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EE 2361- Lab 2a

1. **Assembly code:**

mov #0x9fff,w0

mov w0,AD1PCFG ; Set all pins to digital mode

mov #0b1111111111111110,w0

mov w0,TRISA ; set pin RA0 to output

mov #0x0001,w0

mov w0,LATA ; set pin RA0 high

call foreverLoop

wait\_24cycles: ; 2 cycles for function call

repeat #14 ; 1 cycle to load and prep

nop ; 14+1 cycles to execute NOP 15 times

return ; 3 cycles for the return

; (100\*10^-6)/(62.5\*10^-9)

delay\_100us:

repeat #1593

nop

return

; 5 high and 15 low

write\_0: ; 2 (low)

inc LATA ; 1 (high?)

repeat #2 ; 1

nop ; 2+1 = 3

clr LATA ; 1 (low)

repeat #7 ; 1

nop ; 7+1 = 8

return ; 3

; 11 high, 9 low

write\_1: ; 2 (low)

inc LATA ; 1 (high)

repeat #8 ; 1

nop ; 8+1 = 9

clr LATA ; 1

;repeat #1 ; 1

nop ; 1+1 = 2

return ; 3

foreverLoop:

; F5 Blue = 1111

call delay\_100us

call write\_1

call write\_1

call write\_1

call write\_1

call write\_0

call write\_1

call write\_0

call write\_1

; 05 Green

call write\_0

call write\_0

call write\_0

call write\_0

call write\_0

call write\_1

call write\_0

call write\_1

; F5 Red

call write\_1

call write\_1

call write\_1

call write\_1

call write\_0

call write\_1

call write\_0

call write\_1

bra foreverLoop

.end

1. **Delay calculations**

# of cycles = total time / time for 1 cycle

write\_0: 0.35 us / 62.5 ns = 5.6 **6 cycles HIGH**

1.25 us-0.35us = 0.9 🡪 0.9us / 62.5 ns = 14.4 **14 cycles LOW**

write\_1: 0.7 us / 65.2 ns = 11.2 **11 cycles HIGH**

1.25 us-0.7 us = 0.55 🡪 0.55 us / 62.5 ns = 8.8 **9 cycles LOW**

1. **Bugs**

The main bug I had related to an error in the iLED’s data sheet. According to the data sheet, the 24-bit data sends in the order GRB, when it should actually be RGB. In my program, I had to rearrange the order of hard-coded write\_1’s and write\_0’s in order to get the color pink.

1. **Test Patterns**

I used the hexadecimal values given in lab: F5 05 F5. Then I translated it to binary: 11110101 00000101 11110101, with 0’s correspond to to calls to write\_0, and the 1’s correspond to write\_1.