Lab 10

R. Ferrero, P. Bernardi, E. Giusto

Politecnico di Torino

Dipartimento di Automatica e Informatica (DAUIN)

Torino - Italy

Ex. 1

- In the `main`, before entering the endless loop, power on LED 8 using `LED_On`.
- By pressing button KEY1, power off the current LED and power on the LED on the left (when arrived to LED 4, jump to LED 11).
- By pressing button KEY2, power off the current LED and power on the LED on the right (when arrived to LED 11, jump to LED 4).
- By pressing button INT0, get back to original configuration, with LED 8 on.

What LED is on?

- To know which LED is on you can:
  - Read content of `LPC_GPIO2->FIOPIN`
  - Read content of `LPC_GPIO2->FIOSET`
  - *define* a global variable in funct_led.c:

    ```
    unsigned int led_value;
    ```

    `led_value` stores the on LED.

    In the other files you can access the variable *declaring*:

    ```
    extern unsigned int led_value;
    ```

Button bouncing

- A single push of the button can trigger more than one interrupt request.

- In ex.1, the LED powered on could be the two slots on the left (or right) w.r.t. the powered off one.

- A de-bouncing mechanism has to be implemented in software to serve the first interrupt request and ignore the possible request coming right after it.

Ex. 2
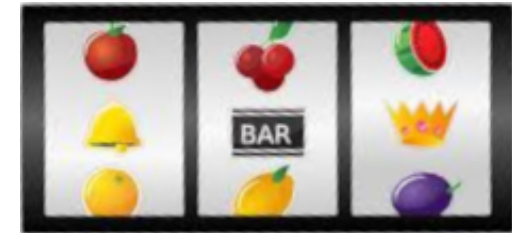
- Implement a slot machine with 3 rolling wheels.
- Every wheel can show one of the two symbols:

Wheel	Symbol 1	Symbol 2
1	led 4 on	led 5 on
2	led 6 on	led 7 on
3	led 8 on	led 9 on

Ex. 2: implementation

- KEY1 button begins a new game and controls the first wheel:
    - Powers off all the LEDs
    - Powers on one of the LEDs 4 and 5 (randomly).
- KEY2 button controls the second wheel:
    - Powers on one of the LEDs 6 and 7 (randomly).
- INT0 button controls the third wheel and states the possible win:
    - Powers on one of the LEDs 8 and 9 (randomly).
    - Depending on the outcome of the game, powers on LED 10 or 11.

Ex. 2: outcome of the game

- The player wins if all 3 symbols are the same:
  - All wheels show symbol 1, or
  - All wheels show symbol 2.
- At the end of the game (after INT0 has been pressed), win is displayed by powering on LED 11.
- If symbols are not all the same, the player loses an LED 10 is powered on.

Random number generation

- LEDs 4-9 have to be powered on randomly.
- A simple way to obtain random numbers is by measuring the elapsed time between the push of two keys (incrementing a variable).