CENG2400 Lab4 Report

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Here is the lab4 report. The following will show the procedure of the experiment.

When detected the switch1(which is GPIO-PIN-F)is pressed, the function GPIO_PORtF_Handler() will be run. Valuable freq represents the blinking frequency of LED. Default frequency is 2Hz, it will change with loop of 2Hz->8Hz->4Hz->2Hz. To avoid freq changes more than once, after running function, a valuable timer will change to 0.

```c
void GPIO_PORtF_Handler(void) {
    GPIOIntClear(GPIO_PORTF_BASE, GPIO_INT_PIN_4) ;
    if(timer >2){
    if(freq == 2){freq=8;}
    else if(freq == 4){freq=2;}
    else if(freq == 8){freq=4;}
    else {freq =2;return;}}
    GPIOIntClear(GPIO_PORTF_BASE, GPIO_INT_PIN_4) ;
    timer=0;
}
```

In terms of timer, function Timer0IntHandler() will handle the timer interrupt. Timer 0 subtimer A will cause the function. Each function runs, timer add 1 for GPIO function, timer is for avoiding switch accidently change frequency and keep 2 seconds to change LED color on any frequency. After that, when it over 2 seconds, the function will change the frequency of LED blinking. The color of LED will change with order Red->Green->Blue->Red.

```c
void Timer0IntHandler(void)
{
    // Clear the timer interrupt

    TimerIntClear(TIMER0_BASE, TIMER_TIMA_TIMEOUT);
    TimerLoadSet(TIMER0_BASE, TIMER_A, (SysCtlClockGet() / freq) /2 - 1);
    if(timer<60) timer+=1;
    else timer=2;

    limit = freq*4;


    if(timer==limit){
        if(magic_number==8)magic_number=2;
        else magic_number*=2;
    timer=0;}

    if(color==1)
    {GPIOPinWrite(GPIO_PORTF_BASE, GPIO_PIN_1|GPIO_PIN_2|GPIO_PIN_3, magic_number);
    color=0;}
    else
    {GPIOPinWrite(GPIO_PORTF_BASE, GPIO_PIN_1|GPIO_PIN_2|GPIO_PIN_3, 0x00);
    color=1;}

}
```