

# Lab-5

Friday, October 09, 2020 11:27 AM

**DATE: 18/09/2020**

**Aim:** 1) Write a program to transmit the value of ADC to GPIO from pin 0.0 to 0.9

Source code:

2) Write a program to transmit the value of ADC through UART using multiple files.

PART 1:

```
UART.c
1 #include<lpc21xx.h>
2 #include "header.h"
3
4 void Uart_Init()
5 {
6     PINSEL0 = 0X00000005;    // selecting UART
7     UOLCR = 0X83;           // line control register (no parity is used, only 8 bit word
8     // length and DLAB bit as 1)
9     UODLL = 0XC3;           // baud rate register (baud rate is 4800)
10    UODLM = 0X00;            // baud rate register
11    UOLCR = 0X03;           // line control register (now DLAB bit is set 0)
12 }
13 void Uart_Data (unsigned char data)
14 {
15     UOTHR = data;           // UOTHR is Transmit Holding register, the data is stored in it
16     while ((UOLSR & 0X20) != 0X20); // wait until this condition is satisfied, and
17     // once it's satisfied, the data will be
18     // sent to THR. UOTHR is a 8 bit register, so at a time we can send only one bit data.
19     // UOLSR is a 8 bit register and THR
20     // comes at 5th bit so if THR becomes empty that means UOLSR = 0X0010 0000 = 0X20
21 }
22 void Uart_String (unsigned char *dat)
23 {
24     while (*dat != '\0')
25     {
26         Uart_Data (*dat);
27         dat++;
28     }
29 }
```

**PART 2:**

**ADC file**

```
header.h  main.c  ADC.c  UART.c
1 #include<lpc21xx.h>
2 #include "header.h"
3
4 void ADC_Init()
5 {
6
7     int ab;
8
9     PINSEL1 = PINSEL1 | (0<<23) | (1<<22);
10
11     ADCR = 0x00200301;
12
13 }
14
15 int ADC_read()
16 {
17
18     int ab=0;
19
20     ADCR = ADCR | (0x01000000);
21
22     while ((ADDR&0x80000000) != 0x80000000);
23
24     ab = (ADDR&0x0000FFC0);
25
26     ab = (ab>>6);
27
28     return ab;
29
30 }
31
32
33
```

MAIN FILE:

```
header.h  main.c  ADC.c  UART.c
1 #include<lpc21xx.h>
2 #include "header.h"
3 int main()
4 {
5
6     int adcvalue = 0;
7
8     Uart_Init();
9
10    ADC_Init();
11
12    Uart_String("Hello World\n");
13
14    while(1)
15    {
16
17        adcvalue = ADC_read();
18
19    }
```

```

20     Uart_Data(adcvalue/1000+'0');
21
22     Uart_Data((adcvalue/100)%10+'0');
23
24     Uart_Data((adcvalue%100)/10+'0');
25
26     Uart_Data((adcvalue%10)+'0');
27
28     Uart_Data('\n');
29
30 }
31
32 }
33

```

#### HEADER FILE:

```

1 void Uart_Init(void);
2
3 void Uart_Data(unsigned char);
4
5 void Uart_String(unsigned char*);
6
7 void ADC_Init(void);
8
9 int ADC_read(void);

```

#### UART FILE:

```

1 #include<lpc21xx.h>
2
3 #include "header.h"
4
5
6
7 void Uart_Init()
8
9 {
10
11     PINSEL0 = PINSEL0 | 0x00000005;
12
13     UOLCR = 0x9B;
14
15     UODLL = 0x62;
16
17     UODLM = 0x00;
18
19     UOLCR = 0x1B;
20
21 }
22
23 void Uart_Data(unsigned char data)
24
25 {
26
27     UOTHR = data;
28
29

```

```

21 }
22
23 void Uart_Data(unsigned char data)
24
25 {
26
27     UOTHR = data;
28
29     while((UOLSR & 0x20) != 0x20);
30
31 }
32
33 void Uart_String(unsigned char *dat)
34
35 {
36     while(*dat!='\0')
37     {
38         Uart_Data(*dat);
39         dat++;
40     }
41 }
42
43
44
45
46
47
48

```

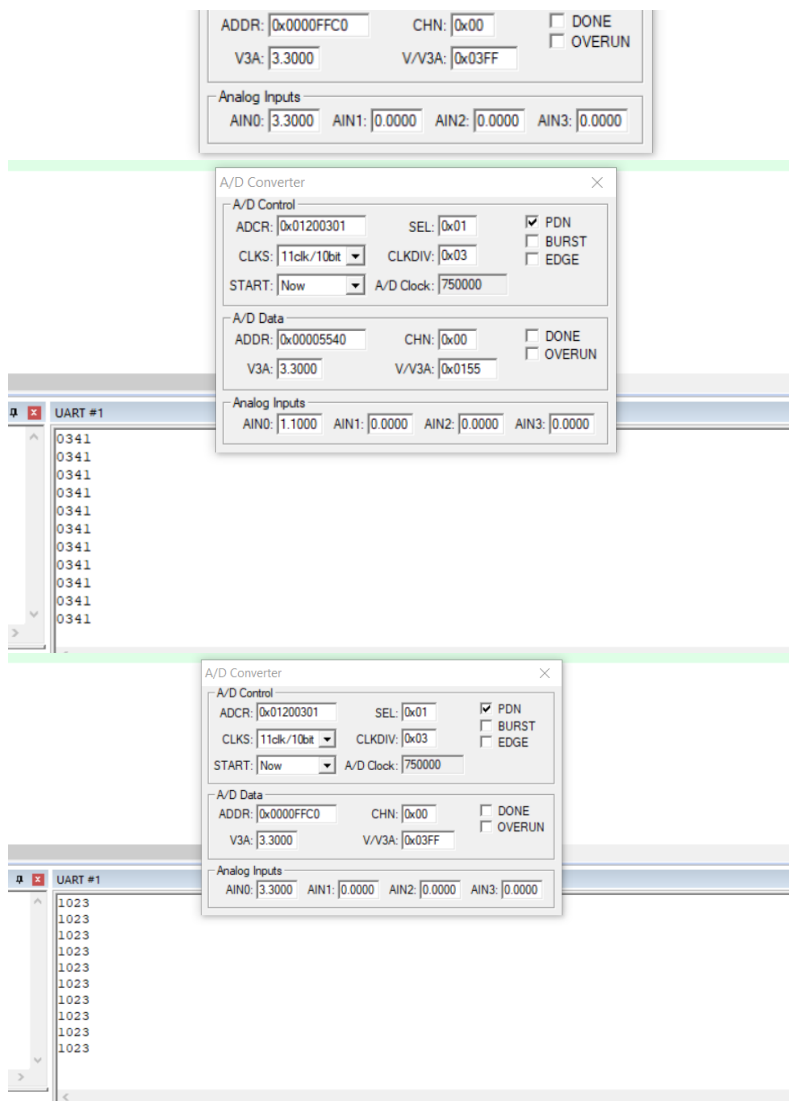
#### OUTPUT:

General Purpose Input/Output 0 (GPIO 0)

IO0DIR:	31	Bits	24	23	Bits	16	15	Bits	8	7	Bits	0
IO0DIR:	0x000003FF											
IO0SET:	0x000003FF											
IO0CLR:	0x00000000											
IO0PIN:	0x73FFFFFF											
Pins:	0x7BFFFFFF											

A/D Converter

A/D Control	
ADCR: 0x00210401	SEL: 0x01
CLKS: 11clk/10bit	CLKDIV: 0x04
START: None	A/D Clock: 600000
<input checked="" type="checkbox"/> PDN <input checked="" type="checkbox"/> BURST <input type="checkbox"/> EDGE	
A/D Data	



Inference:

In the first part I wrote a program to transmit the value of ADC to GPIO from pin 0.0 to 0.9, we have written 3.3 to the pin1 and observed the output

In the second part, I wrote a code to transmit the value of ADC through UART using multiple files namely here in the output we can observe 1023 and 0341 being written multiple times.