Traffic Light Control Using ARM7 LPC2148

Traffic Light Control:

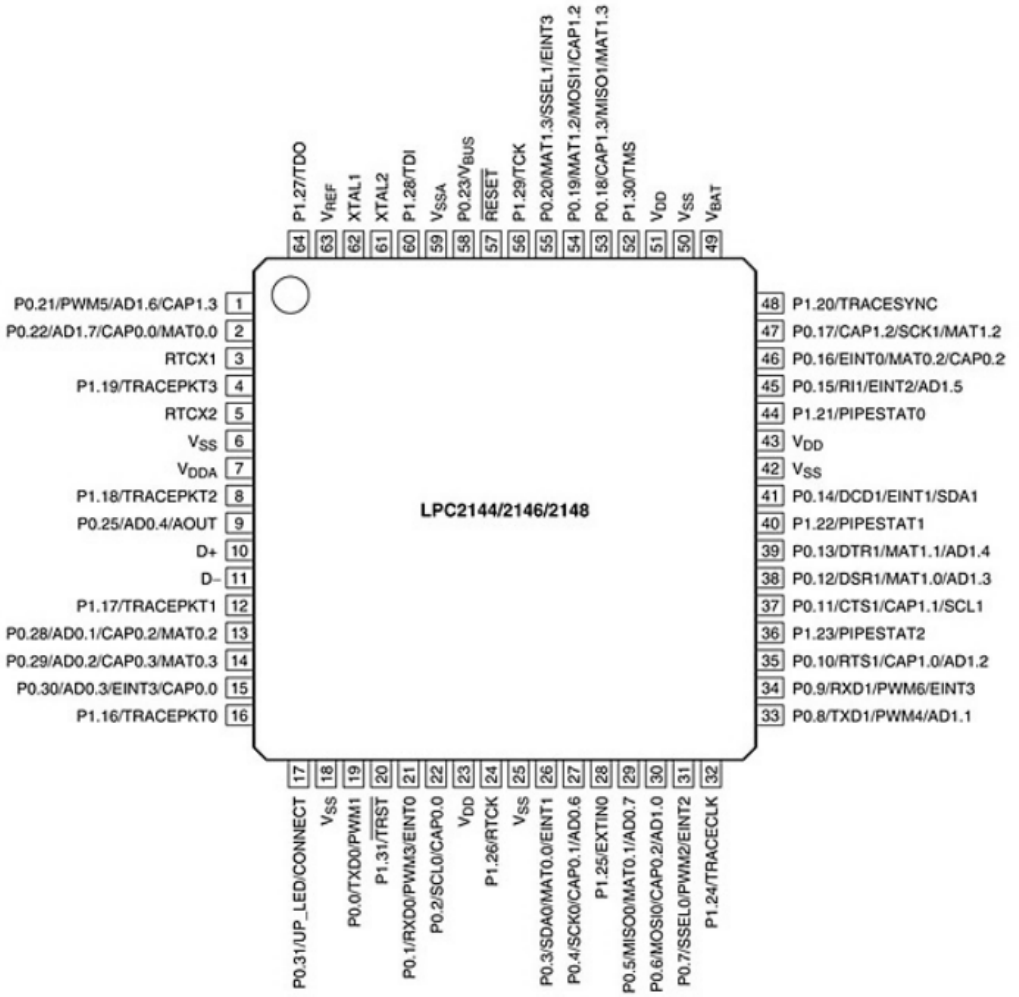
- Traffic lights, which may also be known as stoplights, traffic lamps, traffic signals, signal lights, robots or semaphore, are signaling devices positioned at road intersections, pedestrian crossings and other locations to control competing flows of traffic.
- In the typical sequence of colored lights:
- Illumination of the green light allows traffic to proceed in the direction denoted,
- Illumination of the yellow/amber light denoting, if safe to do so, prepare to stop short of the intersection
- Illumination of the red signal prohibits any traffic from proceeding.

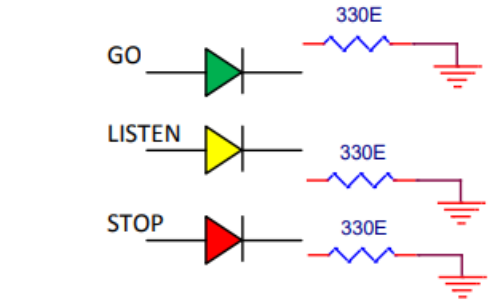
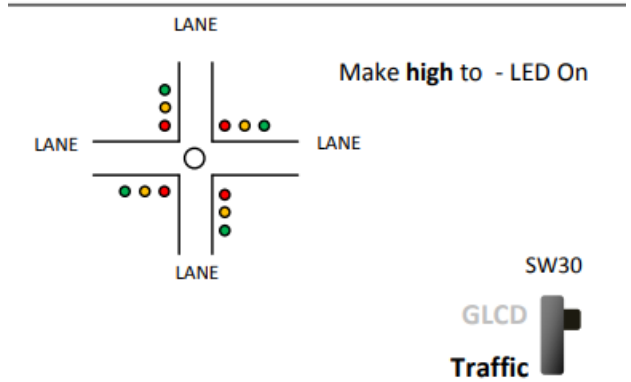
Components Used:

- LPC 2148
- LED Lights(Red,Yellow,Green)
- Seven Segment Display
- Resistors

Pins Used:

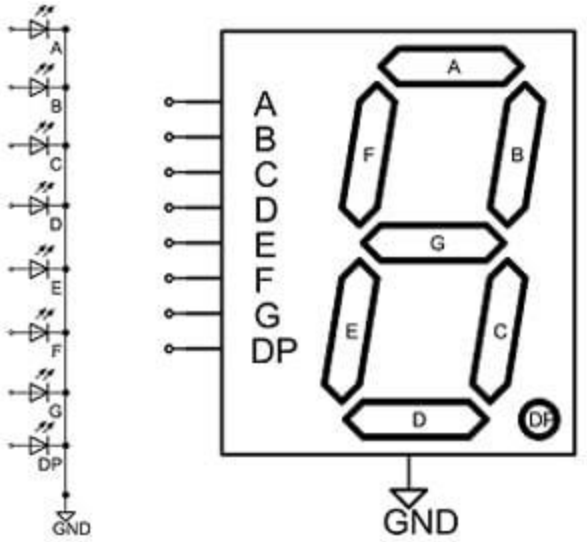
- Port 0 – 0 to 6 for Seven Segment Display
- Port 1 – 16 to 30 for LED's



Direction	LPC2148 Pin	Led Action	Traffic Light Control
NORTH	P0.16	D1 – Red	 
	P0.17	D2 – Yellow	
	P0.18	D3 – Green	
WEST	P0.19	D4 – Red	
	P0.20	D5 – Yellow	
	P0.21	D6 – Green	
SOUTH	P0.22	D7 – Red	
	P0.23	D8 – Yellow	
	P0.25	D9 – Green	
EAST	P0.28	D10 – Red	
	P0.29	D11 – Yellow	
	P0.30	D12 - Green	

Seven Segment Display:

- Used to display the Seconds left for the Green Signal



Seven Segment Display. No	a	b	c	d	e	f	g
1	P0.0	P0.1	P0.2	P0.3	P0.4	P0.5	P0.6
2	P0.7	P0.8	P0.9	P0.10	P0.11	P0.12	P0.13
3	P1.16	P1.17	P1.18	P1.19	P1.20	P1.21	P1.22
4	P1.23	P1.24	P1.25	P1.26	P1.27	P1.28	P1.29

Decimal Digit	Individual Segments Illuminated						
	a	b	c	d	e	f	g
0	1	1	1	1	1	1	0
1	0	1	1	0	0	0	0
2	1	1	0	1	1	0	1
3	1	1	1	1	0	0	1
4	0	1	1	0	0	1	1
5	1	0	1	1	0	1	1
6	1	0	1	1	1	1	1
7	1	1	1	0	0	0	0
8	1	1	1	1	1	1	1
9	1	1	1	1	0	1	1

Code:

```
#include<lpc214x.h>
void segment1();
void segment2();
void segment3();
void segment4();
void delay(){
        int i,j;
        for (i=0; i<2000; i++)
        for (j = 0; j<2000; j++);
}
int main(){
        PINSEL1=0X00000000;
        IODIR0=0X72FF0000;
        while(1){
                IOCLR0=0X404A0000;
                IOSET0=0X10540000; //North Green
                segment1();
                IOCLR0=0X10540000;
                IOSET0=0X10A10000;  //West Green
                segment2();
                IOCLR0=0X10A10000;
                IOSET0=0X22090000;          //South
Green
                segment3();
                IOCLR0=0X22090000;
                IOSET0=0X404A0000;  //East Green
                segment4();
        }
}
```

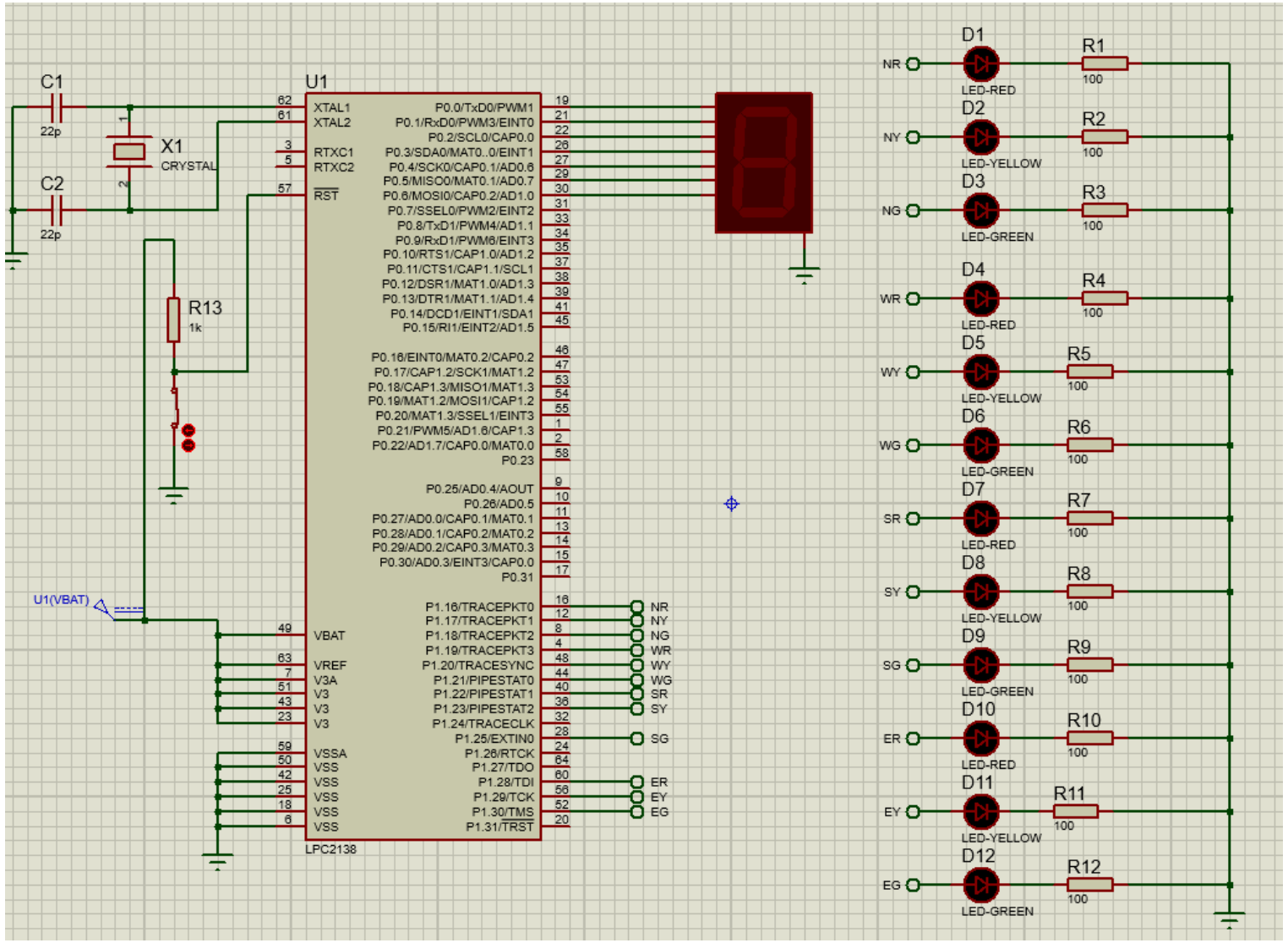
```
void segment1(){
        PINSEL0=0X00000000;
        IODIR0 |=0XFF;
        IOCLR0=0XFF;
        IOSET0=0X6F;
        delay();
        IOCLR0=0XFF;
        IOSET0=0X7F;
        delay();
        IOCLR0=0XFF;
        IOSET0=0X07;
        delay();
        IOCLR0=0XFF;
        IOSET0=0X7D;
        delay();
        IOCLR0=0XFF;
        IOSET0=0X6D;
        delay();
        IOCLR0=0XFF;
        IOSET0=0X66;
        delay();
        IOCLR0=0XFF;
        IOSET0=0X4F;
        delay();
        IOCLR0=0XFF;
        IOSET0=0X5B;
        delay();
        IOCLR0=0XFF;
        IOSET0=0X06;
        delay();
        IOCLR0=0XFF;
        IOSET0=0X3F;
        delay();
        IOCLR0=0XFF;
}
```

```
void segment2(){
        PINSEL0=0X00000000;
        IODIR0 |=0X3F80;
        IOCLR0=0XFF<<7;
        IOSET0=0X6F <<7;
        delay();
        IOCLR0=0XFF <<7;
        IOSET0=0X7F <<7;
        delay();
        IOCLR0=0XFF <<7;
        IOSET0=0X07 <<7;
        delay();
        IOCLR0=0XFF <<7;
        IOSET0=0X7D <<7;
        delay();
        IOCLR0=0XFF <<7;
        IOSET0=0X6D <<7;
        delay();
        IOCLR0=0XFF <<7;
        IOSET0=0X66 <<7;
        delay();
        IOCLR0=0XFF <<7;
        IOSET0=0X4F <<7;
        delay();
        IOCLR0=0XFF <<7;
        IOSET0=0X5B <<7;
        delay();
        IOCLR0=0XFF <<7;
        IOSET0=0X06 <<7;
        delay();
        IOCLR0=0XFF <<7;
        IOSET0=0X3F <<7;
        delay();
        IOCLR0=0XFF <<7;
}
```

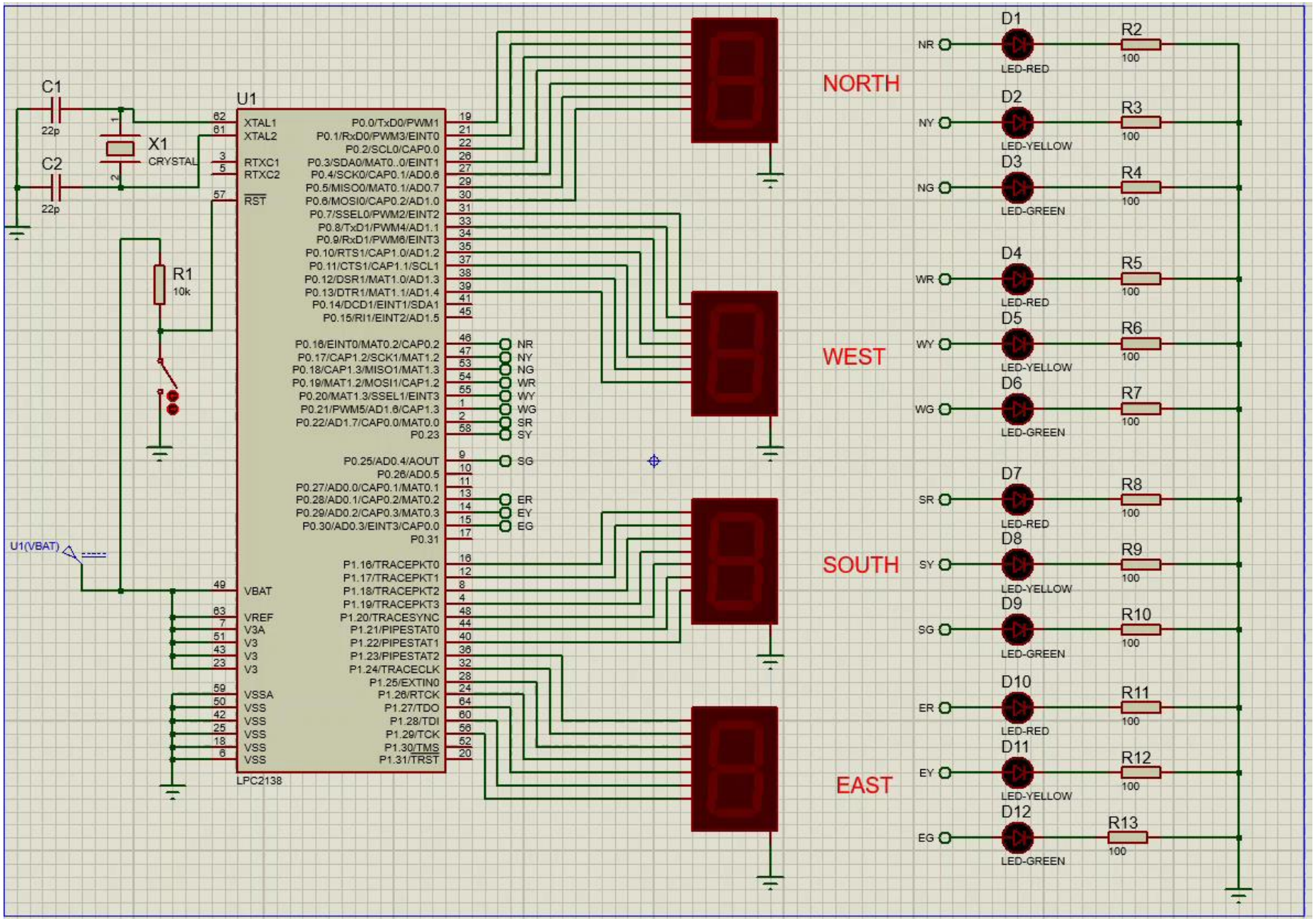
```
void segment3(){
        PINSEL2=0X00000000;
        IODIR1 |=0X7F0000;
        IOCLR1=0XFF<<16;
        IOSET1=0X6F <<16;
        delay();
        IOCLR1=0XFF <<16;
        IOSET1=0X7F <<16;
        delay();
        IOCLR1=0XFF <<16;
        IOSET1=0X07 <<16;
        delay();
        IOCLR1=0XFF <<16;
        IOSET1=0X7D <<16;
        delay();
        IOCLR1=0XFF <<16;
        IOSET1=0X6D <<16;
        delay();
        IOCLR1=0XFF <<16;
        IOSET1=0X66 <<16;
        delay();
        IOCLR1=0XFF <<16;
        IOSET1=0X4F <<16;
        delay();
        IOCLR1=0XFF <<16;
        IOSET1=0X5B <<16;
        delay();
        IOCLR1=0XFF <<16;
        IOSET1=0X06 <<16;
        delay();
        IOCLR1=0XFF <<16;
        IOSET1=0X3F <<16;
        delay();
        IOCLR1=0XFF <<16;
}
```

```
void segment4(){
        PINSEL2=0X00000000;
        IODIR1 |=0X3F800000;
        IOCLR1=0XFF<<23;
        IOSET1=0X6F <<23;
        delay();
        IOCLR1=0XFF <<23;
        IOSET1=0X7F <<23;
        delay();
        IOCLR1=0XFF <<23;
        IOSET1=0X07 <<23;
        delay();
        IOCLR1=0XFF <<23;
        IOSET1=0X7D <<23;
        delay();
        IOCLR1=0XFF <<23;
        IOSET1=0X6D <<23;
        delay();
        IOCLR1=0XFF <<23;
        IOSET1=0X66 <<23;
        delay();
        IOCLR1=0XFF <<23;
        IOSET1=0X4F <<23;
        delay();
        IOCLR1=0XFF <<23;
        IOSET1=0X5B <<23;
        delay();
        IOCLR1=0XFF <<23;
        IOSET1=0X06 <<23;
        delay();
        IOCLR1=0XFF <<23;
        IOSET1=0X3F <<23;
        delay();
        IOCLR1=0XFF <<23;
}
```

Circuit Diagram:



Output:


U1
LPC2138
XTAL1
XTAL2
RTXC1
RTXC2
RST
VBAT
VREF
V3A
V3
V3
V3
VSSA
VSS
VSS
VSS
VSS
VSS
P0.0/TxD0/PWM1
P0.1/RxD0/PWM3/EINT0
P0.2/SCL0/CAP0.0
P0.3/SDA0/MAT0..0/EINT1
P0.4/SCK0/CAP0.1/AD0.6
P0.5/MISO0/MAT0.1/AD0.7
P0.6/MOSI0/CAP0.2/AD1.0
P0.7/SSEL0/PWM2/EINT2
P0.8/TxD1/PWM4/AD1.1
P0.9/RxD1/PWM6/EINT3
P0.10/RTS1/CAP1.0/AD1.2
P0.11/CTS1/CAP1.1/SCL1
P0.12/DSR1/MAT1.0/AD1.3
P0.13/DTR1/MAT1.1/AD1.4
P0.14/DCD1/EINT1/SDA1
P0.15/RI1/EINT2/AD1.5
P0.16/EINT0/MAT0.2/CAP0.2
P0.17/CAP1.2/SCK1/MAT1.2
P0.18/CAP1.3/MISO1/MAT1.3
P0.19/MAT1.2/MOSI1/CAP1.2
P0.20/MAT1.3/SSEL1/EINT3
P0.21/PWM5/AD1.6/CAP1.3
P0.22/AD1.7/CAP0.0/MAT0.0
P0.23
P0.25/AD0.4/AOUT
P0.26/AD0.5
P0.27/AD0.0/CAP0.1/MAT0.1
P0.28/AD0.1/CAP0.2/MAT0.2
P0.29/AD0.2/CAP0.3/MAT0.3
P0.30/AD0.3/EINT3/CAP0.0
P0.31
P1.16/TRACEPKT0
P1.17/TRACEPKT1
P1.18/TRACEPKT2
P1.19/TRACEPKT3
P1.20/TRACESYNC
P1.21/PIPESTAT0
P1.22/PIPESTAT1
P1.23/PIPESTAT2
P1.24/TRACECLK
P1.25/EXTIN0
P1.26/RTCK
P1.27/TDO
P1.28/TDI
P1.29/TCK
P1.30/TMS
P1.31/TRST
NR
NY
NG
WR
WY
WG
SR
SY
SG
ER
EY
EG
C1
22p
C2
22p
X1
CRYSTAL
R1
10k
U1(VBAT)
NORTH
WEST
SOUTH
EAST
D1
LED-RED
D2
LED-YELLOW
D3
LED-GREEN
D4
LED-RED
D5
LED-YELLOW
D6
LED-GREEN
D7
LED-RED
D8
LED-YELLOW
D9
LED-GREEN
D10
LED-RED
D11
LED-YELLOW
D12
LED-GREEN
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
100

Thank You