```python
#Importing the various libraries required for the code to run

import gspread
import RPi.GPIO as GPIO
import drivers
import random
from time import sleep
from datetime import datetime, timedelta
from oauth2client.service_account import ServiceAccountCredentials



#Setting up google sheets API

scope = ['https://spreadsheets.google.com/feeds',
        'https://www.googleapis.com/auth/drive']
creds = ServiceAccountCredentials.from_json_keyfile_name('/home/pi/Desktop/LiterallyAnything/Credentials.json', scope)
client = gspread.authorize(creds)
global sheet
sheet=client.open("Jashanpreet")



#Setting up general purpose input/output pins (GPIO pins) for the pressure pad, buttons and peizo buzzer

GPIO.setmode(GPIO.BOARD)
GPIO.setwarnings(False)
GPIO.setup(10, GPIO.IN, pull_up_down=GPIO.PUD_DOWN)
GPIO.setup(7, GPIO.IN, pull_up_down=GPIO.PUD_DOWN)
GPIO.setup(8, GPIO.IN, pull_up_down=GPIO.PUD_DOWN)
GPIO.setup(11, GPIO.IN, pull_up_down=GPIO.PUD_DOWN)
GPIO.setup(12, GPIO.OUT)



#Setting up the LCD display

display = drivers.Lcd()


#Defining a function which will run the first activity when executed
#In this first activity the user will be given instructions on the lcd display
#In this activity the user gets a limited time to punch/kick/hit the target as many times possible
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#This score is then stored on a google sheets file and stats are displayed onto the lcd display (latest score, best score, average score)

def activity1():



    #The first block of code opens the correct page of the google sheet and display the instructions on the lcd display

    display.lcd_clear()
    worksheet = sheet.get_worksheet(0)
    dataPosition1 = worksheet.cell(2, 3).value
    hitCounter = 0
    display.lcd_display_string("Activity 1", 1)
    display.lcd_display_string("In this activity", 2)
    sleep(1)
    display.lcd_display_string("try to hit the  ", 2)
    sleep(1)
    display.lcd_display_string("target as many  ", 2)
    sleep(1)
    display.lcd_display_string("times possible  ", 2)
    sleep(1)
    display.lcd_display_string("in 30 seconds.  ", 2)
    sleep(1)
    display.lcd_display_string("Begin           ", 2)
    sleep(1)
    display.lcd_clear()
    display.lcd_display_string("Times Hit:", 1)



    #This block of code is the activity and uses while loop and if statements to work
    #The while loop uses the time library to run for only a certain amount of time (30 seconds)
    #Inside the while loop there is a counter which increases everytime there is a signal coming from the pressure pad

    end_time = datetime.now() + timedelta(seconds = 30)
    while datetime.now() < end_time:
        display.lcd_display_string(str(hitCounter), 2)
        sleep(0.25)
        if GPIO.input(7) == GPIO.HIGH:
            hitCounter += 1
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    display.lcd_clear()



    #This block of code updates the information on the spreadsheet and displays the latest score, best score and average score on the lcd display

    worksheet.update_cell(dataPosition1, 1, hitCounter)
    dataPosition1 = int(dataPosition1)
    dataPosition1 += 1
    worksheet.update_cell(2, 3, dataPosition1)
    display.lcd_display_string("Final Score:    ", 1)
    display.lcd_display_string(str(hitCounter), 2)
    sleep(3)
    bestScore = worksheet.cell(2, 6).value
    display.lcd_display_string("Best Score:     ", 1)
    display.lcd_display_string(bestScore, 2)
    sleep(3)
    avgScore = worksheet.cell(3, 6).value
    display.lcd_display_string("Avg Score:     ", 1)
    display.lcd_display_string(avgScore, 2)
    sleep(3)
    display.lcd_clear()




#Defining a function which will run the second activity when executed
#In this second activity the user will be given instructions on the lcd display
#In this activity the user will measure their reaction time by hitting the target as soon as the buzzer beeps
#This score is then stored on a google sheets file and stats are displayed onto the lcd display (latest score, best score, average score)

def activity2():



    #The first block of code opens the correct page of the google sheet and display the instructions on the lcd display

    display.lcd_clear()
    worksheet = sheet.get_worksheet(1)
    dataPosition2 = worksheet.cell(2, 3).value
    display.lcd_display_string("Activity 2", 1)
    display.lcd_display_string("In this activity", 2)
    sleep(1)
    display.lcd_display_string("try to hit the  ", 2)
    sleep(1)
    display.lcd_display_string("target as fast  ", 2)
    sleep(1)
    display.lcd_display_string("as possible when", 2)
    sleep(1)
    display.lcd_display_string("the peizo sounds", 2)
    sleep(1)
    display.lcd_display_string("Begin           ", 2)
    sleep(1)
    display.lcd_clear()
    sleep(2)



    #This block of code is the activity and uses while loop and if statements to work
    #The while loop uses the time library to run for only a certain amount of time (3 seconds)
    #Inside the while loop there is an if statement which checks for an input from the pressure sensor and sets a time for it
    #There is also an output signal which turns the peizo buzzer on and off

    end_time = datetime.now() + timedelta(seconds = 3)
    initialTime = datetime.now()
    finalTime = 0
    GPIO.output(12, GPIO.HIGH)
    sleep(0.2)
    GPIO.output(12, GPIO.LOW)
    while datetime.now() < end_time:
        if GPIO.input(7) == GPIO.HIGH:
            finalTime = datetime.now()
            sleep(0.25)



    #This block of code updates the information on the spreadsheet and displays the latest score, best score and average score on the lcd display
    #This block also makes some calculations using the results from the previous block of code to find out the reaction time which would be the activity's score

    sleep(1)
    timeTaken = finalTime - initialTime
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    timeTaken = str(timeTaken)
    timeTaken = timeTaken.replace(":", "0")
    worksheet.update_cell(dataPosition2, 1, timeTaken)
    dataPosition2 = int(dataPosition2)
    dataPosition2 += 1
    worksheet.update_cell(2, 3, dataPosition2)
    display.lcd_display_string("Reaction time:  ", 1)
    display.lcd_display_string(str(timeTaken), 2)
    sleep(3)
    bestScore = worksheet.cell(2, 6).value
    display.lcd_display_string("Best Score:     ", 1)
    display.lcd_display_string(bestScore, 2)
    sleep(3)
    avgScore = worksheet.cell(3, 6).value
    display.lcd_display_string("Avg Score:      ", 1)
    display.lcd_display_string(avgScore, 2)
    sleep(3)
    display.lcd_clear()



#Defining a function which will run the third activity when executed
#In this third activity the user will be given instructions on the lcd display
#In this activity there will be beeps at random times which the user will have time their hits with in order to secure a point
#This score is then stored on a google sheets file and stats are displayed onto the lcd display (latest score, best score, average score)

def activity3():



    #The first block of code opens the correct page of the google sheet and display the instructions on the lcd display

    display.lcd_clear()
    worksheet = sheet.get_worksheet(2)
    dataPosition3 = worksheet.cell(2, 3).value
    display.lcd_display_string("Activity 3", 1)
    display.lcd_display_string("In this activity", 2)
    sleep(1)
    display.lcd_display_string("try to hit the  ", 2)
    sleep(1)
    display.lcd_display_string("target whenever ", 2)
    sleep(1)
    display.lcd_display_string("the peizo sounds", 2)
    sleep(1)
    display.lcd_display_string("which will be at", 2)
    sleep(1)
    display.lcd_display_string("random times for", 2)
    sleep(1)
    display.lcd_display_string("60 seconds      ", 2)
    sleep(1)
    display.lcd_display_string("Begin           ", 2)
    sleep(1)
    display.lcd_clear()
    sleep(2)
    display.lcd_display_string("Times Hit:", 1)



    #This block of code is the activity and uses while loop and if statements to work
    #The while loop uses the time library to run for only a certain amount of time (60 seconds) and there is another while loop which checks for a hit after the buzzer goes off which will only run for half a second (0.5 seconds)
    #Inside the second while loop there is an if statement which checks for an input from the pressure sensor and adds a value of 1 to the counter for successful hits
    #There is also an output signal which turns the peizo buzzer on and off

    successfulHits = 0
    totalChances = 0
    display.lcd_display_string(str(successfulHits), 2)
    end_time = datetime.now() + timedelta(seconds = 60)
    while datetime.now() < end_time:
        sleep(random.randrange(2, 7))
        totalChances += 1.0
        GPIO.output(12, GPIO.HIGH)
        sleep(0.2)
        GPIO.output(12, GPIO.LOW)
        finish_time = datetime.now() + timedelta(seconds = 0.5)
        while datetime.now() < finish_time:
            if GPIO.input(7) == GPIO.HIGH:
                successfulHits += 1.0
                display.lcd_display_string(str(successfulHits), 2)
                sleep(0.25)
    #This block of code updates the information on the spreadsheet and displays the latest score, best score and average score on the lcd display
    #This block also makes some calculations using the results from the previous block of code to find out the success rate of the user which would be the activity's score

    display.lcd_clear()
    successRate = (successfulHits/totalChances)*100
    worksheet.update_cell(dataPosition3, 1, successRate)
    successRate = worksheet.cell(dataPosition3, 1).value
    dataPosition3 = int(dataPosition3)
    dataPosition3 += 1
    worksheet.update_cell(2, 3, dataPosition3)
    display.lcd_display_string("Final Score:    ", 1)
    display.lcd_display_string(str(successRate) + "%", 2)
    sleep(3)
    bestScore = worksheet.cell(2, 6).value
    display.lcd_display_string("Best Score:     ", 1)
    display.lcd_display_string(bestScore, 2)
    sleep(3)
    avgScore = worksheet.cell(3, 6).value
    display.lcd_display_string("Avg Score:      ", 1)
    display.lcd_display_string(avgScore, 2)
    sleep(3)
    display.lcd_clear()



#This block of code is what is actually being run
#The next 2 blocks use the try and except functions
#The code in the try funtion just simply runs
#In this case the code is just a while loop that constantly runs so it is always going to be checking for the if statements
#Each if statement is simply looking for an input from 1 of 3 buttons and if the condition is met one of the functions created above will run

try:
    display.lcd_clear()
    while True:
        display.lcd_display_string("Choose Activity ", 1)

        if GPIO.input(10) == GPIO.HIGH:
            activity1()

        if GPIO.input(8) == GPIO.HIGH:
            activity2()

        if GPIO.input(11) == GPIO.HIGH:
            activity3()


#The except function interrupts the try function and the code in it and the code then moves on to what is in the except function
#In this case the condition required to activate the except function is KeyboardInterrupt meaning whenever there is an input of ctrl + c in the terminal the code running in the try function will be stopped and we will continue on to the code in the except funciton
#In this function the lcd display will simply display "turning off" signaling that the code has finished and the code will end after clearing the lcd display

except KeyboardInterrupt:
    display.lcd_clear()
    display.lcd_display_string("Turning Off     ", 1)
    sleep(2)
    display.lcd_clear()
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