LAB 8

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Section A

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Roll no. 58

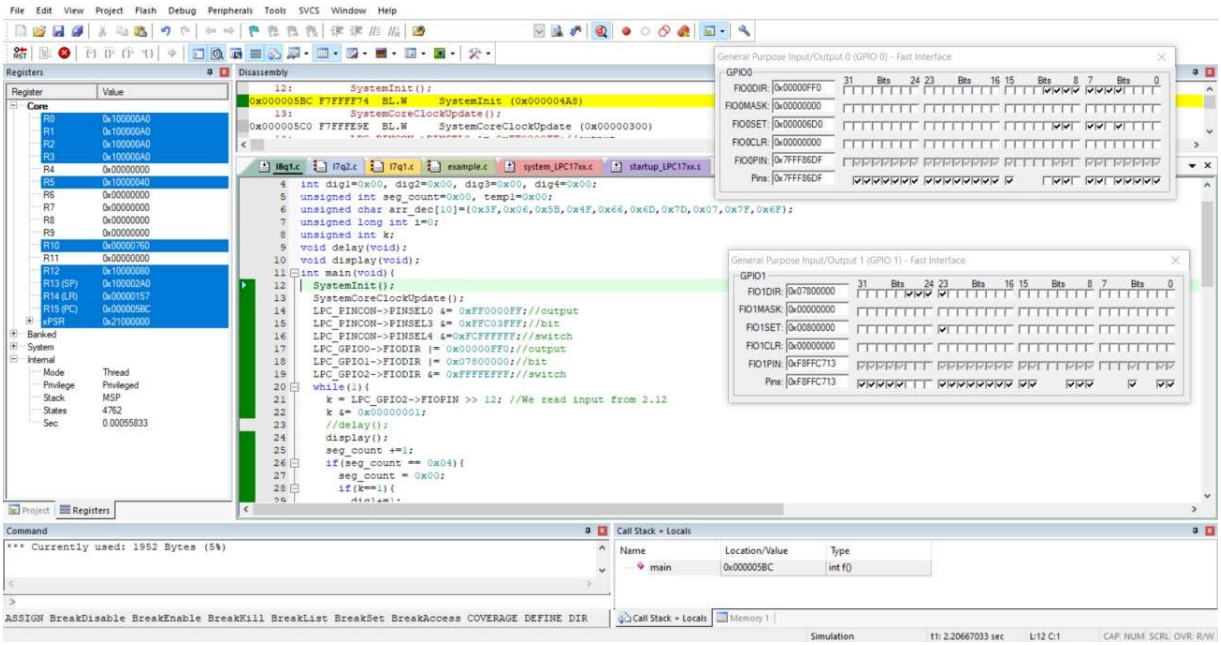
Q1. Write a C program for 4 digit BCD up/down counters on seven segment using a switch and timer with a delay of 1-second between each count.

```
#include<LPC17xx.h>
#include<stdio.h>
unsigned int seg_select[4] = {0<<23, 1<<23, 2<<23, 3<<23};
int dig1=0x00, dig2=0x00, dig3=0x00, dig4=0x00;
unsigned int seg_count=0x00, temp1=0x00;
unsigned char arr_dec[10]={0x3F,0x06,0x5B,0x4F,0x66,0x6D,0x7D,0x07,0x7F,0x6F};
unsigned long int i=0;
unsigned int k;
void delay(void);
void display(void);
int main(void){
        SystemInit();
        SystemCoreClockUpdate();
        LPC_PINCON->PINSEL0 &= 0xFF0000FF;//output
        LPC_PINCON->PINSEL3 &= 0xFFC03FFF;//bit
        LPC_PINCON->PINSEL4 &=0xFCFFFFFF;//switch
        LPC_GPIO0->FIODIR |= 0x00000FF0;//output
        LPC_GPIO1->FIODIR |= 0x07800000;//bit
        LPC_GPIO2->FIODIR &= 0xFFFFEFFF;//switch
        while(1){
                k = LPC_GPIO2->FIOPIN >> 12; //We read input from 2.12
                k &= 0x00000001;
                //delay();
                display();
                seg_count +=1
```

```
if(seg_count == 0x04){
        seg_count = 0x00;
        if(k==1){
                dig1+=1;
                if(dig1 == 0x0A){
                        dig1=0;
                        dig2+=1;
                        if(dig2 == 0x0A){
                                dig2=0;
                                dig3+=1;
                                if(dig3 == 0x0A){
                                        dig3=0;
                                        dig4+=1;
                                        if(dig4 == 0x0A){
                                                dig4=0;
                                        }//end of dig4
                                }//end of dig3
                        }//end of dig2
                }//end of dig1
        }
        else{
                dig1-=1; // if digit is at initial value of 0, this will change to 9
                if(dig1 == -1){
                        dig1=0x9;
                        dig2-=1;
                        if(dig2 == -1){
                                dig2=0x9;
                                dig3-=1;
                                if(dig3 == -1){
```

```
                                                dig3=0x9;
                                                dig4-=1;
                                                if(dig4 == -1){
                                                        dig4=0x9;
                                                }//end of dig4
                                        }//end of dig3
                                }//end of dig2
                        }//end of dig1
                }//end of else
        }//end of segcount
    }//end of while
}//end of main
void display(void){
    LPC_GPIO1->FIOPIN = seg_select[seg_count];
    if(seg_count == 0x00){//for segment U8
        temp1=dig1;
    }
    else if(seg_count == 0x01){//for segment U9
        temp1=dig2;
    }
    else if(seg_count == 0x02){//for segment U10
        temp1=dig3;
    }
    else if(seg_count == 0x03){//for segment U11
        temp1=dig4;
    }
    LPC_GPIO0->FIOPIN = arr_dec[temp1]<<4;//Taking Data Lines for 7-Seg
    for(i=0;i<10;i++);
}
```

```
void delay(void){
        unsigned int i;
        for(i=0;i<10000;i++);
}
```



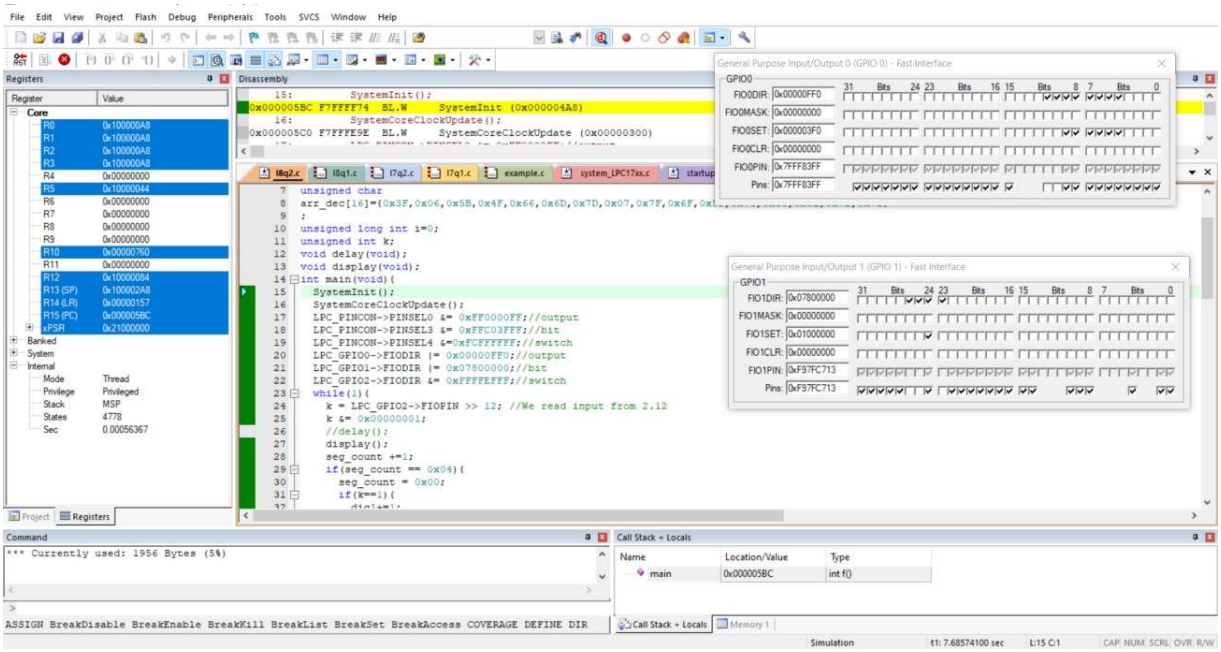
Q2. Write a program for 4 digit Hexadecimal up/down counters on seven segment using a switch and timer with a delay of 1-second between each count.

```
#include<LPC17xx.h>
#include<stdio.h>
unsigned int seg_select[4] = {0<<23, 1<<23, 2<<23, 3<<23};
int dig1=0x00, dig2=0x00, dig3=0x00, dig4=0x00;
unsigned int seg_count=0x00, temp1=0x00;
unsigned char
arr_dec[16]={0x3F,0x06,0x5B,0x4F,0x66,0x6D,0x7D,0x07,0x7F,0x6F,0x5F,0x7C,0x58,0x5E,0x7B,0x71};
unsigned long int i=0;
unsigned int k;
void delay(void);
```

```
void display(void);
int main(void){
	SystemInit();
	SystemCoreClockUpdate();
	LPC_PINCON->PINSEL0 &= 0xFF0000FF;//output
	LPC_PINCON->PINSEL3 &= 0xFFC03FFF;//bit
	LPC_PINCON->PINSEL4 &=0xFCFFFFFF;//switch
	LPC_GPIO0->FIODIR |= 0x00000FF0;//output
	LPC_GPIO1->FIODIR |= 0x07800000;//bit
	LPC_GPIO2->FIODIR &= 0xFFFFEFFF;//switch
	while(1){
		k = LPC_GPIO2->FIOPIN >> 12; //We read input from 2.12
		k &= 0x00000001;
		//delay();
		display();
		seg_count +=1;
		if(seg_count == 0x04){
			seg_count = 0x00;
			if(k==1){
				dig1+=1;
				if(dig1 == 0x10){
					dig1=0;
					dig2+=1;
					if(dig2 == 0x10){
						dig2=0;
						dig3+=1;
						if(dig3 == 0x0A){
							dig3=0;
							dig4+=1;
```

```
                                        if(dig4 == 0x10){
                                                dig4=0;
                                        }//end of dig4
                                }//end of dig3
                        }//end of dig2
                }//end of dig1
        }
        else{
                dig1-=1; // if digit is at initial value of 0, this will change to F
                if(dig1 == -1){
                        dig1=0xF;
                        dig2-=1;
                        if(dig2 == -1){
                                dig2=0xF;
                                dig3-=1;
                                if(dig3 == -1){
                                        dig3=0xF;
                                        dig4-=1;
                                        if(dig4 == -1){
                                                dig4=0xF;
                                        }//end of dig4
                                }//end of dig3
                        }//end of dig2
                }//end of dig1
        }//end of else
    }//end of segcount
  }//end of while
}//end of main
void display(void){
```

```
	LPC_GPIO1->FIOPIN = seg_select[seg_count];
	if(seg_count == 0x00){//for segment U8
		temp1=dig1;
	}
	else if(seg_count == 0x01){//for segment U9
		temp1=dig2;
	}
	else if(seg_count == 0x02){//for segment U10
		temp1=dig3;
	}
	else if(seg_count == 0x03){//for segment U11
		temp1=dig4;
	}
	LPC_GPIO0->FIOPIN = arr_dec[temp1]<<4;//Taking Data Lines for 7-Seg
	for(i=0;i<10;i++);
}
void delay(void){
	unsigned int i;
	for(i=0;i<10000;i++);
}
```


File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Registers
Register
Value
Core
R0 0x100000A8
R1 0x100000A8
R2 0x100000A8
R3 0x100000A8
R4 0x00000000
R5 0x10000044
R6 0x00000000
R7 0x00000000
R8 0x00000000
R9 0x00000000
R10 0x00000760
R11 0x00000000
R12 0x10000084
R13 (SP) 0x100002A8
R14 (LR) 0x00000157
R15 (PC) 0x000005BC
xPSR 0x21000000
Banked
System
Internal
Mode Thread
Privilege Privileged
Stack MSP
States 4778
Sec 0.00056367
Disassembly
15: SystemInit();
0x000005BC F7FFFF74 BL.W SystemInit (0x000004A8)
16: SystemCoreClockUpdate();
0x000005C0 F7FFFE9E BL.W SystemCoreClockUpdate (0x00000300)
General Purpose Input/Output 0 (GPIO 0) - Fast Interface
GPIO0
FIO0DIR: 0x00000FF0
FIO0MASK: 0x00000000
FIO0SET: 0x000003F0
FIO0CLR: 0x00000000
FIO0PIN: 0x7FFF83FF
Pins: 0x7FFF83FF
General Purpose Input/Output 1 (GPIO 1) - Fast Interface
GPIO1
FIO1DIR: 0x07800000
FIO1MASK: 0x00000000
FIO1SET: 0x01000000
FIO1CLR: 0x00000000
FIO1PIN: 0xF97FC713
Pins: 0xF97FC713
l8q2.c
l8q1.c
l7q2.c
l7q1.c
example.c
system_LPC17xx.c
unsigned char
arr_dec[16]={0x3F,0x06,0x5B,0x4F,0x66,0x6D,0x7D,0x07,0x7F,0x6F,
unsigned long int i=0;
unsigned int k;
void delay(void);
void display(void);
int main(void){
SystemInit();
SystemCoreClockUpdate();
LPC_PINCON->PINSEL0 &= 0xFF0000FF;//output
LPC_PINCON->PINSEL3 &= 0xFFC03FFF;//bit
LPC_PINCON->PINSEL4 &=0xFCFFFFFF;//switch
LPC_GPIO0->FIODIR |= 0x00000FF0;//output
LPC_GPIO1->FIODIR |= 0x07800000;//bit
LPC_GPIO2->FIODIR &= 0xFFFFEFFF;//switch
while(1){
k = LPC_GPIO2->FIOPIN >> 12; //We read input from 2.12
k &= 0x00000001;
//delay();
display();
seg_count +=1;
if(seg_count == 0x04){
seg_count = 0x00;
if(k==1){
Project
Registers
Command
*** Currently used: 1956 Bytes (5%)
ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE DEFINE DIR
Call Stack + Locals
Name
Location/Value
Type
main
0x000005BC
int f()
Call Stack + Locals
Memory 1
Simulation
t1: 7.68574100 sec
L:15 C:1
CAP NUM SCRL OVR R/W