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'-----Title-----
' File.....16F877A_adc1.pbp
' Started....1/7/08
' Microcontroller used: Microchip Technology PIC16F877A
'                          microchip.com
' PicBasic Pro Code: micro-Engineering Labs, Inc.
'                          melabs.com

'-----Program Description-----
' The program uses one of the analog-to-digital
' converters,(AN0), to measure the voltage
' on the center pin of a potentiometer (an analog signal).
' It then converts the analog voltage into an 8-bit
' digital value (0 to 255) and displays it on an LCD.

'-----Related Lesson-----
' adc1.pbp (the 16F88 program) is used in
' the lesson Resistive Sensors at:
' http://www.cornerstonerobotics.
org/curriculum/lessons_year2/erii23_resistive_sensors.pdf

'-----New PicBasic Pro Commands-----
' ADCIN Channel,Variable
' Reads analog value into Channel (one of the AN inputs),
' converts the analog value to a digital value and
' stores the result in Variable.

'-----PIC Connections-----
'
'      16F877A Pin          Wiring
'      -----
'      RB4                LCD pin 11(DB4)
'      RB5                LCD pin 12(DB5)
'      RB6                LCD pin 13(DB6)
'      RB7                LCD pin 14(DB7)
'      RA0                Center Lead of Potentiometer
'      RA4                LCD Register Select(RS)
'      RB3                LCD Enable(E)
' See schematic at:
' http://www.cornerstonerobotics.org/schematics/pic16f877a_adc1.pdf

'-----LCD Connections-----
'
'      LCD Pin           Wiring
'      -----
'      1                Ground(Vss)
'      2                + 5v(Vdd)
'      3                Center of 20K Pot(Contrast)
'      4                RA4(Register Select,RS)
'      5                Ground(Read/Write,R/W)
'      6                RB3(Enable)
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```
'          7          No Connection(DB0)
'          8          No Connection(DB1)
'          9          No Connection(DB2)
'         10          No Connection(DB3)
'         11          RB4(DB4)
'         12          RB5(DB5)
'         13          RB6(DB6)
'         14          RB7(DB7)

'-----Constants/Defines-----

' To free up AN0 (Pin RA0) for an analog input, the
' default four LCD Data Bits must be removed from RA0 - RA3.
' This is relocated to the upper 4 bits RB4 - RB7 in PORTB
' using the LCD DEFINE statements below. All other
' default LCD pins and functions are left unchanged.
' For details see:
' http://www.cornerstonerobotics.org/curriculum/lessons\_year2/eri116\_lcd3\_pot\_command\_and\_lcd\_defines.pdf
' or
' Look around page 97 in the PicBasic Pro Compiler Manual.
' The PicBasic Pro Compiler Manual is on line at:
' http://www.microengineeringlabs.com/resources/index.htm#Manuals

    DEFINE LCD_DREG    PORTB    ' PORTB - Data bit Port
    DEFINE LCD_DBIT    4        ' Set starting Data Bit to bit 4

'-----Variables-----

    x  VAR BYTE          ' Byte for potentiometer input

'-----Main Code-----

    PAUSE 1000          ' Pause to allow LCD to setup

start:

    ADCIN 0, x          ' Read analog voltage on AN0(RA0) and
                        ' convert to 8-bit digital value
                        ' and store as x.

    LCDOUT $FE,1,"POT =",#x ' Clears LCD screen, displays
                        ' "POT =" and the 8-bit value of x

    PAUSE 500          ' Pause 1/2 second

    GOTO start          ' Go to loop label

    END
```