SIPP Hackathon Project: Thermometer

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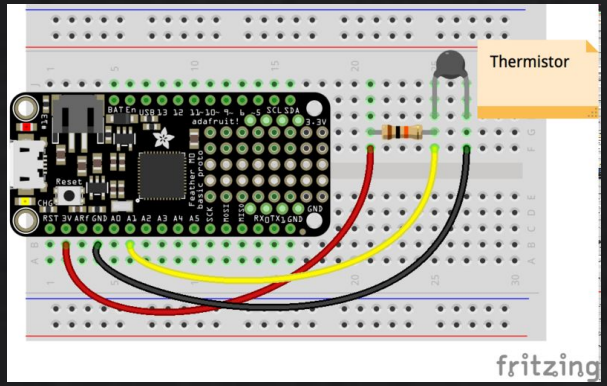
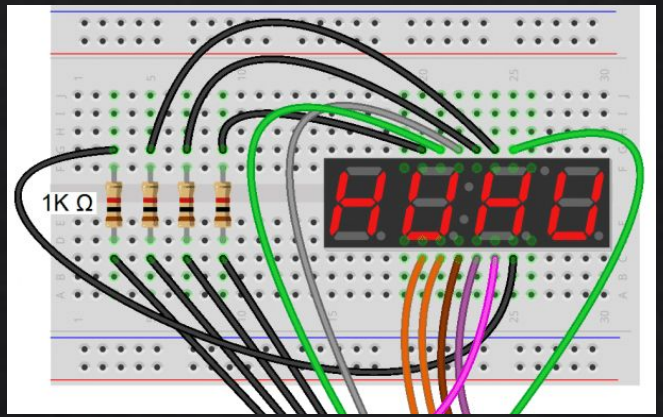
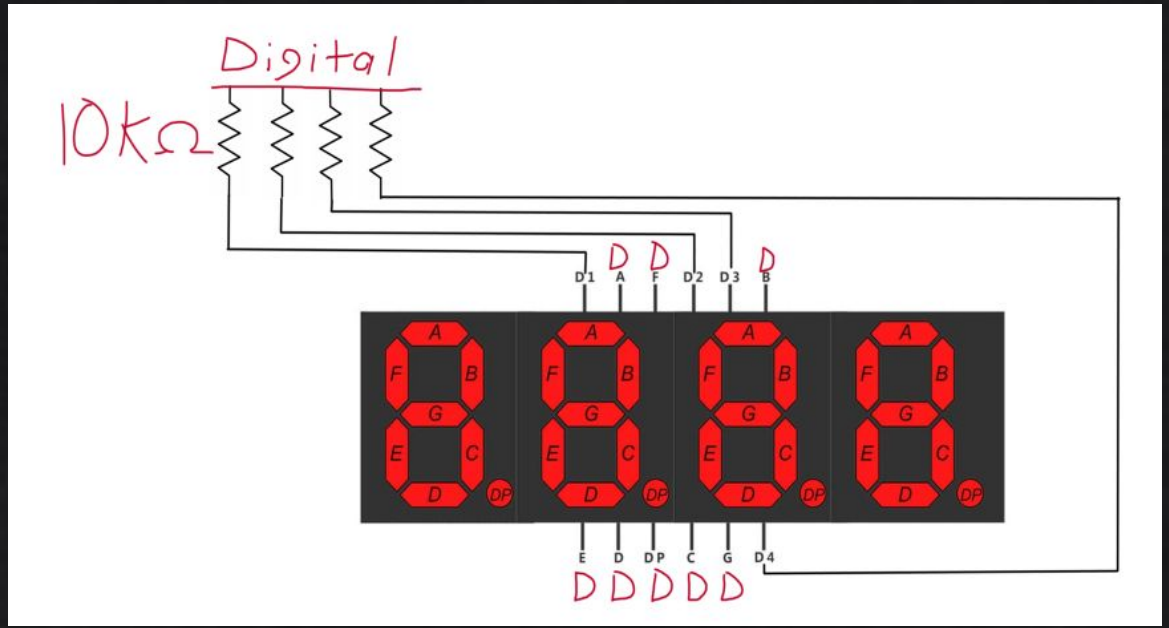


https://learn.adafruit.com/thermistor/circuitpython



https://www.circuitbasics.com/arduino-7-segment-display-tutorial/



```
import time
import board
import digitalio
import analogio
import hackathon
thermistor = analogio.AnalogIn(board.A1)
A=digitalio.DigitalInOut(board.D2)
B=digitalio.DigitalInOut(board.D4)
C=digitalio.DigitalInOut(board.D8)
D=digitalio.DigitalInOut(board.D6)
E=digitalio.DigitalInOut(board.D5)
F=digitalio.DigitalInOut(board.D3)
G=digitalio.DigitalInOut(board.D9)
DP=digitalio.DigitalInOut(board.D7)
A1=digitalio.DigitalInOut(board.D13)
A2=digitalio.DigitalInOut(board.D12)
A3=digitalio.DigitalInOut(board.D11)
A4=digitalio.DigitalInOut(board.D10)
A.direction = digitalio.Direction.OUTPUT
B.direction = digitalio.Direction.OUTPUT
C.direction = digitalio.Direction.OUTPUT
D.direction = digitalio.Direction.OUTPUT
E.direction = digitalio.Direction.OUTPUT
F.direction = digitalio.Direction.OUTPUT
G.direction = digitalio.Direction.OUTPUT
DP.direction = digitalio.Direction.OUTPUT
A1.direction = digitalio.Direction.OUTPUT
A2.direction = digitalio.Direction.OUTPUT
A3.direction = digitalio.Direction.OUTPUT
A4.direction = digitalio.Direction.OUTPUT
def clear():
    A.value=True
    B.value=True
    C.value=True
    D.value=True
    E.value=True
    F.value=True
    G.value=True
    DP.value=True
    A1.value=False
    A2.value=False
    A3.value=False
    A4.value=False
def show(num):
    if num==0:
        A.value=False
        B.value=False
        C.value=False
        D.value=False
        E.value=False
        F.value=False
    A4.value=False
def show(num):
    if num==0:
        A.value=False
        B.value=False
        C.value=False
        D.value=False
        E.value=False
        F.value=False
    elif num==1:
        B.value=False
        C.value=False
    elif num==2:
        A.value=False
        B.value=False
        D.value=False
        E.value=False
        G.value=False
    elif num==3:
        A.value=False
        B.value=False
        C.value=False
        D.value=False
        G.value=False
    elif num==4:
        B.value=False
        C.value=False
        F.value=False
        G.value=False
    elif num==5:
        A.value=False
        C.value=False
        D.value=False
        F.value=False
        G.value=False
    elif num==6:
        A.value=False
        C.value=False
        D.value=False
        E.value=False
        F.value=False
        G.value=False
    elif num==7:
        A.value=False
        B.value=False
        C.value=False
    elif num==8:
        A.value=False
        B.value=False
        C.value=False
        D.value=False
        E.value=False
        F.value=False
        G.value=False
    elif num==9:
        A.value=False
        B.value=False
        C.value=False
        F.value=False
        G.value=False
def analog1(num):
    clear()
    show(num)
    A1.value=True
    A2.value=False
    A3.value=False
    A4.value=False
def analog2(num):
    clear()
    show(num)
    DP.value=False
    A1.value=False
    A2.value=True
    A3.value=False
    A4.value=False
def analog3(num):
    clear()
    show(num)
    A1.value=False
    A2.value=False
    A3.value=True
    A4.value=False
def analog4(num):
    clear()
    '''show(num)
    A1.value=False
    A2.value=False
    A3.value=False
    A4.value=True'''
    A.value=False
    F.value=False
    E.value=False
    D.value=False
    A1.value=False
    A2.value=False
    A3.value=False
    A4.value=True
while True:
    R = 10000 / (65535/thermistor.value - 1)
    Temperature=hackathon.steinhart_temperature_C(R)
    simple=int(Temperature*100)
    A4.value=True
while True:
    R = 10000 / (65535/thermistor.value - 1)
    Temperature=hackathon.steinhart_temperature_C(R)
    simple=int(Temperature*100)
    seg1=simple//100
    digit1=seg1//10
    digit2=seg1%10
    seg2=simple%100
    digit3=seg2//10
    digit4=seg2%10
    time.sleep(0.001)
    analog1(digit1)
    time.sleep(0.001)
    analog2(digit2)
    time.sleep(0.001)
    analog3(digit3)
    time.sleep(0.001)
    analog4(digit4)
    time.sleep(0.001)
```

```
def steinhart_temperature_C(r, Ro=80000.0, To=25.0, beta=3950.0):
    import math
    steinhart = math.log(r / Ro) / beta      # log(R/Ro) / beta
    steinhart += 1.0 / (To + 273.15)         # log(R/Ro) / beta + 1/To
    steinhart = (1.0 / steinhart) - 273.15   # Invert, convert to C
    return steinhart
```