Lab 12 (CS): Input/Output

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Week 12 – Lab

Exercise 1 (1/2)

Background:

- A peripheral device is controlled by writing and reading its registers. Often, a device has multiple registers that can be accessed at consecutive addresses either in the memory address space or in the I/O address space. Each device connected to the I/O bus has a set of I/O addresses, called I/O ports. I/O ports can be mapped to physical memory addresses so that the processor can communicate with the device through instructions that work directly with the memory.

Exercise 1 (2/2)

Description + Constraints:

- Get serial ports from */proc/ioports* using *sudo* permission and save the output to `ex1.txt`.
- What are `dma1`, `pic1` and `timer1`? What do they represent? Write your answers to `ex1.txt`.
- Submit `ex1.txt`.

Note: If you are getting zero-valued addresses when accessing the file, then use `sudo` permission.

Exercise 2 (1/2)

Description:

- Write a C program `ex2.c` that gets keyboard events directly from the keyboard device and prints it to stdout.

Note: Try exploring
`/dev/input/by-path/platform-i8042-serio-0-event-kbd`

Exercise 2 (2/2)

Constraints:

- You have to use the file `/dev/input/by-path/platform-i8042-serio-0-event-kbd` for capturing keyboard events.
- You should use the `input_event` structure from `linux/input.h`[1]
- Only `PRESSED` and `RELEASED` events should be handled.
- Print the output events in format: **PRESSED 0x0023 (35)**
  - Where **PRESSED** - type of event, **0x0023** and **(35)** are hex and decimal representation of event code respectively.
- The progam should be executed using sudo permission.
- Print and save the output to `ex2.txt`
- Save the code in `ex2.c`
- Submit `ex2.txt` and `ex2.c`

[1] `https://www.kernel.org/doc/Documentation/input/input.txt`

Exercise 3 (1/2)

Description:

- Modify previous program to output only shortcuts either: P+E → "I passed the Exam!", C+A+P → "Get some cappuccino!" and one custom shortcut of your choice. Save code in `ex3.c` and sample output in `ex3.txt`

Exercise 3 (2/2)

Constraints:

- The program should print only on specified shortcuts.
- The shortcut P + E, should print ”I passed the Exam!” to stdout.
- The shortcut C + A + P, should print “Get some cappuccino!” to stdout.
- Create the shortcut of your choice with custom message. The number of keys should be at least 2 and no more than 6.
- Print the available shortcuts at start of the program.
- Print and save the output to `ex3.txt`.
- Save the code in `ex3.c`.
- Submit `ex3.txt` and `ex3.c`.

End of lab 12 (CS)