# python code to monitor battery voltage.

#

# requires the following packages:

# pip3 install Adafruit-Blinka

# pip3 install adafruit-circuitpython-ads1x15

import board

import busio

import adafruit\_ads1x15.ads1115 as ADS # ADS1115 module (ADC)

from adafruit\_ads1x15.analog\_in import AnalogIn

import time

from threading import Thread

class BatteryMonitor:

def \_\_init\_\_(

self,

min\_voltage,

R1, # Ohms

R2 # Ohms

):

self.min\_voltage = min\_voltage

# measure resistors with ohmmeter for more accurate reading

self.BATT\_VOLT\_DIV\_RATIO = (R1 + R2) / R1

# Create the I2C bus interface for ADC.

self.i2c = busio.I2C(board.SCL, board.SDA)

self.ads = ADS.ADS1115(self.i2c, address=0x48)

self.batt\_voltage = AnalogIn(self.ads, ADS.P3)

self.under\_voltage = False # init

def MonitorVoltage(self): # to be ran as a thread

while True:

# measure voltage:

self.voltage = self.batt\_voltage.voltage \* self.BATT\_VOLT\_DIV\_RATIO

if self.voltage < self.min\_voltage:

self.under\_voltage = True

else:

self.under\_voltage = False

time.sleep(0.1)

return

if \_\_name\_\_ == "\_\_main\_\_":

# initialize battery class

battery = BatteryMonitor(min\_voltage = 6.8, R1 = 330000, R2 = 200000)

# begin a thread monitoring battery voltage

Thread(daemon=True, target=battery.MonitorVoltage).start()

while True:

time.sleep(2)

if battery.under\_voltage:

print("BATTERY IS UNDER VOLTAGE!")

else:

print("BATTERY IS HAPPY")

print(battery.voltage)