

'-----Title-----

' File.....read_voltage.pbp
' Started....5/28/12
' Microcontroller used: Microchip Technology PIC16F88
' microchip.com
' PicBasic Pro Code: micro-Engineering Labs, Inc.
' melabs.com

'-----Program Description-----

' Prints 0 to +15 volts reading to 16 x 2 parallel
' LCD which uses Hitachi 44780 controller.

'-----Related Lessons-----

' See LCD BASICS lesson at:
' http://cornerstonerobotics.org/curriculum/lessons_year2/erii14_lcd1.pdf
' read_voltage.pbp is used in the lesson Control and Navigation 4 at:

'-----Comments-----

'-----New PicBasic Pro Command-----

' The PicBasic Pro Compiler Manual is on line at:
' <http://www.microengineeringlabs.com/resources/index.htm#Manuals>

'-----PIC Connections-----

16F88 Pin	Wiring
RA0	LCD pin 11(DB4)
RA1	LCD pin 12(DB5)
RA2	LCD pin 13(DB6)
RA3	LCD pin 14(DB7)
RA4	LCD Register Select(RS)
RB3	LCD Enable(E)
RB7	Voltage Divider Network

' See schematic for the other usual PIC connections

'-----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)
7	No Connection(DB0)
8	No Connection(DB1)
9	No Connection(DB2)

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'          10          No Connection(DB3)
'          11          RA0(DB4)
'          12          RA1(DB5)
'          13          RA2(DB6)
'          14          RA3(DB7)

'-----Revision History-----

'-----Initialization-----

TRISB = %10000000      ' Set Pin RB7 as an input

ANSEL = %01000000     ' Set channel 6 as analog and the other
                      ' channels as digital.

OSCCON = $60          ' Sets the internal oscillator in the
                      ' 16F88 to 4 MHz

x          VAR        BYTE  ' Defines x as a BYTE variable
y          VAR        WORD  ' Defines y as a WORD variable
VHigh     VAR        BYTE  ' Defines VHigh as a Byte variable
VLow      VAR        BYTE  ' Defines VLow as a Byte variable

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

PAUSE 1000            ' Pause to allow LCD to setup

DO                    ' DO loop
ADCIN 6, x            ' Read analog voltage on AN6
                      ' (pin RB7) and convert to 8-bit
                      ' digital value then store as x.

y = (x*30)/51         ' Multiply 8-bit digital value x by 30
                      ' and then divide by 51 to get voltage
                      ' reading times 10.
                      ' Example: If 8-bit digital value = 255,
                      ' (255*30)/51 = 150 (10 times the voltage
                      ' reading of 15.0 volts.

VHigh = y/10          ' Divide y by 10 to get the whole
                      ' number digits of the voltage reading.
                      ' Place result in VHigh.
                      ' Example: 150/10 = 15

VLow = y//10          ' '/' operator returns the remainder.
                      ' y//10 divides y by 10 and places the
                      ' remainder in VLow.
                      ' Example: 150//10 = 0
                      ' 150/10 = 15.0
                      ' The remainder 0 is placed in VLow.

LCDOUT $FE,1,"Voltage = ", #VHigh, ".", #VLow
                      ' Prints the whole number digits of the
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*' voltage, VHigh, then a decimal point ".",
' then the decimal digit VLow.*

PAUSE 1000

' 1 second pause

LOOP

END