Lab 5: ADC (Analog to digital Conversion)

Instructor: Sung-Yeul Park
TA: S M Rakiul Islam

ECE 3411
Department of Electrical and Computer Engineering
University of Connecticut

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Connections

- Connect the board as in Fig.1.
- Use a potentiometer to get the sensing value to the ADC peripheral Pins
- Connect AREF pin to 5V to use the external voltage reference properly

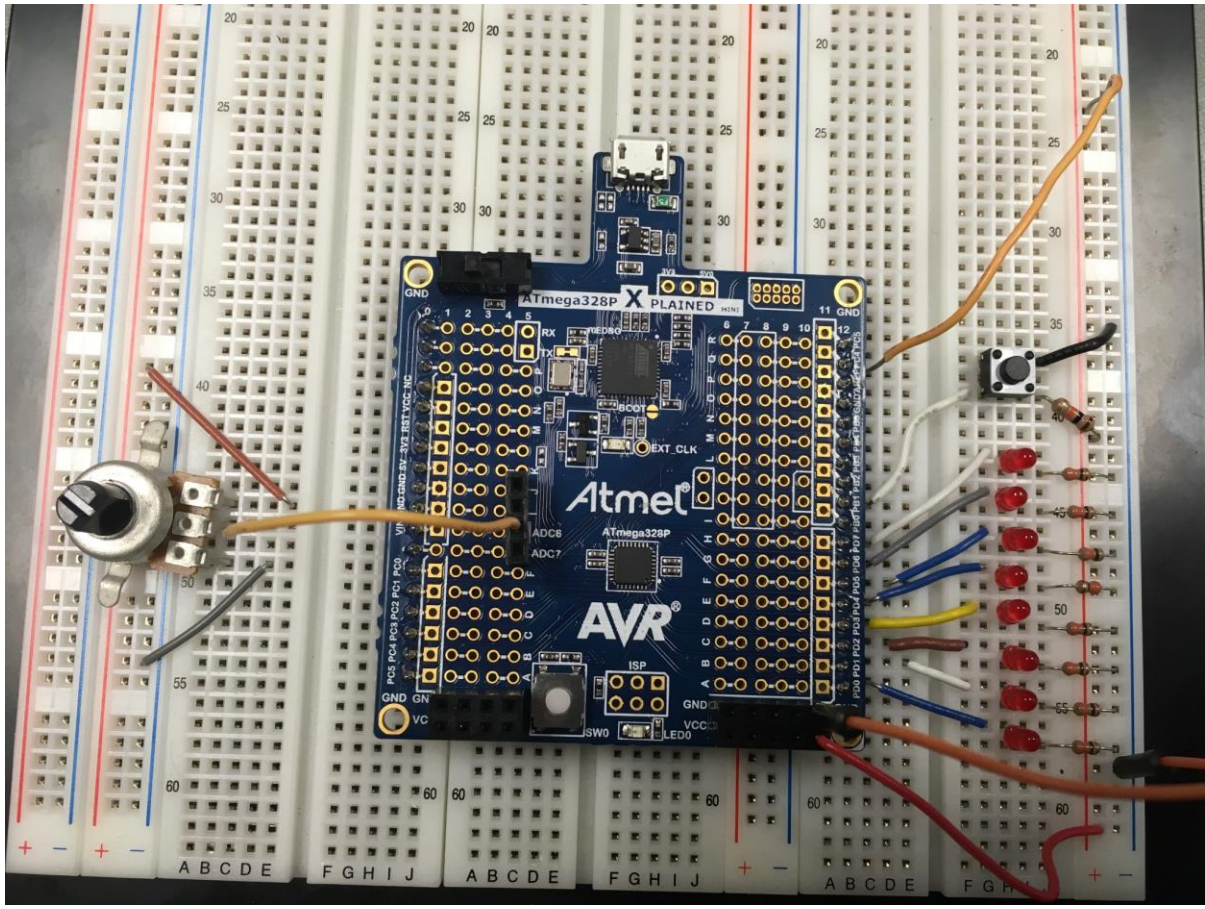
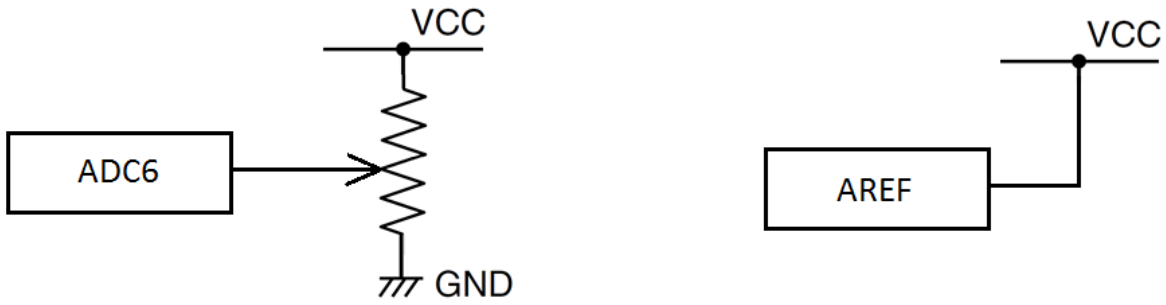


Fig1. Connections for ADC

Hardware Changes for Task1

In this lab, we'll be measuring analog voltages using ADC

- Connect the potentiometer to ADC6 pin as shown below.
- Connect AREF pin to VCC → Reference voltage becomes 5V.



Programming practice

- Practice the Example of textbook 7.1, 7.2, 7.4 and 7.4
- Interpret datasheet properly
- See the training modules for ADC
- Now make a program to use ADC peripheral

Task1(**Need to Demo**): Simple Voltmeter

We are going to design a simple voltmeter that measures voltages between 0-5V with ~4mV resolution.

- Connect a potentiometer to produce variable voltage at ADC6 pin.
- Connect AREF pin to VCC
- Read the analog input voltage using ADC every 100ms
- Configure a LED from PORT D with a blinking frequency of 50Hz
- Convert the ADC reading to voltage measurement
- Change the duty cycle/on time based on the input voltage
  duty cycle= input voltage/5V
  On time=duty cycle × Period
- print in UART console if you can.

Note: Use the full 10-bit resolution of the ADC

Now you should be able to observe different voltage readings as you twist the potentiometer knob.