Homework 3 Linux I/O

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1. What is Linux IIO subsystem?
   A: The Industrial I/O subsystem is intended to provide support for devices that in some sense are analog to digital or digital to analog converters (ADCs, DACs).
   Ex. ADCs, Gyros, Pressure sensors.

2. How is the efficiency compared between interrupt I/O and polling I/O?
   A:Interrupt is inefficient when devices constantly interrupt the CPU. Polling is inefficient when CPU does not find a device for pairing.

3. pi_2_mmio.h
   The pointer operation was to set array offset by seven and ten respectively

```
1.  #ifndef PI_2_MMIO_H
2.  #define PI_2_MMIO_H
3.
4.  #include <stdint.h>
5.
6.  #define MMIO_SUCCESS 0
7.  #define MMIO_ERROR_DEVMEM -1
8.  #define MMIO_ERROR_MMAP -2
9.  #define MMIO_ERROR_OFFSET -3
10.
11. extern volatile uint32_t* pi_2_mmio_gpio;
12.
13. int pi_2_mmio_init(void);
14.
15. static inline void pi_2_mmio_set_input(const int gpio_number) {
16.   // Set GPIO register to 000 for specified GPIO number.
17.   *(pi_2_mmio_gpio+((gpio_number)/10)) &= ~(7<<(((gpio_number)%10)*3));
18. }
19.
20. static inline void pi_2_mmio_set_output(const int gpio_number) {
21.   // First set to 000 using input function.
22.   pi_2_mmio_set_input(gpio_number);
23.   // Next set bit 0 to 1 to set output.
24.   *(pi_2_mmio_gpio+((gpio_number)/10)) |=  (1<<(((gpio_number)%10)*3));
25. }
26.
27. static inline void pi_2_mmio_set_high(const int gpio_number) {
28.   *(pi_2_mmio_gpio+7) = 1 << gpio_number;
29. }
30.
31. static inline void pi_2_mmio_set_low(const int gpio_number) {
32.   *(pi_2_mmio_gpio+10) = 1 << gpio_number;
33. }
34.
35. static inline uint32_t pi_2_mmio_input(const int gpio_number) {
36.   return *(pi_2_mmio_gpio+13) & (1 << gpio_number);
37. }
38.
39. #endif
```

4.


```
pi@raspberrypi:~/desktop/Adafruit_Python_DHT/examples $ ls
AdafruitDHT.py  google_spreadsheet.py  simpletest.py
pi@raspberrypi:~/desktop/Adafruit_Python_DHT/examples $ ls -a
.  ..  AdafruitDHT.py  google_spreadsheet.py  simpletest.py
pi@raspberrypi:~/desktop/Adafruit_Python_DHT/examples $ sudo ./AdafruitDHT.py 11 4
Temp=28.0*  Humidity=36.0%
pi@raspberrypi:~/desktop/Adafruit_Python_DHT/examples $
```