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#Hotplate Sensing
#Feb 29, 2019
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import RPi.GPIO as GPIO
import time
import uControllersDataAcquisition as DtA
#============================================================================#
#This segment of code deals with setting up GPIO pins for the MCP
GPIO.setmode(GPIO.BOARD)

CS = [29, 32, 18, 8]
CLK = [31, 36, 22, 10]
DOUT = [33, 38, 24, 12]
DIN = [37, 40, 26, 16]

for i in range(0,4):
    GPIO.setup(CS[i], GPIO.OUT)
    GPIO.setup(CLK[i], GPIO.OUT)
    GPIO.setup(DOUT[i], GPIO.IN)
    GPIO.setup(DIN[i], GPIO.OUT)
#============================================================================#
#This creates two matrices that can hold 25 different lists of data (One for
#each MCP channel and corresponding times.)
TEMP = [[] for i in range(0,25)]
TIME = [[] for i in range(0,25)]
#============================================================================#
#Here is where the magic happens
try:
    my_test = True
    start_time = time.time()
    while my_test == True:
        #This is in charge of ending the program in case a sensor reads 100C
        #and also helps us see that we are getting good data
        test = DtA.calc_tempMCPBudgetLM34(DtA.readMCP(0, CS[0], CLK[0], DOUT[0], DIN[0]))
        print(test)
        test = float(test)
        if test > 100:
            break
        #These two loops go through each MCP (i) and each MCP channel(n)
        for i in range(0,4):
            for n in range(0,8):
                if i == 3 and n == 1:#Last channel of the last MCP taking data.
                    break
                #It reads from a function defined in the data acquisition file
                d = DtA.readMCP(n, CS[i], CLK[i], DOUT[i], DIN[i])
                TIME[8 * i + n].append(time.time() - start_time)
                t = DtA.calc_tempMCPBudgetLM34(d)
                TEMP[8 * i + n].append(t)
#============================================================================#
#This just writes data to a file.
    file = open('./Data/HOTPLATETESTING.txt', 'w')
    for i in range(0,25):
        for n in range(0,len(TIME[i])):
        #Write the data as comma delimites
            file.write(str(TIME[i][n]) + ',' + TEMP[i][n] + '\n')
```

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    #always close the file you are using
    file.close()
#================================================================================#
except KeyboardInterrupt:
    print("it's fried, dude")

finally:
    GPIO.cleanup()
    print("Isaac cleaned the oven...")
```