

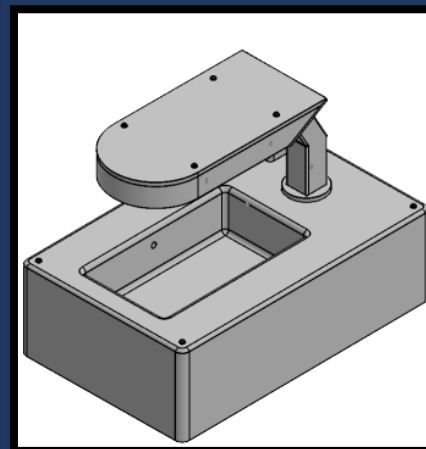
Self Growing Garden with Low Moisture Detection System



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Aims

Design and build a self-growing garden with an automatic water dispenser system that can be kept indoors



Conclusion

1. The project had performed as expected
2. Minor modifications were applied
3. Aims and Objectives were met

Objectives

- Research existing growth chambers
- Create a PDS Design and generate at least two concept designs to maximise the efficiency and distribution of the lighting.
- Create a one-to-one scale solid works drawing and covert to 3D printing software
- Print and assemble product
- Test and review performance of final product

Manufacturing

- All the parts were created in CAD using Solidworks
- The CAD files were converted to 3D printing software files
- The parts are 3D printed
- Base is made using clear acrylic
- Manufacturing techniques:
 - Soldering
 - Drilling
 - Jig-sawing
 - Angle grinding
 - Joining

Testing

- Initial test carried was to see if the motor and LEDs would turn off/on based on the output of the Arduino.
- Second test carried out was to see if the base could retain the water and soil without leaking
- The third and final test conducted was with the moisture probes and relay switch to turn on the water pump

Evaluation

- Servo motor and LEDs were responsive to the LDR
- The Servo motor turns too quickly resulting in the base vibrating
- Lights were flickering because the Servo motor was drawing too much current
- The base retained the water without any leaks occurring
- Moisture probes worked as expected and turned on the pump when the soil was dry

Recommendations

- To prevent the motor from turning too quickly, a code is used to program the Arduino that tells the Servo motor to turn to a specific angle in a set time. The greater the time, the slower the rotation.
- Changing the control pulse will also lower the speed of rotation.
- To prevent the LEDs from flickering on and off whilst the motor is rotating, a NeoPixel Shield can be used to light up 40 LEDs at once using the Arduino's 5V output pin