

```

/*
 * read_modify_write_sftw_sw0.c
 *
 * Created: 2/3/2022 11:49:03 PM
 * Author : Jason Tan
 */

#include <avr/io.h>

int main(void)
{
    //pointer to PIN2CTRL array of pin configuration registers
    uint8_t* ptr = (uint8_t*)&PORTA.PIN2CTRL;
    PORTC_PIN0CTRL = 0x08; //Enable internal pull up for PC0
    PORTC_PIN1CTRL = 0x08; //Enable internal pull up for PC1

    //DIR is what configure the port pins as inputs or outputs
    VPORTA_DIR = 0x00; //Configure PORTA pins ( PA7, PA6, PA5, PA4, PA3, PA2) as the
        inputs
    VPORTC_DIR = 0x00; //Configure PORTC pins ( PC1, PC0) as the inputs
    VPORTD_DIR = 0xFF; //Configure PORTD pins (PD07 through PD00) as output pins

    VPORTB_DIR = 0x08; //PB3 output for LED0
    PORTB_PIN2CTRL = 0x08; //Pull up enable for SW0

    //Configure PA7 - PA2 as input buffers with internal pull up resistors
    for(uint8_t i = 0; i < 8; i++){
        *(ptr + i) |= PORT_PULLUPEN_bm;
    }

    uint8_t n = 3; //Field value starting from 3
    uint8_t field_mask = 0x0F; //Field mask
    uint8_t field_val; //Read PA3-PA2 and PC1-PC0.
    VPORTD_OUT = ~((VPORTA_IN & 0xFC) | (VPORTC_IN & 0x03));

    while (1)
    {
        //Check for if SW0 is press meaning that sends a logic 0
        field_val = ((VPORTC_IN & 0x03 ) | (VPORTA_IN & 0x0C));
        if(!(VPORTB_IN & PIN2_bm)){
            //
            //0b1000 0111          0b1111 PA3 PA2 PC1 PC0
            // -> 1 PA3 PA2 PC1 PC0 000
            VPORTD_OUT = (VPORTD_OUT & ~(field_mask << n)) | (((field_val &
                field_mask) << n) ^ 0x78);
        }
    }
}

```

