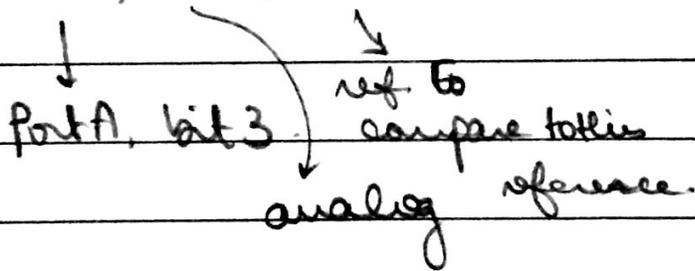


Lab 7: PIC 16F887PWM: → periodic digital output (1, 0)WDT → watch dog timer.. A/D converter: we use V<sub>ref</sub> to check.. SFR: specific for: ie instructions, options.. EEPROM: electrical erasable rom.  
(when on or and off to keep).

. 3 independent counters T01, T02, T03.

ex: pin 3: RA3 / AN3 / V<sub>ref</sub> + |

→ CCP: comparators

Port A = 0x001  
 True A = 0x011

Port A output: True A: 0x011 (255) : all input  
 or depends which input 1  
 or output 0

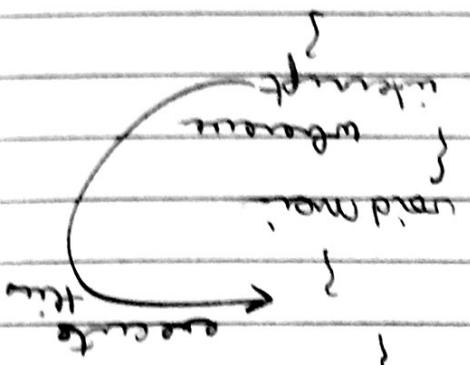
• Reg:

ANSEL = 0  
 ANSELH = 0  
 GEN = bit = 0  
 GENH = bit = 0  
 PORTA = bit = 0

to use them as digital  
 → if not using any  
 avoiding output

use keypad  
 micro C

• while (1) : to have an loop.



void main  
 void interrupt

• Bl interrupt:

Observer: write

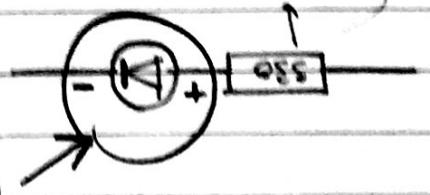
if (i RA0) {  
 i (read) = 1

• lower debouncing for mechanical push button

not correct

$$R = \frac{V_{CC} - V_{button}}{I_{button}}$$

also used for current limitation



watch out + and -

when we pin  
 → voltage enters  
 pin to 0 (connected to ground)



no a resistor for current limitation  
 resistor: always connected pin

10K: pull up resistor

How to put  
 the switch?

Ex A: one input and one output

10

ExB: Led Blink using timer 6 seconds

1010 0000  
no input  
out: LED

TR0  
having: using timer 0 that do interrupts at 255

every tick is 4 clock cycles

$\frac{4}{4} = \text{time of each tick}$

$1: 4 \text{ Hz}$   
 $\frac{4 \text{ Hz}}{4}$

Time of one instruction

Time:  $255 \times \frac{4}{4} = 255 \text{ Hz}$

Time of the processor: 600 mhz

tick to us count 1

What we change inside reg: bit 0

Processor option reg

1M:  $1.56 \Rightarrow 256 \text{ us} \times 256$

$6 \times 10^6 = \boxed{7} \times 256 \times 256 \times 0.5$

connect to a counter = 70

every function, go up

decrement 1 - hit counter

=> Blink led

TR0

interrupt

GIE  
global interrupt

we don't set it; we only next it  
also: TOIF is a flag  
make sure to reset with first interrupt

and TOIF are enabled  
Timer 0 enabled in wicon

option reg  
interrupt on external

clear

option: ext

we need 6 seconds => 6 sec: each tick: 1 Hz

$\Rightarrow 7 \times 10^6$  instruction

Processor: 1: 256: every 1: 256

$256 \times 256 \times 7 = 6 \times 10^6$

TR020

in order to start from

wicon

BIT: GIE

10100000

BIT 5: TOIF

0x10

BIT 2: TIF

interrupt = 0 I will save to next tick

= 92 counter

$x = \frac{6 \times 10^6}{256 \times 256}$

sp: input from PIC: 819,672 x Δ

if V = 5V: 1023

V = 0V: 0

Part F: RA2

~~3.19 x 10^1~~  
to get which would

$$38^{\circ}\text{C} \rightarrow 10^{\circ}\text{C} = 25^{\circ}\text{C} = \frac{2^{10}-1}{\text{ }^{\circ}\text{C}/\text{u}}$$

5-0 (conversion) / 1024

Ex C: Generate PWM: 25% → 75% based on DIP switch.

RA, RC2 that enable PWM

go to go and search for PWM

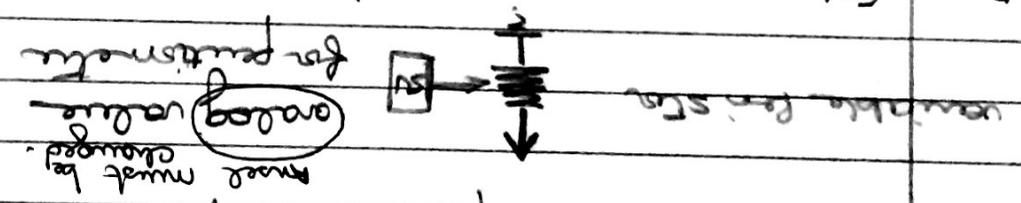
→ macros to output

no ports Ex D: shift where there bit are + module connected.

for LCD (qbit) allocation

Ex E: int to shift to change integers to string to be displayed on LCD.

Bonus: F10: (Port 0 can be configured F10).



0 → 5V  
0 → 5V  
10 bits → 10 bit values  
2<sup>10</sup> because ranges

Δ = 4.88 mV resolution

difference between levels

→ ex:  $\frac{4V}{4V} = 819,672$  levels