Introduction to Embedded System Design

MSP430 Switch Interfacing

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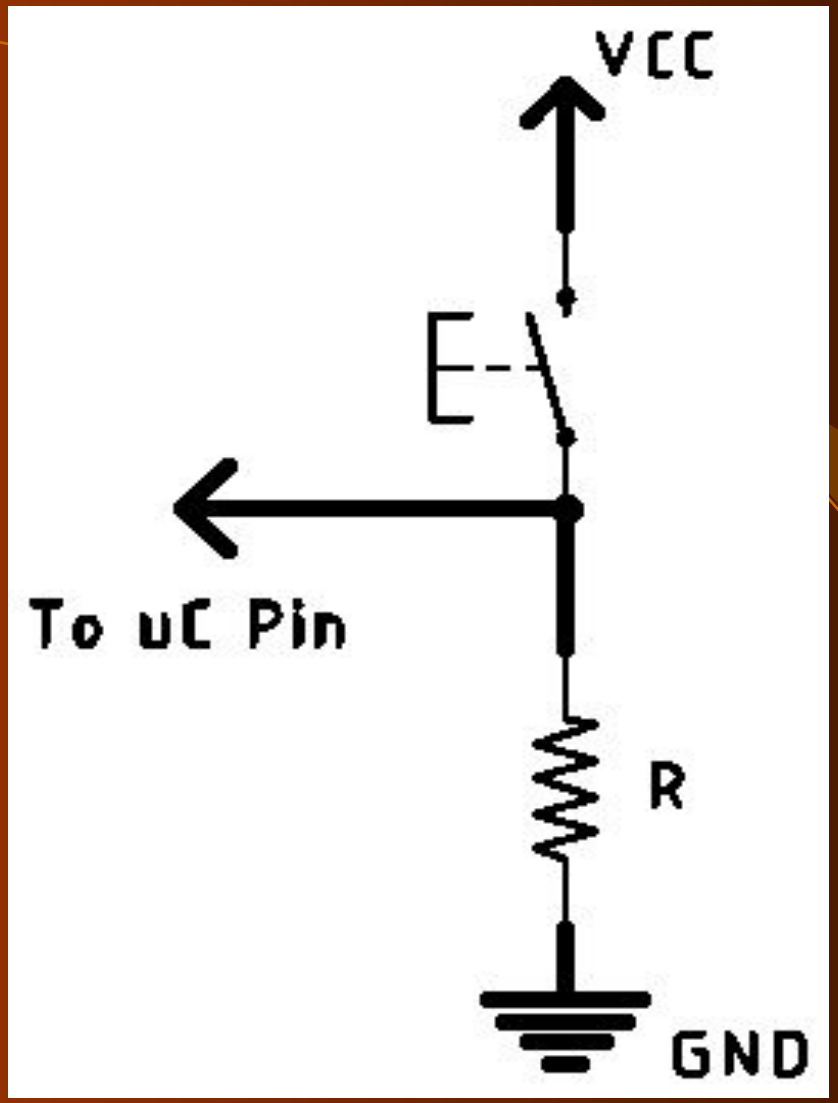
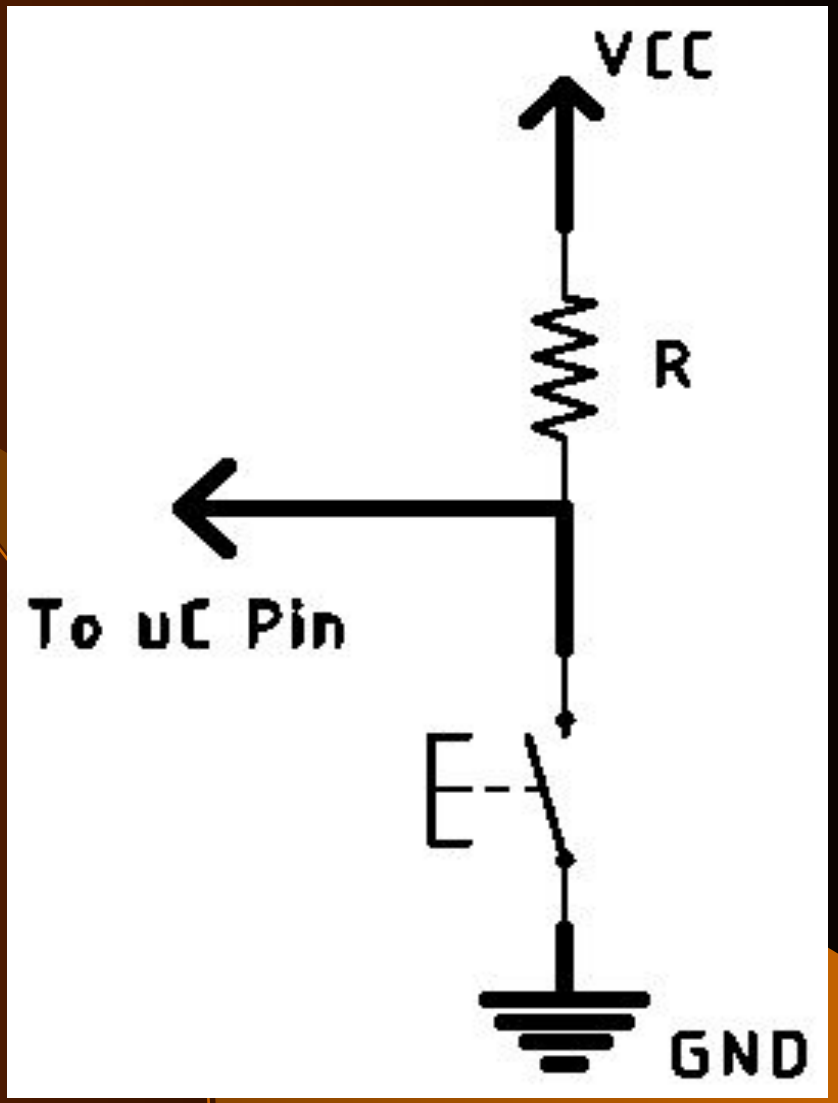
Digital Switch Interfacing

Possible ways for a switch connection :

- Pull up configuration
- Pull down configuration

Digital Switch Interfacing





Digital Input Registers

The MSP430 registers required for switch inputs:

- PxDIR
- PxIN
- PxOUT
- PxREN

Reading inputs

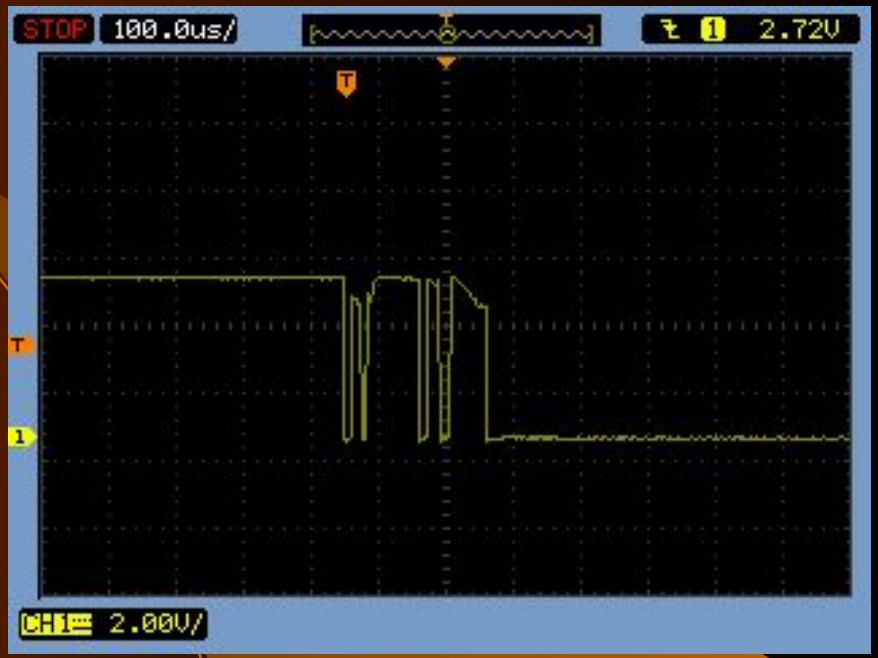
Suppose there is a switch connected to P1.3 in a pull up state (As is the case in LunchBox), and we need to read the value of the pin.

Here is a snippet of code example for testing individual bits in a register:

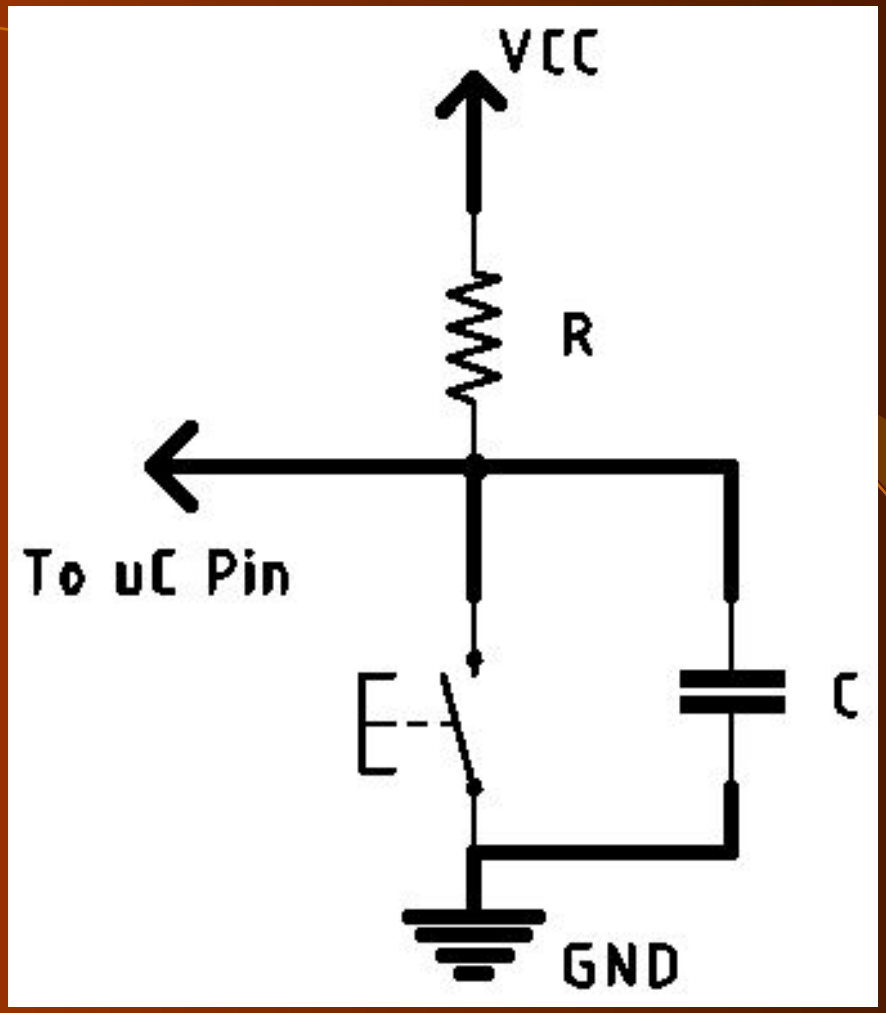
```
if ((P1IN & BIT3) == 0)
    //to be done when P1.3 = 0
else
   // to be done when P1.3 = 1
```

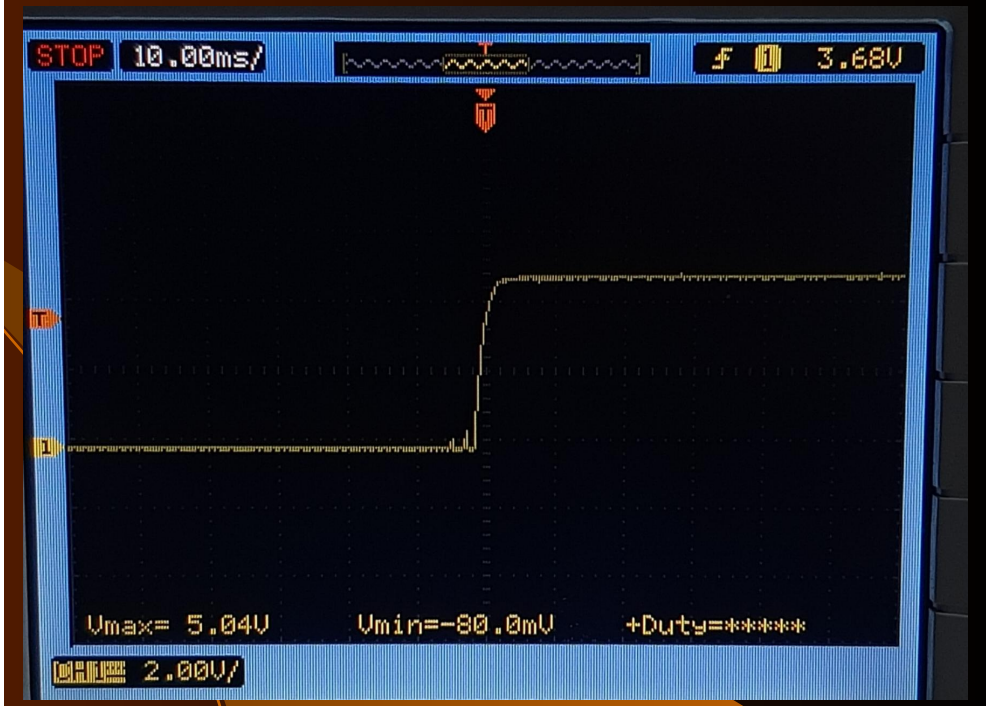
Switch Bouncing

- Common problem associated with the mechanical switches and relays.
- Made up of spring metals which are forced to contact each other by an actuator.
- While they collide each other there is a possibility of rebounding for some time before they make a stable contact.



Hardware Debouncing





Software Debouncing

- Provide a delay of ~20 milliseconds after the first change is detected.

Let’s start programming!