Testing Strategy

We plan to test our whole system with a number of different tests on different levels. These levels include:

- Unit testing (individual components or modules with test fixtures, simulators, or emulators)
- Integration testing (interaction of multiple components or modules with test benches, test harnesses or test platforms)
- System testing (checks a system's compliance in accordance with the necessary given requirements (performance, load, reliability, and security))
- Acceptance testing (tested by the user or customer)

The level of acceptance testing may, however, still be out of scope for this upcoming sprint

Unit Testing

DHT sensor:

- Increase and/or decrease the temperature and see whether it registers the temp change
- Increase the temperature to see whether it sends a signal when the temperature gets too high

Return to home position:

- Make it go to the home position and check if it does
- Make it go to the home position and make sure that it stops once it's there
- Does the X home button work
- Does the Y home button work
- Does the Z home button work
- Do the steppers return to the home position at the start?
- Do the steppers return to the home position at the end of a program?
- Do the buttons send a stop signal?

Communications between ESP-32 and Arduino with sensors:

None

Communication between ESP32 and Arduino with motor module:

- Does the received message get split correctly
- Does the message result in the correct mode being activated
- Does the message result in the correct speed value

Accelerometer:

- Move the accelerometer a certain distance at different speeds and make sure it indicates correct information about its speed
- Make sure the program calculates the correct information about its position

Motors:

- Make sure the motor moves in the right direction
- Make sure the motor moves the correct amount of steps
- Does the correct motor move
- Does the X stepper move fluently
- Does the Y stepper move fluently
- Does the Z stepper move fluently

- Does the X stepper move the correct amount of steps
- Does the Y stepper move the correct amount of steps
- Does the Z stepper move the correct amount of steps
- Does the X stepper move in the correct rotation
- Does the Y stepper move in the correct rotation
- Does the Z stepper move in the correct rotation
- Does the correct stepper motor move
- Are multiple steppers able to move simultaneously

GUI:

- Is there a connection between ESP32 and GUI?
- Test how robust the program is by filling in the form a few times with different files.

Integration Testing

DHT sensor:

None

Return to home position:

None

Communications between ESP-32 and Arduino with sensors:

- Does the Arduino Receive a string from the ESP32
- Is the message in the correct protocol

Communication between ESP32 and Arduino with motor module:

- Send some coordinates and make sure the message arrives in its entirety
- Does the message get sent
- Does the message get received

Accelerometer:

None

Motors:

None

GUI:

- Test how robust the program is by filling in the form a few times with different files.

System Testing

DHT sensor:

None

Return to home position:

None

Communications between ESP-32 and Arduino:

None

Communication between ESP32 and Arduino with motor module:

None

Accelerometer:

None

Motors:

None

GUI:

None