İZMİR KATİP ÇELEBİ UNIVERSITY
FACULTY OF ENGINEERING AND ARCHITECTURE
DEPARTMENT OF MECHATRONICS ENGINEERING

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MECHATRONICS ENGINEERING

ADVANCED PROGRAMMING

FINAL PROJECT

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Introduction:

As a female creature I care about my skin and humidity is important, so that your skin doesn`t age. Thereby, in this project I decided to create a device that measures temperature and humidity.

So, What is the best humidity level for healthy skin?

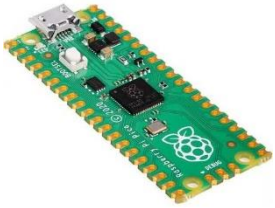
50% relative humidity is ideal for healthy skin. In the summer months, optimal humidity may be as high as 60% relative humidity, and in the winter months, optimal humidity may be as low as 30% relative humidity. 45-55% relative humidity is a good range says on https://www.preservskincare.com/blog/snnsay76gtd6rujzssxyysoztvmebx

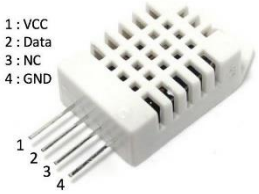
Moreover, I want to add a humidifier, so that as soon as the humidity in the room drops, the humidifier is activated.

Procedure:

The list of the materials needed for this project:

- Raspberry Pi Pico





- Humidity and Temperature sensor DHT22
- Liquid Crystal Display

- Humidifier

- Servo Motor SG90

- I2C module

Extra:

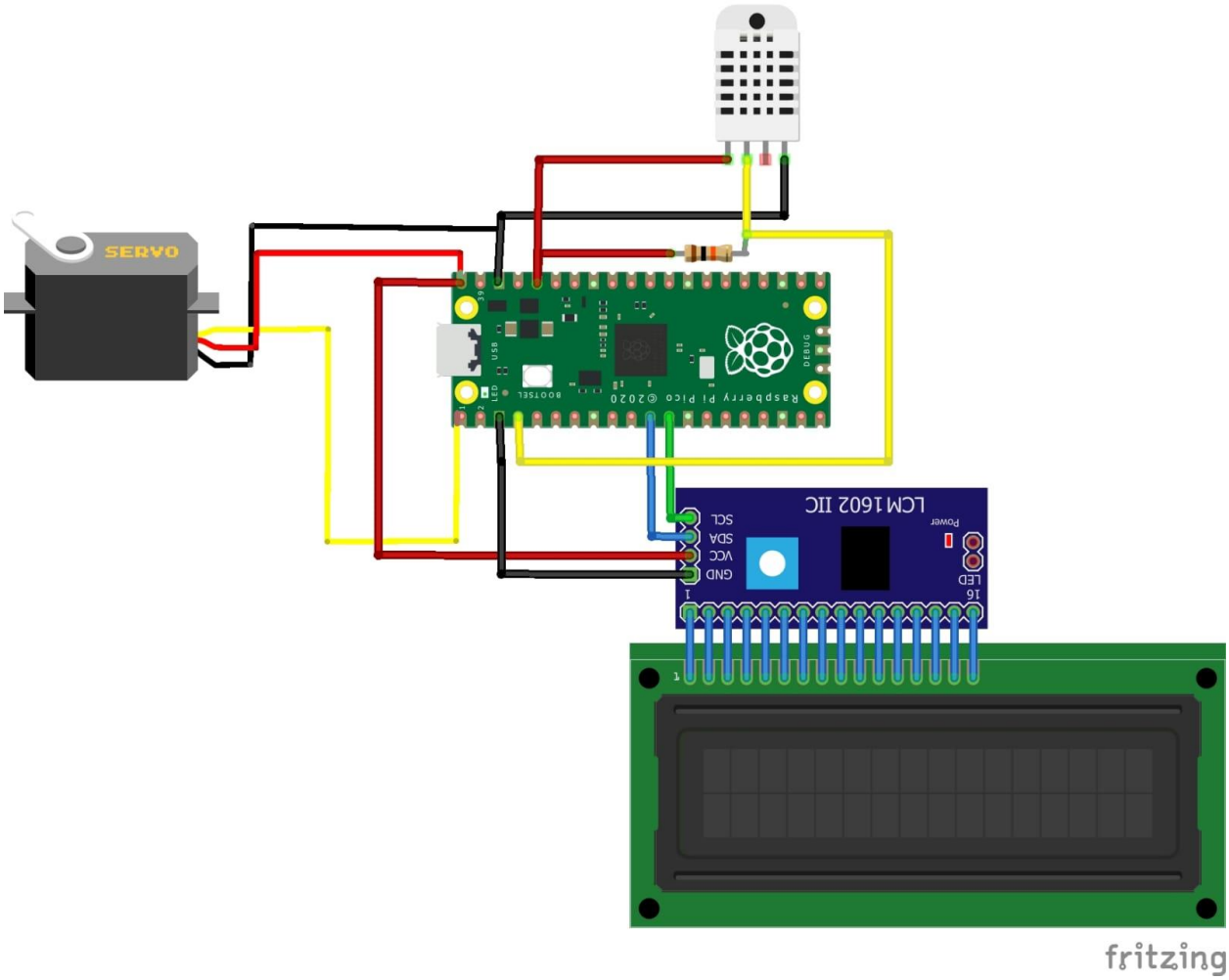
- Buzzer

- Led

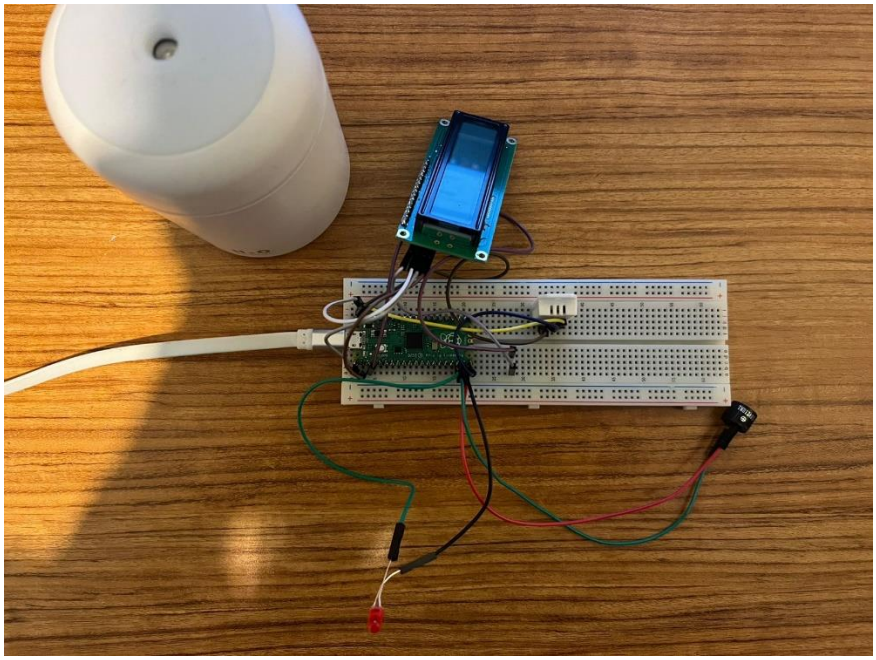
Software:

- Python (Micro Python Thonny)

The final scheme:



Circuit Design:



My prototype:

Due to the fact that my motor was broken at the last moment, I had to impromptu change my project. I wrote the code for the motor, however I could use the output pwm for the led and buzzer.

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Python Code:

```
from machine import I2C, Pin, PWM
from time import sleep
from pico_i2c_lcd import I2cLcd
from DHT22 import DHT22
import utime
import time

i2c = I2C(0, sda=Pin(0), scl=Pin(1), freq=100000)

I2C_ADDR = i2c.scan()[0]
lcd = I2cLcd(i2c, I2C_ADDR, 2, 16)

dht22=DHT22(Pin(15,Pin.IN,Pin.PULL_UP))#sensor connected GPIO 15 pin


pwm = PWM(Pin(14))
pwm.freq(50)


def setServoCycle (position):

    pwm.duty_u16(position)

    sleep(0.01)
  # pwm.duty_u16(0)

while True:
    pwm.duty_u16(0)
    T, H = dht22.read()
    lcd.move_to(0,0)
    lcd.putstr("Temp :")
    lcd.move_to(7,0)
    lcd.putstr(str(T)+"C")

    lcd.move_to(0,1)
    lcd.putstr("Humi :")
    lcd.move_to(7,1)
    lcd.putstr(str(H))
    print(T,H)
    time.sleep_ms(500)

    if T>35:
        for position in range(600,6000,50):
            setServoCycle(position)
          #  time.sleep_ms(1000)
        for position in range(6000,600,-50):
            setServoCycle(position)
            time.sleep(20)
            T=0
        break
```

Conclusion:

I really enjoyed this project, because I learned a lot about Python(MicroPython) , Rasberry Pi Pico and etc. I was impressed by the specifications of the Pico. There was plenty of amazing project to do with it. In other words, it supports a huge variety of peripheral sensors and devices, but I`ve chosen DHT22, since I can use it for myself also. However, I faced some problems with codding. Moreover, I broke my Servomotor on the last day, so I had to change some aspects of my project. So, as soon as temperature in the room rises and humidity relatively decreases, led and buzzer warns user about it, and needs to activate humidifier.

In my opinion, these kind of devices has to be in every house, so that people can know if the air is dry or not. Especially, it`s important for winter times, when the weather and indoor heating systems can make the air dry and dry out your eyes, nose, lips, and skin. Therefore, humidifiers can reduce the spread of germs, prevent dry skin, relieve allergy and asthma symptoms, loosen congestion, and alleviate snoring.