# SAAND
# TEMPERATURE & HUMIDITY SENSOR

GNG1103 Group D8

Nada El Rayes

Amanda Beraldo Brandao de Souza

DongYu Wang

Aaron MacNeil

Shayleen Ghanaat

## *Empathize*

# *Prioritized client needs*

1. Provide consistent and reliable data about humidity and temperature inside the delivery box
2. Make accurate measurements
3. Be resistant to the conditions inside box (humidity, heat)
4. Low power consumption
5. Compact & lightweight

*Define*

# *Problem statement*

JAMZ Automated Delivery needs a reliable and accurate device to monitor the temperature and humidity of the food delivered, which will send a warning to their drone operator when the temperature or humidity is not in the acceptable range.

# *Design criteria*

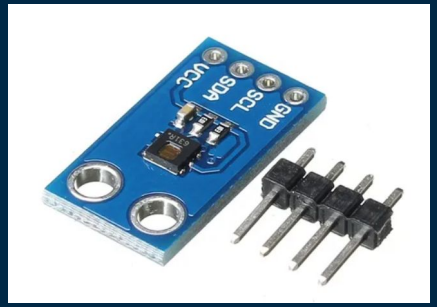
| *Functional requirements* | **Non-Functional requirements** |
| --- | --- |
| ❖ Consistent data | ❖ Compactness |
| ❖ Water resistance | ❖ Colour |
| ❖ Power consumption | ❖ Product life (years) |
| ❖ Weight | ❖ Housing aesthetics |

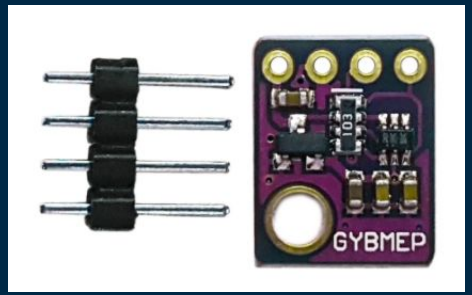
# *Specifications*

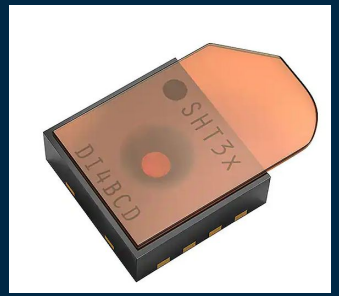
| Metrics | Target specifications |
| --- | --- |
| ❖ Reliability: % | ❖ Reliability: 95% |
| ❖ Temperature ideal range: °C | ❖ Temperature ideal range: between 0°C and 19°C |
| ❖ Humidity ideal range: % | ❖ Humidity ideal range: below 50%Humidity ideal range: below 50% |
| ❖ Total weight: kg | ❖ Total weight: below 1kg |
| ❖ Frequency: datapoints/sec | ❖ Frequency: 2 data points/sec |

# *Benchmarking*

Sensor



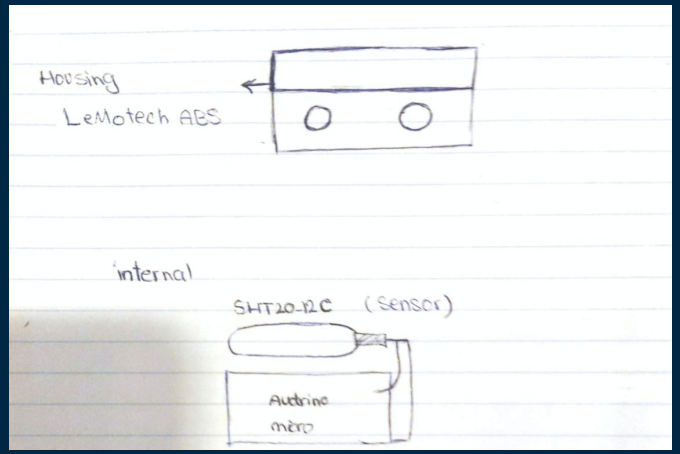




Housing

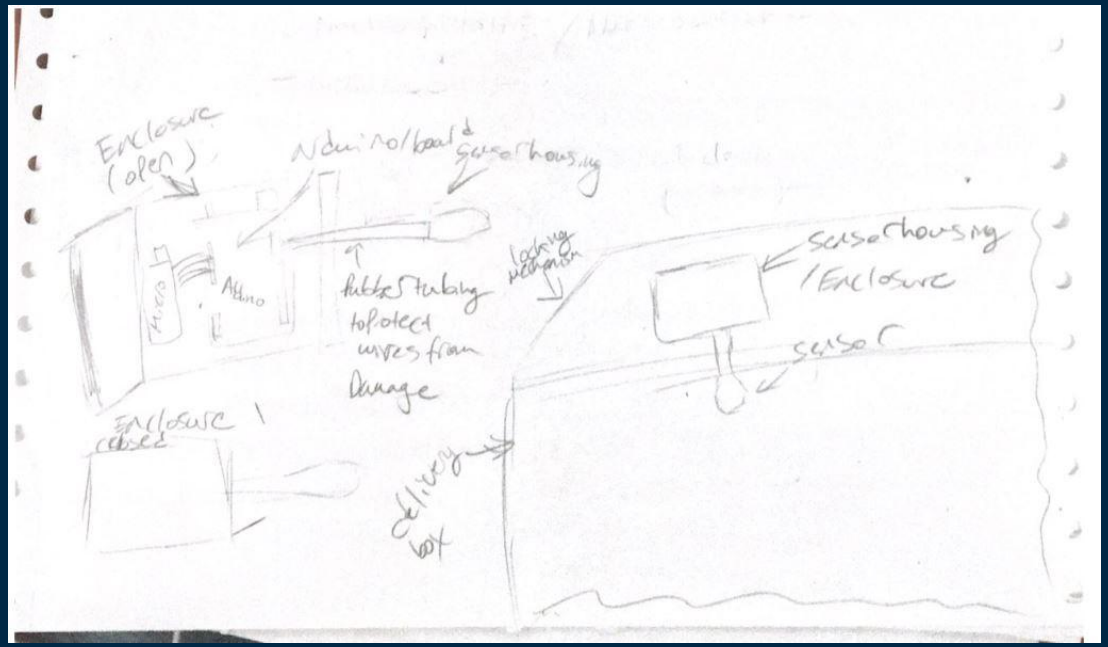
*Ideate*

# *Concept generation*

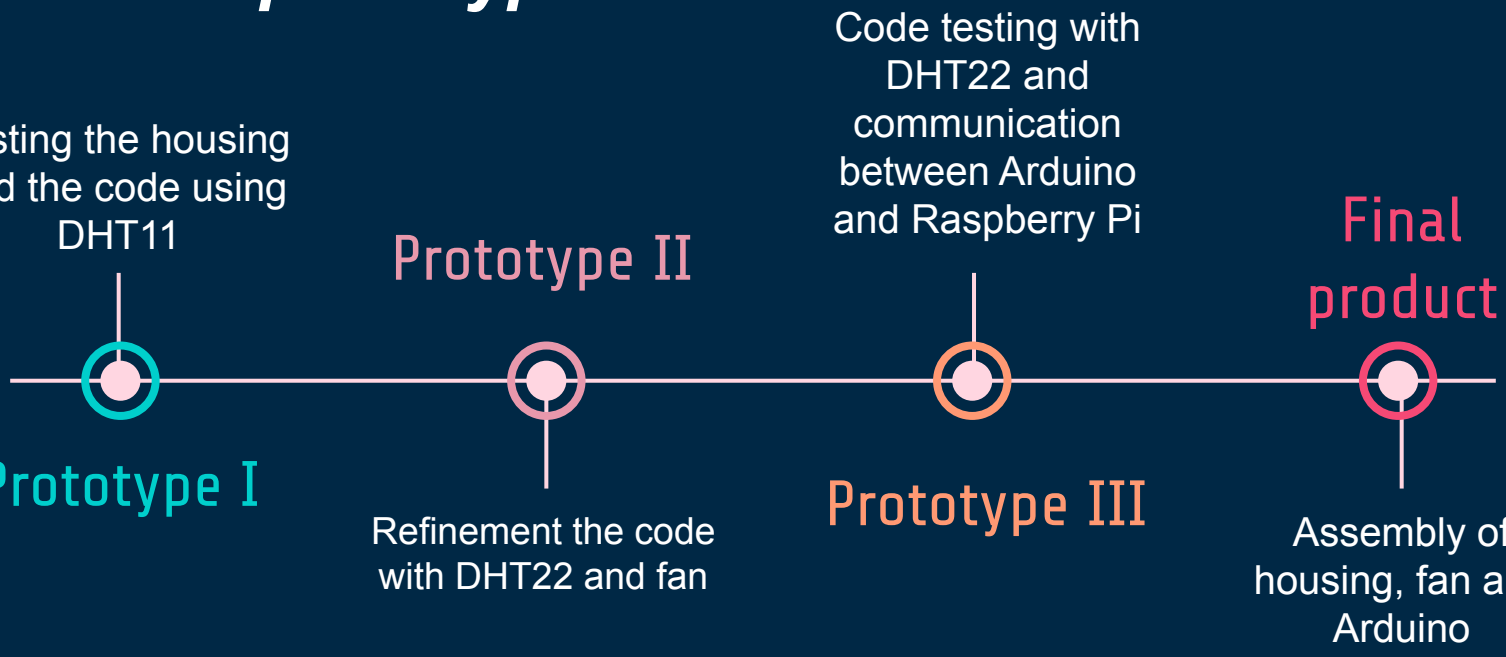
## Housing



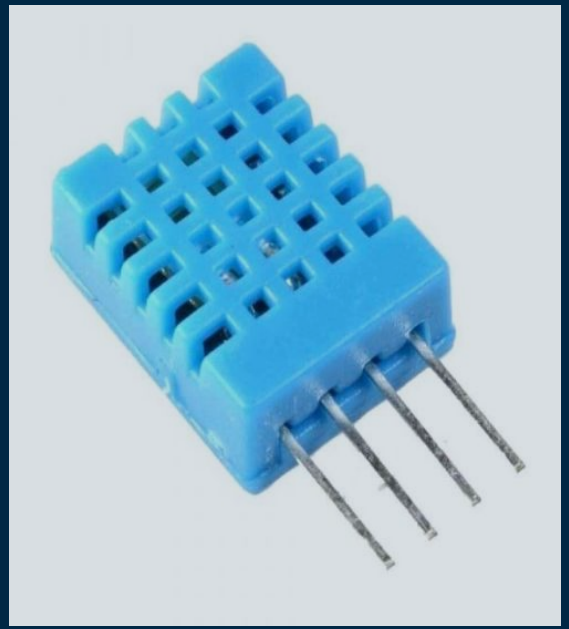

## Circuit



# *Relevant prototypes*



# Prototype 1

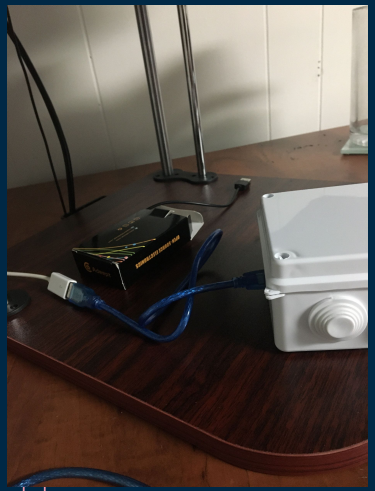



## Objectives

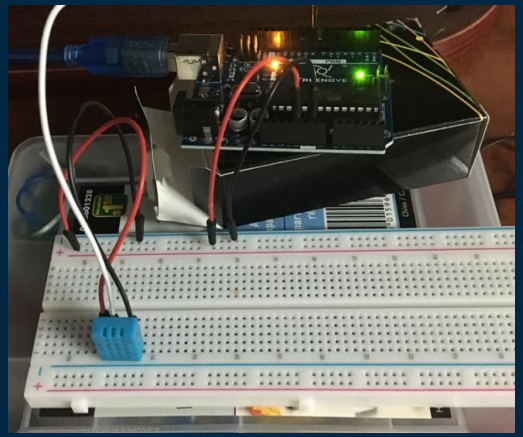
- Code performance using one DHT11 sensor
- Housing water resistance and heat test

# *Testing for Prototype 1*

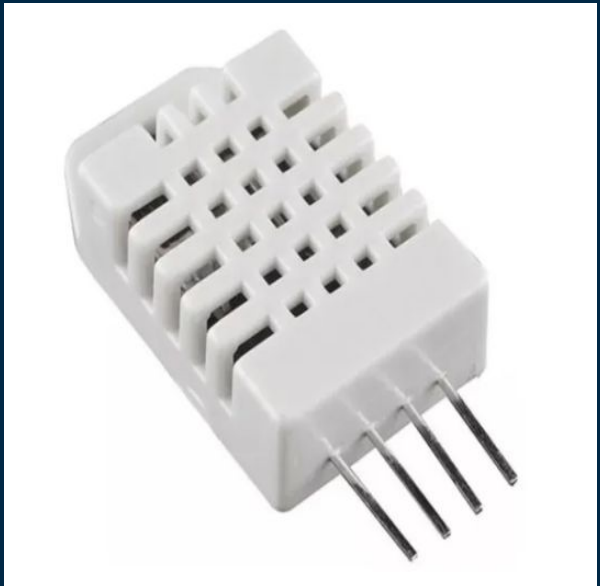
Housing waterproof & heat test



Code with sensor readings



# Prototype 2

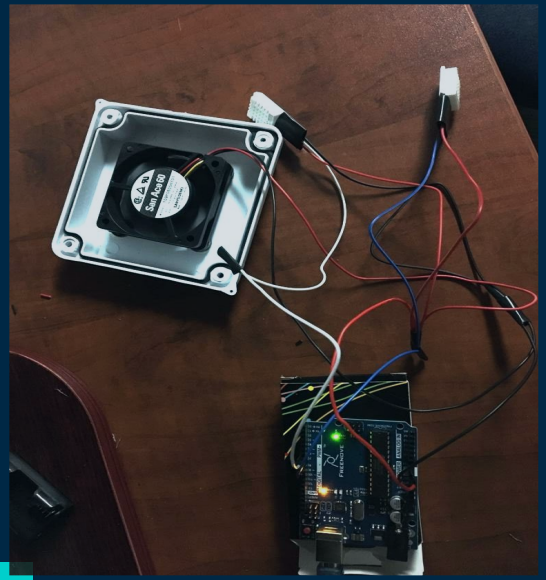



## Objectives

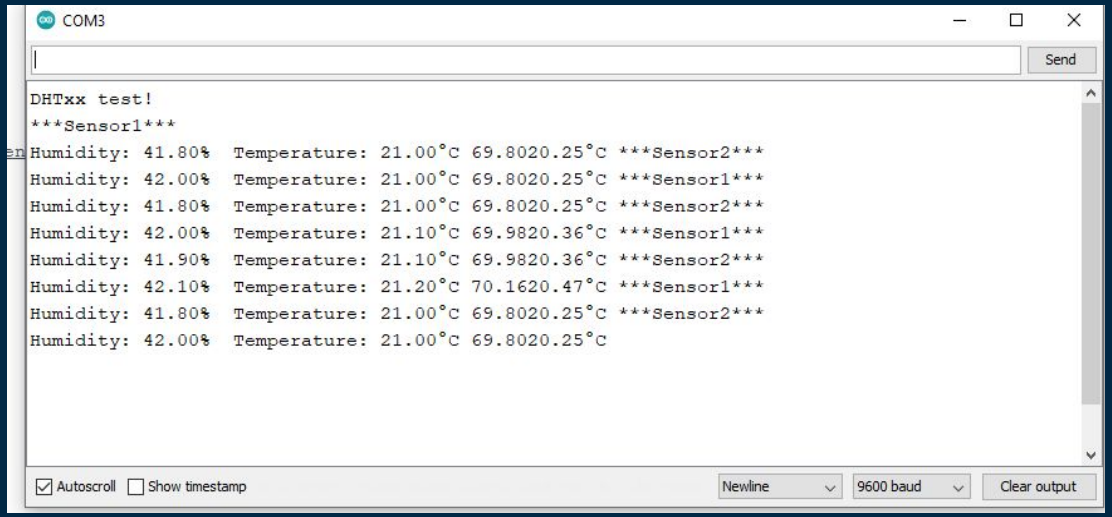
- Measure efficiency of fan
- Refinement of code using two DHT22 sensor

# *Testing for Prototype 2*

Fan power consumption test



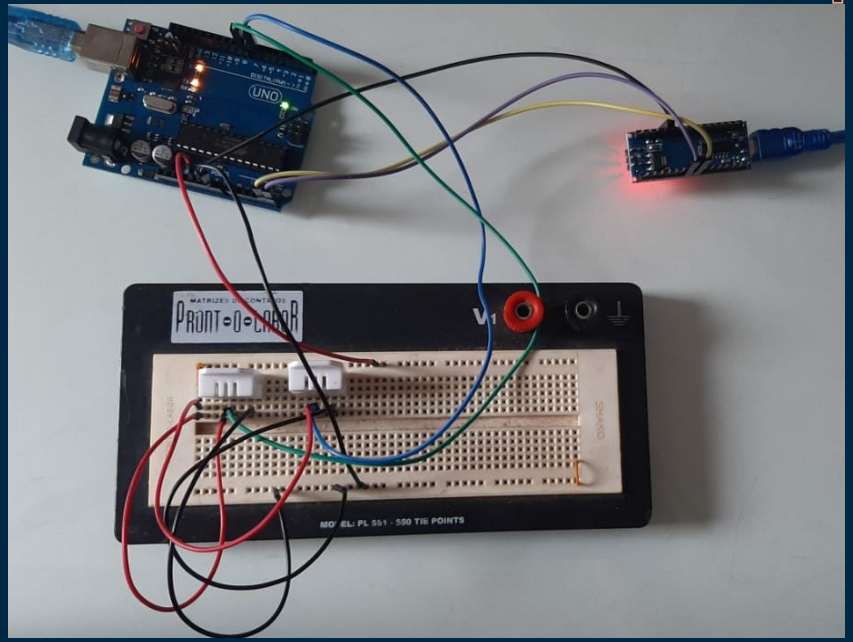
Code revision 2: with sensor readings



# *Prototype 3*

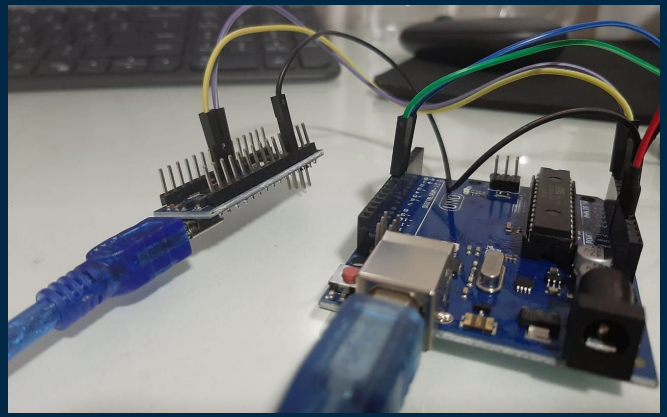
## *Objectives*

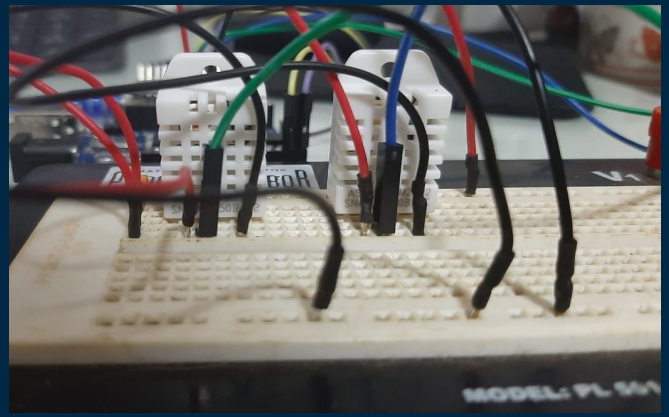
- Revise code using two DHT22 sensors
- Develop communication between microcontrollers



# *Testing for Prototype 3*

Code revision 3: with sensor readings and communication between microcontrollers





# *Decisions made*

- Use I2C communication protocol
- Use two DHT22 sensors
- Using a junction box instead of 3D printed housing
- Implementing a cooling fan

# *Lessons learned*

Work with budget reduction

We should effectively communicate together

Updating the libraries before starting to code

Research compatibility of components before purchasing item

# Next steps...

- Set the code to send data to the drone’s Raspberry Pi when the value for humidity and temperature is not in acceptable range.
- Final assembly of project components

# Thank you for your attention!