ASSIGNMENT N0 9

ON chip ADC Programming

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```
#include <p18f4550.h>
#include "vector_relocate.h"

#define LCD_DATA    PORTD
#define en          PORTEbits.RE2
#define rw          PORTEbits.RE1
#define rs          PORTEbits.RE0

void ADC_Init(void);
unsigned int Get_ADC_Result(void);
void Start_Conversion(void);
void msdelay(unsigned int time);
void init_LCD(void);
void LCD_command(unsigned char cmd);
void LCD_data(unsigned char data);
void LCD_write_string(char *str);

void main() {
   char msg1[] = "Result";
   char msg2[] = "ADC O/P:";
   unsigned char Thousands, Hundreds, Tens, Ones;
   unsigned int adc_val;

   ADCON1 = 0x0F;
```

```
    TRISD = 0x00;
    TRISE = 0x00;

    ADC_Init();
    init_LCD();
    LCD_write_string(msg1);
    LCD_command(0xC0);
    LCD_write_string(msg2);

    while (1) {
        Start_Conversion();
        adc_val = Get_ADC_Result();
        LCD_command(0xC8);

        Thousands = (adc_val / 1000) + '0';
        Hundreds  = ((adc_val % 1000) / 100) + '0';
        Tens      = ((adc_val % 100) / 10) + '0';
        Ones      = (adc_val % 10) + '0';

        LCD_data(Thousands);
        LCD_data(Hundreds);
        LCD_data(Tens);
        LCD_data(Ones);

        msdelay(300);
    }
}
```

```
void ADC_Init() {
   ADCON0 = 0b00001000;
   ADCON1 = 0b00001101;
   ADCON2 = 0b10001110;
   ADCON0bits.ADON = 1;
}

void Start_Conversion() {
   ADCON0bits.GO = 1;
}

unsigned int Get_ADC_Result() {
   while (ADCON0bits.GO);
   return ((unsigned int)ADRESH << 8) | ADRESL;
}

void msdelay(unsigned int time) {
   unsigned int i, j;
   for (i = 0; i < time; i++)
      for (j = 0; j < 710; j++);
}

void init_LCD(void) {
   LCD_command(0x38);
   msdelay(15);
   LCD_command(0x01);
   msdelay(15);
   LCD_command(0x0C);
```

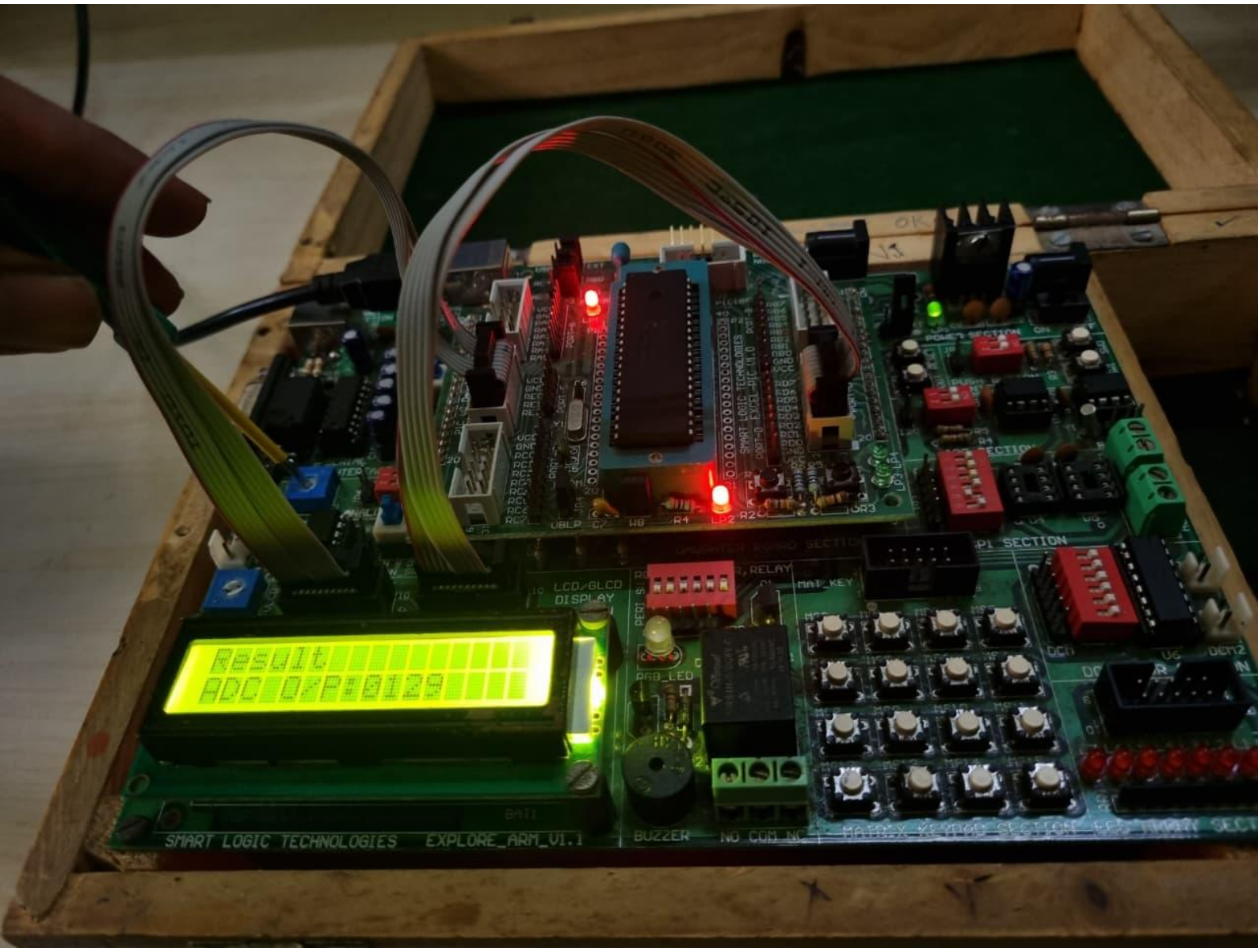
```
    msdelay(15);
    LCD_command(0x80);
    msdelay(15);
}

void LCD_command(unsigned char cmd) {
    LCD_DATA = cmd;
    rs = 0;
    rw = 0;
    en = 1;
    msdelay(15);
    en = 0;
}

void LCD_data(unsigned char data) {
    LCD_DATA = data;
    rs = 1;
    rw = 0;
    en = 1;
    msdelay(15);
    en = 0;
}

void LCD_write_string(char *str) {
    while (*str) {
        LCD_data(*str++);
        msdelay(15);
} }
```

OUTPUT :


Result
ADC O/P:0129
LCD/GLCD
DISPLAY
RGB_LED
RELAY
MAT_KEY
SMART LOGIC TECHNOLOGIES
EXPLORE_ARM_VI.1
BUZZER