Experiment no: 03

Name of the experiment: Write a programa to display ADC value in the virtual terminal using PIC microcontroller.

Objective(s):

(i) To design a circuit that display ADC value virtual terminal.

(ii) to learn about the display of ~~value~~ ADC value in the virtual terminal.

Theory: The role of ADC connector is to connect analog voltage value to digital values. The ADT connector analog voltage to binary numbers. There binary number can be in different length 2,4, 8,10 bit. The more bits the binary number has, the higher the resolution of the A/D.

With two bits, we can only display a different option.

00	01	10	11

We can show the change from 3 to 5 watt with 4 levels.

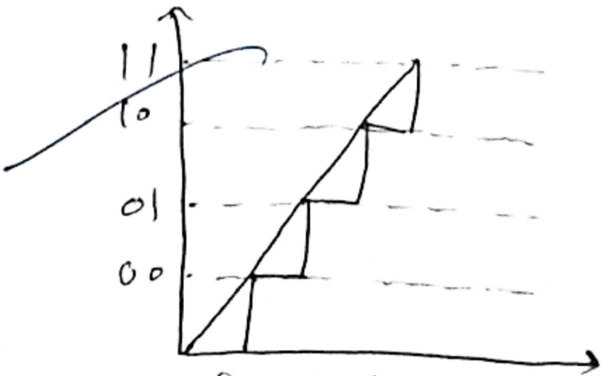

fig: Display of 4 levels.

We can see from fig: a vout is not close enough to the original analog input voltage value. Thus, we can say that A/D with ·the binary number of two bit has a low resolution and there is a large gap between the real value ~~on~~ of the analog input value and the values. represented by the A/D.

Now, let us consider that the voltage that supplier to the A/D converter is still varies from to 5volt the A/D converter the input to a binary number of the bits.

With three bits we can get 8 different option

000	001	010	011	100	101	110	111

We can see the · 8 bit in the following:

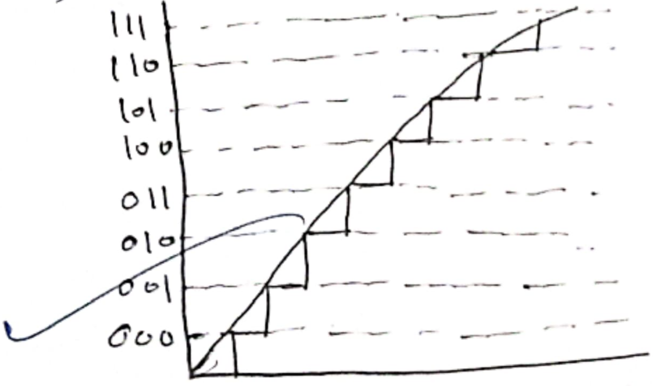

Fig: Display of 8 bits.

From fig, we can see that gap between the analog signal and the digital signal is smaller composed to the prevoys graph.

Therefore we can see that A/D of the microcontroller with a larger amount of bits has a higher resolution A/D takes less time, then, the conversion tree of the high resolution A/D.

We can use the triangle method to calculate the binary representation · of an analog input voltage for example, Let us calculate binary value. representation on the analog input voltage ·of 3.65 voltage.

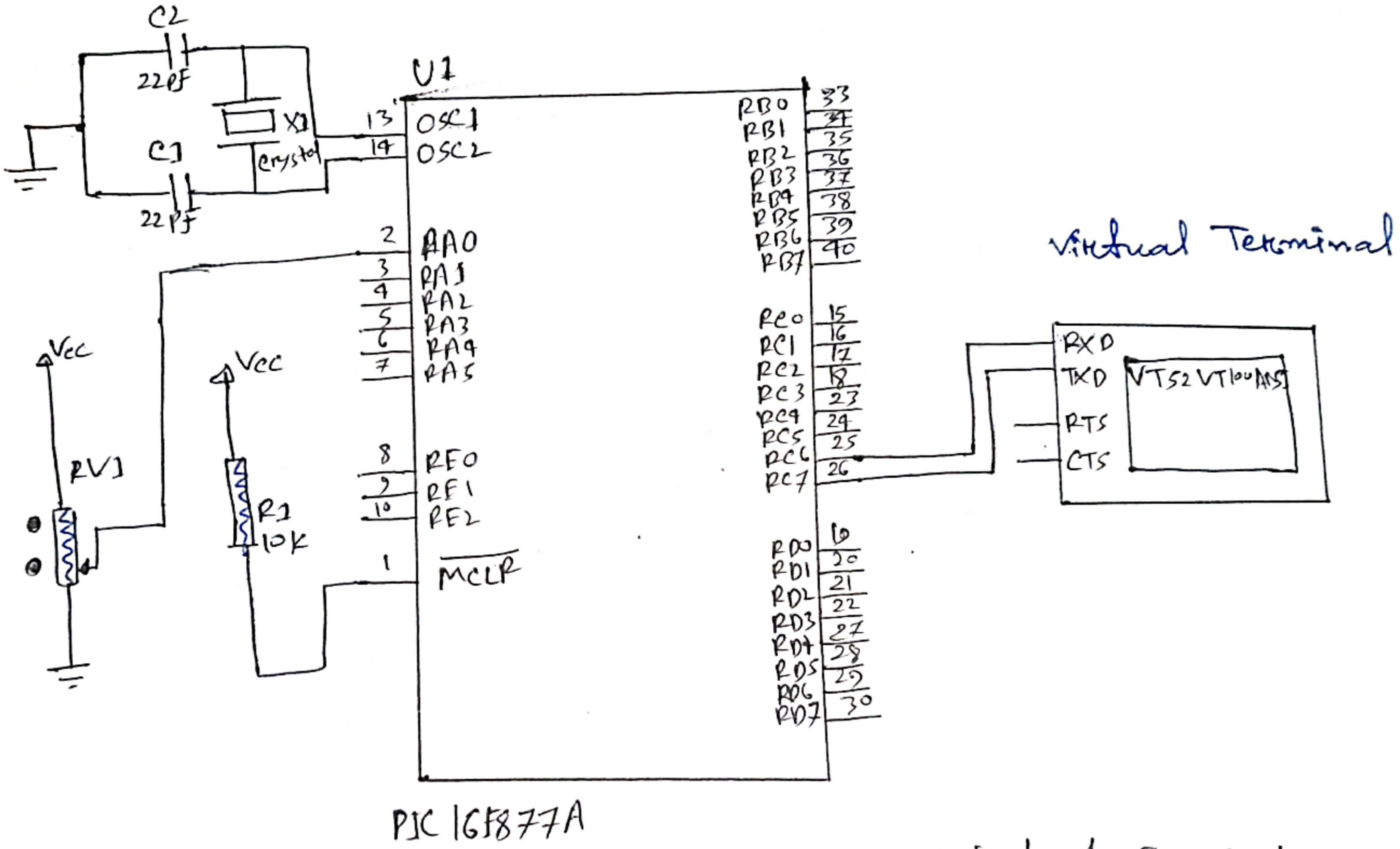

figure: Displaying ADC value in virtual Terminal

Sounce code:

```
    int val ADC:
    chan x[4]:
  Void main( )
     {
      UART1. init (9600)
      ADC_init ( );
      while( )
       { valADC = ADC_Read (0);
        in(To str(valADC.x);
        UART1_write Text("Analog value=".)/Print
        UART1_write_Text (x)
        Str cpy (x. "");/:
        UART1_write(13);
        Delay_ms(1000)
         }
         }
```