Week 7 Lab
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ENGR113-D

Code:

```
import time
import adafruit_dht
import board
import analogio
import pulseio
from adafruit_motor import servo
import busio
from adafruit_seesaw.seesaw import Seesaw
import digitalio
import adafruit_sdcard
import storage
import adafruit_pcf8523

#Recording data in SD card function
def record_data(n, x):
    with open("/sd/water_log.txt", "a") as fp:
        fp.write('{}:\n'.format(n))
        fp.write("Date: %d/%d/%d\n" % (t.tm_mon, t.tm_mday, t.tm_year))
        fp.write("Time: %d:%02d:%02d\n" % (t.tm_hour, t.tm_min, t.tm_sec))
        if x == 'd':
            fp.write('Condition: Dry\nWatering...\n\n')
        else:
            fp.write('Condition: Moist\nNo Action Taken\n\n')

#Main code block
if __name__ == "__main__":
    #RTC
    myI2C = busio.I2C(board.SCL, board.SDA)
    rtc = adafruit_pcf8523.PCF8523(myI2C)

    #SD Card
    spi = busio.SPI(board.SCK, board.MOSI, board.MISO)
    cs = digitalio.DigitalInOut(board.D10)
    sdcard = adafruit_sdcard.SDCard(spi, cs)
    vfs = storage.VfsFat(sdcard)
    storage.mount(vfs, "/sd")

    #Formatting data output file for writing
    with open("/sd/water_log.txt", "w") as my_file:
```

```
    my_file.write('Plant Watering System Data Log:\n\n')

  #Record counting index
  n=0

  #User setting RTC date and time
  print('\n\nSet date and time for recording purposes')
  #user_time = input('Enter Real Time Clock info in this format: yyyy/mm/dd/hh/mm or
2021/12/25/09/30\n')
  #time_vals = user_time.split('/')
  #t = time.struct_time((time_vals[0],time_vals[1], time_vals[2], time_vals[3], time_vals[4], 0,
0, -1, -1))
  t = time.struct_time((2021, 01, 24, 09, 30, 0, 0, -1, -1))
  rtc.datetime = t

  with open('/sd/sample_data.txt', 'r') as file:
    lines = file.readlines()

  while True:
    try:
      #Checking sensor data to make watering decision
      for ln in lines:
        ln=ln[0]
        print('{}: Reading Sensor'.format(n))
        t = rtc.datetime
        record_data(n, ln)
        n+=1
        time.sleep(5)

      break
    except RuntimeError as e:
  # Reading doesn't always work! Just print error and we'll try again
      print("Reading from DHT failure: ", e.args)
    time.sleep(1)
```

Input file:

```
m
d
m
d
d
d
m
d
d
m
```

Output File:
Plant Watering System Data Log:

0:
Date: 1/24/2021
Time: 9:30:00
Condition: Moist
No Action Taken

1:
Date: 1/24/2021
Time: 9:30:05
Condition: Dry
Watering...

2:
Date: 1/24/2021
Time: 9:30:10
Condition: Moist
No Action Taken

3:
Date: 1/24/2021
Time: 9:30:15
Condition: Dry
Watering...

4:
Date: 1/24/2021
Time: 9:30:20
Condition: Dry
Watering...

5:
Date: 1/24/2021
Time: 9:30:25
Condition: Dry
Watering...

6:
Date: 1/24/2021
Time: 9:30:30
Condition: Moist
No Action Taken

7:
Date: 1/24/2021
Time: 9:30:35
Condition: Dry
Watering...

8:
Date: 1/24/2021
Time: 9:30:40
Condition: Dry
Watering...

9:
Date: 1/24/2021
Time: 9:30:45
Condition: Moist
No Action Taken