

// C programming of PWM1 with different duty cycle

```
#include<stdio.h>
#include <lpc17xx.h>
```

```
void PWM_init(void)
{
    LPC_PINCON->PINSEL3 |= (2<<4); // pwm1.1 , p1.18
    LPC_PWM1->TCR=(1<<0); // enable counter and PWM
    LPC_PWM1->PR=0; //to fix the period of pwm
    LPC_PWM1->MCR=(1<<1); //reset the timer on match
    LPC_PWM1->MR0=24999; //ton+toff = 1ms
    LPC_PWM1->PCR=(1<<9); //PWM1 enable
}

int main (void)
{
    PWM_init();
    while(1)
    {

        LPC_PWM1->MR1=6250; //ton, duty cycle = 24999/6250=25%
                        //ton=12500,duty cycle = 24999/12500=50%
                        //ton=18750,duty cycle = 24999/18750=75%
        LPC_PWM1->LER=(1<<1); //Enable the bits in LER register to load and latch the new
                        //match values in MR1 register

    }
}
```

Logic:

Duty Cycle = $\text{ton} / (\text{ton} + \text{toff}) = \text{ton} / T$

Ex: $T = 24999$ and $\text{ton} = 6250$, Duty Cycle = 25%

Similarly if $T = 24999$, for 50% Duty Cycle, $\text{ton} = 12500$

// C programming of PWM1 , PWM2 and PWM3 with different duty cycle

```
#include<stdio.h>
```

```
#include <lpc17xx.h>
```

```
void PWM_init(void)
```

```
{
    LPC_PINCON->PINSEL3 |= (2<<4)|(2<<8)|(2<<10);// pwm1.1 p1.18,pwm1.2 p1.20,pwm1.3 p1.21
    LPC_PWM1->TCR=(1<<0);// enable counter and PWM
    LPC_PWM1->PR=0;//to fix the period of pwm
    LPC_PWM1->MCR=(1<<1);//reset the timer on match
    LPC_PWM1->MR0=24999;//ton+toff = 1ms
    LPC_PWM1->PCR=(1<<9)|(1<<10)|(1<<11);//PWM1,PWM2andPWM3 enable
}
```

```
int main (void)
```

```
{
    PWM_init();
    while(1)
    {

        LPC_PWM1->MR1=6250;//ton,duty cycle = 24999/6250=25%
        LPC_PWM1->MR2=12500;//ton=12500,duty cycle = 24999/12500=50%
        LPC_PWM1->MR3=18750;//ton=18750,duty cycle = 24999/18750=75%
        LPC_PWM1->LER=0xe;//Enable the bits in LER register to load and latch the new
                               //match values in MR1,MR2 and MR3 registers
    }
}
```

// C programming of PWM1 with different duty cycle to control the speed of DC motor/dimming of LED

```
#include<stdio.h>
#include <lpc17xx.h>
uint32_t x;
void delay(uint32_t);
void PWM_init(void)
{
    LPC_PINCON->PINSEL3 |= (2<<4); // pwm1.1 , p1.18
    LPC_PWM1->TCR=(1<<0); // enable counter and PWM
    LPC_PWM1->PR=0; //to fix the period of pwm
    LPC_PWM1->MCR=(1<<1); //reset the timer on match
    LPC_PWM1->MR0=500; //24999; //ton+toff = 1ms
    LPC_PWM1->PCR=(1<<9); //PWM enable
}

int main (void)
{
    PWM_init();
    while(1)
    {
        for(x=0;x<=500;x=x+10)
        {
            LPC_PWM1->MR1=x; //ton,duty cycle = 24999/6250=25%
                        //ton=12500,duty cycle = 24999/12500=50%
                        //ton=18750,duty cycle = 24999/18750=75%
            LPC_PWM1->LER=(1<<1); //Enable the bits in LER register to load and latch the new
                        //match values
            delay(300000);
        }
    }
}

void delay(uint32_t i)
{
    uint32_t a;
    for(a=0;a<=i;a++);
}
```