```
/*
* ADCsingend.c
*
* Created: 20/06/2013 15:18:02
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*
================================================================================
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*
* Description
* ------------------------------------------------
* ADC conversion
        12 bit resolution
        left adjustment
        Free run mode
        Unsigned single-ended input
        Pin A2 -- Positive input
*/

#define F_CPU 2000000UL
#define __AVR_ATxmega128A3U
#include <avr/io.h>
#include <avr/interrupt.h>
#include <util/delay.h>

// ADC variables
unsigned int reading;
float vin;

int main(void)
{
      // ADC configuration
      // Channel 0, ADC A, single ended
      ADCA_CH0_CTRL = ADC_CH_INPUTMODE_SINGLEENDED_gc;
      // Input pin A2 is connected to channel 0
      ADCA_CH0_MUXCTRL = ADC_CH_MUXPOS_PIN2_gc;
      // Enables free run and unsigned mode
      ADCA_CTRLB = ADC_FREERUN_bm;
      // Vref = internal (VCC/1.6) = 2.0625
      ADCA_REFCTRL = ADC_REFSEL_VCC_gc;
      // ADC prescaler = 64
      ADCA_PRESCALER = ADC_PRESCALER_DIV64_gc;
      // Enable ADC module
      ADCA_CTRLA = ADC_ENABLE_bm;
      // Start-up time
      _delay_us(100);

    while(1)
    {
            // Wait till IF = 1; conversion complete
        while(!(ADCA_INTFLAGS & 0x01)){}
            reading = ADCA_CH0RES;
            ADCA_INTFLAGS = 0x01;
            // Converts reading value into voltage
            // Vcc / 1.6 = 3.3 / 1.6 = 2.065
            // Delta V = 2.0625 * 0.05 = 0.103
            // TOP + 1 = 4096
            // vin = (reading * 2.0625 / 4096) - 0.103
            vin = (reading * 2.0625 / 4096.0) - 0.103;
    }
}
```