Lab8 description

System A

- For System A, you can perform the lab portion using a virtual Raspberry pi on your own laptop. You can choose to bring and use your own physical Raspberry pi if needed.
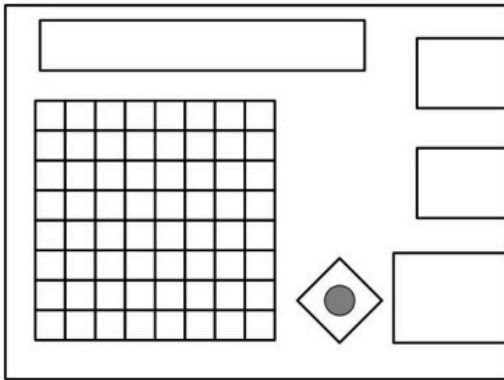- A picture of a SenseHat is shown in Figure 1.

Figure 1. SenseHat

- Students need to write a Python program to perform the following functions.
    - When a program starts, a red dot and cyan color dot should be shown on the LED matrix as shown in Figure 2 (A)
    - A user should be able to control the cyan dot like a snake game using the joystick
    - If the cyan dot reaches the red dot, a yellow color '#' symbol should be displayed.
    - If the button is pressed, the LED matrix should be able to be initialized as shown in Figure 2 (A)

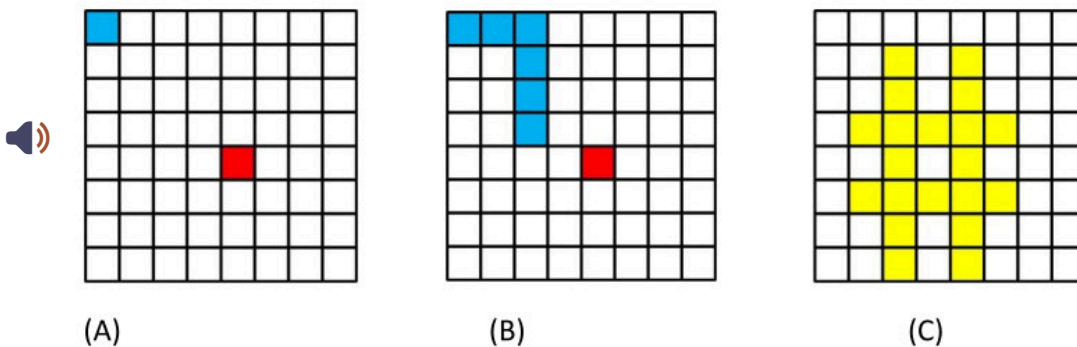(A)   (B)   (C)

Figure 2. SenseHat LED matrix

- A header for a typical Raspberry Pi board is shown in Figure 3. The LED matrix is controlled via I2C communication. Specifically, the names are SDA1 and SCL1.
  Fill out the following table (Table 1). Header pin numbers are numeric values. <u>Make sure to include this in your lab report.</u>
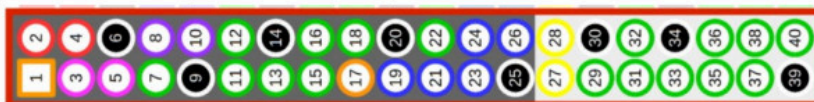

Figure 3. Raspberry Pi Board Pinout

	A header pin number
SDA1	
SCL1	

Table 1. Pin number, I2C

System B

- 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 4. This is a BH EDU board with a Raspberry Pi pico board.
- The power wires between the Raspberry pi pico board and BH EDU board were already pre-wired. Please, do not remove these power wires.
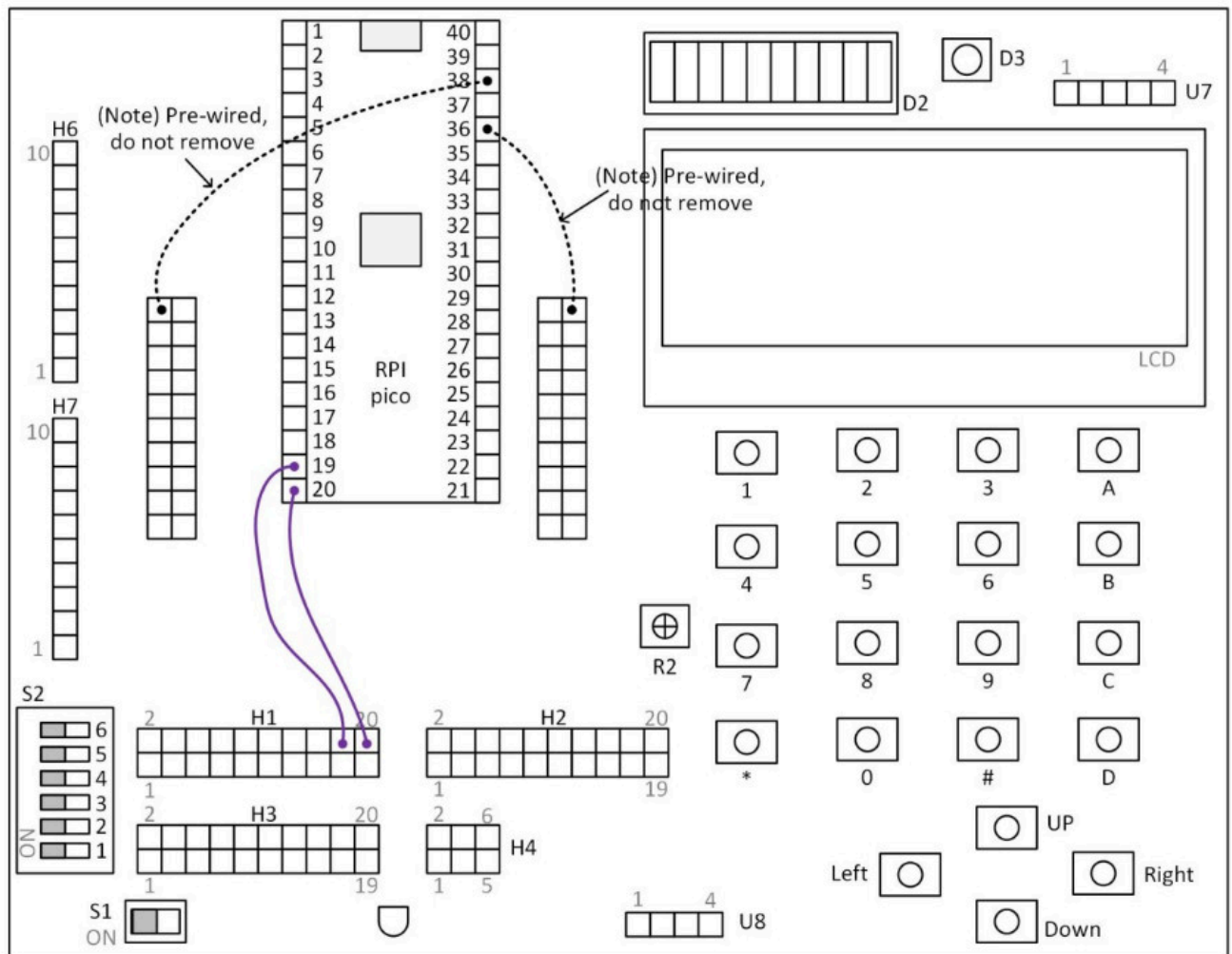- Students need to use wires for the jumper wire connections shown in purple color.

Figure 4. Connection diagram

- Students need to write a Micro-Python for a Raspberry Pi pico. The function to describe is to blink two LEDs on the bar LED alternatively. To be clear, two LEDs should not blink simultaneously but alternately. The blink duration should be reasonably slow so that it can be recognized.

- (Note) When it prompts in Thonny like the window below, make sure to choose "This computer". For reference, if you happen to choose "Raspberry Pi pico", the program will be stored in a Raspberry Pi pico. Make sure to delete any file that you stored in Raspberry Pi pico when you return your lab kit.
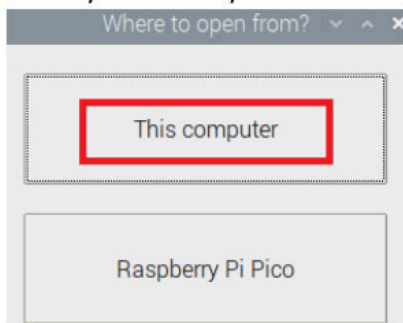
- Make sure to complete the lab check-off assignment (Lab8-50X) posted on CANVAS before the given deadline. The code files should be submitted as a part of the lab check-off assignment.
- In this laboratory, the code submission can be screenshots of the source codes. You can submit picture files for the source codes from your VM machine.
- Laboratory assignment deadlines are 15 minutes before the end of your registered laboratory session.