# ARM-Based Microcontrollers

## TM4C123GH6PM Interrupts & Timers PERIPHERALs (Part 2)


By : Ahmed Magdy

# AGENDA

- Raw Interrupts Vs Masked Interrupts
- Input Capture Timer mode

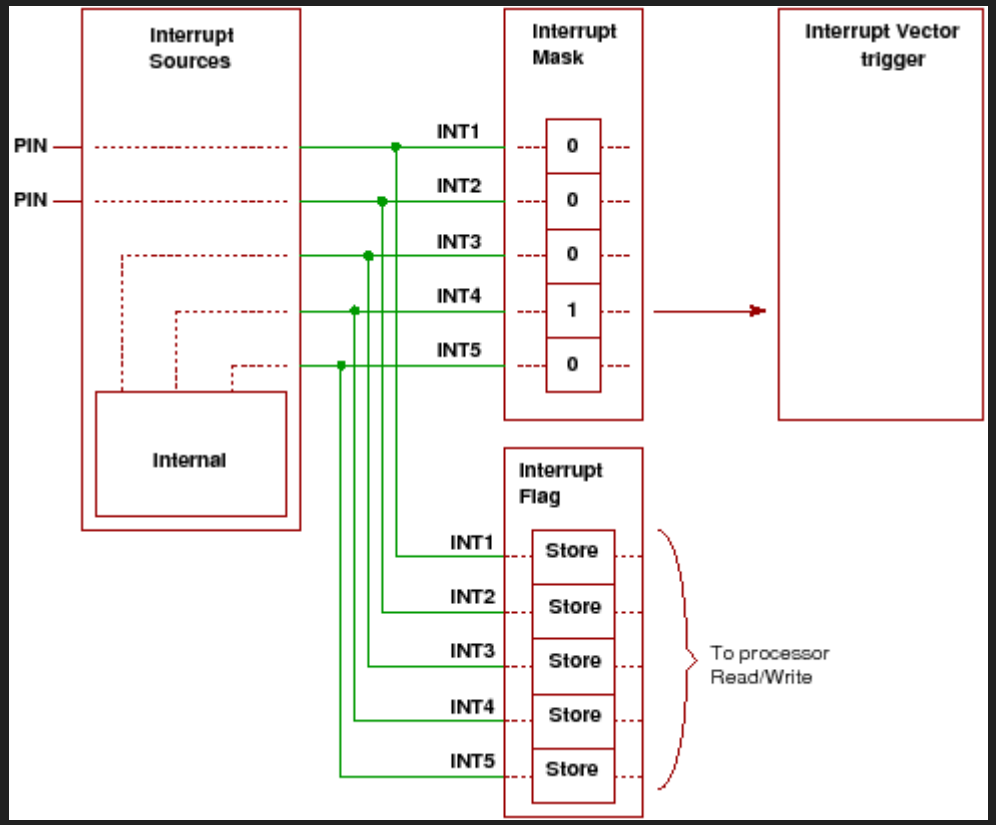

# Raw Interrupts Vs Masked Interrupts

- Raw Interrupts:

  They are the HW notification triggered signals by the peripheral whenever a certain configured event occurs.

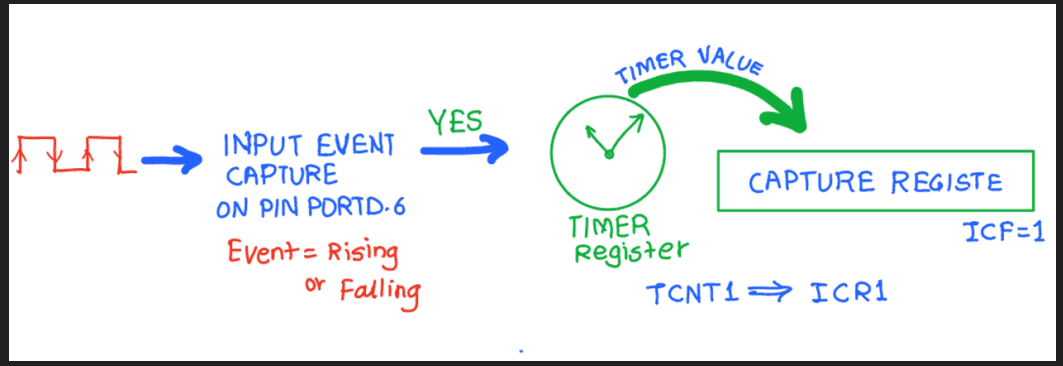
- Masked Interrupts:

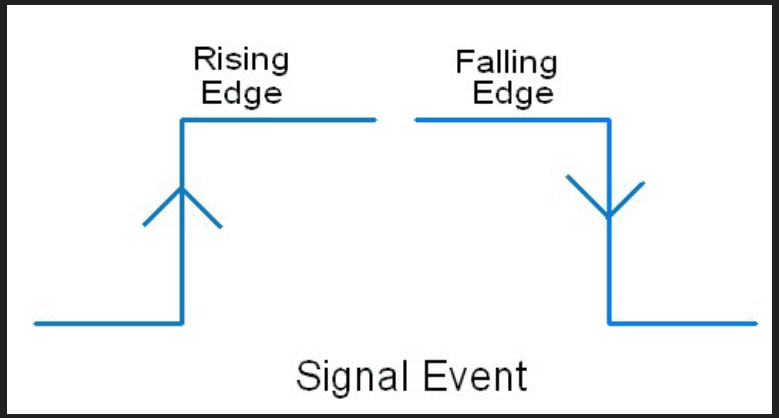
  A featured added to the peripheral so that some of the Raw Interrupts signal can be ignored and not get reported to the NVIC interrupt controller as interrupt request signal (IRQ)



# Input Capture Timer mode

- In input edge-time mode, an I/O pin is used to capture the signal transition events. When an event occurs, the content of the timer counter is captured in another register while the counter keeps counting. The program can then read the counter value when the event occurs at a slightly later time.



# Input Capture Timer mode

```
/* This function captures two consecutive rising edges of a periodic signal from Timer
Block 0 Timer A and returns the time difference (the period of the signal). */
int Timer0A_periodCapture(void)
{
        int lastEdge, thisEdge;
        /* capture the first rising edge */
        TIMER0->ICR = 4;                        /* clear timer0A capture flag */
        while((TIMER0->RIS & 4) == 0) ;         /* wait till captured */
        lastEdge = TIMER0->TAR;                 /* save the timestamp */
        /* capture the second rising edge */
        TIMER0->ICR = 4;                        /* clear timer0A capture flag */
        while((TIMER0->RIS & 4) == 0) ;         /* wait till captured */
        thisEdge = TIMER0->TAR;                 /* save the timestamp */

        return (thisEdge – lastEdge) & 0x00FFFFFF;   /* return the time difference */
}
```