Lab 03 - Ex 1

Target $\Rightarrow$ 2 ms

F_{XTAL} = 16 MHz $\qquad$ 2000 / 16 = 125

T_{XTAL} = $\frac{1}{16}$ µs

prescaler = 1 : 256

Time per tick = $256 \times \frac{1}{16}$ = 16 µs.

Counter increment = 2000 / 16 = 125

Start = 256 - 125 = 131

Lab 02 - Ex. 2/3

Target $\Rightarrow$ 500 ms

$F = 16\ MHz$

$T = \frac{1}{16}\ \mu s$

Scale $= 1:1024$

$T_{tick} = 1024 \times \frac{1}{16} = 64\ \mu s$

Max delay $= \frac{64}{1000} \times 256 = 16.384\ ms$

Lab 03 - Ex. 4

Target $\Rightarrow$ 1000 ms

F $\Rightarrow$ 16 MHz

T $\Rightarrow$ $\frac{1}{16}$ µs

Scale $\Rightarrow$ 1:256

Tick $\Rightarrow$ $\frac{1}{16} \times 256 = 16$ µs.

Count $\Rightarrow$ $\frac{10^6}{16} = 62,500$

Start $\Rightarrow$ $2^{16} - 62500 = 3,036$ //

Lab 03 - Ex 5

Target ⇒ 100 ms (2ms × 50)

$F = 16\ MHz$

$T = \frac{1}{16}\ \mu s$

Scale = 1:256

$T_{tick} = 256 \times \frac{1}{16}\ \mu s = 16\mu s$

$Count = \frac{2000}{16} = 125$

Start = 256 − 125 = 131

time per delay = 125 × 16 µs = 2,000µs

# of iterations = 50

Total delay = 50 × 2 ms = 100ms

Lab 03 - Ex 6

Target = 50 ms (2 ms)

$\frac{50 \times 1000}{1000}$

F = 16 MHz

$T = \frac{1}{16}$ µs

500 → 25

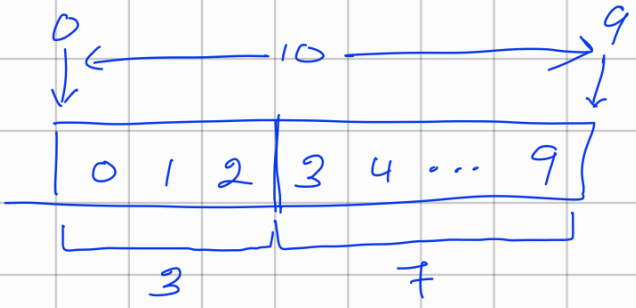
$\frac{50 \times 1000}{2000}$

Scale. = 1:256

$T_{tick} = 256 \times \frac{1}{16} = 16$ µs

$count = \frac{2000}{16} = 125$

Start = 256 − 125 = 131




```
for (i=0 ; i<25 ; i++) {
    delay_0(25)
}
```

Time per delay = 16 µs × 125 = 2,000 µs = 2 ms

loops = 25

Total delay = 25 × 2 ms = 50 ms

Target $\Rightarrow$ 500 ms

$F = 16\ MHz$

$T = \frac{1}{16}\ \mu s$

Scale $= 1 : 256$

$T_{tick} = 256 \times \frac{1}{16} = 16\ \mu s$

$Count = \frac{500 \times 10^{3}}{16} = 31{,}250$

$Start = 2^{16} - 31250 = 34{,}286$ //

No for loops.