



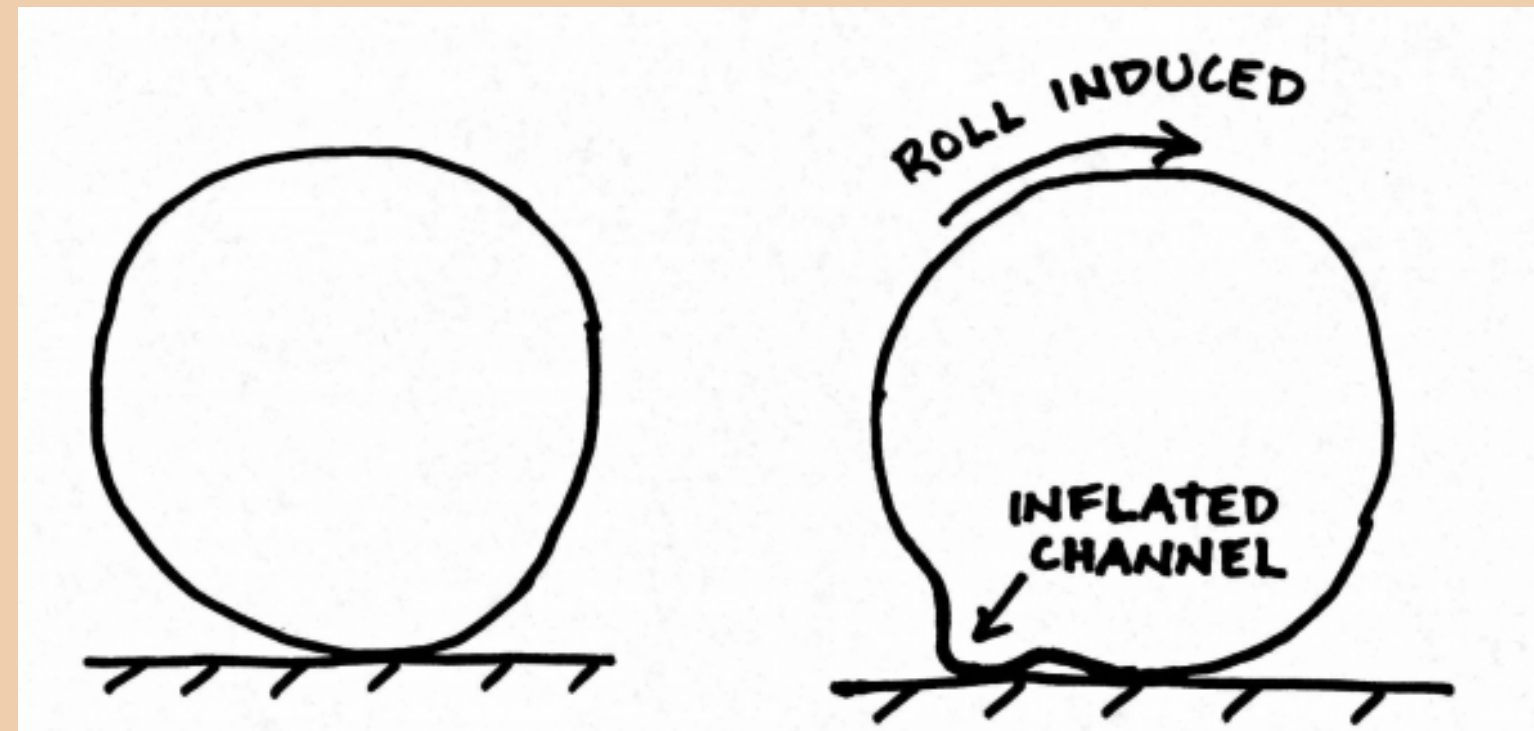
Softwheel Robot

Presented By : Group M-D



Project Overview

Softwheel robot is an untethered, cylindrical soft robot, which is propelled in a rolling motion by pneumatically actuated channels.



Arduino code

TIN KER CAD Softwheel Robot

All changes saved

Code Start Simulation Send To

Text 1 (Arduino Uno R3)

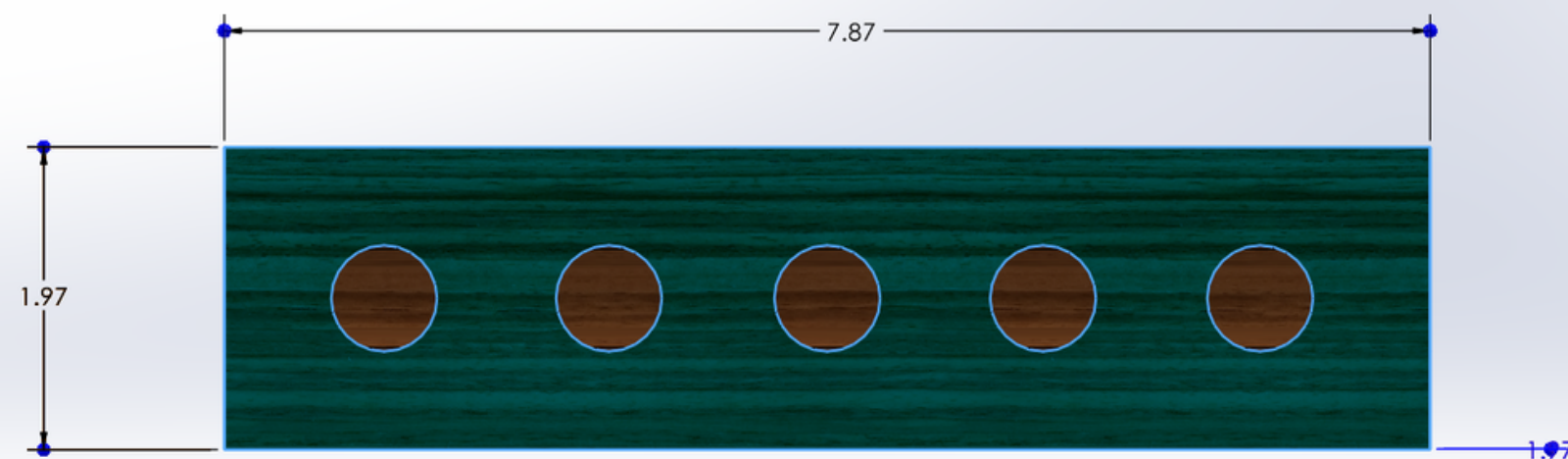
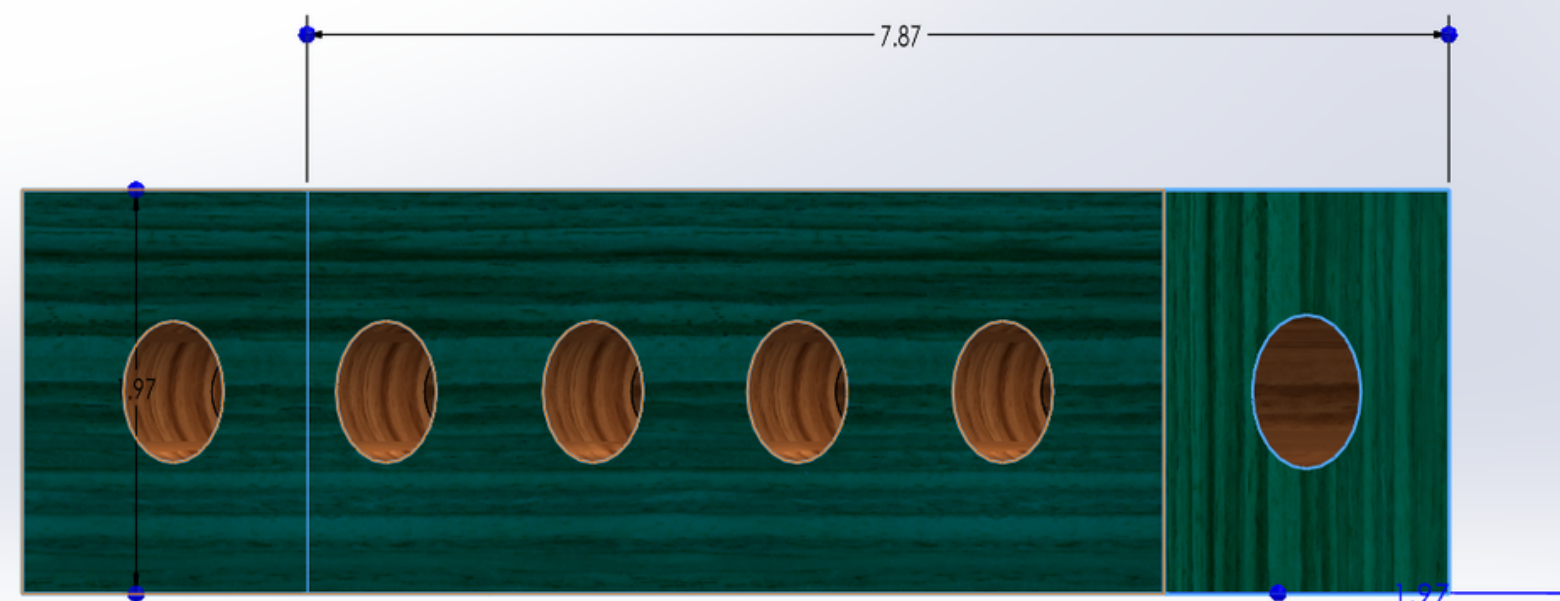
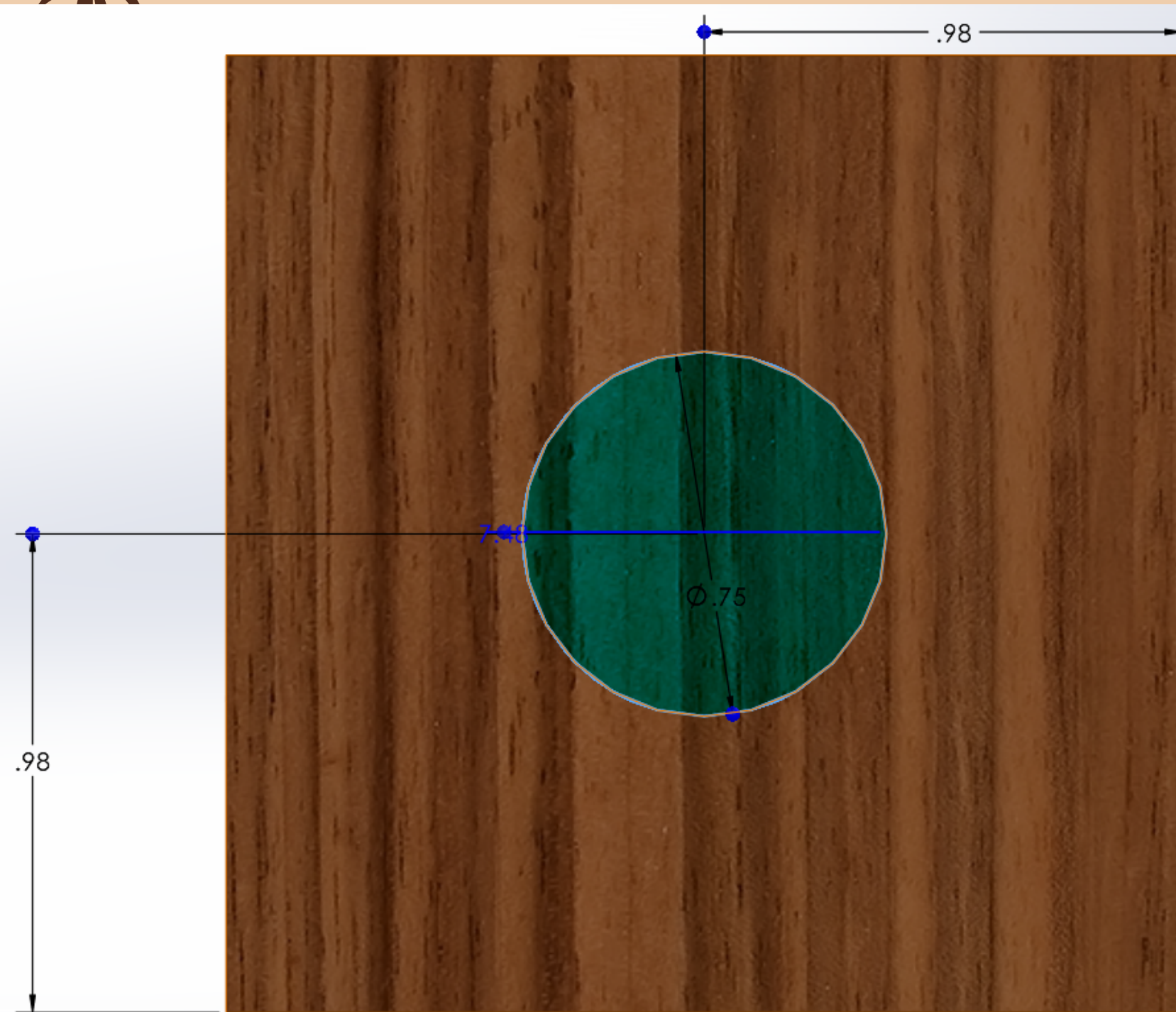
```
24 delay(1000);
25 digitalWrite(Gled,LOW);
26 digitalWrite(Rled,HIGH);
27 delay(1000);
28 digitalWrite(Rled,LOW);
29 digitalWrite(Bled,HIGH);
30 delay(1000);
31 digitalWrite(Bled,LOW);
32 }
33 if(!digitalRead(PBb))
34 {
35     digitalWrite(Bled,HIGH);
36     delay(1000);
37     digitalWrite(Bled,LOW);
38     digitalWrite(Rled,HIGH);
39     delay(1000);
40     digitalWrite(Rled,LOW);
41     digitalWrite(Gled,HIGH);
42     delay(1000);
43     digitalWrite(Gled,LOW);
44 }
45 Serial.println(digitalRead(PBa));
46 Serial.println(digitalRead(PBb));
47 }
```

Serial Monitor

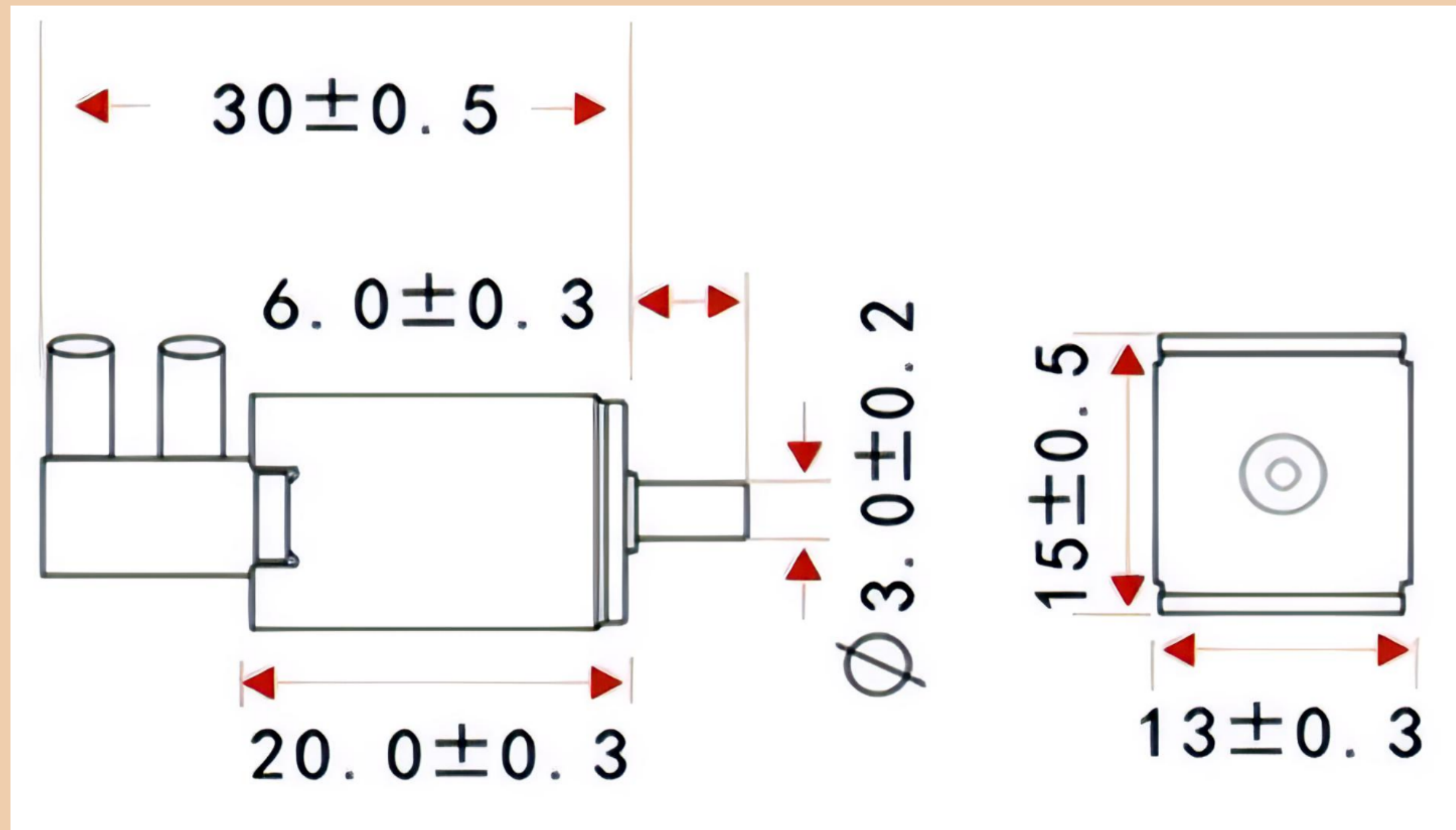


Manifold- SolidWorks Model

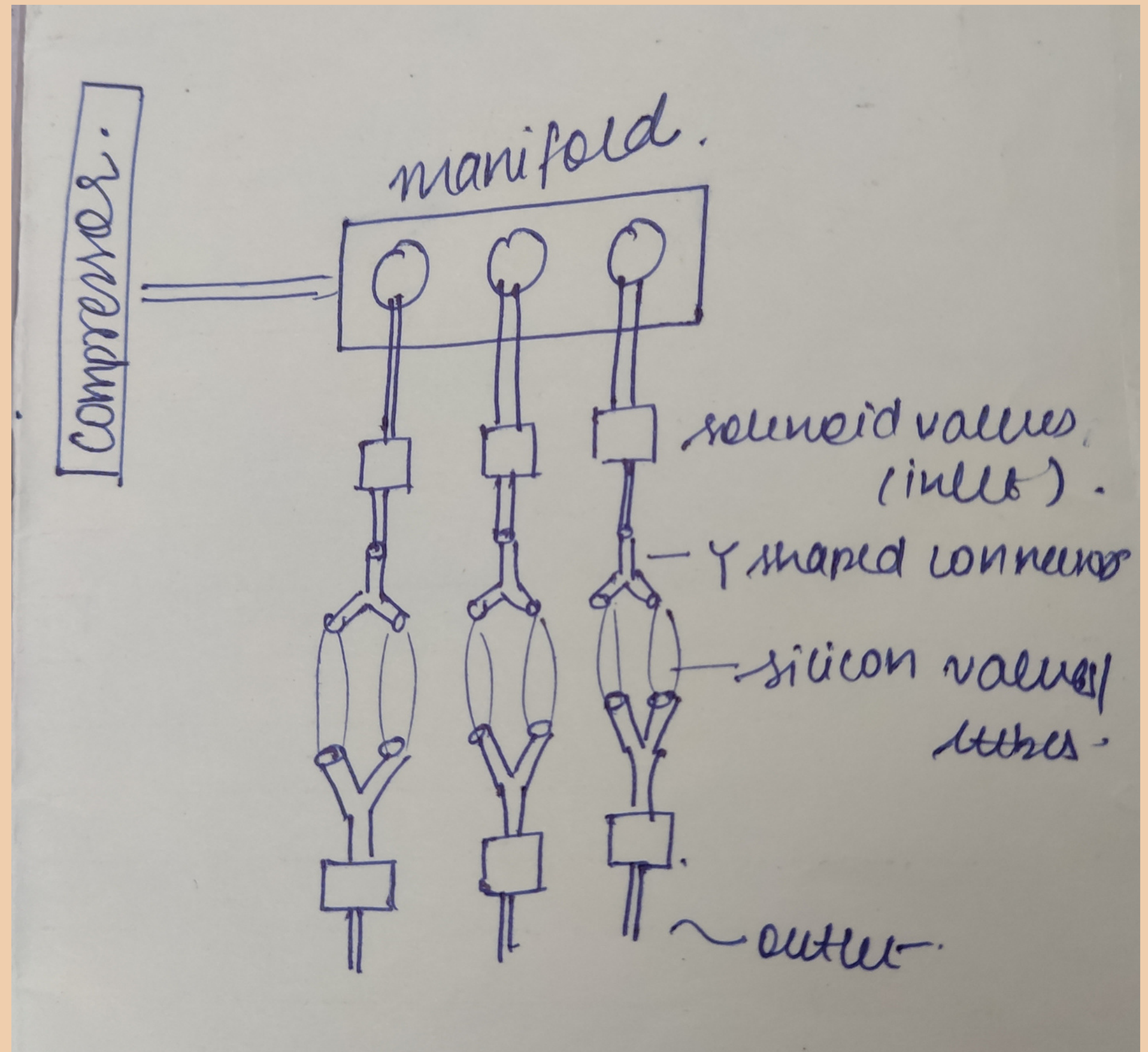
h3



Solenoid valve- dimensions




Rough flow chart of project





Plan for the project

For the setup, we plan to use a PVC pipe with six evenly spaced slits to insert the silicone tubes. The silicone tubes will be prepared in the lab using liquid silicone composite. Additionally, a manifold with three outlets will be created in the workshop, which will be connected to a compressor to supply high-pressure gas. Three solenoid valves, each connected to two opposite silicone tubes, will come through the outlets of the manifold. Finally, the silicone tubes will be connected to an Arduino and operated using a specific code.



Applications

Soft Exo-suit



Octopus-inspired robot



Universal gripper



Fluid-drive origami-inspired artificial muscles



X-RHex



Soft griper



Origami robot



Rehabilitation glove



Octobot

Mostly stiff

Few selective compliant elements


Entirely soft

Soft robots with different degree of stiffness



Areas of improvement

-Components can be contained inside the soft wheel so that it can move freely without being connected to any external equipment.





Project Timeline

Week 1

Discussion about project. Analyzing the working principle of softwheel robot and its individual parts.
Making the project in theory and submitting the list of materials.

Week 2


Finding out alternates for the previous parts that had to be used for cost cutting and an efficient robot.
Making a flow chart describing how the robot would look like in reality.

Week 3

Making a proper report giving overview of the project, explaining its working and its progress.

Week 4

Made SolidWORKS model for the mould of silicon valves and sent in for 3D printing





Project Timeline

Week 5

**CAM Analysis
Assignment**

Week 6

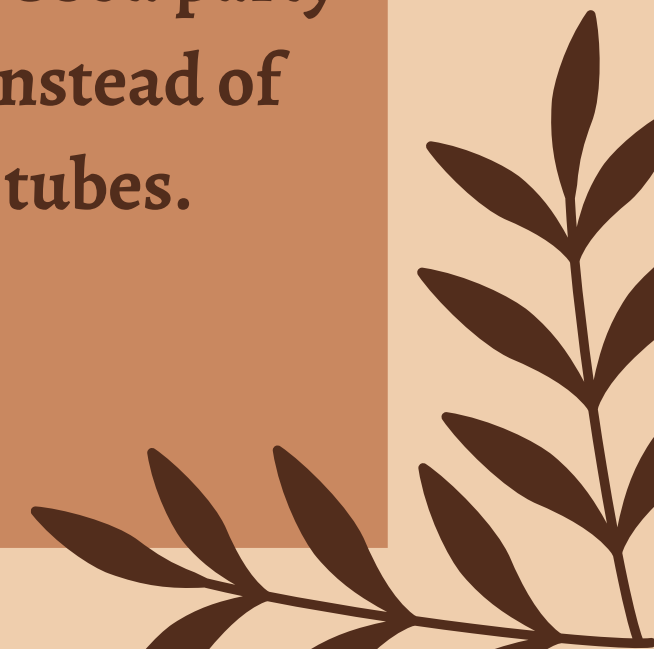
**3D printed model for
the silicon tubing
mold;
went mechanical
workshop and
designed 3 valve
manifold.**

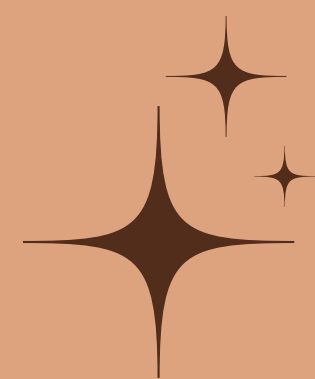
Week 7

**Tried to make silicon
tubes from the molds
that were 3D printed.
Went Chandigarh to
buy final materials for
the project.**

Week 8

**Did some variations in
the project. Used party
balloons instead of
silicon tubes.**





Thank You

