KEYPAD LOCKSYSTEM CODE

Program:

```c
#include<lpc214x.h>

#define bit(x) (1<<x) //Macros for shifting the bits by 'x'

unsigned char pass[4] = "5555";   //Set Default Password

unsigned int i, range = 0;

unsigned char r_loc, c_loc;

unsigned char key[4][3] = {"123","456","789","*0#"}; //Keypad Key Digits

unsigned char keypad(void); // Function Declaration

void delay () // Delay Function Definition
{
   unsigned int temp, ct;

   for(ct=0; ct<30; ct++)
           {
      for(temp = 0; temp < 65000; temp ++);
   }
}
```

```c
/* --------- DC Motor ----- */

void forward(void);
void reverse(void);
void stop(void);


/* --------- LCD ---------*/

void lcd_init(void);
void cmd(unsigned char a);
void dat(unsigned char b);
void show(unsigned char *s);
void lcd_delay(void);


/* ----------- Keypad ------*/

#define c1 (IOPIN1&1<<20)

#define c2 (IOPIN1&1<<21)

#define c3 (IOPIN1&1<<22)

/* ------- Main -------*/
int main()
{
```

```c
unsigned char rx_arr[4]; //Store the INPUT Password

int count; //Counter to keep count of number of digits in the Password.

VPBDIV = 0x01; // PCLK = 60MHz where APB bus clock (PCLK) is the same as the processor clock (CCLK)

IO1DIR |= 0x0f<<16; //P1.16, P1.17, P1.18, P1.19

IO0DIR |= 0xf00fc; //P0.2, P0.3, P0.4, P0.5, P0.6, P0.7, P0.16, P0.17, P0.18 - Set as OUTPUT

lcd_init();

while(1) {
    cmd(0x80); //Cursor to the Beginning of the 1st Line

    show("#Enter Password#"); //Print the Display

    cmd(0xc5); //LCD Setup

    for(count=0; count <4; count++)
    {

        rx_arr[count] = keypad(); //Getting Input

        dat("); //Printing " to denote that the Password has been Typed
    }
```

```
if (( pass[0] == rx_arr[0] ) && ( pass[1] == rx_arr[1] ) &&
    ( pass[2] == rx_arr[2] ) && ( pass[3] == rx_arr[3] ))
                    {
    cmd(0xc0); //Cursor to the beginning of the 2nd Line


    show("   Thank You!   "); //Print the TEXT


    forward();
    delay();
    stop();


    cmd(0xc0);


    show("  Come Again!!  "); //Print the TEXT


    delay();
    reverse();
    delay();
    stop();

}
                    else

                    {
    cmd(0xc0);


    show("Wrong Password");
```

```c
            delay();
        }


                        cmd(0x01);


    }
}


/* ----- Keypad Function ----*/
unsigned char keypad()
{
    IO1PIN &= ~(0xff<<16);


    IO1PIN |= 0xf0<<16;


    while(c1 && c2 && c3);


    while(!c1 || !c2 || !c3)
            {
        if(!c1 && c2 && c3)     c_loc=0;
        else if(c1 && !c2 && c3)   c_loc=1;
        else if(c1 && c2 && !c3)   c_loc=2;


        IO1CLR = 1<<16;
        IO1SET = 0x0e<<16;
```

```c
if(!c1 || !c2 || !c3)
                    {
    r_loc=0;
    break;
}


IO1CLR = 1<<17;
IO1SET = 0x0d<<16;


if(!c1 || !c2 || !c3)
                    {
    r_loc=1;
    break;
}


IO1CLR = 1<<18;
IO1SET = 0x0b<<16;


if(!c1 || !c2 || !c3)
                    {
    r_loc=2;
    break;
}


IO1CLR = 1<<19;
IO1SET = 0x07<<16;
```

```c
        if(!c1 || !c2 || !c3)
                                {
           r_loc=3;
           break;
        }
    }


   while(!c1 || !c2 || !c3);


   return (key[r_loc][c_loc]);
}



/* ----- LCD Functions -------*/

void lcd_init()
{
   cmd(0x02);
   cmd(0x28);
   cmd(0x0c);
   cmd(0x06);
   cmd(0x80);
}


void cmd(unsigned char a)
{
   IO0PIN &= 0xffffff03;
```

```c
    IO0PIN |= (a & 0xf0) << 0;
    IO0CLR |= bit(2);            //rs=0
    IO0CLR |= bit(1);            //rw=0
    IO0SET |= bit(3);            //en=1

    lcd_delay();

    IO0CLR |= bit(3);            //en=0

    IO0PIN &= 0xffffff03;
    IO0PIN |= ((a << 4)  & 0xf0) << 0;
    IO0CLR |= bit(2);            //rs=0
    IO0CLR |= bit(1);            //rw=0
    IO0SET |= bit(3);            //en=1

    lcd_delay();

    IO0CLR |= bit(3);            //en=0
}

void dat(unsigned char b)
{
    IO0PIN &= 0xffffff03;
    IO0PIN |= (b & 0xf0) << 0;
    IO0SET |= bit(2);            //rs=1
    IO0CLR |= bit(1);            //rw=0
    IO0SET |= bit(3);            //en=1
```

```c
    lcd_delay();
    IO0CLR |= bit(3);          //en=0

    IO0PIN &= 0xffffff03;
    IO0PIN |= ((b << 4)  & 0xf0) << 0;
    IO0SET |= bit(2);              //rs=1
    IO0CLR |= bit(1);              //rw=0
    IO0SET |= bit(3);          //en=1

    lcd_delay();

    IO0CLR |= bit(3);          //en=0
}

void show(unsigned char *s)
{
    while(*s)
            {
        dat(*s++);
    }
}

void lcd_delay()
{
    unsigned int i;

    for(i=0;i<=1000;i++);
```

```c
}

/* ---------- DC Motor ---------*/
void forward()
{

    IO0SET = bit(16) | bit(18);
    IO0CLR = bit(17);
}

void reverse()
{

    IO0SET = bit(17) | bit(18);
    IO0CLR = bit(16);
}

void stop()
{
    IO0CLR = bit(18);
}
```