the commands `echo` or `cat`, send content to this fifo (using the redirection `> my_fifo_file`).

From a 2^e terminal, display the contents of the fifo. Conclusion?

EXERCICE 4: FORKS AND MACARONI

4.1 fork 1 – pipe 1

Set up a pipe between a father and son process. The father reads on the standard inlet and writes it in the pipe, the son reads in the pipe and writes on the standard outlet.

When the father reaches the end of the file (`<ctrl>-d`), he sends a signal `SIGKILL` to the son who is ending, then waits for the son to die.

4.2 fork 1 – pipe 2

Resume the previous program, but now the son counts the number of characters sent by the father, and returns this number to him by a 2^e pipe each time the father transmits.

4.3 fork 2 – pipe 2

Resume the previous program, but now the father's work is done by a second son. The father will only watch the end of his two sons.