**Ayush Goyal**

**190905522 CSE D 62**

**ES Lab 7(contd.) Week 8 – Programs on Multiplexed Seven Segment Display**

**2. Write a C program to simulate a 4-digit BCD down counter.**

**CODE:**

#include<LPC17xx.h>

#include<stdio.h>

unsigned int seg\_select[4] = {0<<23, 1<<23, 2<<23, 3<<23};

int dig1=0x09, dig2=0x09, dig3=0x09, dig4=0x09;

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;

void delay(void);

void display(void);

int main(void){

    SystemInit();

    SystemCoreClockUpdate();

    LPC\_PINCON->PINSEL0 &= 0xFF0000FF;

    LPC\_PINCON->PINSEL3 &= 0xFFC03FFF;

    LPC\_GPIO0->FIODIR |= 0x00000FF0;

    LPC\_GPIO1->FIODIR |= 0x07800000;

    while(1){

        delay();

        display();

        seg\_count +=1;

        if(seg\_count == 0x04){

            seg\_count = 0x00;

            dig1-=1;

            if(dig1 < 0){

                dig1=0x09;

                dig2-=1;

                if(dig2 < 0){

                    dig2=0x09;

                    dig3-=1;

                    if(dig3 < 0){

                        dig3=0x09;

                        dig4-=1;

                        if(dig4 < 0){

                            dig4=0x09;

                        }*//eod4*

                    }*//eod3*

                }*//eod2*

            }*//eod1*

        }*//eosegcount*

    }*//eowhile*

}*//eomain*

void display(void){

    LPC\_GPIO1->FIOPIN = seg\_select[seg\_count];

    if(seg\_count == 0x00){*//for segment U9*

        temp1=dig1;

    }

    else if(seg\_count == 0x01){*//for segment U10*

        temp1=dig2;

    }

    else if(seg\_count == 0x02){*//for segment U11*

        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<100000;i++);

}

void delay(void){

    unsigned int i;

    for(i=0;i<10000;i++);

}

**OUTPUT:**

**3. Write a C program for 4-digit BCD up/down counters on seven segment display using a switch.**

**CODE:**

#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;

                            }*//eod4*

                        }*//eod3*

                    }*//eod2*

                }*//eod1*

            }

            else{

                dig1-=1;

                if(dig1 < 0){

                    dig1=0x09;

                    dig2-=1;

                    if(dig2 < 0){

                        dig2=0x09;

                        dig3-=1;

                        if(dig3 < 0){

                            dig3=0x09;

                            dig4-=1;

                            if(dig4 < 0){

                                dig4=0x09;

                            }*//eod4*

                        }*//eod3*

                    }*//eod2*

                }*//eod1*

            }*//eoelse*

        }*//eosegcount*

    }*//eowhile*

}*//eomain*

void display(void){

    LPC\_GPIO1->FIOPIN = seg\_select[seg\_count];

    if(seg\_count == 0x00){*//for segment U9*

        temp1=dig1;

    }

    else if(seg\_count == 0x01){*//for segment U10*

        temp1=dig2;

    }

    else if(seg\_count == 0x02){*//for segment U11*

        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<100000;i++);

}

void delay(void){

    unsigned int i;

    for(i=0;i<10000;i++);

}

**OUTPUT:**

**4. Write a program for 4-digit Hexadecimal up/down counters on seven segment displays using a switch.**

**CODE:**