

EE443 Experiment-3

Analog-to-Digital Converter

1. Read Analog-to-Digital Converter section in the ATmega8A datasheet. You need to initialize your ADC registers inside a macro which will be added to the macros.asm file. While setting up your ADC registers consider the following requirements:
 - The analog input will be taken from pin **ADC3** using a potentiometer
 - Internal 2.56V reference voltage should be selected
 - Prescaler should be Clk/128
 - Single conversion mode should be selected instead of Free Running
 - ADC Conversion Complete Interrupt should be activated

Hint: Read the Register Descriptions of ADMUX and ADCSRA registers thoroughly.

2. At the beginning of your main program you should call your ADC setup macro and a 16 bit number which is less than 1024 should be loaded on r31 and r30 where high byte stored in R31 and low byte stored in R30.
3. Potentiometer value will be read from ADC interrupt service routine and loaded to r14(low) r15(high) registers to display on 7-seg display.
4. In the main routine, you should continuously compare the value read from the potentiometer and the value determined in the r30-r31 registers. If the 10-bit value we read from the potentiometer is smaller than the 16-bit value from the r30-r31 registers the LED connected to PORTB1 will turn on. If it is greater than the LED will turn off.

Hint: Consider modifying prescaler value of Timer/Counter Control Register if the ADC result is not displayed properly.