MICROS 32 BITS
STM – TIMERS

ROBINSON JIMENEZ MORENO

UNIVERSIDAD MILITAR
NUEVA GRANADA

```c
#include <stdio.h>
#include "stm32f7xx.h"

int main(void){
  RCC -> AHB1ENR = 0X2; //PUERTO B
  RCC -> APB1ENR = 0X1; //TIMER 2
  GPIOB -> MODER = 0X10004001; //COLOCAR EN SALIDA PARA ENCENDER LOS LEDS
  GPIOB -> OTYPER = 0X0; //PUSH PULL
  GPIOB -> OSPEEDR = 0X10004001; //VELOCIDAD MEDIA
  GPIOB -> PUPDR = 0X10004001; //PULL UP
  TIM2 -> CR1 = 0X1; //CONTADOR HABILITADO, DIVISION X1
  TIM2 -> ARR = 0XFFFFFFFF; //VALOR DE RESET
  TIM2 -> PSC = 20000; //PRE-ESCALER DE TIEMPO

  while(1){


      if (TIM2 -> CNT <10){
    GPIOB -> ODR = 0X0080;     }
    else  if (TIM2 -> CNT > 200 & TIM2 -> CNT <500){
    GPIOB -> ODR = 0X0001;     }
      else  if (TIM2 -> CNT >   500 & TIM2 -> CNT <700 ){
      GPIOB -> ODR = 0X4000;     }
    else  if (TIM2 -> CNT >   900){
       TIM2 -> EGR = 1;    }
  }
}
```

```c
#include <stdio.h>
#include "stm32f7xx.h"

int main(void){
  RCC -> AHB1ENR = 0X2; //PUERTO B
  RCC -> APB1ENR = 0X1; //TIMER 2
  GPIOB -> MODER = 0X10004001; //COLOCAR EN SALIDA PARA ENCENDER LOS LEDS
  GPIOB -> OTYPER = 0X0; //PUSH PULL
  GPIOB -> OSPEEDR = 0X10004001; //VELOCIDAD MEDIA
  GPIOB -> PUPDR = 0X10004001; //PULL UP

  TIM2 -> CR1 = 0X1; //CONTADOR HABILITADO, DIVISION X1
  TIM2 -> ARR = 800; //VALOR DE RESET
  TIM2 -> PSC = 20000; //PRE-ESCALER DE TIEMPO

  while(1){
      if (TIM2 -> CNT <10){
    GPIOB -> ODR = 0X0080;
    }
    else  if (TIM2 -> CNT > 200 & TIM2 -> CNT <500){
    GPIOB -> ODR = 0X0001;
    }
      else  if (TIM2 -> CNT >   500){
      GPIOB -> ODR = 0X4000;
    }

  }
}
```

```
////////////////////////////////////////////////////////////////

#include <stdio.h>
#include "stm32f7xx.h"

int main(void){
  int temp=0;
  RCC -> AHB1ENR = 0X6; //PUERTO B
  RCC -> APB1ENR = 0X1; //TIMER 2
  GPIOC -> MODER = 0;
  GPIOB -> MODER = 0X10004001; //COLOCAR EN SALIDA PARA ENCENDER LOS LEDS
  GPIOB -> OTYPER = 0X0; //PUSH PULL
  GPIOB -> OSPEEDR = 0X10004001; //VELOCIDAD MEDIA
  GPIOB -> PUPDR = 0X10004001; //PULL UP
  TIM2 -> CR1 = 0X1; //CONTADOR HABILITADO, DIVISION X1
  TIM2 -> ARR = 0X500; //VALOR DE RESET
  TIM2 -> PSC = 20000; //PRE-ESCALER DE TIEMPO

  while(1){
        if ((GPIOC-> IDR & 0X2000)== 0X2000){
        temp= TIM2 -> CNT;
        if (temp  <10){
    GPIOB -> ODR = 0X0080;    }
        else  if (temp >  500 & temp  <700 ){
      GPIOB -> ODR = 0X4000;    }
  }
}}
```

```
////////////////////////////////////////////////////////////////

#include <stdio.h>
#include "stm32f7xx.h"

int main(void){
  int temp=0;
  RCC -> AHB1ENR = 0X6; //PUERTO B
  RCC -> APB1ENR = 0X1; //TIMER 2
  GPIOC -> MODER = 0;
  GPIOB -> MODER = 0X10004001; //COLOCAR EN SALIDA PARA ENCENDER LOS LEDS
  GPIOB -> OTYPER = 0X0; //PUSH PULL
  GPIOB -> OSPEEDR = 0X10004001; //VELOCIDAD MEDIA
  GPIOB -> PUPDR = 0X10004001; //PULL UP
  TIM2 -> CR1 = 0X1;
  TIM2 -> ARR = 0X550000; //VALOR DE RESET
  TIM2 -> PSC = 20000; //PRE-ESCALER DE TIEMPO

  while(1){
        if ((GPIOC-> IDR & 0X2000)== 0X2000){
        TIM2 -> EGR = 1;
        while ((GPIOC-> IDR & 0X2000)== 0X2000);
        temp= (TIM2 -> CNT)/2;
        if (temp  <500){
    GPIOB -> ODR = 0X0080;     }
        else  if (temp >  600 & temp  <900 ){
      GPIOB -> ODR = 0X4000;     }
        else GPIOB -> ODR = 0X4081;
  }
}}
```

Timer 1 seg ON

```c
#include <stdio.h>
#include "stm32f7xx.h"

int main(void){
  RCC -> AHB1ENR = 0X2; //PUERTO B
  RCC -> APB1ENR = 0X1; //TIMER 2
  GPIOB -> MODER = 0X10004001; //COLOCAR EN SALIDA PARA ENCENDER LOS LEDS
  GPIOB -> OTYPER = 0X0; //PUSH PULL
  GPIOB -> OSPEEDR = 0X10004001; //VELOCIDAD MEDIA
  GPIOB -> PUPDR = 0X10004001; //PULL UP

  TIM2 -> CR1 = 0X1; //CONTADOR HABILITADO, DIVISION X1
  TIM2 -> DIER = 0X1; //HABILITAR LA INTERRUPCION AL TERMINAR CADA CONTEO
  TIM2 -> ARR = 800; //CALCULAR CON TIMER CALCULATOR
  TIM2 -> PSC = 20000; //CALCULAR CON TIMER CALCULATOR 1HZ
  NVIC_EnableIRQ(TIM2_IRQn);

  while(1){

  }
}

extern "C"{

  void TIM2_IRQHandler(void)
  {
    TIM2->SR &= ~(1<<0);
    GPIOB -> ODR ^= 0X4081; //INTERMITENCIA DE LOS LEDS
  }

}
```