실습 10강 GPIO 실습-1(LED)

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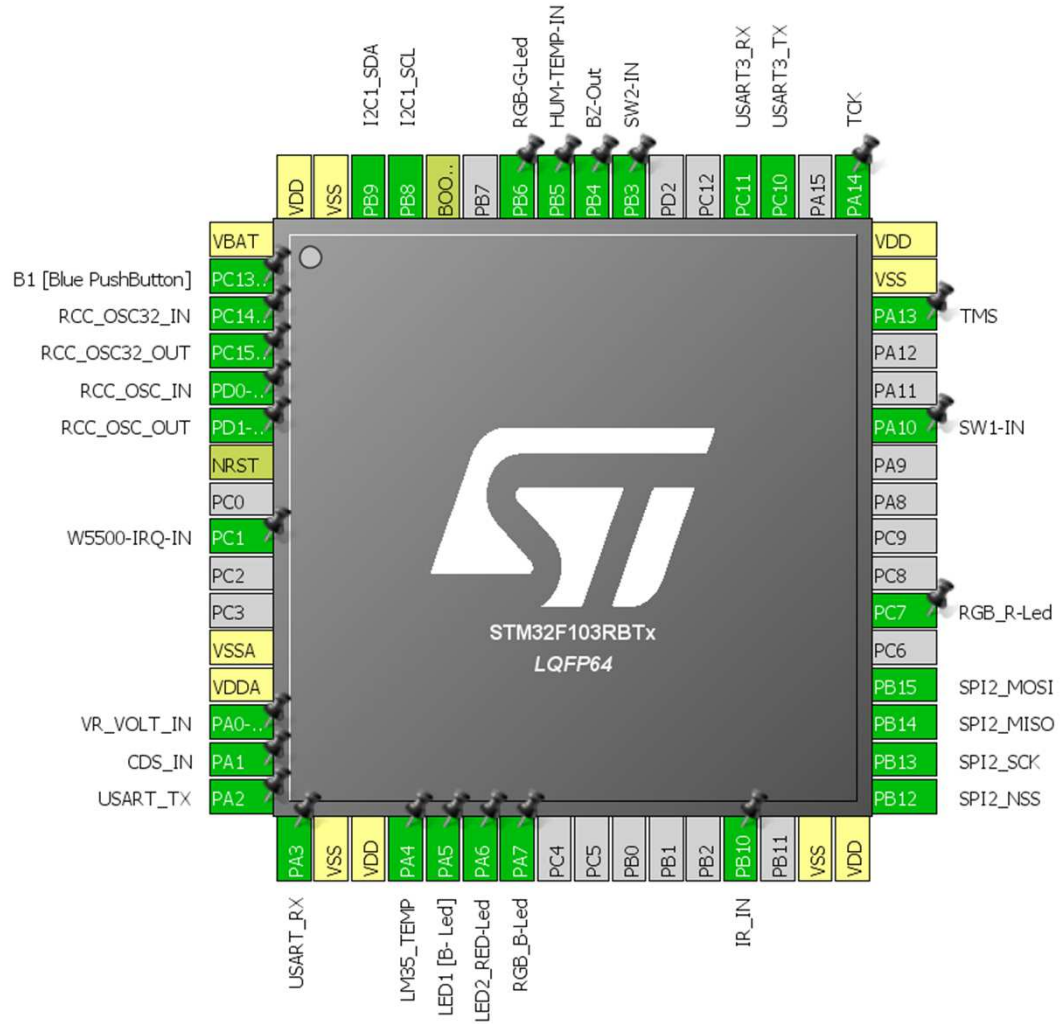
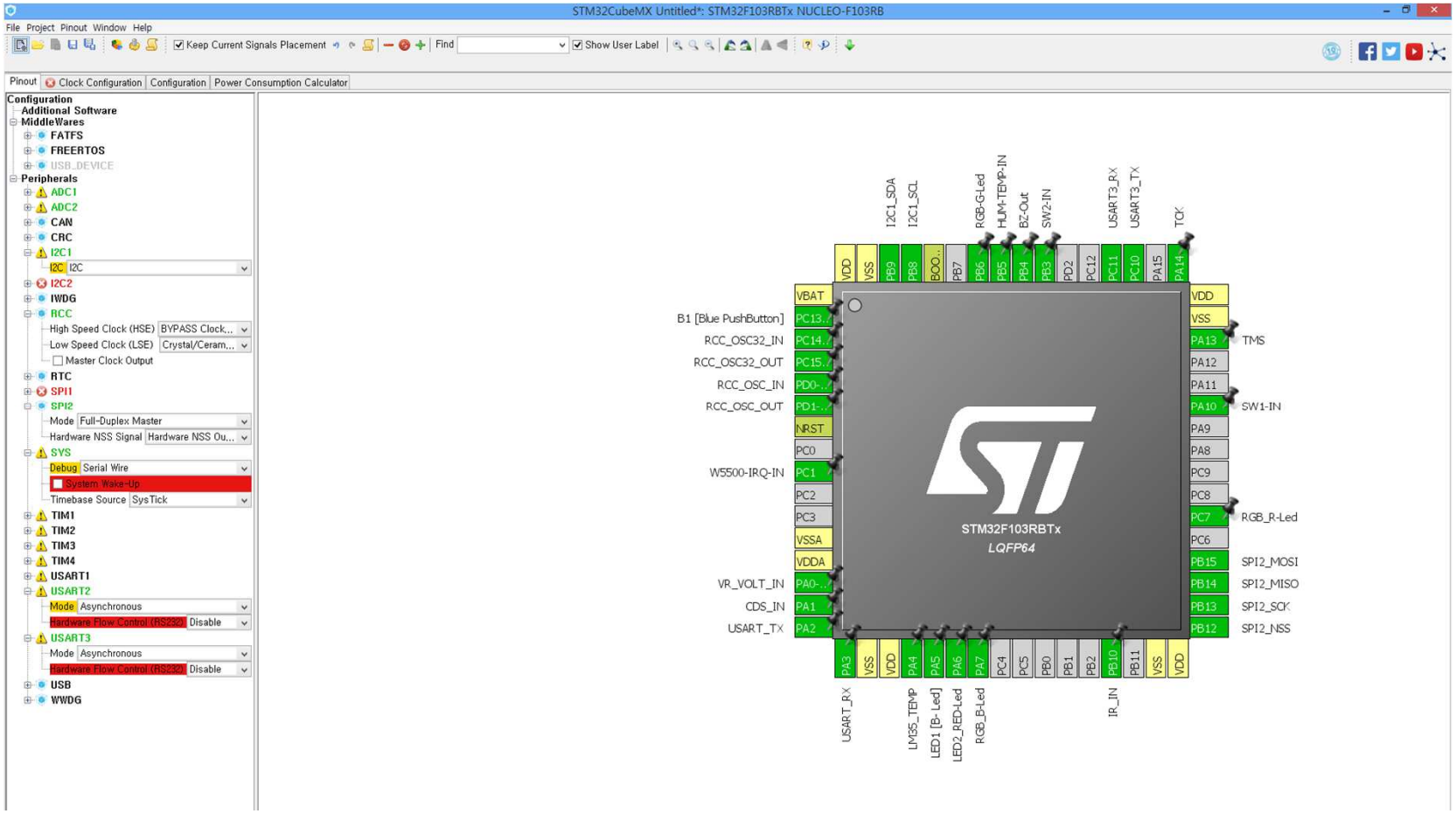
목 차


10.1
LED Test

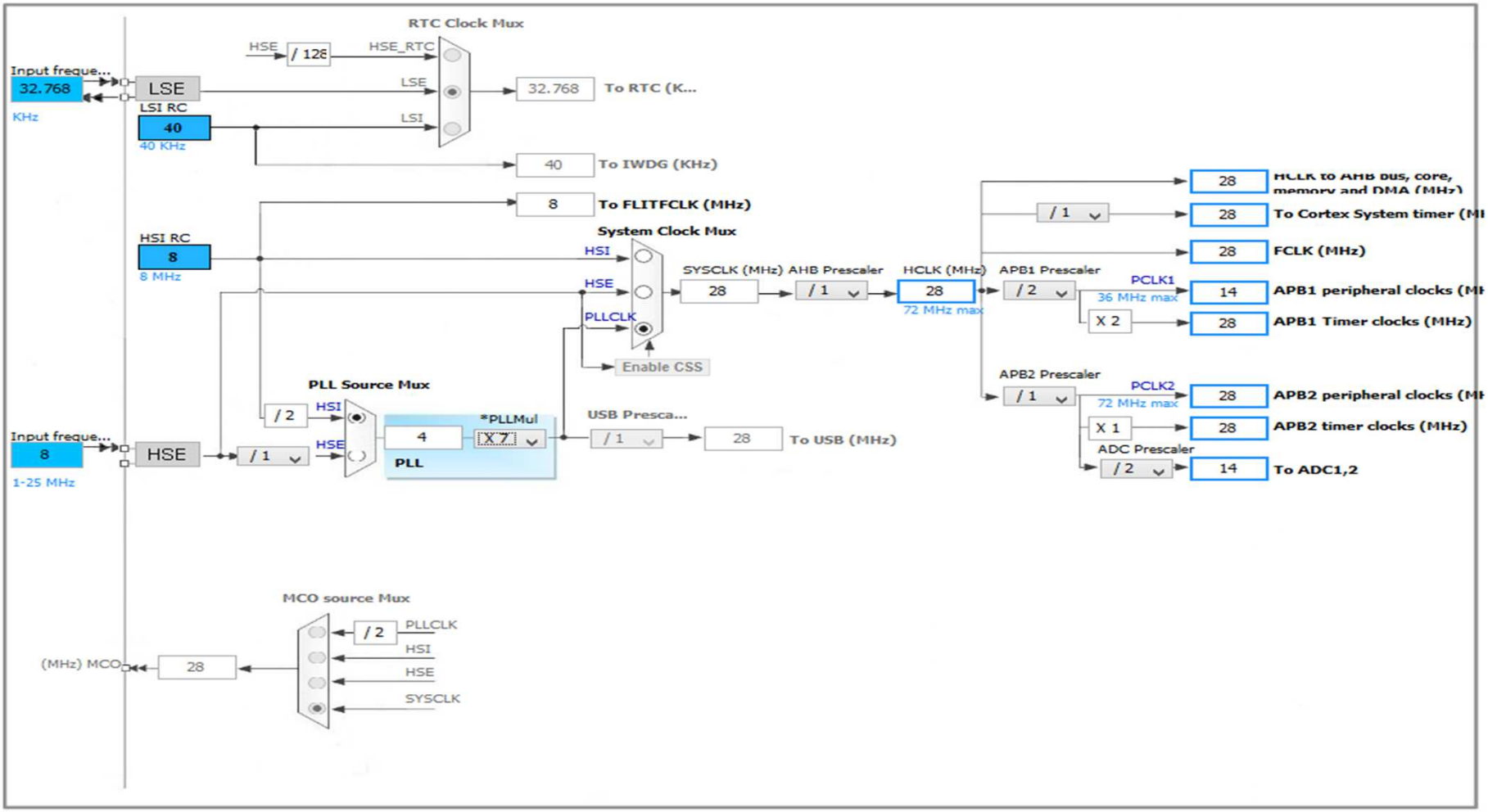
10.1.1 LED Test(CubeMX MCU I/O Pin Map)



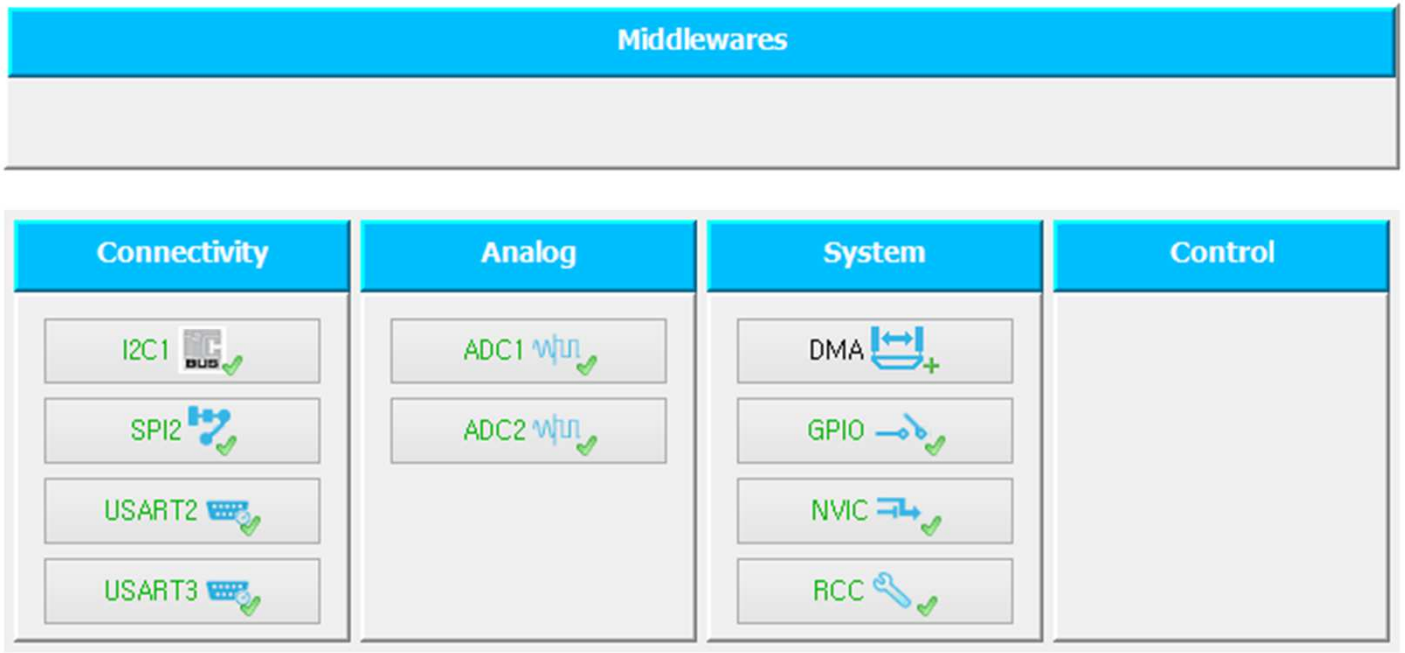
10.1.1 LED Test(CubeMX MCU I/O Pin Map)



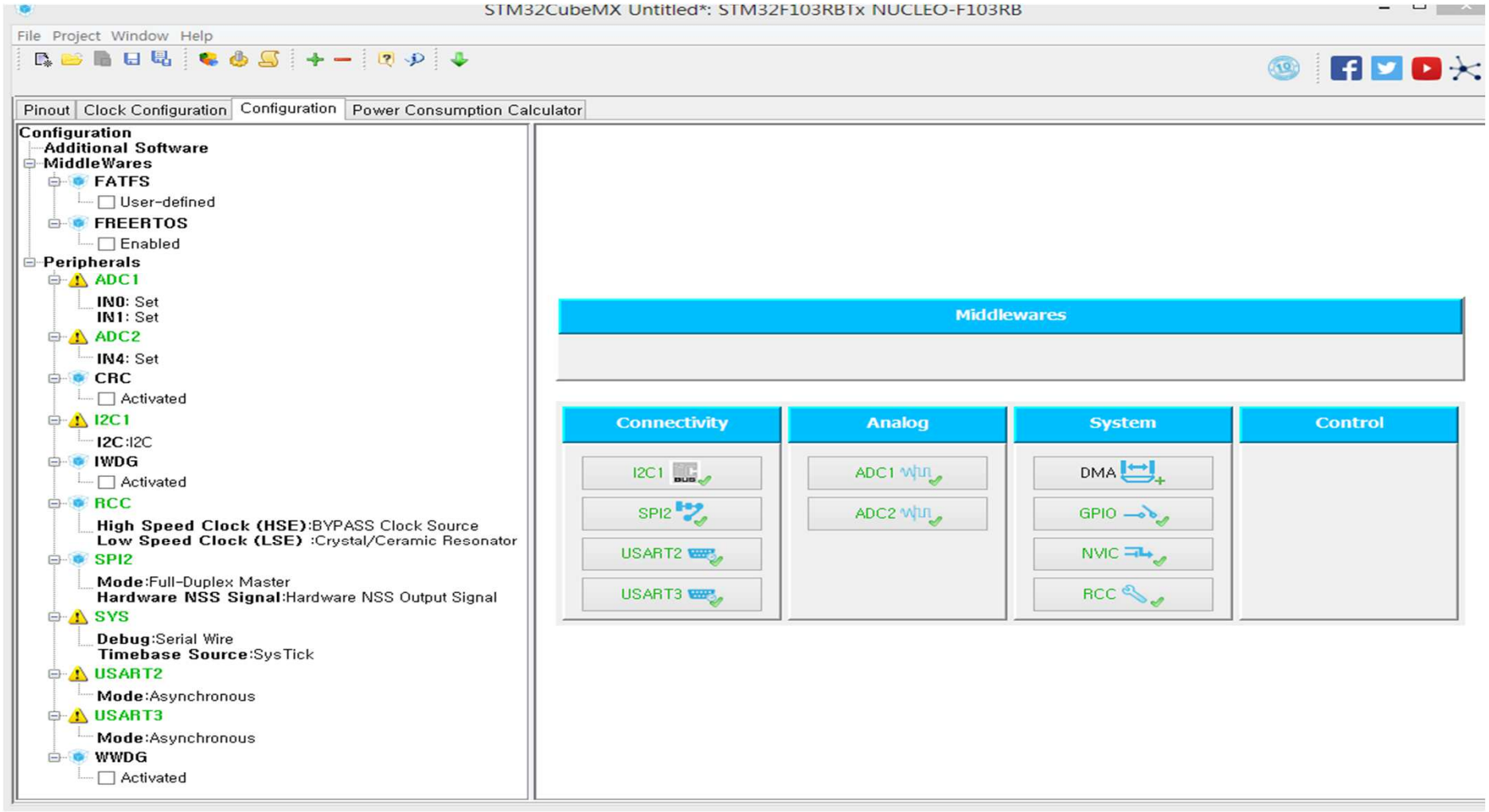
10.1.2 LED Test(System CLK)



10.1.3 LED Test(기능별 상세 설정)



10.1.3 LED Test(기능별 상세 설정)




10.2
Source Code

10.2.1 Main.h(GPIO PIN define)

```
52 #define B1_Pin GPIO_PIN_13
53 #define B1_GPIO_Port GPIOC
54 #define B1_EXTI_IRQn EXTI15_10_IRQn
55 #define W5500_IRQ_IN_Pin GPIO_PIN_1
56 #define W5500_IRQ_IN_GPIO_Port GPIOC
57 #define W5500_IRQ_IN_EXTI_IRQn EXTI1_IRQn
58 #define VR_VOLT_IN_Pin GPIO_PIN_0
59 #define VR_VOLT_IN_GPIO_Port GPIOA
60 #define CDS_IN_Pin GPIO_PIN_1
61 #define CDS_IN_GPIO_Port GPIOA
62 #define USART_TX2_Pin GPIO_PIN_2
63 #define USART_TX2_GPIO_Port GPIOA
64 #define USART_RX2_Pin GPIO_PIN_3
65 #define USART_RX2_GPIO_Port GPIOA
66 #define LM35_TEMP_Pin GPIO_PIN_4
67 #define LM35_TEMP_GPIO_Port GPIOA
```

10.2.1 Main.h(GPIO PIN define)

```
68 #define LED1_Pin GPIO_PIN_5
69 #define LED1_GPIO_Port GPIOA
70 #define LED2_RED_Led_Pin GPIO_PIN_6
71 #define LED2_RED_Led_GPIO_Port GPIOA
72 #define RGB_B_Led_Pin GPIO_PIN_7
73 #define RGB_B_Led_GPIO_Port GPIOA
74 #define IR_IN_Pin GPIO_PIN_10
75 #define IR_IN_GPIO_Port GPIOB
76 #define RGB_R_Led_Pin GPIO_PIN_7
77 #define RGB_R_Led_GPIO_Port GPIOC
78 #define SW1_IN_Pin GPIO_PIN_10
79 #define SW1_IN_GPIO_Port GPIOA
80 #define TMS_Pin GPIO_PIN_13
81 #define TMS_GPIO_Port GPIOA
82 #define TCK_Pin GPIO_PIN_14
83 #define TCK_GPIO_Port GPIOA
```

10.2.1 Main.h(GPIO PIN define)

```
84 #define USART_TX3_Pin GPIO_PIN_10
85 #define USART_TX3_GPIO_Port GPIOC
86 #define USART_RX3_Pin GPIO_PIN_11
87 #define USART_RX3_GPIO_Port GPIOC
88 #define SW2_IN_Pin GPIO_PIN_3
89 #define SW2_IN_GPIO_Port GPIOB
90 #define BZ_Out_Pin GPIO_PIN_4
91 #define BZ_Out_GPIO_Port GPIOB
92 #define HUM_TEMP_IN_Pin GPIO_PIN_5
93 #define HUM_TEMP_IN_GPIO_Port GPIOB
94 #define RGB_G_Led_Pin GPIO_PIN_6
95 #define RGB_G_Led_GPIO_Port GPIOB
```

10.2.2 My GPIO LIB

- // my code
- **#define Low GPIO_PIN_RESET**
- **#define Hi   GPIO_PIN_SET**
- #define ON   1
- #define OFF   0
- #define _ON   0
- #define _OFF 1

- **#define out_port(port, pin, str) HAL_GPIO_WritePin(port, pin, str)**
- **#define out_tg(port, pin) HAL_GPIO_TogglePin(port, pin)**

10.2.3 main.c

- **#include "main.h"**
- **#include "stm32f1xx_hal.h“**

- /* Private variables ---*/
- ADC_HandleTypeDef hadc1;
- ADC_HandleTypeDef hadc2;

- I2C_HandleTypeDef hi2c1;

- SPI_HandleTypeDef hspi2;

- UART_HandleTypeDef huart2;
- UART_HandleTypeDef huart3;

10.2.3 main.c

- /* Private function prototypes -----------------*/
- **void SystemClock_Config(void);**
- **static void MX_GPIO_Init(void);**
- **static void MX_USART2_UART_Init(void);**
- **static void MX_USART3_UART_Init(void);**
- **static void MX_SPI2_Init(void);**
- **static void MX_I2C1_Init(void);**
- **static void MX_ADC1_Init(void);**
- **static void MX_ADC2_Init(void);**

10.2.3 main.c

```
int main(void)
{
  HAL_Init();
  SystemClock_Config();
  MX_GPIO_Init();
  MX_USART2_UART_Init();
  MX_USART3_UART_Init();
  MX_SPI2_Init();
  MX_I2C1_Init();
  MX_ADC1_Init();
  MX_ADC2_Init();
  while(1)
   {

   }
}
```


10.3
Main Source Code

10.3.1 Main Source Code

```
while (1)
  {
   out_port(GPIOA, LED1_Pin | GPIO_PIN_6, 1);
   HAL_Delay(200);
   out_port(GPIOA, LED1_Pin | GPIO_PIN_6, 0); // led 2
   HAL_Delay(200);
   out_tg(GPIOA, LED1_Pin);
   HAL_Delay(200);
   out_port(LED2_RED_Led_GPIO_Port, LED2_RED_Led_Pin, 1);
   HAL_Delay(200);
   out_tg(GPIOA, LED1_Pin | LED2_RED_Led_Pin);
   HAL_Delay(200);
   out_tg(BZ_Out_GPIO_Port, BZ_Out_Pin);
```

10.3.1 Main Source Code

```
out_port(RGB_R_Led_GPIO_Port, RGB_R_Led_Pin, Hi);
HAL_Delay(200);
out_port(RGB_R_Led_GPIO_Port, RGB_R_Led_Pin, Low);

out_port(RGB_G_Led_GPIO_Port, RGB_G_Led_Pin, Hi);
HAL_Delay(200);
out_port(RGB_G_Led_GPIO_Port, RGB_G_Led_Pin, Low);

out_port(RGB_B_Led_GPIO_Port, RGB_B_Led_Pin, 1);
HAL_Delay(200);
out_port(RGB_B_Led_GPIO_Port, RGB_B_Led_Pin, 0);

HAL_Delay(200);
```

10.3.1 Main Source Code

```
out_port(RGB_R_Led_GPIO_Port, RGB_R_Led_Pin, Hi);
out_port(RGB_G_Led_GPIO_Port, RGB_G_Led_Pin,
 GPIO_PIN_SET);
out_port(RGB_B_Led_GPIO_Port, RGB_B_Led_Pin, 1);
HAL_Delay(200);
out_port(RGB_R_Led_GPIO_Port, RGB_R_Led_Pin, 0);
out_port(RGB_G_Led_GPIO_Port, RGB_G_Led_Pin,
 GPIO_PIN_RESET);
out_port(RGB_B_Led_GPIO_Port, RGB_B_Led_Pin, Low);
HAL_Delay(200);
out_tg(BZ_Out_GPIO_Port, BZ_Out_Pin);
HAL_Delay(200);
```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