## APPENDIX A

# PROGRAM

```
#include<header.h>

unsigned int ALCOHOL;

int ADC() //FOR ACCELEROMETER

{

    unsigned int val;

    PINSEL1|=0X15040000;

    ADCR=0X00200402; //from msb-scbits=1, opnl mode, 8bitmod, clk freq, 1st channel
    ADCR|=0X01000000;

    while(!(ADDR & 0X80000000));  //when done bit is not high be here

    ADCR|=~0X01000000;

    val=ADDR;

    val>>=6;

    val&=0x000003ff;

    return(val);

}

int ADC1()

{

    unsigned int val;

    PINSEL1|=0X15040000;

    ADCR =0X00200404; //from msb-scbits=1, opnl mode,8bit mod, clkfreq, 4th channel

    ADCR|=0X01000000;

    while(!(ADDR & 0X80000000));  //when done bit is not high be here
```

```
    ADCR|=~0X01000000;
    val=ADDR;
    val>>=6;
    val&=0x000003ff;
    return(val);
}
void convert(unsigned int x)
{
    unsigned int b=0,y=0;
    unsigned char z1=0,z2=0,z3=0,z4=0;
    y=x/10;
    z1=x%10;
    z2=y%10; //hexa to dec conversion
    delay(10);
    b=y/10;
    z3=b%10;
    z4=b/10;
    delay(10);
    z1=z1 | 0x30; //Decimal to ASCII
    z2=z2 | 0x30;
    z3=z3 |0x30;
    z4=z4 |0x30;
    lcd_data(z4);
    lcd_data(z3);
```

```
    lcd_data(z2);
    lcd_data(z1);
}
void main() //FOR DISPLAY ON LCD
{
    unsigned char xaxis, yaxis;
    lcd_int();
    lcdstring("LCD INITIALISED");
    delay(500000);
    lcd_cmd(0x01);
    lcdstring("vehicle tracking");
    lcd_cmd(0xc0);
    lcdstring("accident detection");
    delay(500000);
    while(1)
    {
        xaxis=ADC();
        yaxis=ADC1();
        lcd_cmd(0x01);
        lcdstring("XAXIS=");
        convert(xaxis);
        delay(5000000);
        lcd_cmd(0x01);
        lcdstring("YAXIS=");
```

```
            convert(yaxis);
            delay(5000000);
            alcohol_check();
            delay(5000000);
        }
}
void alcohol_check() //FOR ALCOHOL SENSOR
{
    IODIR0|=0X00000400;
    PINSEL0=0X00000000;
    ALCOHOL=IOPIN0;
    ALCOHOL=ALCOHOL & 0X00000400;
    lcd_int();
    if(ALCOHOL == 0X00000400)
    {
        lcd_cmd(0x01);
        lcd_cmd(0x80);
        lcdstring("  DRIVER IS");
        lcd_cmd(0xC0);
        lcdstring("   ALCOHOLIC");
        delay(5000000);
    }
    else
    {
```

```
            lcd_cmd(0x01);
            lcd_cmd(0x80);
            lcdstring("  DRIVER IS");
            lcd_cmd(0xC0);
            lcdstring(" NOT  ALCOHOLIC");
            delay(5000000);
      }
}
#include<header.h>
void lcd_int() //FOR INITIALIZING LCD
{
      unsigned char cmd[]={0x01,0x02,0x06,0x0e,0x28,0x80};
      unsigned int i;
      IODIR1|=0x03000000; //pin 24,25 rs and en  port 1 respectively
      IODIR0|=0x0000F000; //pin 12 13 14 15 data pins port 0
      for(i=0;i<=5;i++)
      {
            lcd_cmd(cmd[i]);
      }
}
void lcd_cmd(unsigned char command)
{
      nsigned int com; //32 BIT
      IOCLR1=0x03000000; //rs=0 en=0
```

```
    com=(command&0xf0); //8 bit
    com=com<<8; //shifting from 4 5 6 7 to 12 13 14 15 place(shifting by 8)
    IOCLR0|=0X0000f000;
    IOSET0|=com; //copy command to port pin
    IOCLR1|=0x03000000;
    IOSET1|=0x02000000; //en=1
    delay(50000);
    IOCLR1|=0x02000000; //en=0
    com=(command&0x0f);
    com=com<<12; //shifting from 0 1 2 3 to 12 13 14 15 place(shifting by 12)
    IOCLR0|=0X0000f000;
    IOSET0|=com;
    IOCLR1|=0x03000000;
    IOSET1|=0x02000000;
    delay(50000);
    IOCLR1|=0x02000000;
}
void lcd_data(unsigned char data1)
{
    unsigned int dat;
    IOCLR1|=0x03000000; //rs=0 en=0
    dat=(data1&0xf0);
    dat=dat<<8;
    IOCLR0|=0X0000f000;
```

```
    IOSET0|=dat; //copy data to port pin
    IOCLR1|=0x03000000;
    IOSET1|=0x03000000; //rs=1 en=1
    delay(50000);
    IOCLR1|=0x02000000; //en=0
    IOCLR1|=0x03000000;
    dat=(data1&0x0f);
    dat=dat<<12;
    IOCLR0|=0X0000f000;
    IOSET0|=dat;
    IOCLR1|=0x03000000;
    IOSET1|=0x03000000;
    delay(50000);
    IOCLR1|=0x02000000;
}
void delay(unsigned int t) //FOR DELAY
{
    unsigned int i;
     for(i=0;i<=t;i++);
}
void lcdstring(unsigned char *p)
{
    while(*p!='\0')
    {
```

```
        lcd_data(*p++);
    }
}
```

**Header program**:

```
#include<lpc21xx.h>
void lcd_int();
void lcd_cmd(unsigned char command);
void lcd_data(unsigned char data1);
void delay(unsigned int t);
void lcdstring(unsigned char *p);
void alcohol_check();
```

## APPENDIX B

# SYSTEM FLOW CHART