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1  import time
2  import math
3  import RPi.GPIO as IO
4  # Import the MCP4725 module.
5  import Adafruit_MCP4725
6
7  # Create a DAC instance.
8  dac = Adafruit_MCP4725.MCP4725()
9
10 IO.setmode(IO.BOARD)
11 IO.setup(15, IO.IN) #Setup input from button
12
13 #Setup for sin wave with voltage and frequency input
14 def sin_wave(volt_input, freq_input):
15     t = 0.0
16     tStep = 0.0005
17     scale = 4096/3.3
18     while True:
19         voltage = scale * ((volt_input - 1) + math.sin(freq_input*t*(50/3.0)))
20         dac.set_voltage(int(voltage))
21         t += tStep
22         time.sleep(0.0005)
23
24 #Setup for square wave with voltage and frequency input
25 def square_wave(volt_input, freq_input):
26     while True:
27         voltage = volt_input * (4096/3.3)
28         dac.set_voltage(int(voltage))
29         time.sleep((1.0/freq_input)/2.0)
30         voltage = 0
31         dac.set_voltage(int(voltage))
32         time.sleep((1.0/freq_input)/2.0)
33
34 #Setup for triangle wave with voltage and frequency input
35 def triangle_wave(volt_input, freq_input):
36     tStep = 0.005
37     scale = volt_input*(4096 / 3.3)
38     slope = 2*volt_input*freq_input*(10/8.4)
39
40     while True:
41         voltage = 0
42         while voltage<volt_input:
43             voltage += slope * tStep
44             dac.set_voltage(int(voltage*(4096/3.3)))
45             time.sleep(0.005)
46         while voltage >= 0:
47             voltage -= slope * tStep
48             dac.set_voltage(int(voltage*(4096/3.3)))
49             time.sleep(0.005)
50
51 #Waiting for button input to call on the specific waveform
52 while True:
53     if(IO.input(15)):
54         shape_input = input("Shape of Waveform: ")
55         volt_input = input("Max output voltage: ")
56         freq_input = input("Frequency: ")
57
58         if (shape_input == 'sin'):
59             sin_wave(volt_input, freq_input)
60         elif (shape_input == 'triangle'):
61             triangle_wave(volt_input, freq_input)
62         elif (shape_input == 'square'):
63             square_wave(volt_input, freq_input)
64         else:
65             print "Wrong shape input"
66

```