

Laboratory Exercise # 5 | ADC Module

The goal of this experiment is to configure and utilize the Analog-to-Digital (A/D) Converter module of the PIC16F877A microcontroller. The experiment involves reading an analog input signal from a potentiometer, converting it into a digital value, and displaying the output using LEDs and seven-segment displays.

Exercise 5-1: A/D Converter

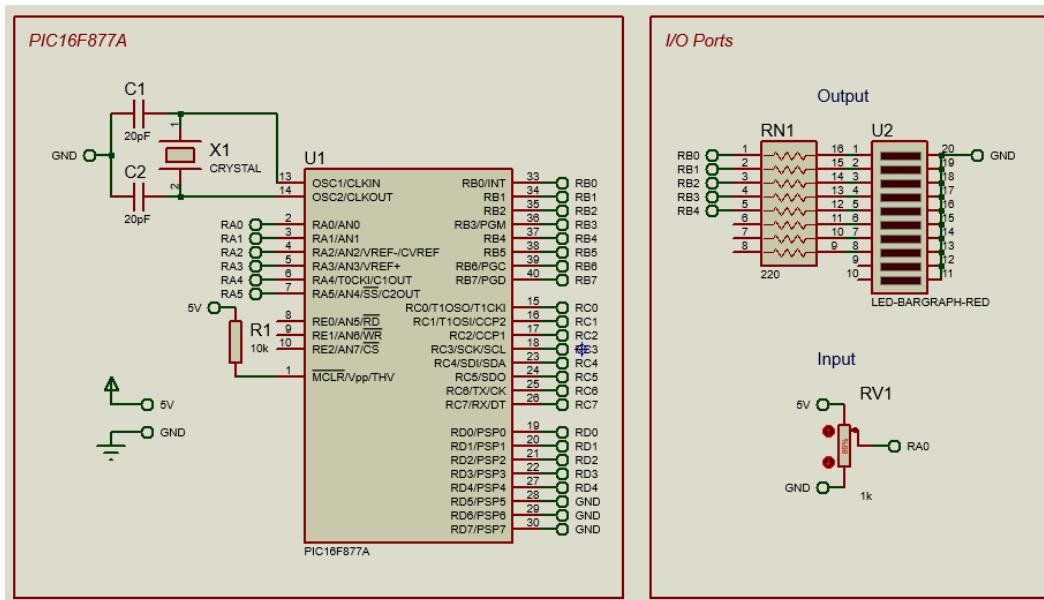


Figure 1. Schematic diagram for 5-1 ADC Circuit

Applied Voltage	Obtained A/D Value	LED Lighting
	0 to 169	No LED are lit up
	170 to 340	LED 1 is lit up
	341 to 511	LEDs 1 & 2 are lit up
	512 to 682	LEDs 1 to 3 are lit up
	683 to 853	LEDs 1 to 4 are lit up
	854 to 1024	All LEDs are lit up

Table 1. LED output for range of analog input voltage

Outputs:

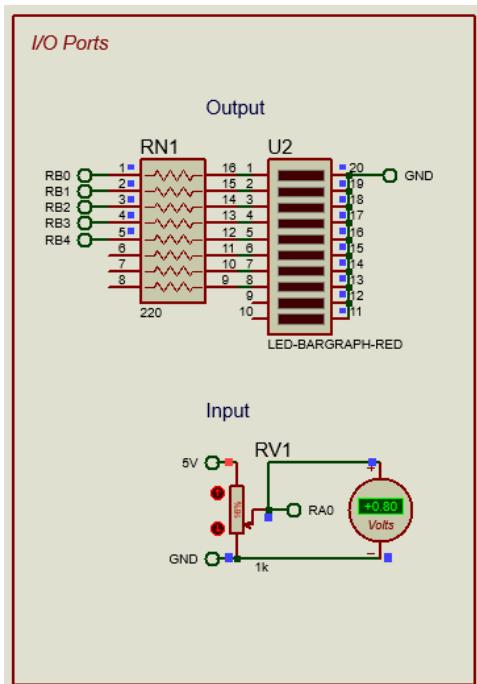


Figure 2. 0-169 A/D Value

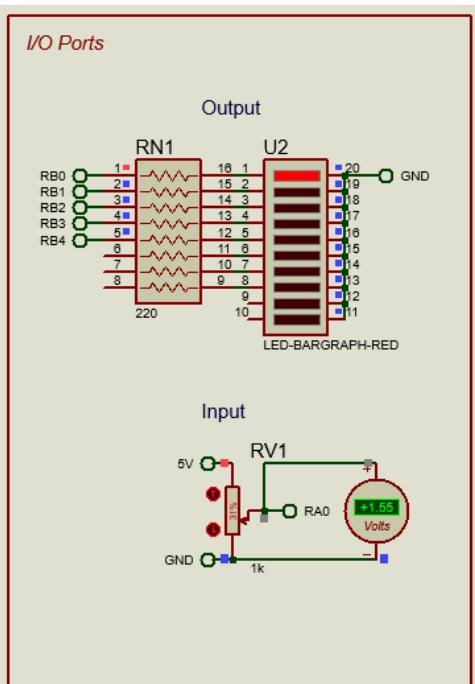


Figure 3. 170 to 340 A/D Value

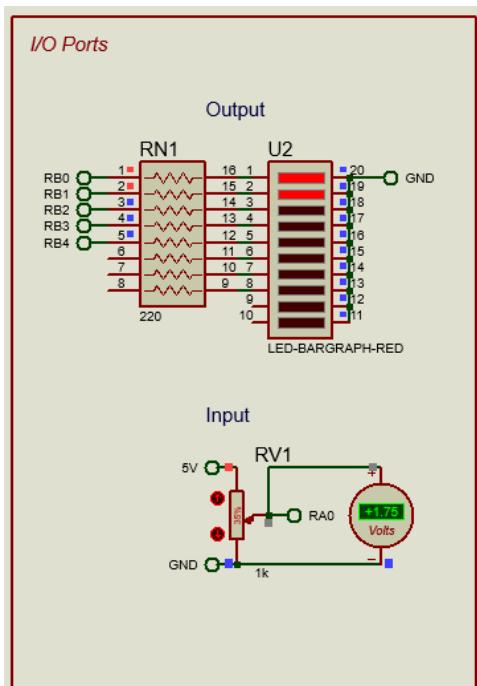


Figure 4. 683 to 853 A/D Value

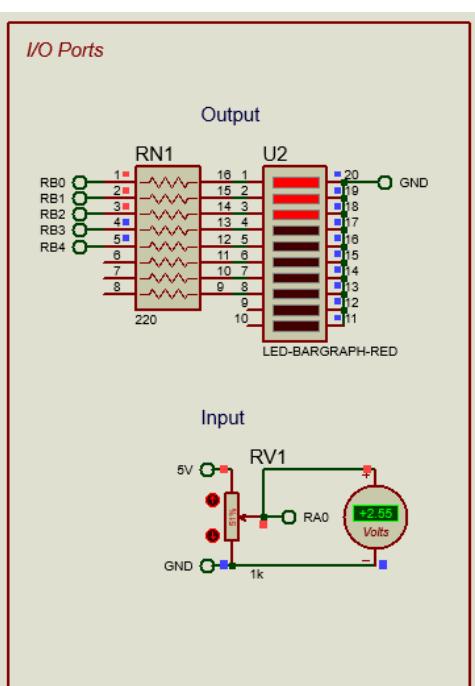
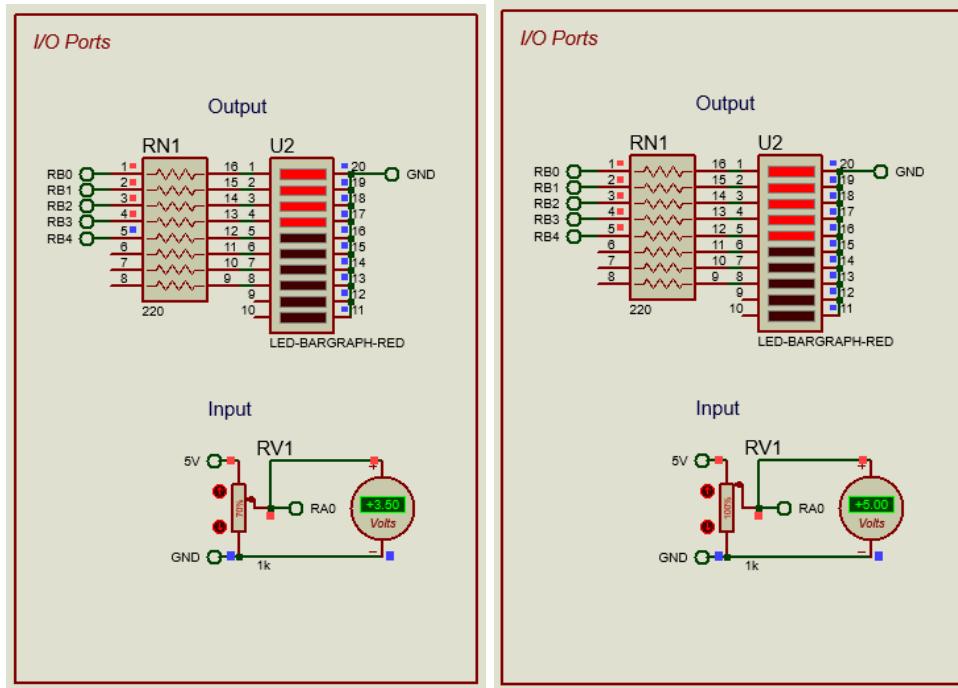


Figure 5. 512 to 682 A/D Value



Exercise 5-2: Hands-on

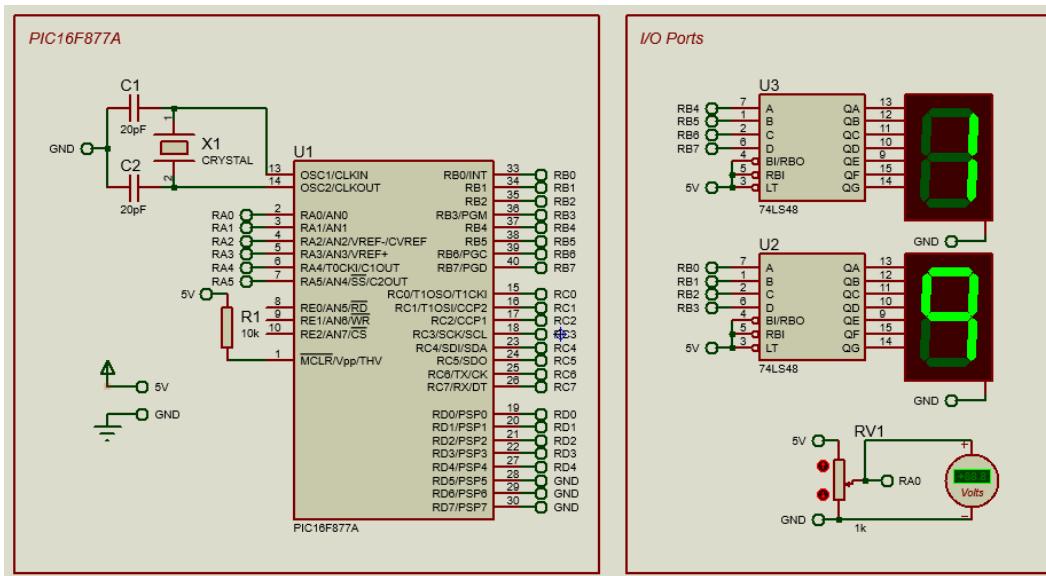
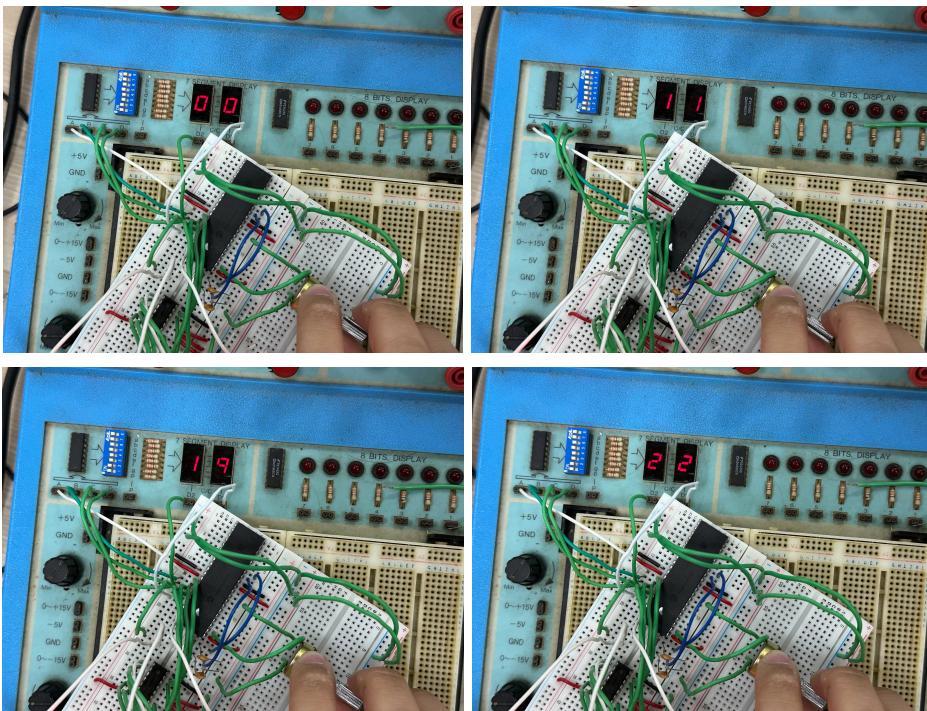
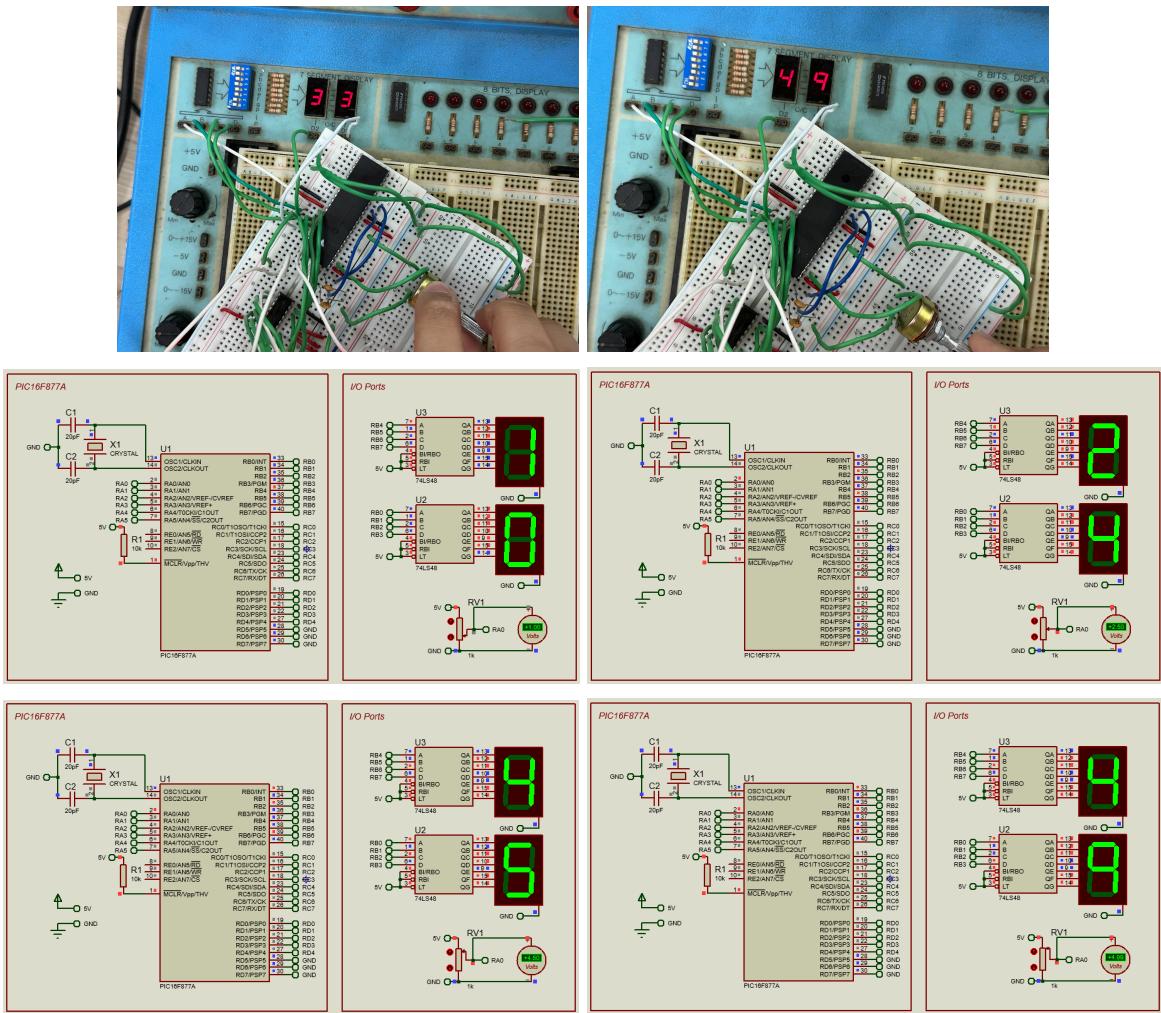


Figure 8. Schematic diagram for 5-2 ADC Circuit

Outputs:





Figures 9-18. Output readings for Obtained A/D Value