Keypad interfacing with ARM7 ( LPC2148 )

#include <lpc21xx.h>

#define LCD (0xff<<8)

#define RS (1<<16)

#define RW (1<<17)

#define EN (1<<18)

#define r1 (1<<16)

#define r2 (1<<17)

#define r3 (1<<18)

#define r4 (1<<19)

#define c1 (1<<20)

#define c2 (1<<21)

#define c3 (1<<22)

#define c4 (1<<23)

void delay(unsigned int time);           // variable delay function

void lcd\_ini(void);

void lcd\_print(char \*str);

void lcd\_cmd(unsigned char command);

void lcd\_dat(unsigned int data);

unsigned char keypad (void);

void keypad\_delay(void);

int main (void)

   {

        PINSEL0 = 0x00000000;

        IODIR0 = 0Xffffffff;

        PINSEL1 = 0x00000000;

        IODIR1 = 0x00f00000;

        lcd\_ini();

        lcd\_print("Press any key");

        lcd\_cmd(0xc0);

        while(1)

          {

                lcd\_dat(keypad());

          }

        return 0;

   }

void keypad\_delay(void)

   {

        unsigned int t1,t2;

        for(t1=0;t1<300;t1++)

                for(t2=0;t2<1275;t2++);

   }

unsigned char keypad (void)

   {

        unsigned char key;

        IOCLR1|=(c1|c2|c3|c4|r1|r2|r3|r4);

        while(1)

           {

                IOCLR1|=c1;

                IOSET1|=(c2|c3|c4);                     // first column = 0

                if((IOPIN1&r1)==0)

                   {

                        key='7';

                        keypad\_delay();

                        return key;

                   }

                else if((IOPIN1&r2)==0)

                  {

                        key='8';

                        keypad\_delay();

                        return key;

                  }

                else if((IOPIN1&r3)==0)

                  {

                        key='9';

                        keypad\_delay();

                        return key;

                  }

                else if((IOPIN1&r4)==0)

                  {

                        key='/';

                        keypad\_delay();

                        return key;

                  }

                IOCLR1|=c2;

                IOSET1|=(c1|c3|c4);                     //second column = 0

                if((IOPIN1&r1)==0)

                  {

                        key='4';

                        keypad\_delay();

                        return key;

                  }

                else if((IOPIN1&r2)==0)

                  {

                        key='5';

                        keypad\_delay();

                        return key;

                  }

                else if((IOPIN1&r3)==0)

                  {

                        key='6';

                        keypad\_delay();

                        return key;

                  }

                else if((IOPIN1&r4)==0)

                  {

                        key='\*';

                        keypad\_delay();

                        return key;

                  }

                IOCLR1|=c3;

                IOSET1|=(c1|c2|c4);                     //third column = 0

                if((IOPIN1&r1)==0)

                  {

                        key='1';

                        keypad\_delay();

                        return key;

                  }

                else if((IOPIN1&r2)==0)

                  {

                        key='2';

                        keypad\_delay();

                        return key;

                  }

                else if((IOPIN1&r3)==0)

                  {

                        key='3';

                        keypad\_delay();

                        return key;

                  }

                else if((IOPIN1&r4)==0)

                  {

                        key='-';

                        keypad\_delay();

                        return key;

                  }

                IOCLR1|=c4;

                IOSET1|=(c1|c2|c3);                     //forth column = 0

                if((IOPIN1&r1)==0)

                  {

                        lcd\_cmd(0x01);

                        keypad\_delay();

                  }

                else if((IOPIN1&r2)==0)

                  {

                        key='0';

                        keypad\_delay();

                        return key;

                  }

                else if((IOPIN1&r3)==0)

                  {

                        key='=';

                        keypad\_delay();

                        return key;

                  }

                else if((IOPIN1&r4)==0)

                  {

                        key='+';

                        keypad\_delay();

                        return key;

                  }

          }

   }

void lcd\_cmd(unsigned char command)

  {

        IO0CLR|=(RS|RW|EN|LCD);

        IO0SET|=(command<<8);

        IO0CLR|=RS;

        IO0CLR|=RW;

        IO0SET|=EN;

        delay(2);

        IO0CLR|=EN;

        delay(3);

  }

void lcd\_dat(unsigned int data)

  {

        IO0CLR|=(RS|RW|EN|LCD);

        IO0SET|=(data<<8);

        IO0SET|=RS;

        IO0CLR|=RW;

        IO0SET|=EN;

        delay(2);

        IO0CLR|=EN;

        delay(3);

  }

void lcd\_print(char \*str)

  {

        while(\*str!='\0')

          {

                lcd\_dat(\*str);

                str++;

          }

  }

void lcd\_ini(void)

  {

        delay(5);

        lcd\_cmd(0X38);

        lcd\_cmd(0X0f);

        lcd\_cmd(0X06);

        lcd\_cmd(0X01);

        delay(5);

        lcd\_cmd(0X80);

  }

void delay(unsigned int time)           // variable delay function

  {

        unsigned int t1,t2;

        for(t1=0;t1<time;t1++)

                for(t2=0;t2<1275;t2++);

  }

