LAB 6

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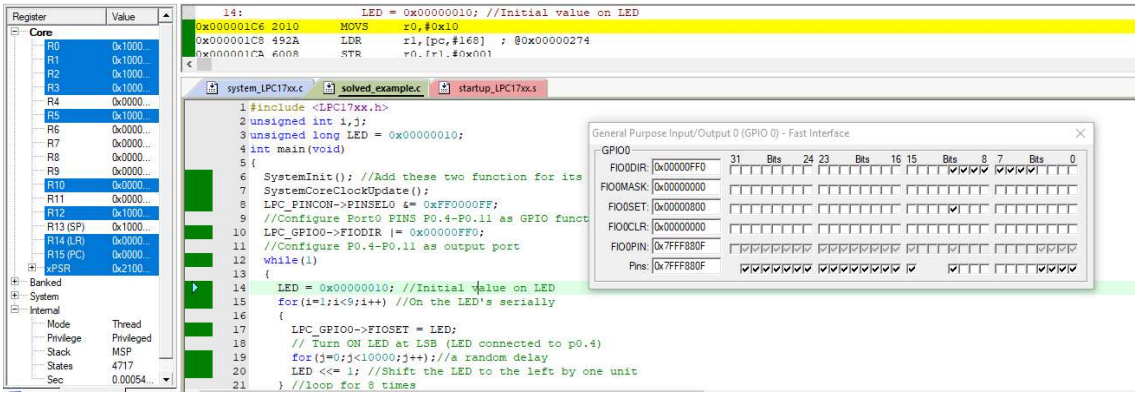
Section A

Solved example

```
#include <LPC17xx.h>
unsigned int i,j;
unsigned long LED = 0x00000010;
int main(void)
{
	SystemInit(); //Add these two function for its internal operation
	SystemCoreClockUpdate();
	LPC_PINCON->PINSEL0 &= 0xFF0000FF;
	//Configure Port0 PINS P0.4-P0.11 as GPIO function
	LPC_GPIO0->FIODIR |= 0x00000FF0;
	//Configure P0.4-P0.11 as output port
	while(1)
	{
		LED = 0x00000010; //Initial value on LED
		for(i=1;i<9;i++) //On the LED's serially
		{
			LPC_GPIO0->FIOSET = LED;
			// Turn ON LED at LSB (LED connected to p0.4)
			for(j=0;j<10000;j++);//a random delay
			LED <<= 1; //Shift the LED to the left by one unit
		} //loop for 8 times
	LED = 0x00000010;
	for(i=1;i<9;i++) //Off the LED's serially
		{
```

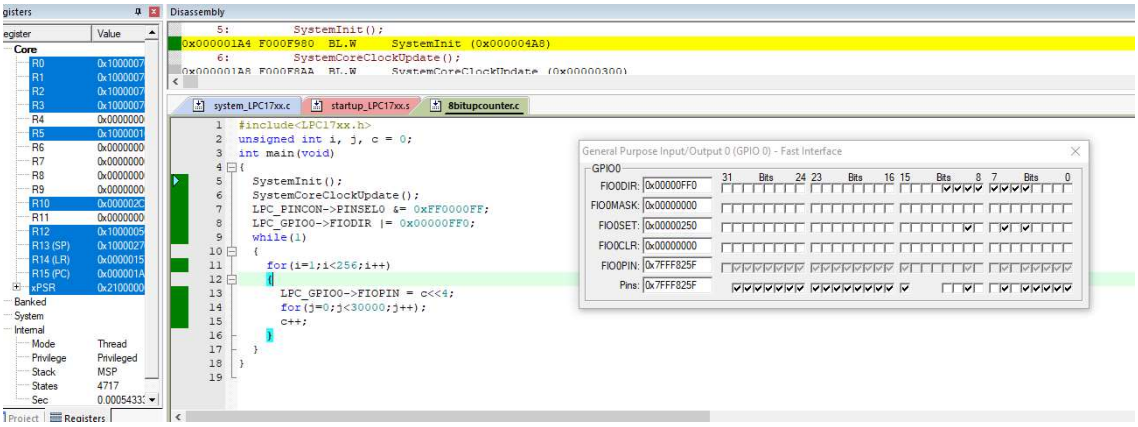
```
                LPC_GPIO0->FIOCLR = LED;
                //Turn OFF LED at LSB (LED connected to p0.4)
                for(j=0;j<10000;j++);
                        LED <<= 1;
                }
        }

}
```



EXERCISE

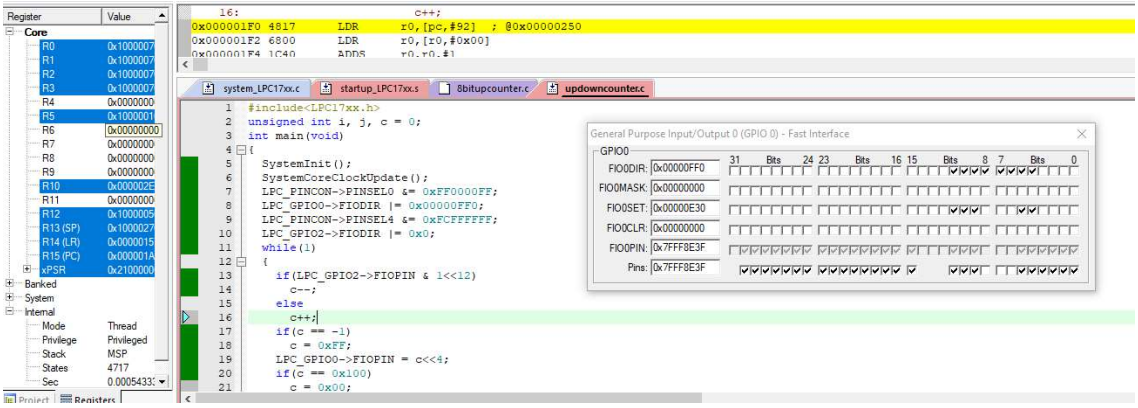
1. 8bit up counter

```
#include<LPC17xx.h>

unsigned int i, j, c = 0;

int main(void)

{

        SystemInit();

        SystemCoreClockUpdate();

        LPC_PINCON->PINSEL0 &= 0xFF0000FF;

        LPC_GPIO0->FIODIR |= 0x00000FF0;

        while(1)

        {

                for(i=1;i<256;i++)

                {

                        LPC_GPIO0->FIOPIN = c<<4;

                        for(j=0;j<30000;j++);

                        c++;

                }

        }

}
```



2.8bit up/down counter

```
#include<LPC17xx.h>
unsigned int i, j, c = 0;
int main(void)
{
	SystemInit();
	SystemCoreClockUpdate();
	LPC_PINCON->PINSEL0 &= 0xFF0000FF;
	LPC_GPIO0->FIODIR |= 0x00000FF0;
	LPC_PINCON->PINSEL4 &= 0xFCFFFFFF;
	LPC_GPIO2->FIODIR |= 0x0;
	while(1)
	{
		if(LPC_GPIO2->FIOPIN & 1<<12)
			c--;
		else
			c++;
		if(c == -1)
			c = 0xFF;
		LPC_GPIO0->FIOPIN = c<<4;
		if(c == 0x100)
			c = 0x00;
		for(i=0; i<20000; i++);
}
}
```


Register
Value
Core
R0 0x1000007
R1 0x1000007
R2 0x1000007
R3 0x1000007
R4 0x0000000
R5 0x1000001
R6 0x00000000
R7 0x0000000
R8 0x0000000
R9 0x0000000
R10 0x000002E
R11 0x0000000
R12 0x1000005
R13 (SP) 0x1000027
R14 (LR) 0x0000015
R15 (PC) 0x000001A
xPSR 0x2100000
Banked
System
Internal
Mode Thread
Privilege Privileged
Stack MSP
States 4717
Sec 0.0005433
Project
Registers
16: c++;
0x000001F0 4817 LDR r0,[pc,#92] ; @0x00000250
0x000001F2 6800 LDR r0,[r0,#0x00]
0x000001F4 1C40 ADDS r0,r0,#1
system_LPC17xx.c
startup_LPC17xx.s
8bitupcounter.c
updowncounter.c
1 #include<LPC17xx.h>
2 unsigned int i, j, c = 0;
3 int main(void)
4 {
5 SystemInit();
6 SystemCoreClockUpdate();
7 LPC_PINCON->PINSEL0 &= 0xFF0000FF;
8 LPC_GPIO0->FIODIR |= 0x00000FF0;
9 LPC_PINCON->PINSEL4 &= 0xFCFFFFFF;
10 LPC_GPIO2->FIODIR |= 0x0;
11 while(1)
12 {
13 if(LPC_GPIO2->FIOPIN & 1<<12)
14 c--;
15 else
16 c++;
17 if(c == -1)
18 c = 0xFF;
19 LPC_GPIO0->FIOPIN = c<<4;
20 if(c == 0x100)
21 c = 0x00;
General Purpose Input/Output 0 (GPIO 0) - Fast Interface
GPIO0
FIO0DIR: 0x00000FF0
FIO0MASK: 0x00000000
FIO0SET: 0x00000E30
FIO0CLR: 0x00000000
FIO0PIN: 0x7FFF8E3F
Pins: 0x7FFF8E3F
31 Bits 24 23 Bits 16 15 Bits 8 7 Bits 0

3.ring counter

```
#include<LPC17xx.h>

unsigned int i,j;

unsigned long int LED;

int main(void)

{

        SystemInit();

        SystemCoreClockUpdate();

        LPC_PINCON->PINSEL0 &= 0xFF0000FF;

        LPC_GPIO0->FIODIR |= 0x00000FF0;

        while(1)

        {

    LED=0X00000010;

    for(i=1;i<9;i++)

                {

                        LPC_GPIO0->FIOSET=LED;

                        for(j=0;j<20000;j++);

                        LPC_GPIO0->FIOCLR=LED;

                        LED<<=1;

    }

        }

}
```