Introduction to Embedded Systems CSE 211

Project Submission

Team 15

Ahmed Mamdouh	19p5326
Abdelrahman Gamal	19p4193
Hussam Elsayed	18p6670
Andrew boules	18p7917
Hanin Essam Sayed	18P9927

Table of Contents

Table of Figures

1. Project Description

In this project we aim to design a traffic light control system.
This system consists of 4 traffic lights, 2 car traffic lights, and 2 pedestrian traffic lights.
Car traffic light:
The first car traffic light shall stay GREEN for 5 seconds, then YELLOW for 2 seconds, then turns RED. When one of the traffic lights is set to RED the other one has to go GREEN exactly after 1 second. The same
sequence then is repeated.
Pedestrian traffic light:
Each pedestrian traffic light has 2 LEDs (red & green), and controlled with a push button.
once the push button is pressed, the traffic light goes from red to green for 2 seconds.

2. Flow Chart

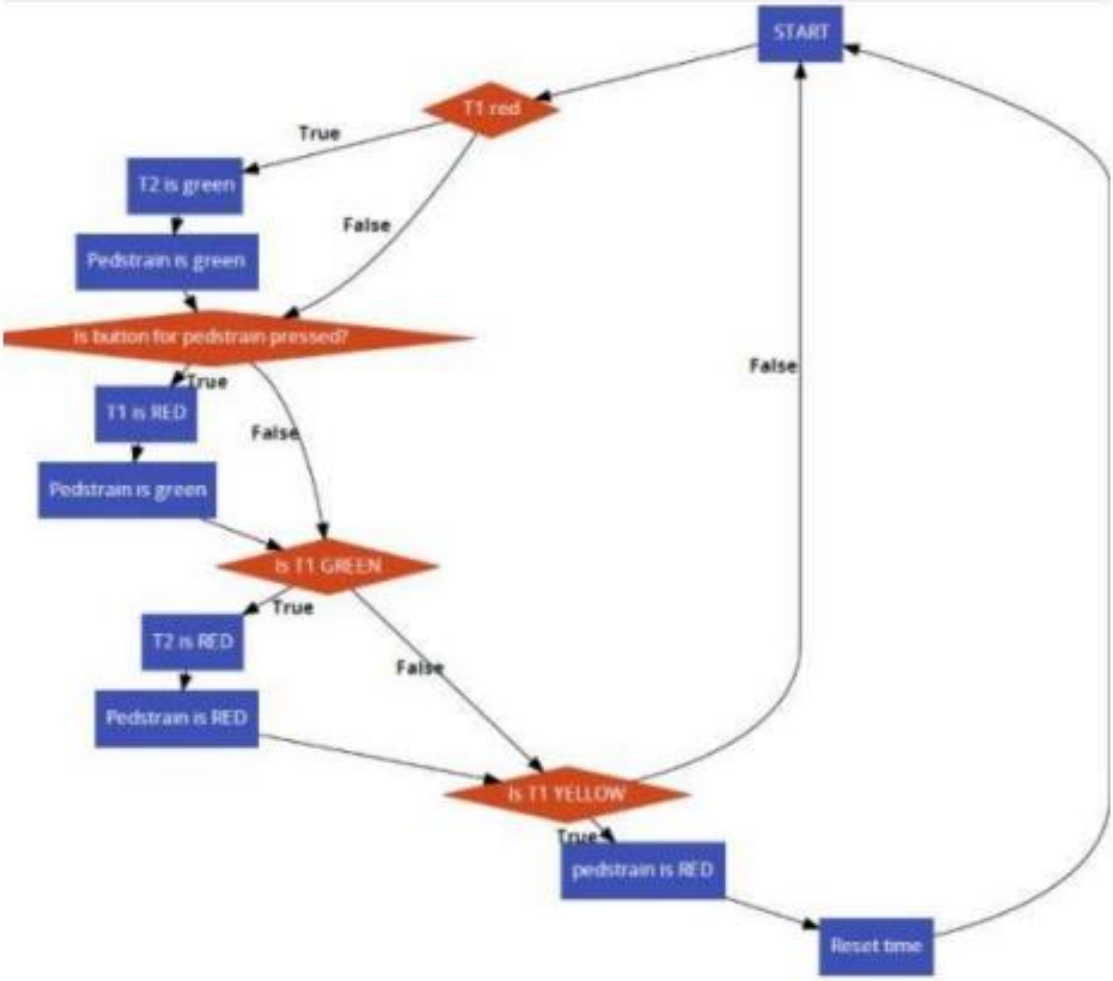
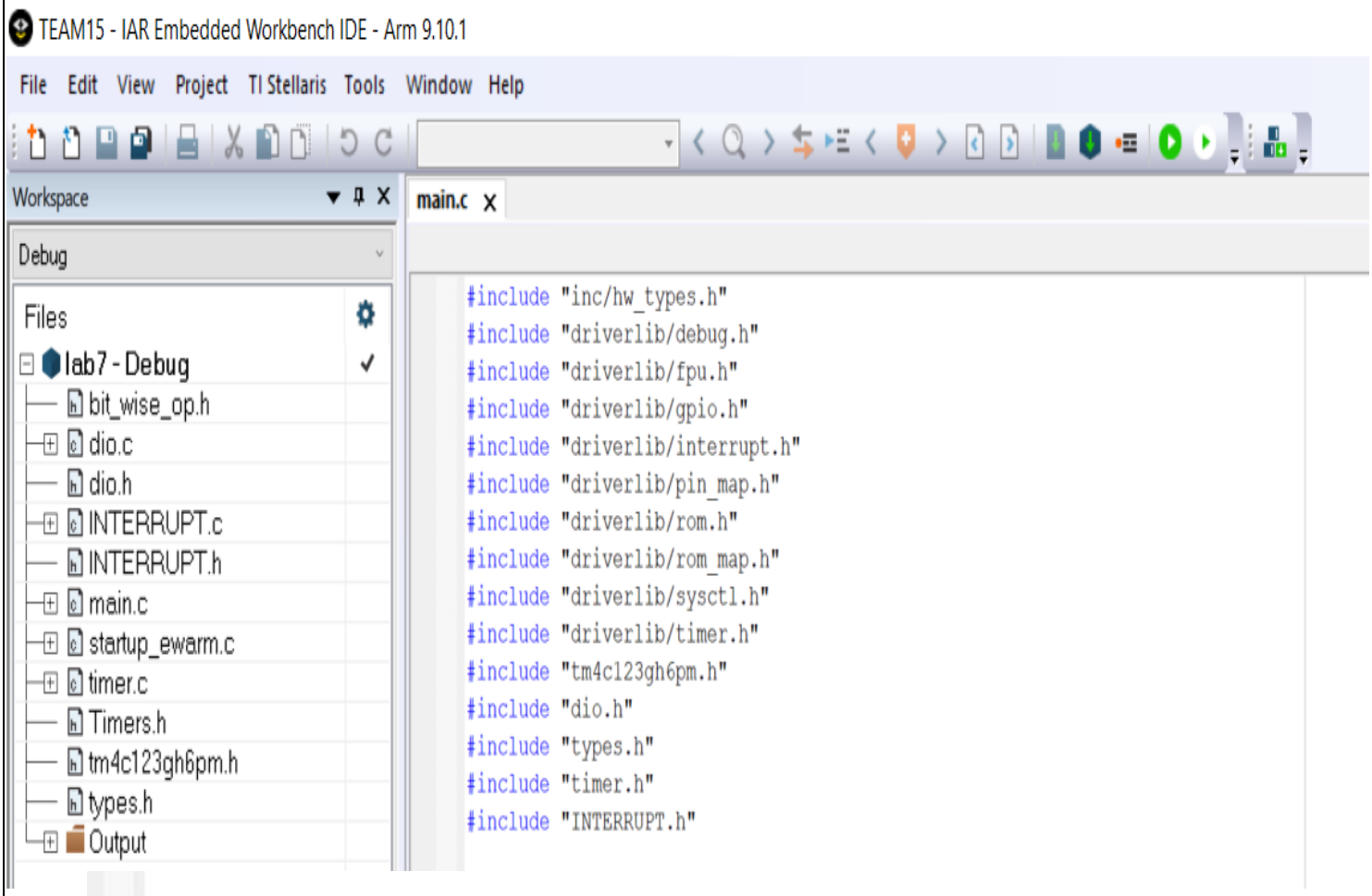


Figure 1: Flow chart

3. Code

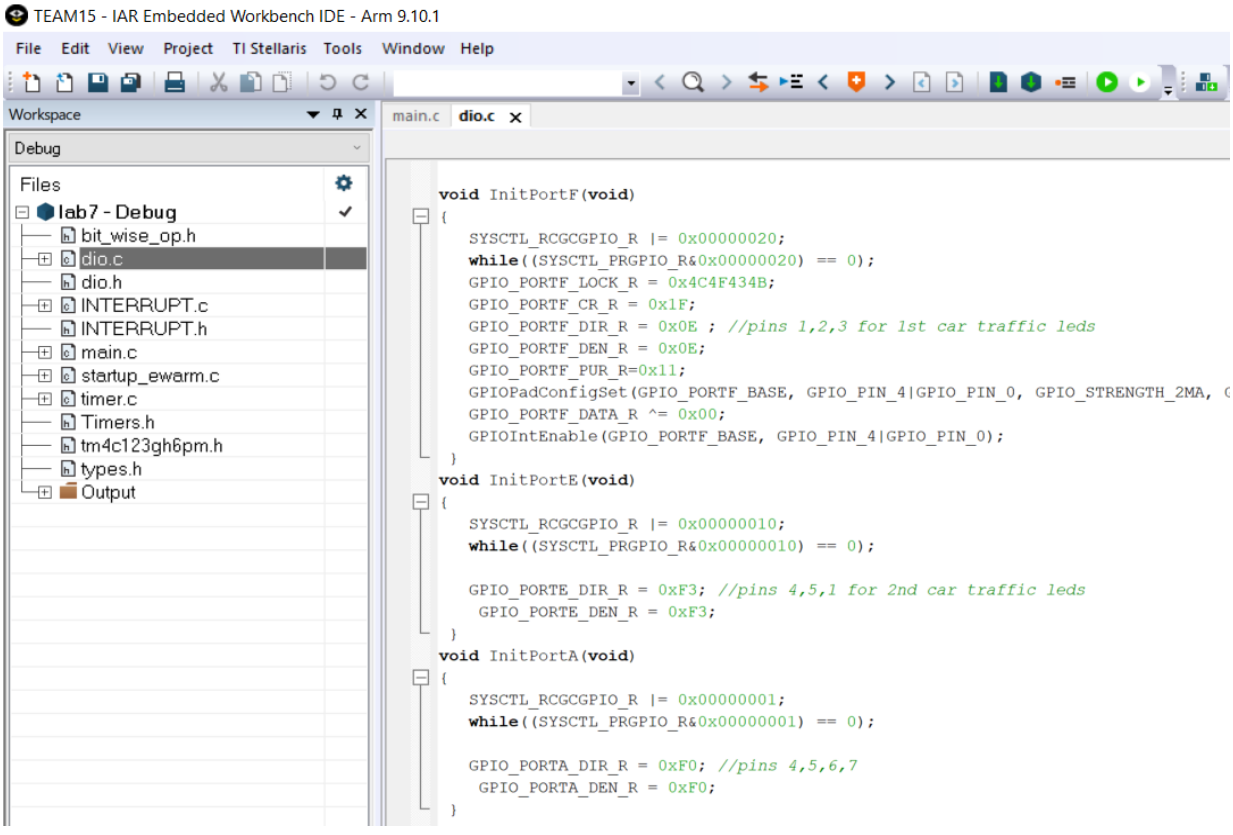
main.c

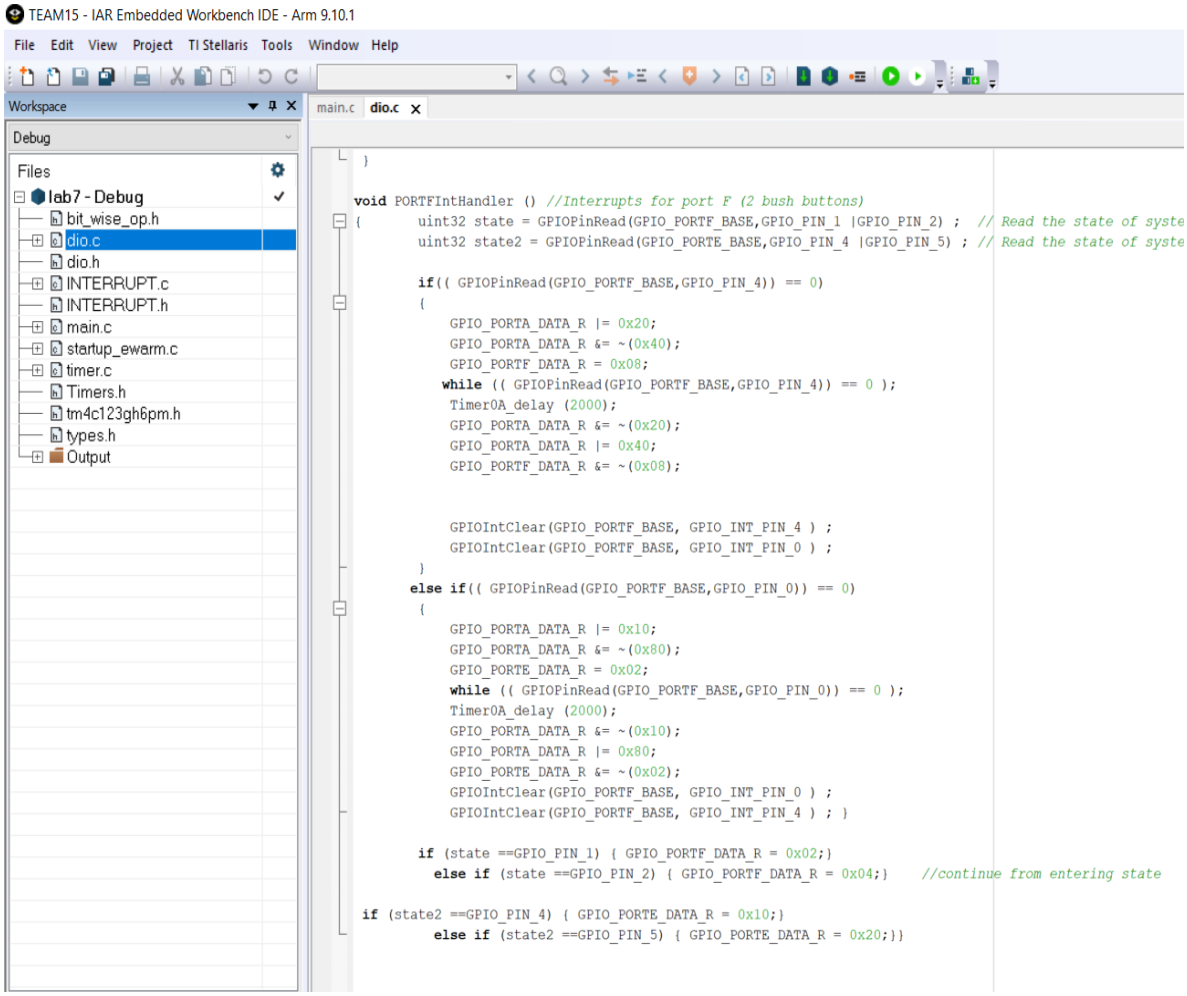



```
int main()

{   InitPortF() ;   //For traffic system 1 (3 LEDs) and 2 Push buttons
    InitPortE() ;  // For traffic system 2 (3 LEDs)
    InitPortA() ;  //For Pedstrain LEDs
    InitINTERRUPTS() ;  // Initialization for interrupts on 2 buttons
    Timer0_Init();     //First timer for first system
    Timer1_Init() ;   //Second timer for second system
```

```
while(1)
{

  GPIO_PORTF_DATA_R |= 0x02;
  GPIO_PORTE_DATA_R |= 0x02;
  GPIO_PORTA_DATA_R = 0x50;
  Timer0A_delay (5000);     // System 1 GREEN
  GPIO_PORTF_DATA_R &= ~(0x02);
  GPIO_PORTF_DATA_R |= 0x04;
  Timer0A_delay (2000);    // System 1 YELLOW
  GPIO_PORTF_DATA_R &= ~ (0x04);
  GPIO_PORTF_DATA_R |= 0x08;
  GPIO_PORTA_DATA_R = 0xA0;
  Timer0A_delay (1000);  // Delay 1 sec between traffic and pedstrain
  GPIO_PORTE_DATA_R &= ~(0x02);
  GPIO_PORTE_DATA_R |= 0x10;
  Timer1A_delay (5000);  // System 2 GREEN
  GPIO_PORTE_DATA_R &= ~(0x10);
  GPIO_PORTE_DATA_R |= 0x20;
  Timer1A_delay (2000);     // System 2 YELLOW
  GPIO_PORTE_DATA_R &= ~(0x20);
  GPIO_PORTE_DATA_R |= 0x02;
  Timer1A_delay (1000);      // Delay 1 sec between traffic and pedstrain
  GPIO_PORTE_DATA_R &= ~(0x02);
  GPIO_PORTF_DATA_R &= ~(0x08); }}
```

dio.c





4. Drive link

Here you'll find the working video and the project file which include all files that used in the code.

https://drive.google.com/drive/folders/1lPrWFtdxIQT9vKurqavUPoFaofze7j5L?usp=sharing

That's all, thank you ☺..