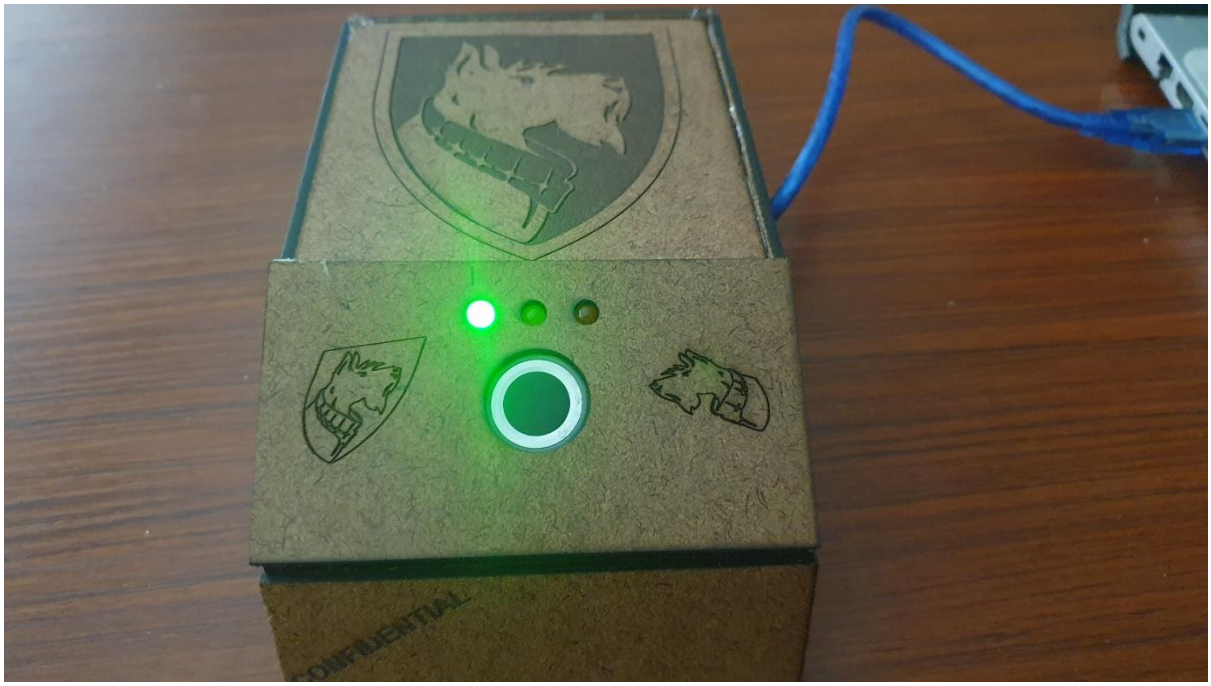
Final Project: Fingerprint Scanner Box

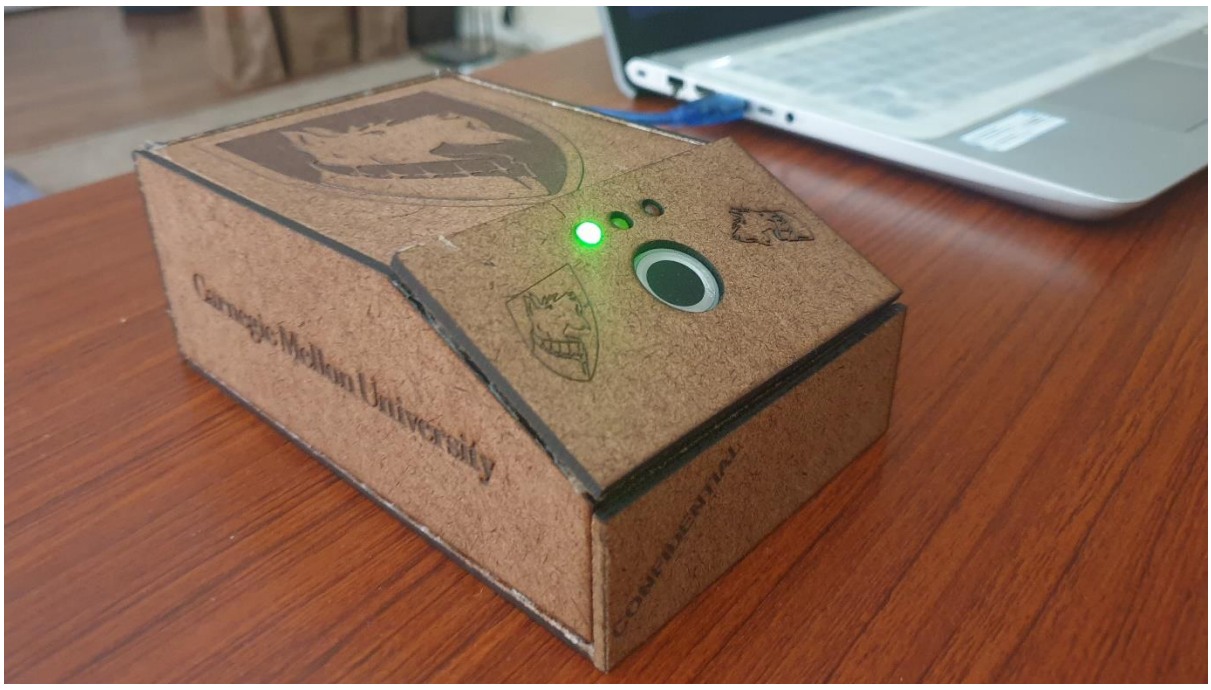
Designers

Neel Joshi

Summary

This project aims to fabricate a 3D wooden box rocking Carnegie Mellon University brandings produced via laser engraving. The box mounts a fingerprint sensor along a slant surface designed for ease of operation. The sensor can store up to 80 scans of fingerprints in its own memory, along with Arduino code which can helps in reading, recognising, deleting fingerprints.





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Bill of Materials

Item No.	Description	Quantity	Unit Price ($)	Total ($)
1	Capacitive Fingerprint Sensor / Scanner	1	$19.95	$19.95
2	LEDs (Red, Green, Blue)	3	$0.10	$0.30
3	Plywood Birch 1/8"x12"x12"	2	$2.00	$4.00
4	Jumper Cables	10	$0.05	$0.50
5	Arduino UNO R3 Board	1	$0.00	$0.00
6	Breadboard	1	$0.00	$0.00
7	Resistor 10 kilo Ohms	3	$0.01	$0.03
8	3D Printing Material PLA, 16 g	1	$8.00	$8.00
9	Wood Glue	1	$0.03	$0.03
			Grand Total	**$32.81**

Project Purchases

Description	Quantity	Unit Price ($)	Total ($)
Capacitive Fingerprint Sensor / Scanner	1	$19.95	$19.95
LEDs (Red, Green, Blue)	3	$0.10	$0.30
Plywood Birch 1/8"x12"x12"	2	$2.00	$4.00
Jumper Cables	10	$0.05	$0.50
Resistor 10 kilo Ohms	3	$0.01	$0.03
3D Printing Material PLA, 16 g	1	$8.00	$8.00
Wood Glue	1	$0.03	$0.03
		Grand Total	**$32.81**

Equipment

1) computer with 3D CAD software – SolidWorks parametric
2) 3D printer - Dremel3D40
3) laser cutter – Epilog mini
4) Arduino – UNO R3 Board and Arduino IDE software
5) Wood glue gun
6) Soldering gun
7) Soldering stand

Detailed Assembly

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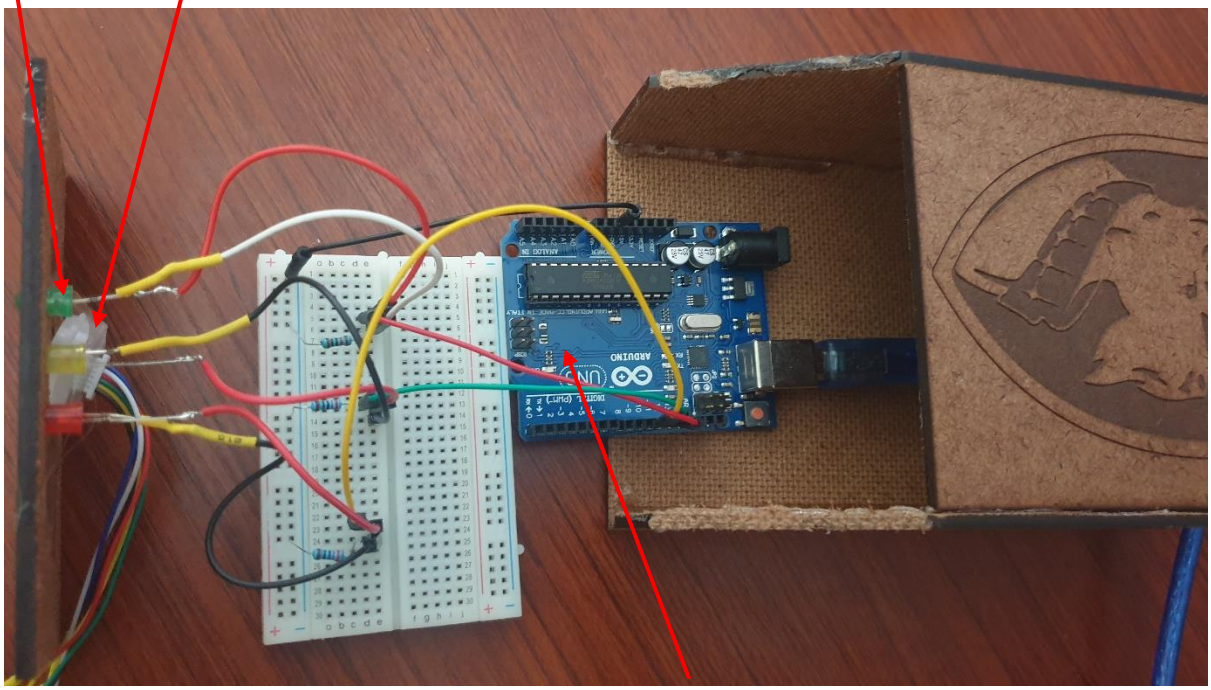
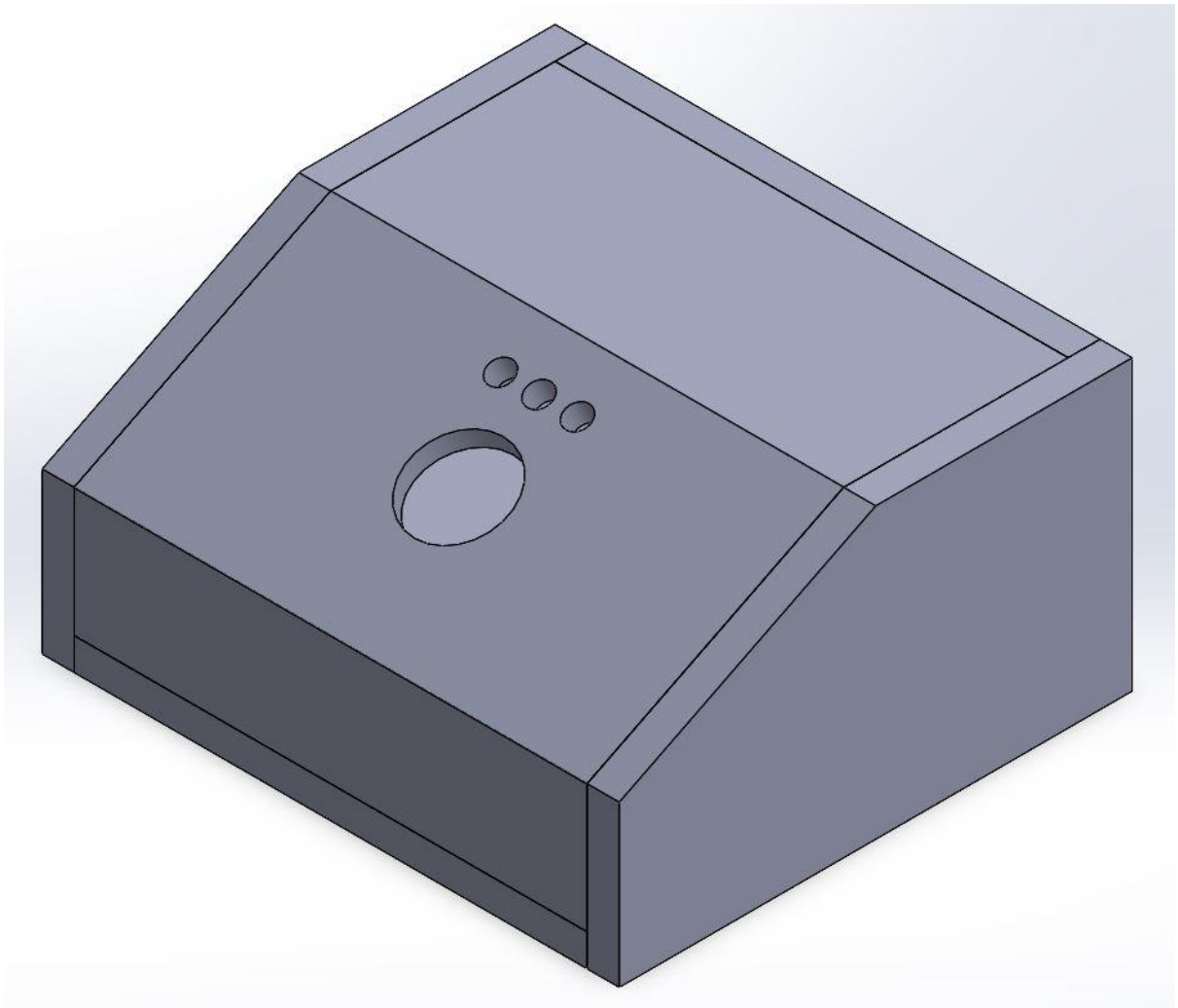


CAD Assembly



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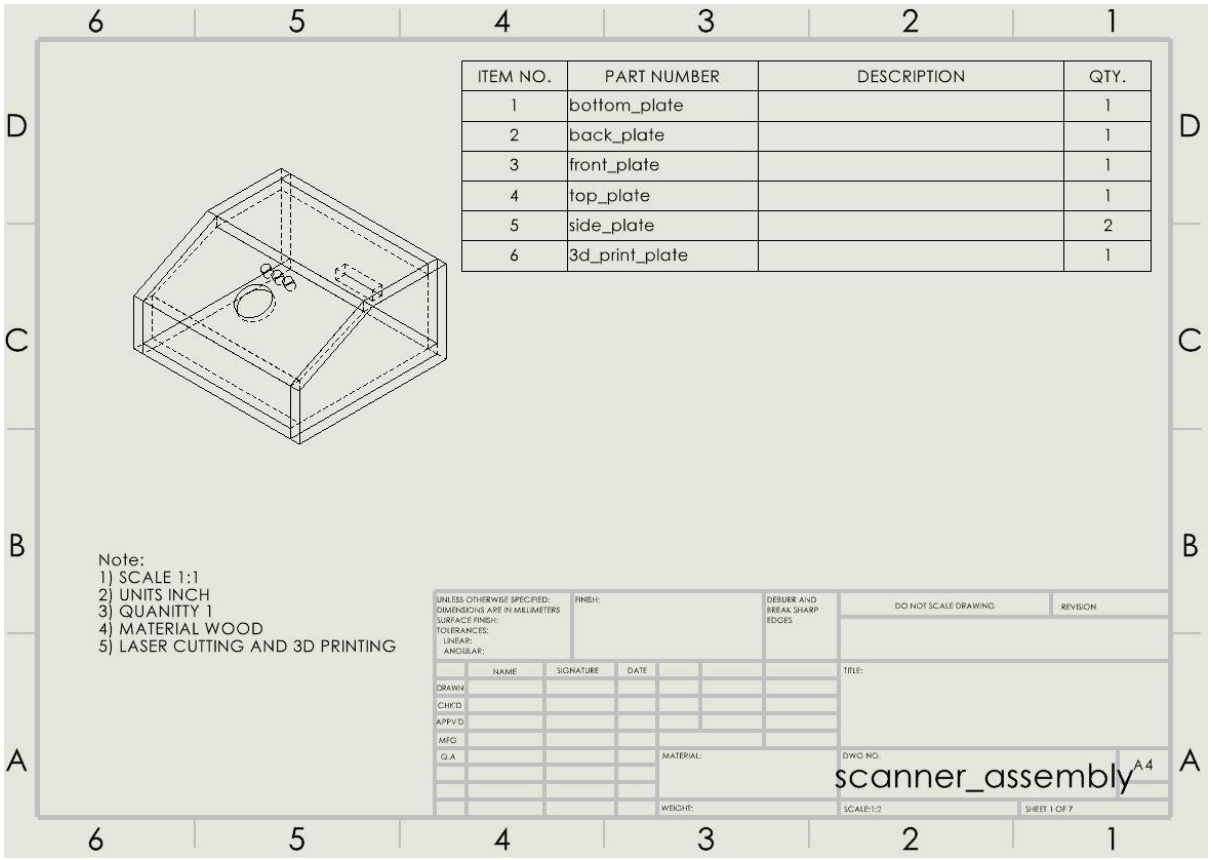
Technical Drawings

All dimensions in inches.

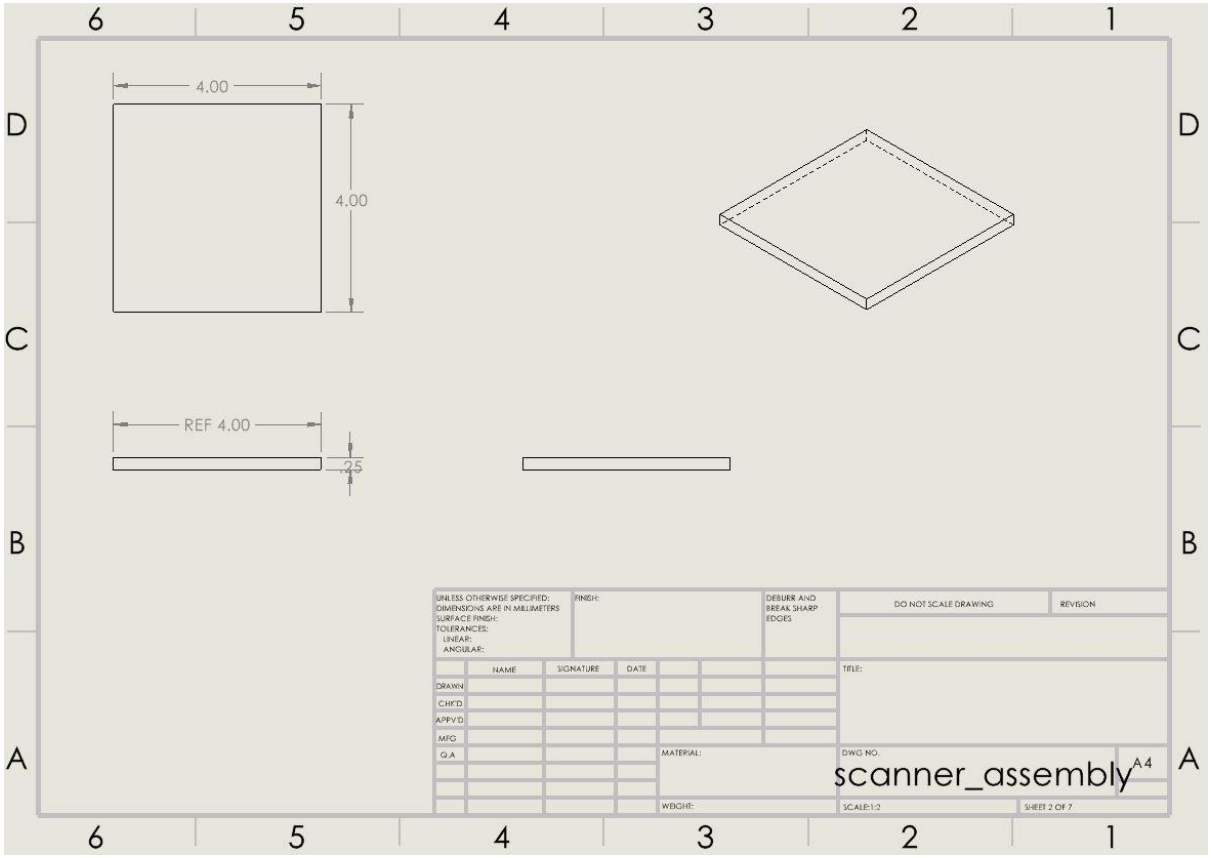


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	bottom_plate		1
2	back_plate		1
3	front_plate		1
4	top_plate		1
5	side_plate		2
6	3d_print_plate		1

Note:
1) SCALE 1:1
2) UNITS INCH
3) QUANITTY 1
4) MATERIAL WOOD
5) LASER CUTTING AND 3D PRINTING

scanner_assembly A4

SHEET 1 OF 7



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SHEET 2 OF 7

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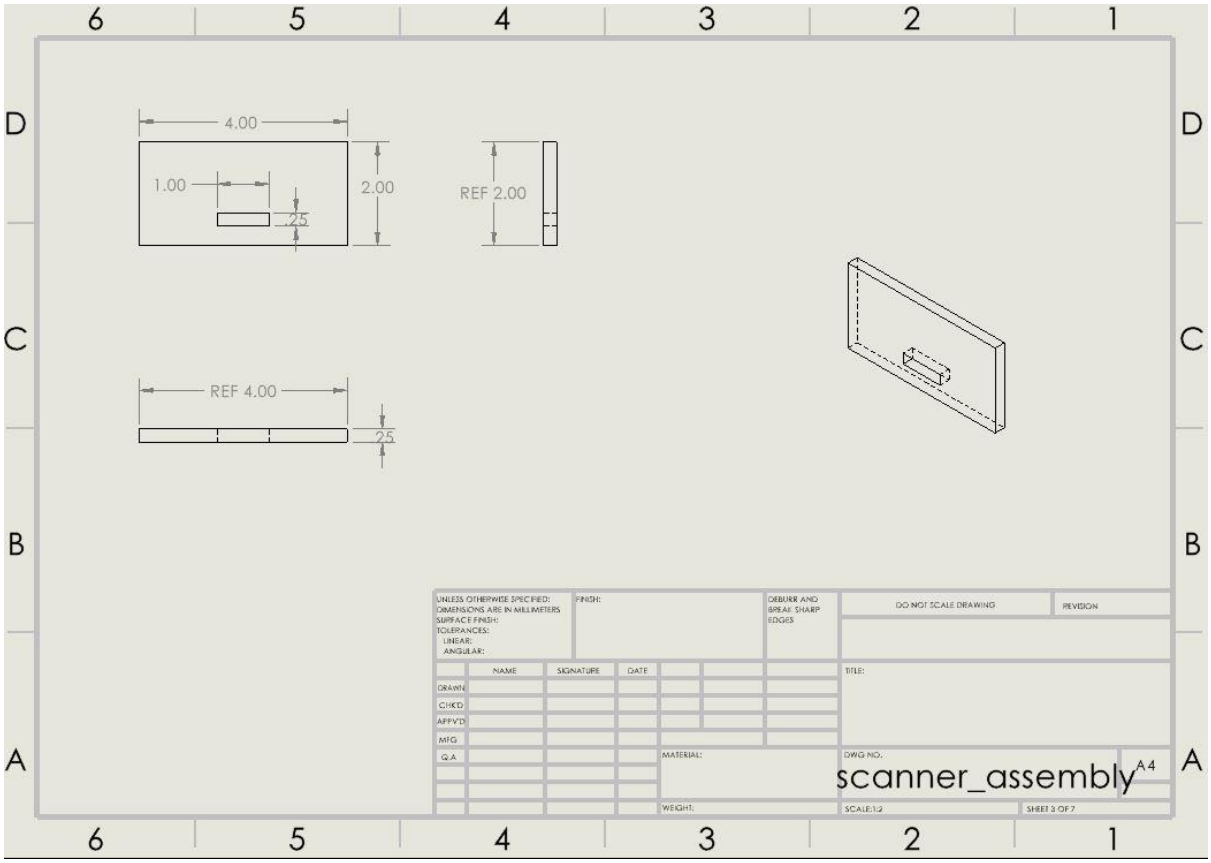

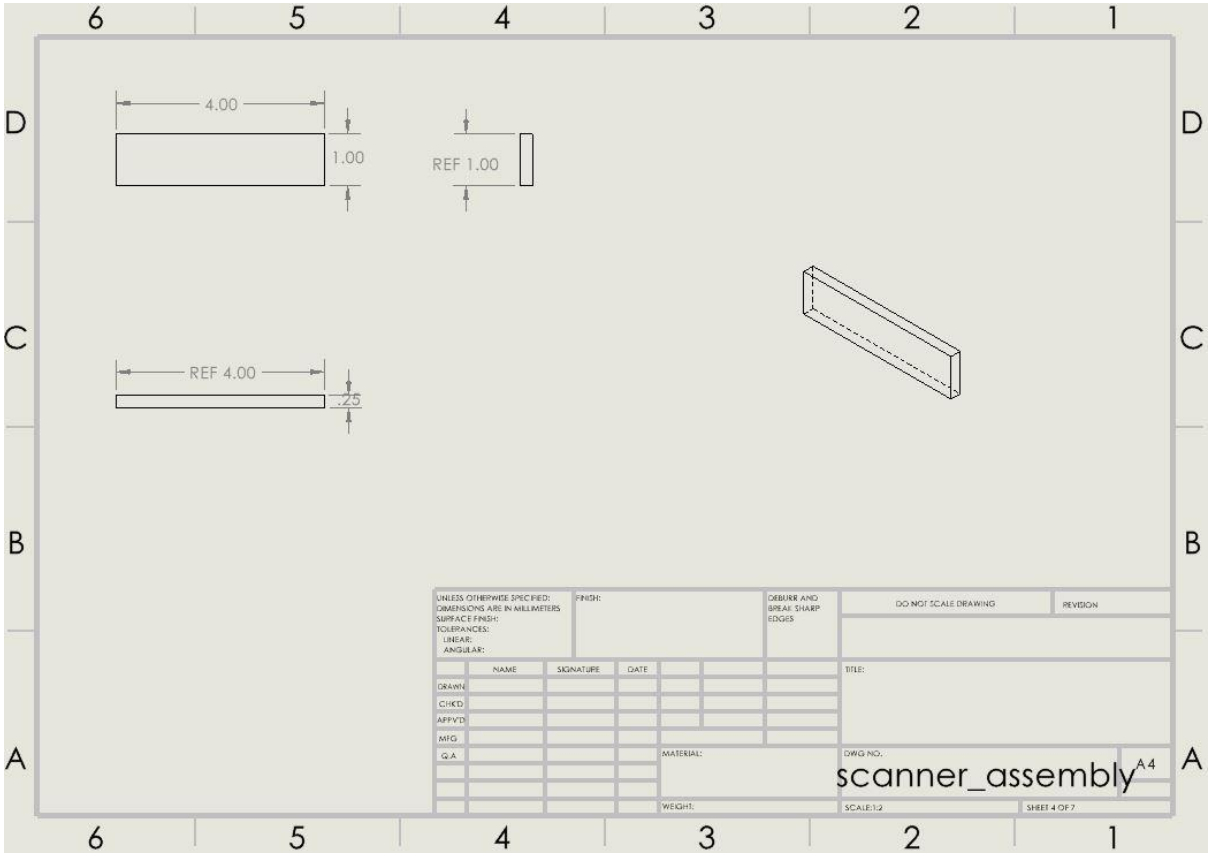

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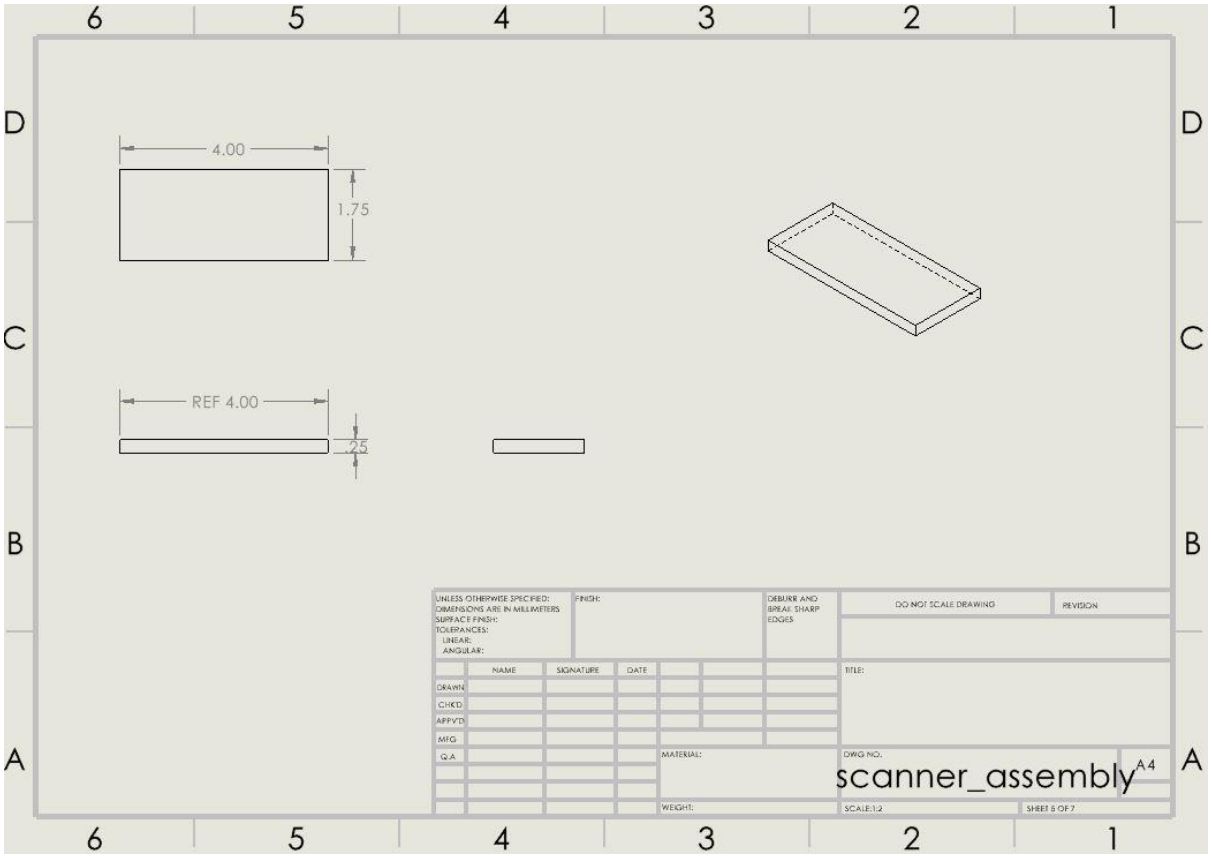

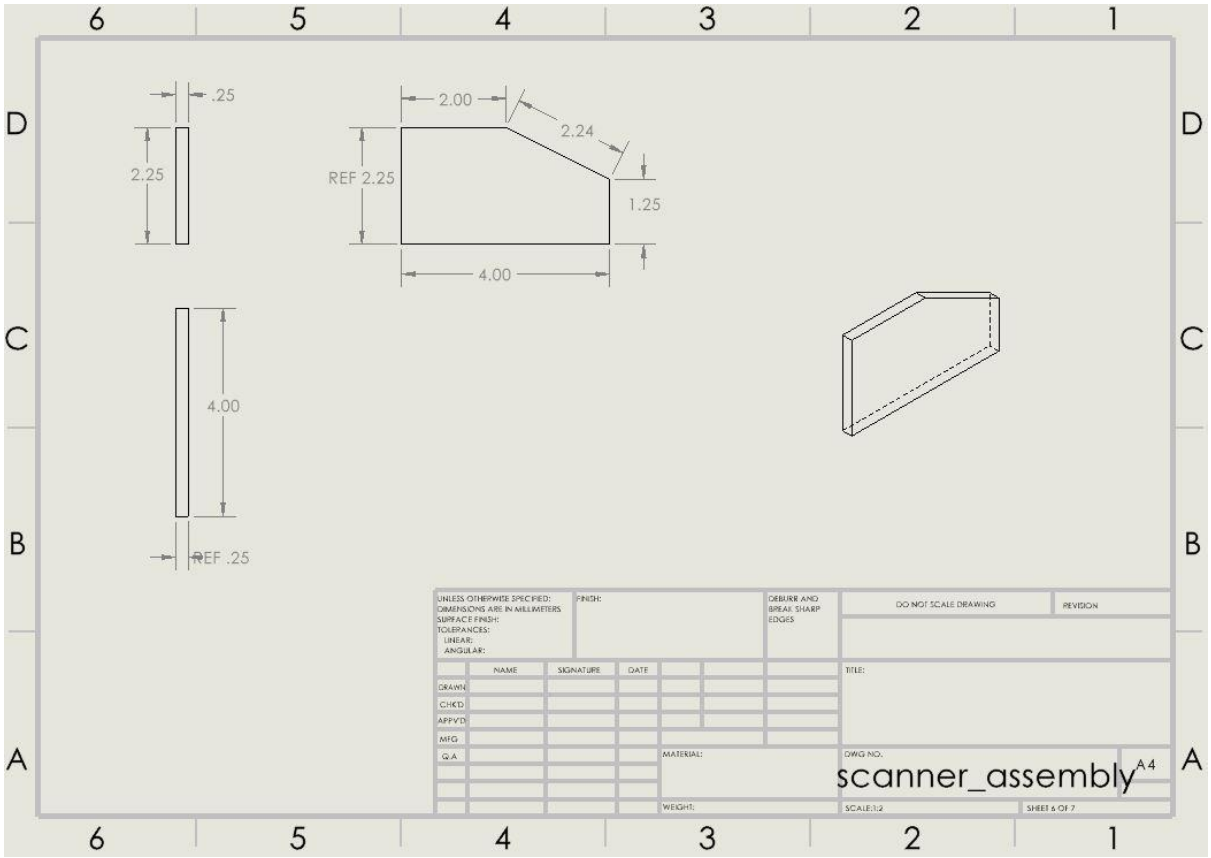

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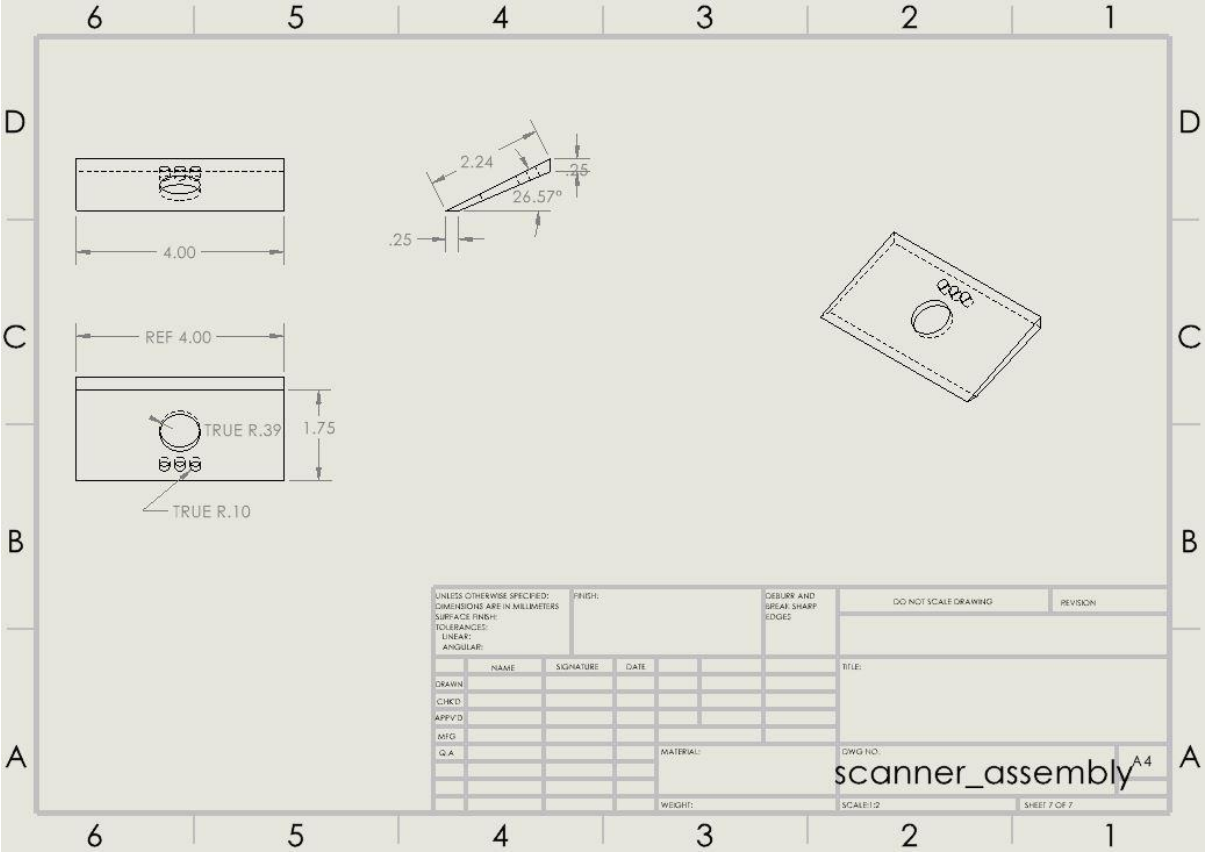

Arduino Code

```
void setup() {        // the setup function runs once when you press reset or power the board
 pinMode(12, OUTPUT);   // initialize digital pin LED_BUILTIN as an output.
 pinMode(13, OUTPUT);
 pinMode(11, OUTPUT);
}

// the loop function runs over and over again forever
void loop() {
  digitalWrite(11, HIGH);
  delay(1000/4);
  digitalWrite(11, LOW);
//  delay(1000/4);
  digitalWrite(12, HIGH);         // turn the LED on (HIGH is the voltage level)
  delay(1000/4);                  // wait for a second (1000 milliseconds)
  digitalWrite(12, LOW);          // turn the LED off by making the voltage LOW
//  delay(1000/4);                  // wait for a second
  digitalWrite(13, HIGH);
  delay(1000/4);
  digitalWrite(13, LOW);
  delay(1000/4);
}
```

Manufacturer's source code is available at the following GitHub repository.

https://github.com/adafruit/Adafruit-Fingerprint-Sensor-Library