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/*
 * File:   improve_gate.c
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 *
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 * Updated on October 26th, 2023
 */

#include <xc.h>

/*
 * SINGLE will mean both GP2 -> GP1 and GP3 -> GP0 will output one trigger
for
 * each gate moving from low to high. If SINGLE is not defined, GP3 -> GP0
will
 * also output a trigger when the gate moves from high to low.
 */
#define SINGLE

// CONFIG
#pragma config WDTE = OFF           // Watchdog Timer (WDT disabled)
#pragma config CP = OFF             // Code Protect (Code protection off)
#pragma config MCLRE = OFF          // Master Clear Enable (GP3/MCLR pin fuction
is digital I/O, MCLR internally tied to VDD)
#define _XTAL_FREQ 4000000
#define DELAY 200

unsigned char count1;
unsigned char count2;
unsigned char trigger1;
unsigned char trigger2;
unsigned char previous;
unsigned char current;

void main(void) {
    TRISGPIO = 0b00001100;          // GP2 -> GP1, GP3 -> GP0
    CMCON0 = 0;                     // Clear comparator
    OPTION = 0b11000000;            // No pull-ups

    while(1) {
        if (GPIObits.GP2) {
            if (!trigger1) {
                trigger1 = 1;
                count1 = DELAY;
                GPIObits.GP1 = 1;
            } else {
                if (count1) {
                    count1++;
                } else {
                    GPIObits.GP1 = 0;
                }
            }
        }
    }
}

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        } else {
            trigger1 = 0;
        }
#ifdef SINGLE
        if (GPIObits.GP3) {
            if (!trigger2) {
                trigger2 = 1;
                count2 = DELAY;
                GPIObits.GP0 = 1;
            } else {
                if (count2) {
                    count2++;
                } else {
                    GPIObits.GP0 = 0;
                }
            }
        } else {
            trigger2 = 0;
        }
#else
        current = GPIObits.GP3;
        if (current != previous) {
            trigger2 = 1;
            count2 = DELAY;
            GPIObits.GP0 = 1;
        }
        if (count2 > 0) {
            count2++;
            if (!count2) {
                GPIObits.GP0 = 0;
            }
        }
        previous = current;
#endif
    }
    return;
}

```