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Embedded Systems – Assignment 1

Problem Description:
Use MPLAB X IDE and the PIC18F45K50's assembly language to write code for lighting up at least one of the Curiosity Board's LEDs when one of its push buttons is pressed.

Pseudocode:

Initialize LEDs to 0;   // 0 == off, 1 == on

while(true) {
        if (push button RB4 == pushed)
                LEDs = 1;
        else
                LEDs = 0;
}

Assembly Code:
Code from "ES_A1.asm"; included in .zip file.

```
1    #include <p18F45K50.inc>
2
3        CONFIG WDTEN = OFF       ; Disable the watchdog timer.
4        CONFIG MCLRE = ON        ; MCLEAR pin is on.
5        CONFIG DEBUG = ON        ; Enable debug mode.
6        CONFIG LVP = ON          ; Low-voltage programming is on.
7        CONFIG PBADEN = OFF      ; RB[5:0] will be configured as digital inputs (datasheet, pg. 133)
8        CONFIG FOSC = INTOSCIO   ; Internal oscillator (port function on RA6)
9
10       org 0    ; Start code at 0.
11
12   Start:
13       CLRF PORTA
14       CLRF LATA
15       CLRF TRISA  ; Use LATA as output (to the LEDs)
16       CLRF PORTB
17       CLRF LATB
18
19       BSF TRISB, 4    ; RB4 (the push button) is being used as input now.
20
21   Main:
22       ; If RB4 is 0 (clear), skip the next instruction.
23       ; When RB4 is pressed, it sends a low (0) signal. When not pressed, it sends a high (1) signal.
24       BTFSC PORTB, 4  ; BTFSC = "bit test file; skip if clear"
25       GOTO Off     ; This GOTO will be reached when RB4 isn't being pushed.
26       GOTO On      ; This GOTO will be reached when RB4 is being pushed.
27
28   Off:
29       CLRF LATA
30       GOTO Main
31
32   On:
```

```
32    On:
33        ; LEDs RA[6:5] should turn on.
34        BSF LATA, 6
35        BSF LATA, 5
36        GOTO Main
37
38    end
```

Wiring Diagram: