Lab5 description

Lab 5

System A

- For safety, please, remember and make sure to unplug your Launchpad from the USB port before making any hardware changes.
- Connect jumper wires as shown in Figure 1.

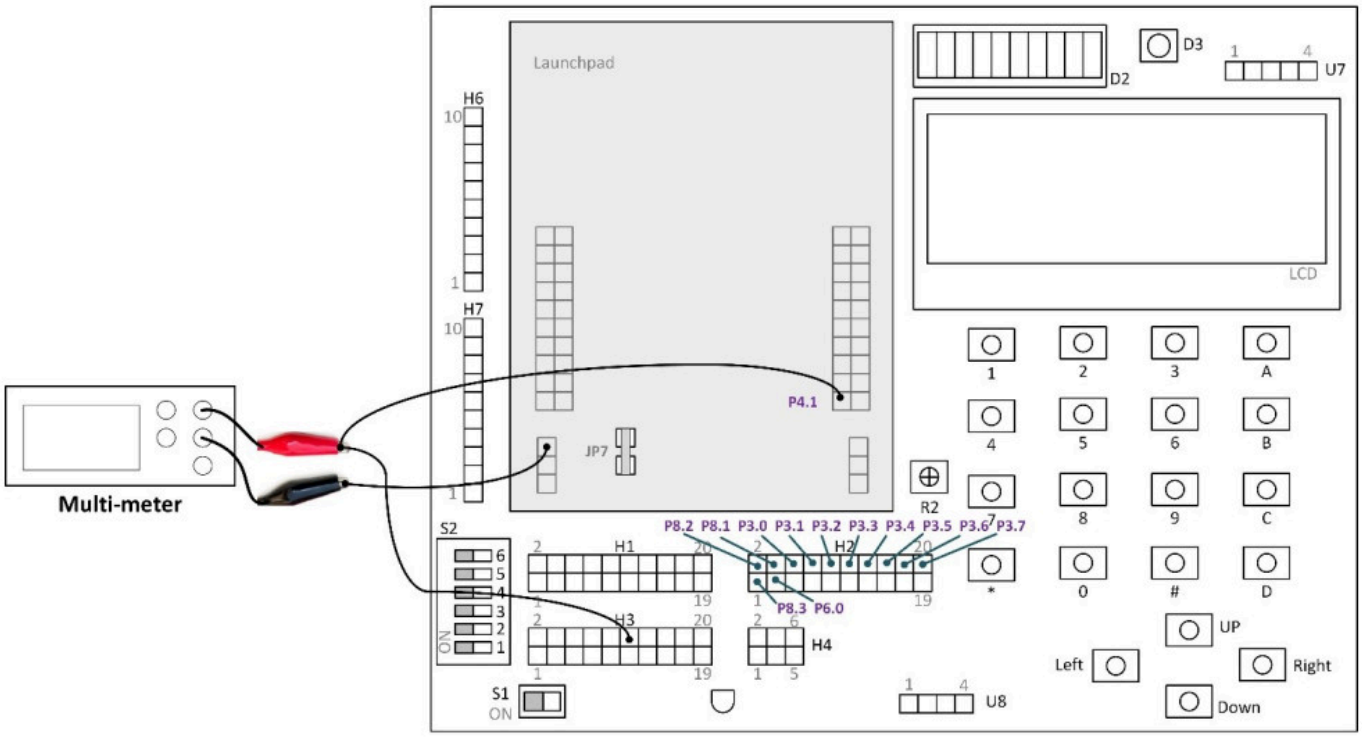

Figure 1. Connection

- Write a program in C/C++ to implement the following function.
  - Use the ADC module on the MSP430FR5994 MCU, and make sure to use it as a 12-bit resolution (unsigned) as we studied in class.
- (Note) You can suspend (pause) the program to check the raw NADC value.
- Fill out the following table when measured for 0.5-V and 1.5-V cases. Make sure to include this table in your lab report

Target voltage	Measured voltage (Multi-meter)	NADC (Launchpad)
0.5 V		
1.5 V		

- (Note) By tweaking the potentiometer, you can generate various voltage levels. A measured voltage may not exactly match the desired voltage. You can try to set the value within ±5%.

System B

- For System B, you can remove the connection to the multimeter for the P4.1, and connect the P4.1 properly as shown in Figure 2.

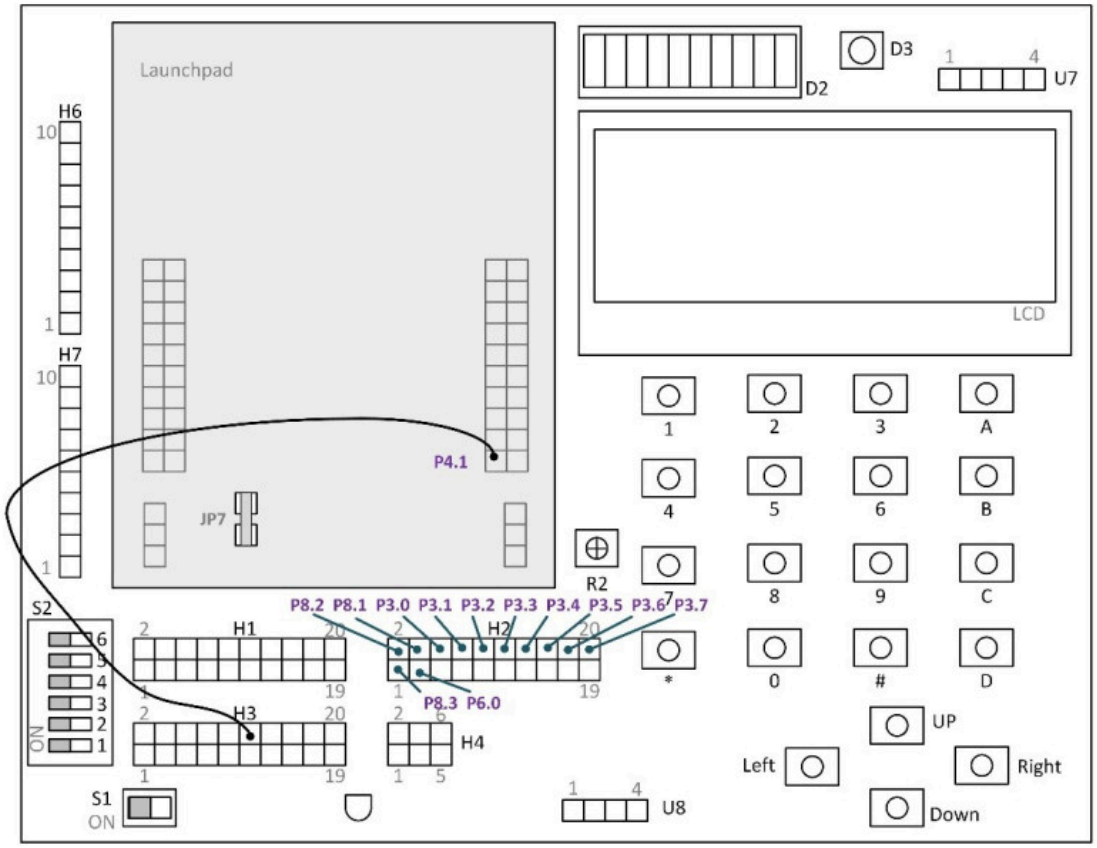

Figure 2. Connection

- For System B, you will write a program to implement the following functions.
  - Use the ADC module on the MSP430FR5994 MCU, and make sure to use it as a 12-bit resolution (unsigned) as we studied in class.
  - For the first line of the LCD, display your name(s).
  - For the second line of the LCD, display the converted voltage that can be read through the P4.1 pin.
  - The voltage range from 0 V to 3.3 V on the LCD display should be matched with the actual full range of the rotation of the potentiometer knob.
- The decimal places should be **two**. For instance, 1.23
- You should play a different note or stop playing a note as you tweak the potentiometer and as follows:

Voltage < 1V	Stop playing a note
1V ≤ Voltage < 2V	C note
2V ≤ Voltage < 3V	D note
Voltage ≥ 3V	E note

- Make sure to complete the lab check-off assignment (Lab5-50X) posted on CANVAS before the given deadline. The code files should be submitted as a part of the lab check-off assignment. Laboratory assignment deadlines are 15 minutes before the end of your registered laboratory session.

Reference

- B. Hur, "Learning Embedded Systems with MSP430 FRAM microcontrollers", 2nd ed. 2023.