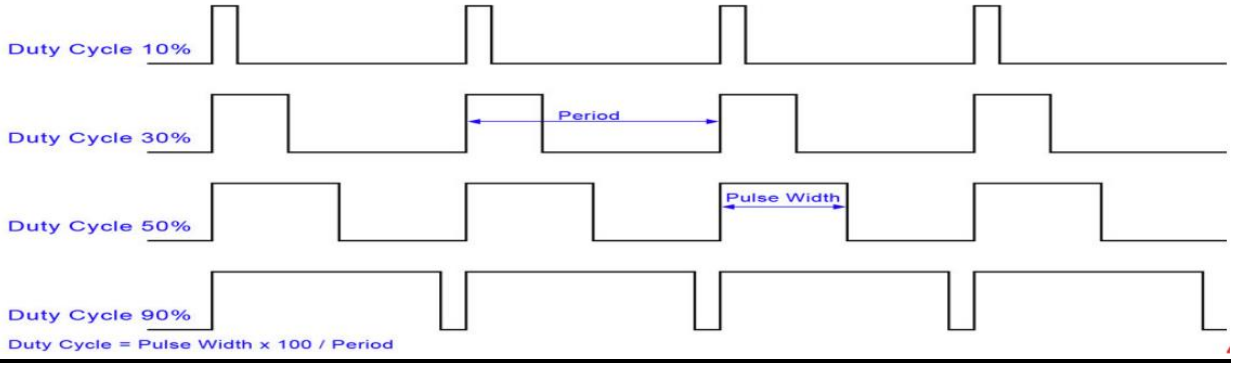
Calculations

Fast PWM:

- Duty Cycle:
  - It is the ratio between the High-level time "on period" and the total time of the cycle "off period".
  - $Duty\ Cycle = \frac{High\ level\ period}{time\ of\ full\ cycle} = \frac{Pulse\ Width}{Period}$



- The frequency of this PWM can be calculated by:

$$PWM\ frequency = \frac{frequency\ of\ system}{counts \times prescaler}$$

$$PWM\ frequency = \frac{frequency\ of\ system}{(TOP + 1) \times prescaler}$$

➢ <u>On Timer0 or Timer2</u>:

According to the previous, the frequency of PWM in Timer0 or Timer2 will be constant as the following table:

Prescaler	Fast PWM at Timer0/2
1	62,500 Hz
8	7812.5 Hz
32	1,953.125 Hz (Timer2 only)
64	976.5625 Hz
128	488.28 Hz (Timer2 only)
256	244.14 Hz
1024	61.04 Hz

Expected Output From the PWM Drawer on the Screen

$$Duty\ Cycle\ \% = \frac{High\ Time}{Period\ Time} \times 100$$

$$High\ Time\ ms = \frac{High\ Count\ * Prescaler\ * 10^3}{F_{CPU}}$$

$$Period\ Time\ ms = \frac{(High\ Count + Low\ Count)\ * Prescaler\ * 10^3}{F_{CPU}}$$