

PROJECT

MEDICINE DELIVERY ROBOT

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Course: IE 221

Assisted by: Kasy Pho





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TEAM

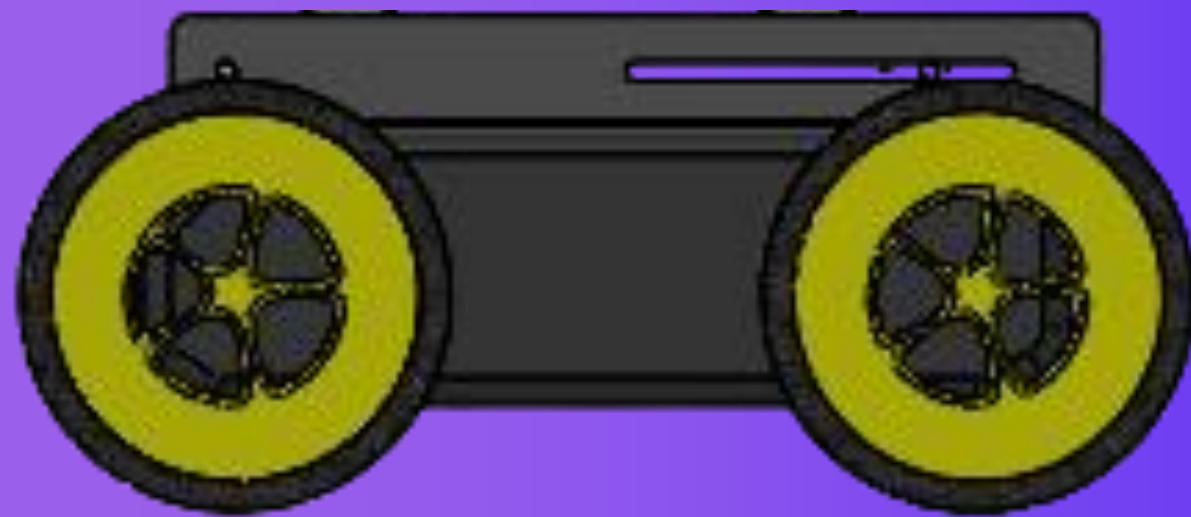
Sreyleap nin
Wanvatana Ouk
Socheatkhemaro Kor
Manith Choeun
Kakada Vongvorn
Kimsrong Vy

INTRODUCTION

HAVE YOU EVER DREAMT OF A DELIVERY MACHINE IN A HOSPITAL?THIS IS A MEDICINE DELIVERY ROBOT,THAT CAN HELP US DELIVER MEDICINE TO PATIENTS ON AN EXPECTED TIME.TO BETTER HEALTH CARE SERVICE IN THE 21ST CENTURY ,THIS MACHINE CAN LEVEL UP THE QUALITY OF THE HOSPITAL.



PROBLEM STATEMENT



Robot delivering medicine could involve addressing issues such as :

- ensuring timely and accurate deliveries
- navigating various environments safely
- maintaining security of medications
- and integrating with existing healthcare systems.

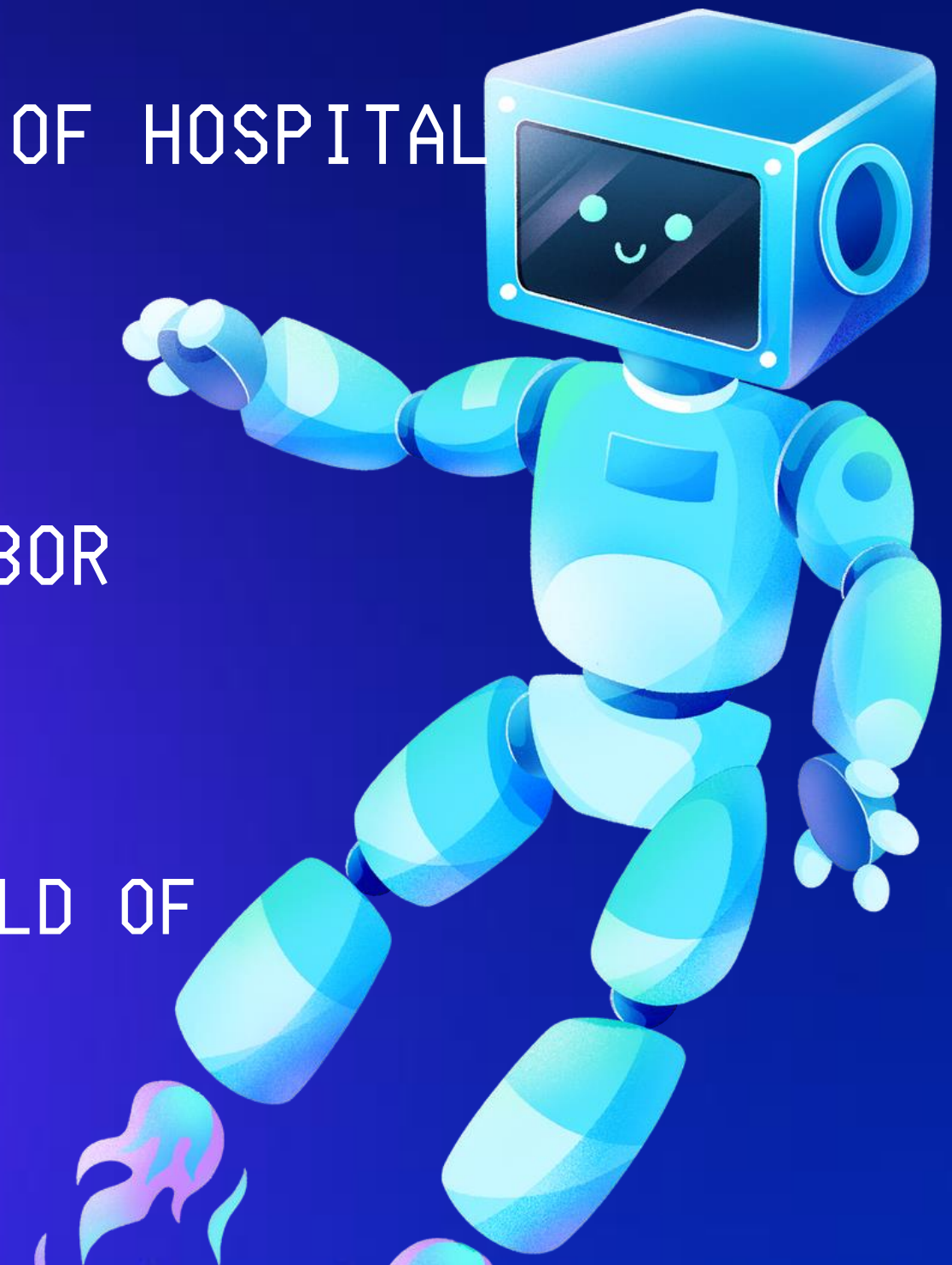
OBJECTIVES

Our main goal is to serve our stakeholders,
which are health care people and patients.
We built this machine to:

BETTER THE QUALITY OF HOSPITAL
SERVICE

REDUCE THE HUMAN-LABOR

RAISING TECHNOLOGY OF THE FIELD OF
SCIENCE



PROJECT TIMELINE



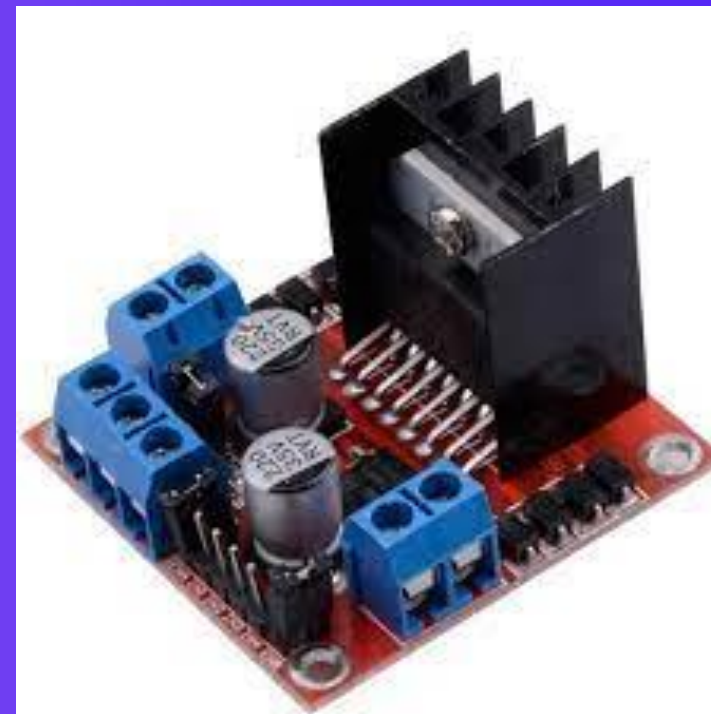
TIMELINE:

1. PLANNING AND RESEARCH: 1 WEEK (PROCESSING)
 2. COMPONENT ACQUISITION: 1 WEEK (DEPENDS ON AVAILABILITY)
 3. ASSEMBLY: 1 WEEK
 4. PROGRAMMING AND TESTING: 1 WEEK
 5. ITERATION: ONGOING
- TOTAL: 4 WEEKS

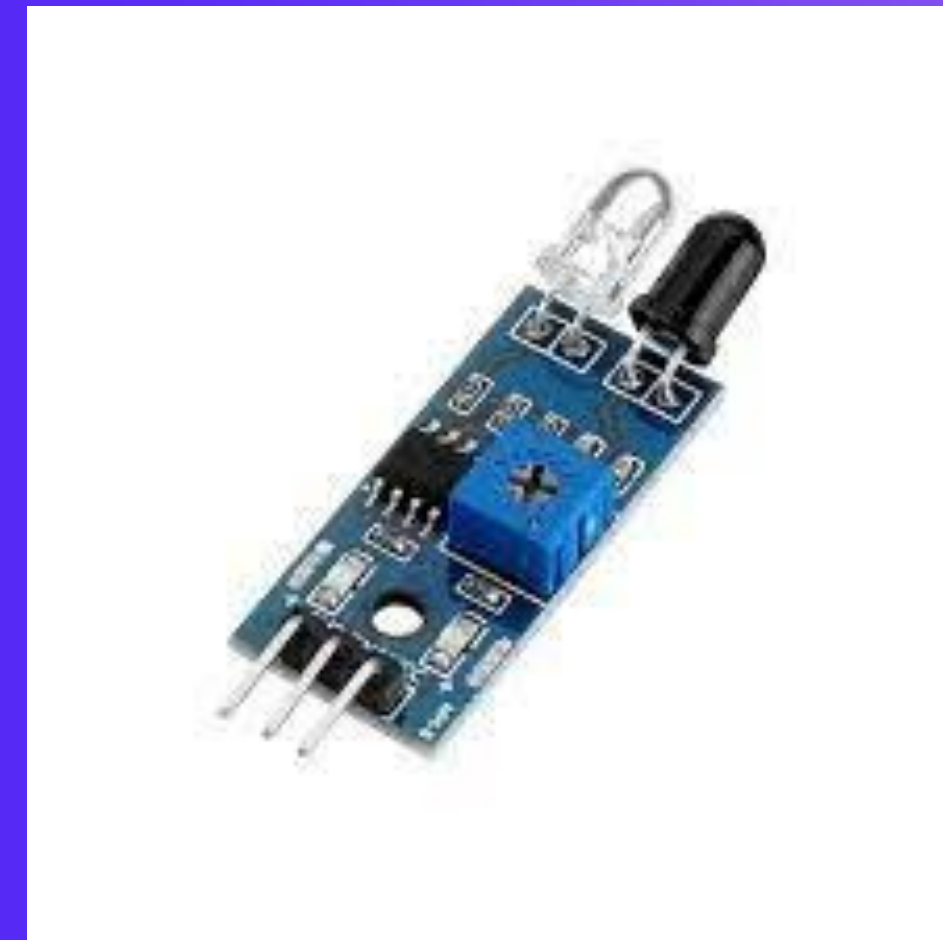
TOOLS USING



Arduino Uno



L298N Driver



IR sensor



HC-06
Bluetooth

TOOLS USING



TOOLS USING



Financial Usage



- UNO R3 MEGA328P +USB Cable:(1PCS): \$8.
- IR Infrared Obstacle Avoidance (4PCS): \$2.20
- 3.7V 18650 Lithium Battery(4PCS): \$3.00
- 18650 Battery Charger 3.7V 4.2V(1PCS): \$2.50
- HC-05 Wireless Serial 6Pin(1PCS): \$5.00
- Driver L298N 3A Motor Board(1PCS): \$2.00
- Case SW 3.7V 18650 Holder(1PCS): \$0.60
- Wire 40P Dupont Cable(1PCS): \$0.75
- Wire 40P Dupont Cable(1PCS): \$0.75
- TT Geared Motor Yellow 3-12V(4PCS): \$3.20
- TT Yellow Wheel 65mm(4PCS): \$3.00

2/12/2024 10:53 AM

Sales Receipt #10486

LET STORE

#50B, St 221, Phsar Depo II, Phnom Penh

Contact: 089 603 311

Rate: 1 USD = 4100 KHR

Bill To: Mr. Maro Maro

061 302 400

Item Name	Qty	Price	Ext Price
UNO R3 MEGA328P +USB Cable	1	\$8.00	\$8.00
3119 CP2102			
IR Infrared Obstacle Avoidance	4	\$0.55	\$2.20
3264 3.3-5V			
3.7V 18650 Lithium Battery	4	\$0.75	\$3.00
6340 800mAh			
18650 Battery Charger 3.7V 4.2V	1	\$2.50	\$2.50
3404 2 Slot			
HC-05 Wireless Serial 6Pin	1	\$5.00	\$5.00
3100 HC05			
Driver L298N 3A Motor Board	1	\$2.00	\$2.00
3335 Red Board			
Case SW 3.7V 18650 Holder	1	\$0.60	\$0.60
6201 2S 2 Slot			
Wire 40P Dupont Cable	1	\$0.75	\$0.75
3571 FM 20cm			
Wire 40P Dupont Cable	1	\$0.75	\$0.75
3570 MM 20cm			
TT Geared Motor Yellow 3-12V	4	\$0.80	\$3.20
4840 1:48 S2			
TT Yellow Wheel 65mm	4	\$0.75	\$3.00
4853 65mm*30mm			
Subtotal:			\$31.00
5 % Disc:			- \$1.55
RECEIPT TOTAL:			\$29.45
Cash:			\$29.45
Total Sales Discounts:			\$1.55
Note: Purchases are not Returnable or Refundable			
Thank for shpping with us. Please come again!			

Financial Usage



- M3 GB818 Phillips Cross Bolt 5032 M3*8 (20PCS): \$0.24
- Nut DIN934 304 Stainless Steel 5516 M3 (10PCS): \$0.30
- M3 Copper Brass Pillar F-M 2695 M3*50+6(6PCS): \$1.14
- Car Body Aluminum 4WD(1PCS): \$3.75
- M3 Copper Brass Pillar F-M (82687 M3*10+6(10P)PCS): \$0.36

TOTAL: \$35.24

2/13/2024 12:52 PM

Sales Receipt #10530

LET STORE

#50B, St 221, Phsar Depo II, Phnom Penh

Contact: 089 603 311

Rate: 1 USD = 4100 KHR

Item Name	Qty	Price	Ext Price
M3 GB818 Phillips Cross Bolt 5032 M3*8 (10PCS)	2	\$0.12	\$0.24
Nut DIN934 304 Stainless Steel 5516 M3 (10PCS)	2	\$0.15	\$0.30
M3 Copper Brass Pillar F-M 2695 M3*50+6(10P)	0.6	\$1.90	\$1.14
Car Body Aluminum 4WD 4877 4WD Down	1	\$3.75	\$3.75
M3 Copper Brass Pillar F-M 2687 M3*10+6(10P)	0.8	\$0.45	\$0.36

Subtotal: \$5.79

RECEIPT TOTAL: \$5.79

Cash: \$5.79

Note: Purchases are not Returnable or Refundable
Thank for shpping with us. Please come again!

Design

We devided our car design in to 2 parts

Robot

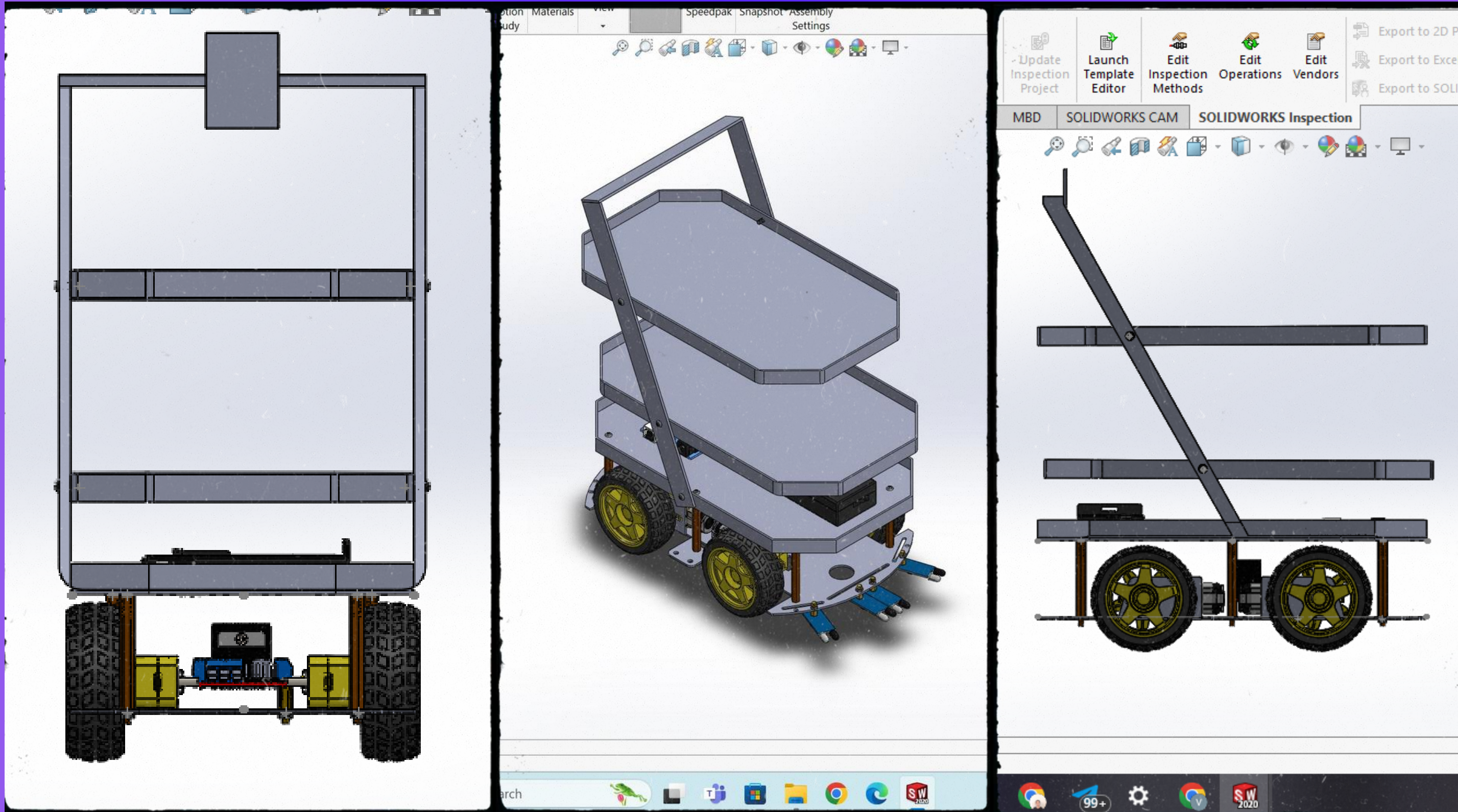


APP



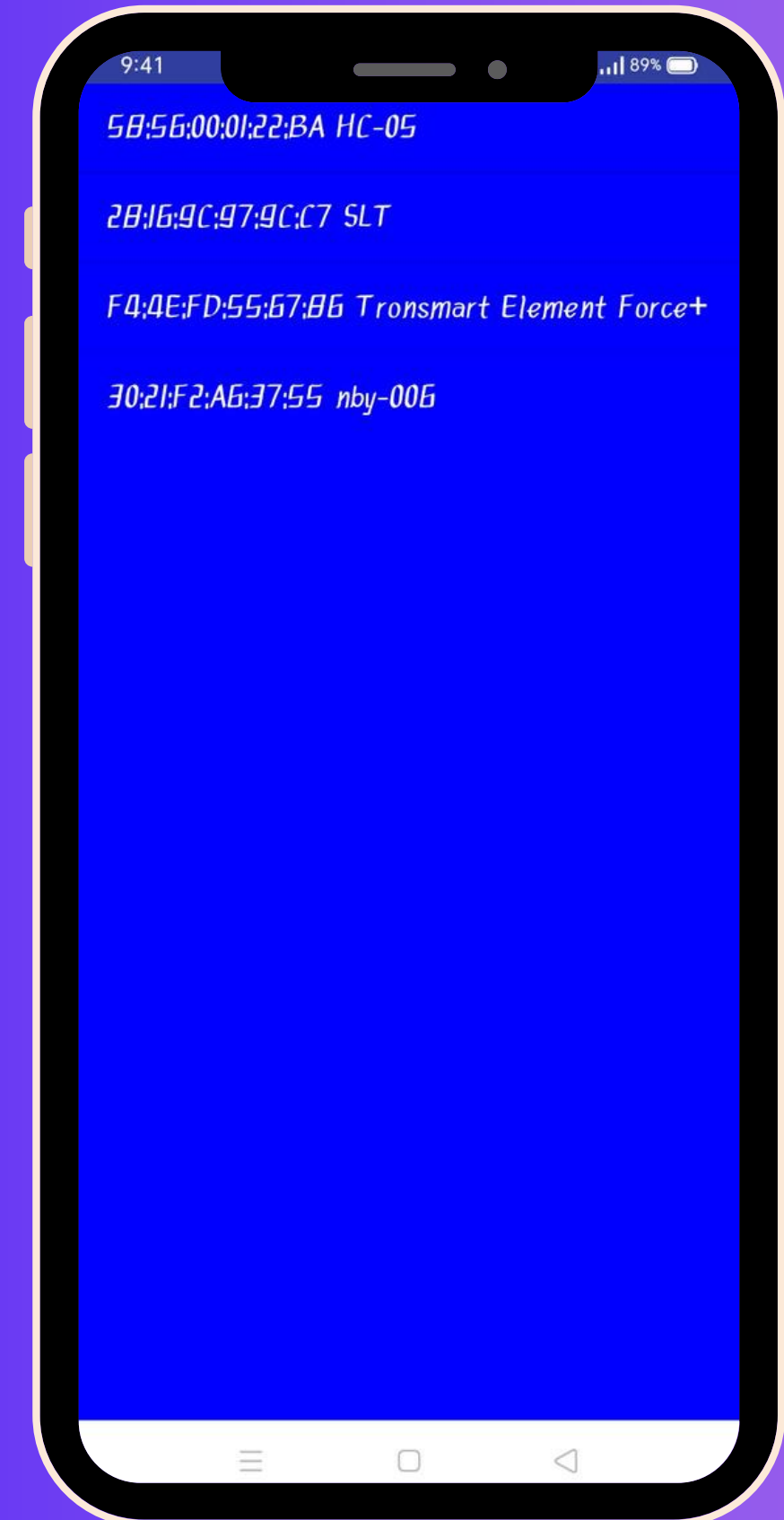
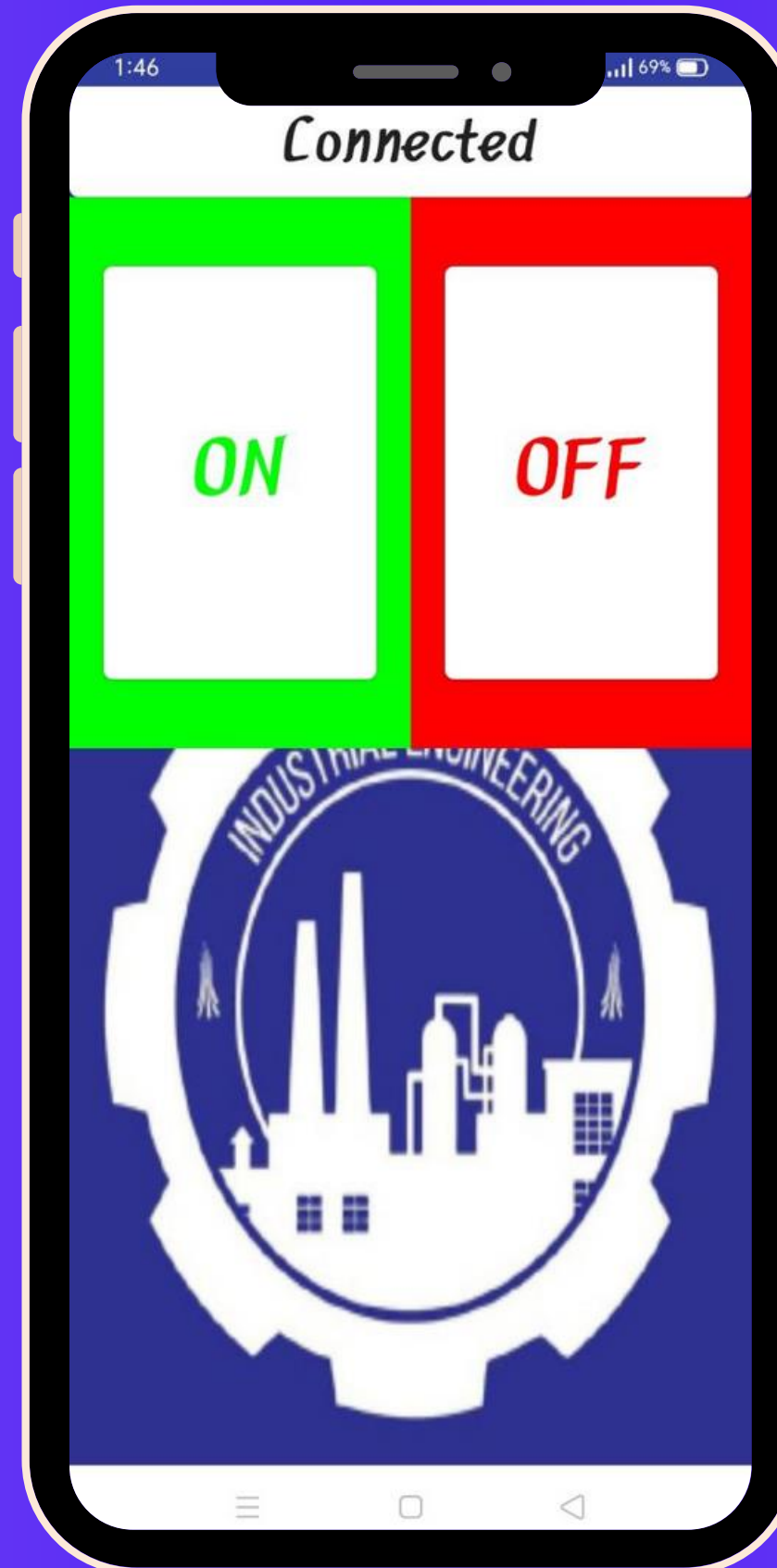
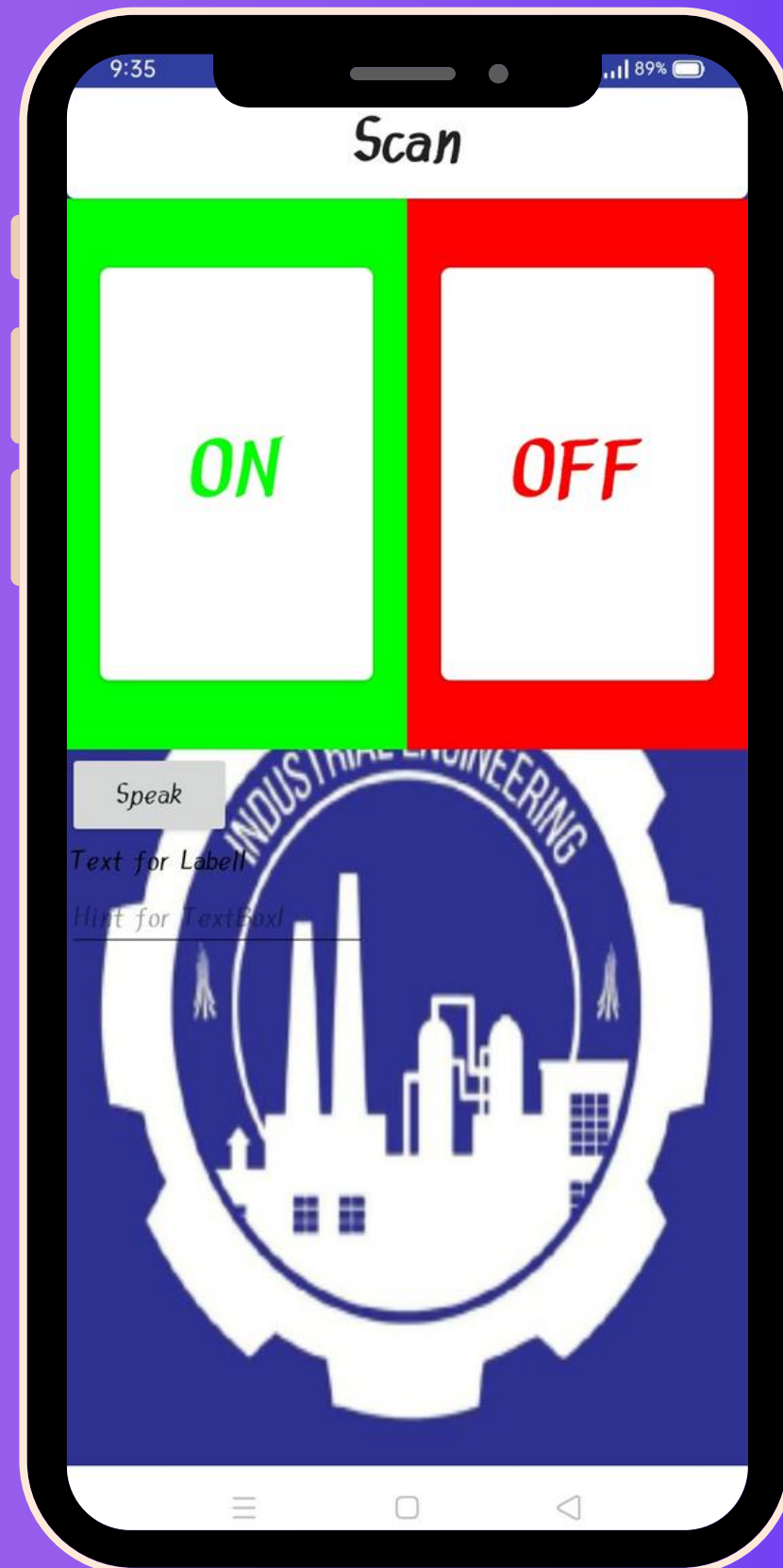
Design

Robot

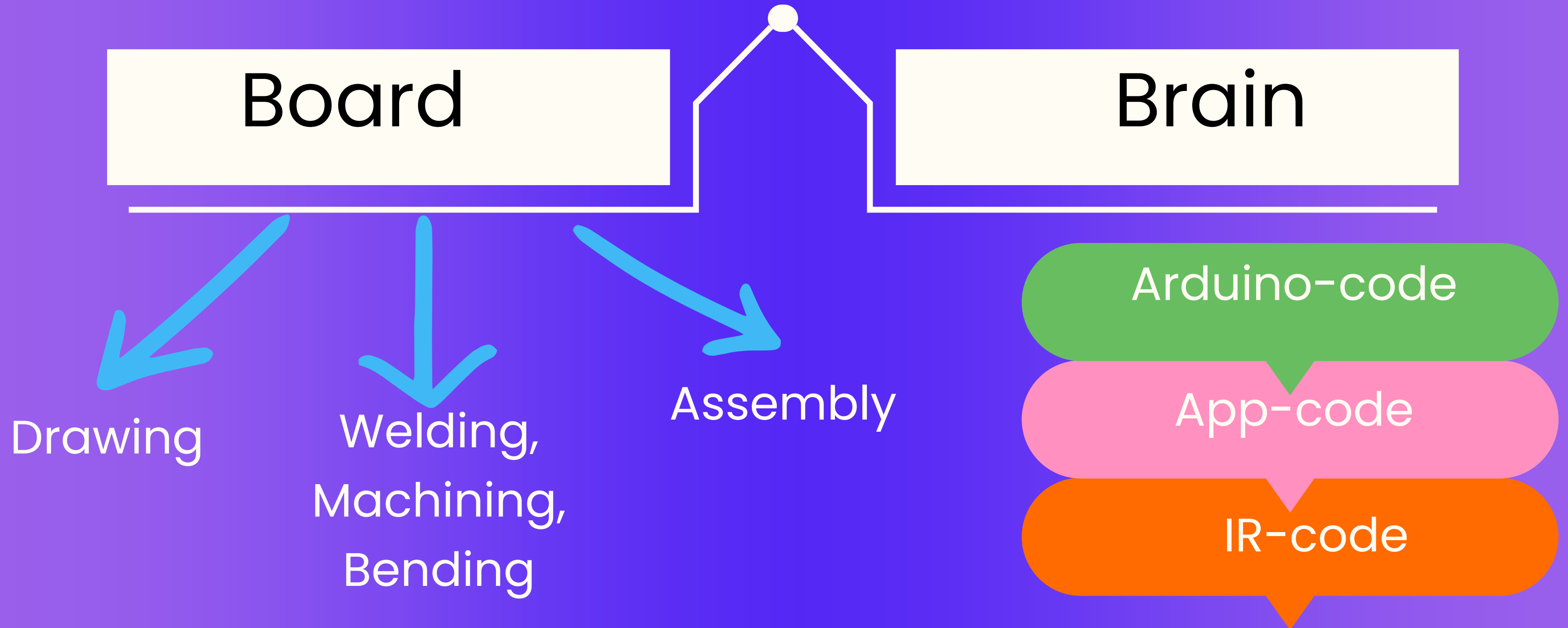


Design

APP



Process



App

0

Process

The screenshot displays the MIT App Inventor web interface for a project named "Arduino1". The interface is divided into several sections:

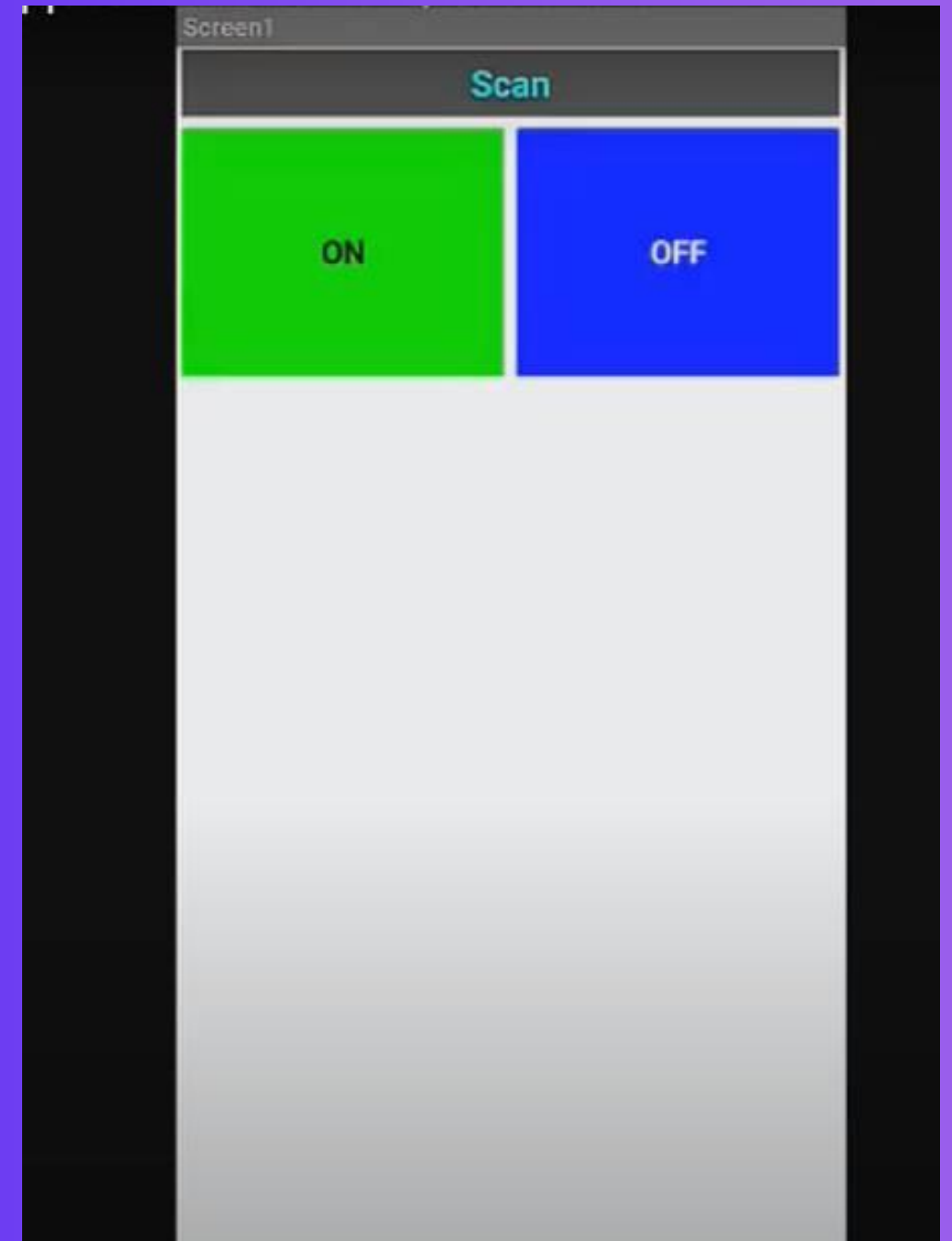
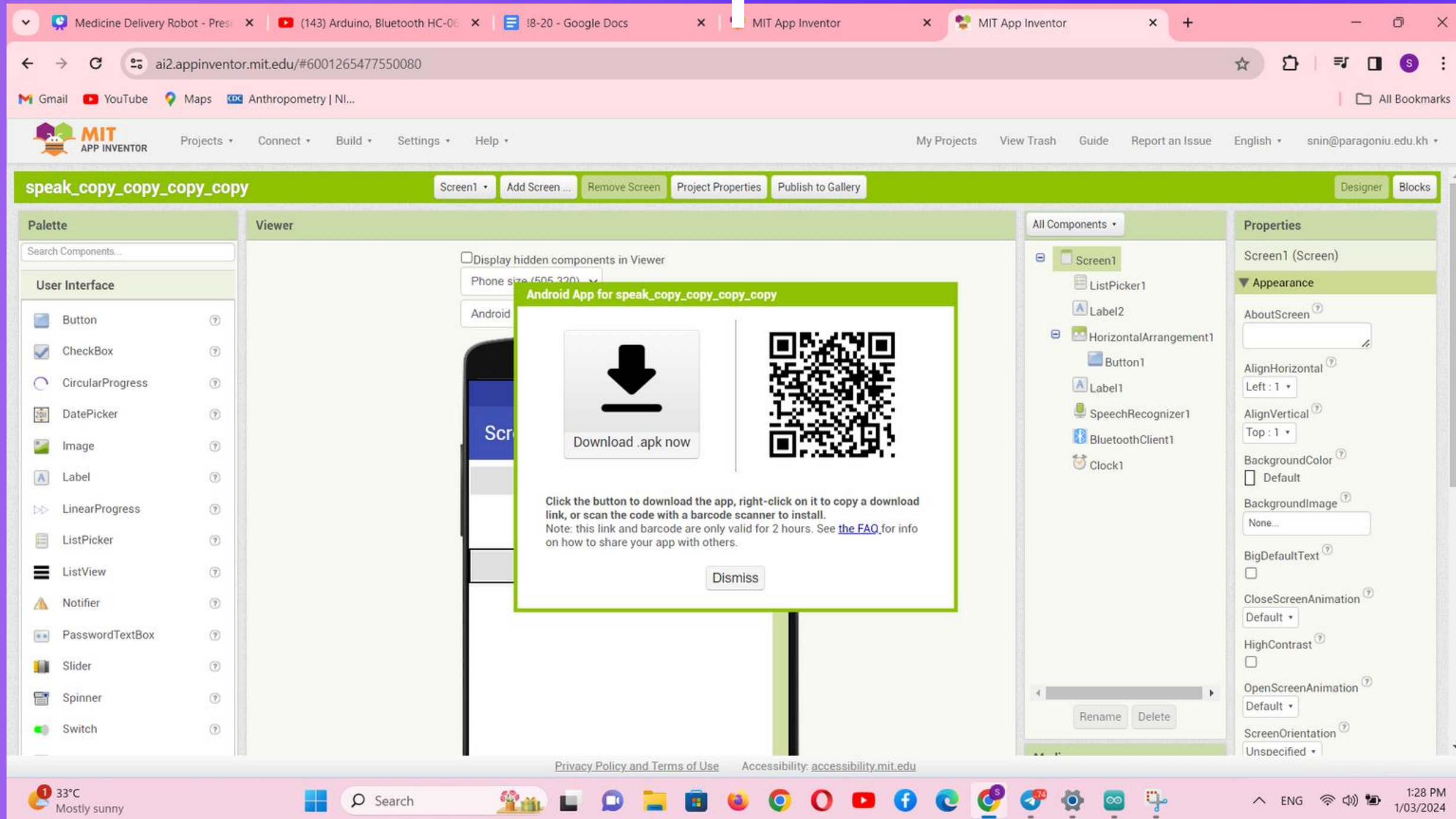
- Top Bar:** Includes the MIT App Inventor logo, navigation links (Projects, Connect, Build, Settings, Help), a "Loading ..." status indicator, and user information (My Projects, View Trash, Guide, Report an Issue, English, watanavan1202@gmail.com).
- Project Bar:** Shows the project name "Arduino1" and buttons for "Screen1", "Add Screen...", "Remove Screen", "Project Properties", and "Publish to Gallery".
- Blocks Panel:** A sidebar on the left containing categorized blocks: Built-in (Control, Logic, Math, Text, Lists, Dictionaries, Colors, Variables, Procedures), Screen1, ListPicker1, HorizontalScrollArrang, HorizontalArrangen, ON, and OFF.
- Viewer:** The main workspace showing a visual representation of the app. It includes a list picker component and a Bluetooth client component. The logic is as follows:
 - when ListPicker1 .BeforePicking**: do set ListPicker1 . Elements to BluetoothClient1 . AddressesAndNames
 - when ListPicker1 .AfterPicking**: do set ListPicker1 . Selection to call BluetoothClient1 . Connect address ListPicker1 . Selection; set ListPicker1 . Text to "Connected"
 - when ON .Click**: do call BluetoothClient1 . SendText text "1"
 - when OFF .Click**: do call BluetoothClient1 . SendText text "0"
- Bottom Bar:** Contains links for "Privacy Policy and Terms of Use" and "Accessibility: accessibility.mit.edu".

App

0

1

Process



Arduino

0

Process

2

```
sketch_feb29a | Arduino IDE 2.3.1-nightly-20240212
File Edit Sketch Tools Help
Select Board
sketch_feb29a.ino
1 #include <SoftwareSerial.h>
2
3 int tx = 10;
4 int rx = 11;
5
6 SoftwareSerial Bluetooth(tx, rx);
7 char control;
8
9 // motors pins
10 int ENA = 3; // ENA
11 int IN1 = 5;
12 int IN2 = 4;
13 int ENB = 9; // ENB
14 int IN3 = 7;
15 int IN4 = 8;
16
17
18 void setup()
19 {
20   Bluetooth.begin(9600);
21   // set Dc motors pin to output signal
22   pinMode(ENA, OUTPUT);
23   pinMode(IN1, OUTPUT);
24   pinMode(IN2, OUTPUT);
25   pinMode(ENB, OUTPUT);
26   pinMode(IN3, OUTPUT);
27   pinMode(IN4, OUTPUT);
28 }
29
30 void loop() {
31
```

Ln 55, Col 2 × No board selected

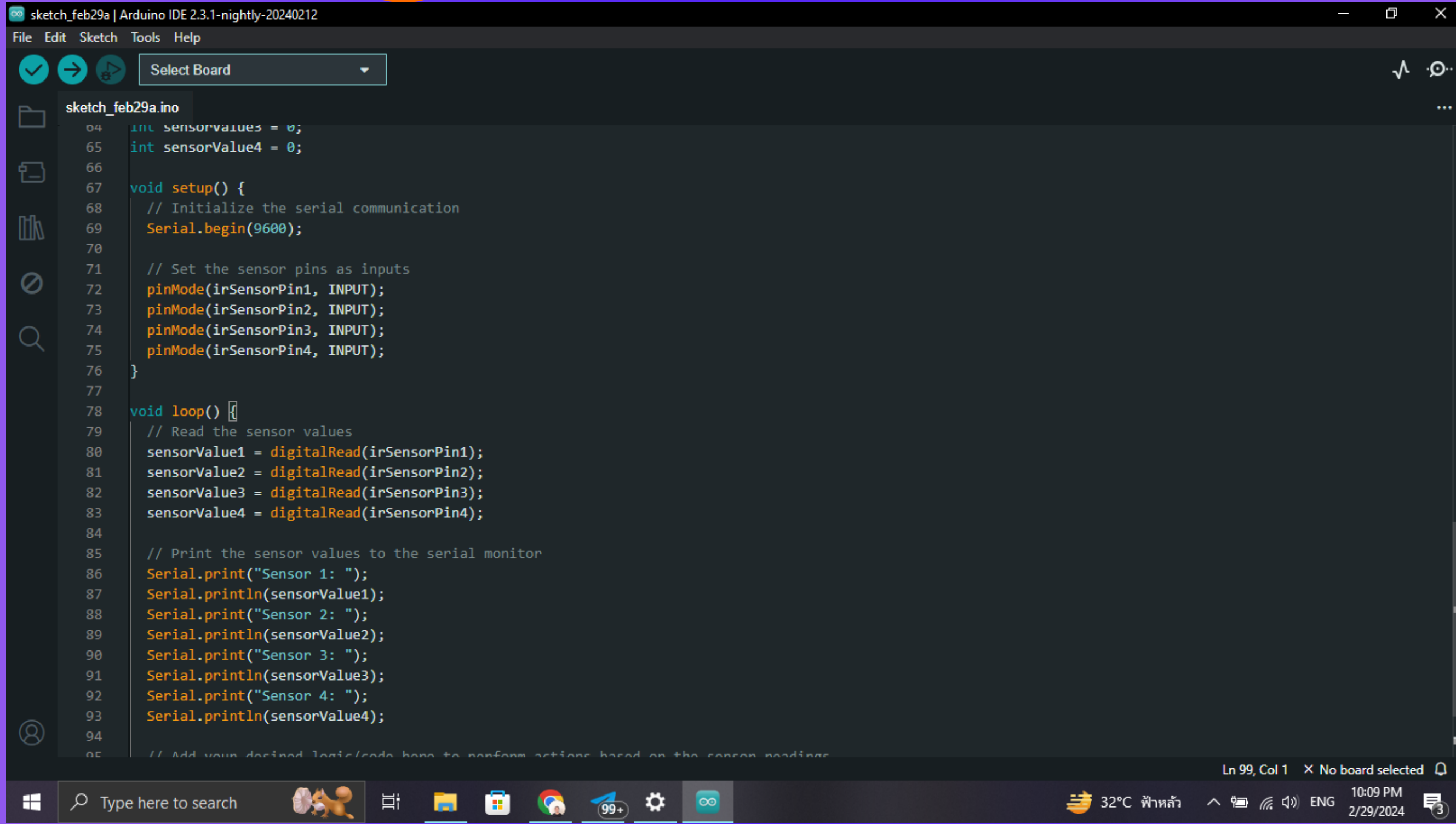
Type here to search 32°C ฟ้ามุ่ย 10:04 PM 2/29/2024


```
33  if(Bluetooth.available() > 0){
34      control = Bluetooth.read();
35      Bluetooth.print(control);
36  }
37  if(control == "1"){
38      // Read Dc motors values
39      digitalWrite(IN1, LOW);
40      digitalWrite(IN2, HIGH);
41      analogWrite(ENA, 255); // Full speed
42      digitalWrite(IN3, LOW);
43      digitalWrite(IN4, HIGH);
44      analogWrite(ENB, 255); // Full speed
45  }
46  }
47  if(control == "0"){
48      // Read Dc motors values
49      digitalWrite(IN1, HIGH);
50      digitalWrite(IN2, LOW);
51      analogWrite(ENA, 255); // Full speed
52      digitalWrite(IN3, HIGH);
53      digitalWrite(IN4, LOW);
54      analogWrite(ENB, 255); // Full speed
55  }
56  }
```


IR

03

Process

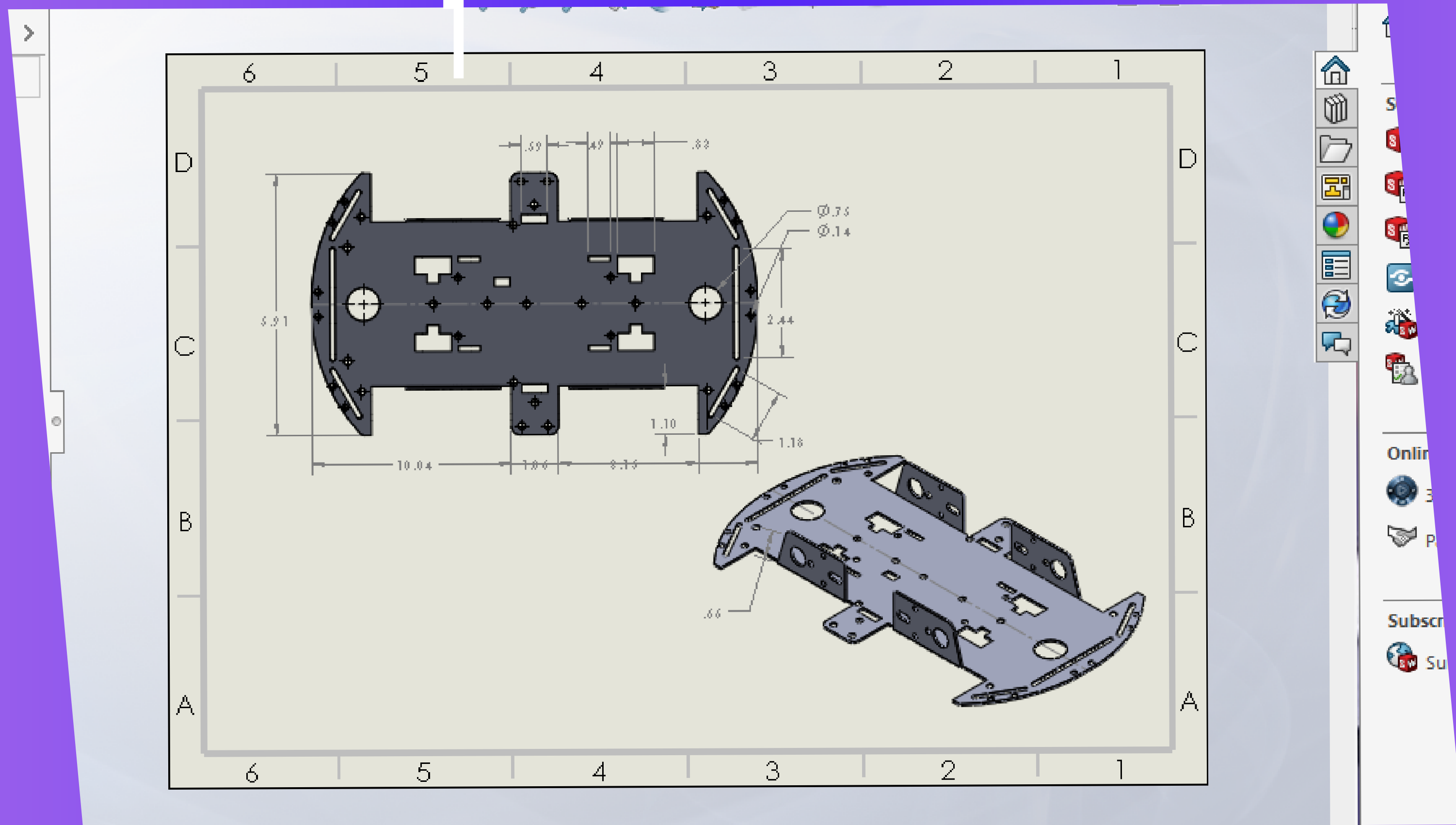


The screenshot shows the Arduino IDE interface with a sketch named 'sketch_feb29a.ino'. The code is written in C++ and is designed to read four digital sensors (likely IR sensors) connected to pins 1, 2, 3, and 4. The code includes a setup function to initialize the serial communication and set the pins as inputs, and a loop function to read the sensor values and print them to the serial monitor.

```
sketch_feb29a.ino
04 int sensorValue1 = 0;
05 int sensorValue2 = 0;
06 int sensorValue3 = 0;
07 int sensorValue4 = 0;
08
09 void setup() {
10   // Initialize the serial communication
11   Serial.begin(9600);
12
13   // Set the sensor pins as inputs
14   pinMode(irSensorPin1, INPUT);
15   pinMode(irSensorPin2, INPUT);
16   pinMode(irSensorPin3, INPUT);
17   pinMode(irSensorPin4, INPUT);
18 }
19
20 void loop() {
21   // Read the sensor values
22   sensorValue1 = digitalRead(irSensorPin1);
23   sensorValue2 = digitalRead(irSensorPin2);
24   sensorValue3 = digitalRead(irSensorPin3);
25   sensorValue4 = digitalRead(irSensorPin4);
26
27   // Print the sensor values to the serial monitor
28   Serial.print("Sensor 1: ");
29   Serial.println(sensorValue1);
30   Serial.print("Sensor 2: ");
31   Serial.println(sensorValue2);
32   Serial.print("Sensor 3: ");
33   Serial.println(sensorValue3);
34   Serial.print("Sensor 4: ");
35   Serial.println(sensorValue4);
36
37   // Add your desired logic/code here to perform actions based on the sensor readings
38 }
```

The IDE status bar at the bottom indicates 'Ln 99, Col 1' and 'No board selected'. The Windows taskbar at the very bottom shows the system clock as 10:09 PM on 2/29/2024, along with the temperature 32°C and the location พัทยา.

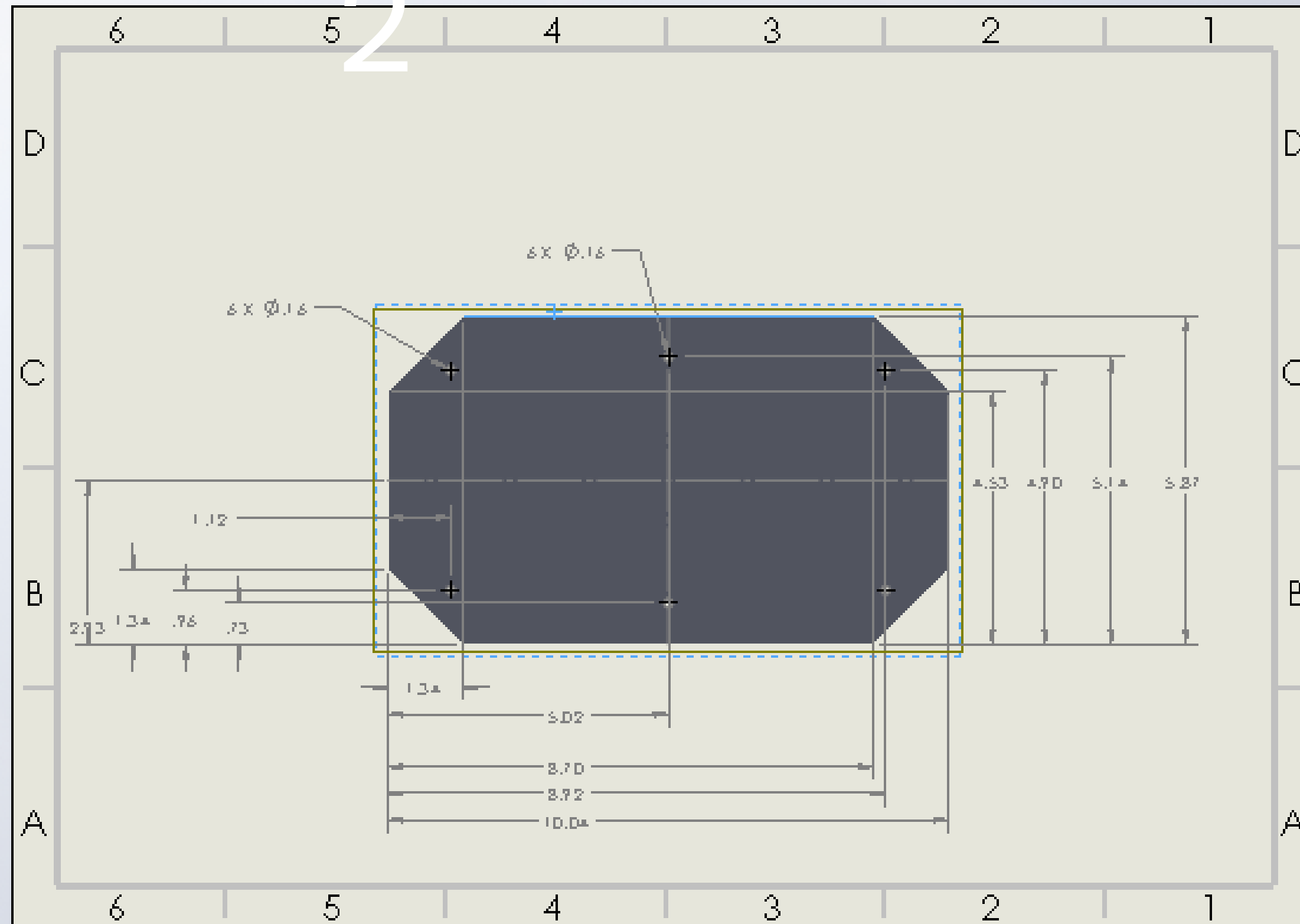
Process



Drawing

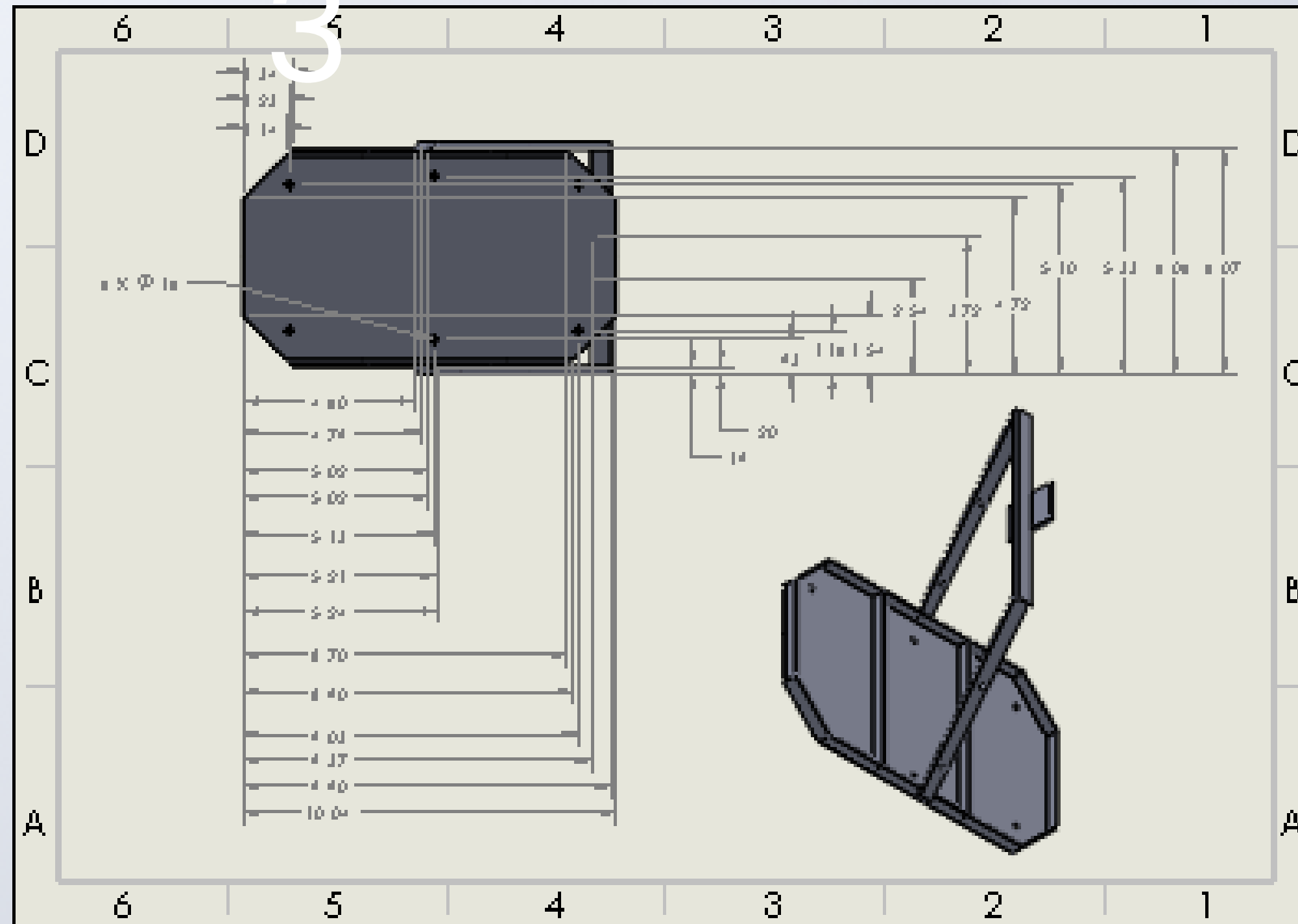
0

Process



Drawing

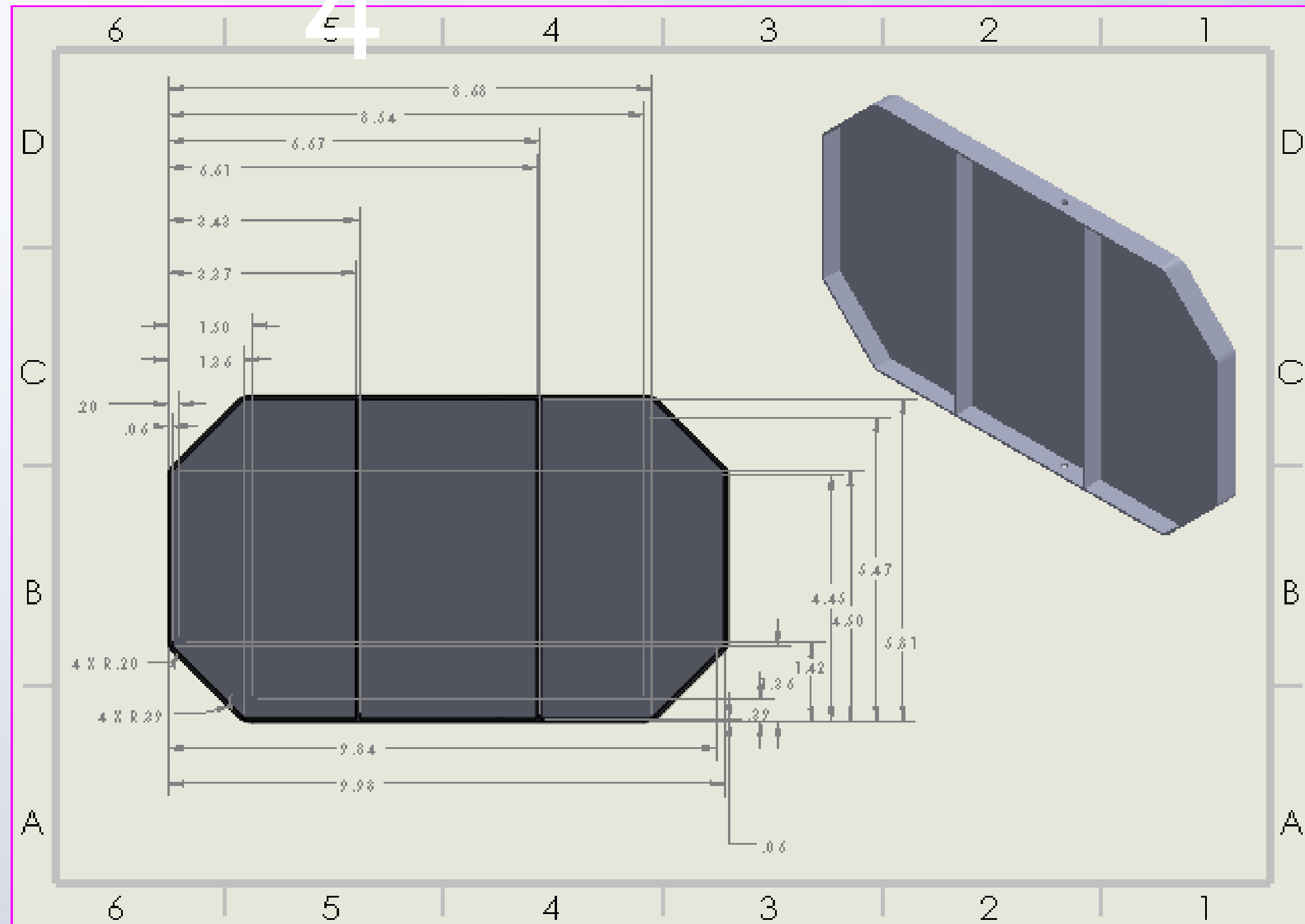
Process



Drawing

0

Process



Bending

0

1

Process



Drilling

0

Process



Cutting

0

1

Process



Welding

0

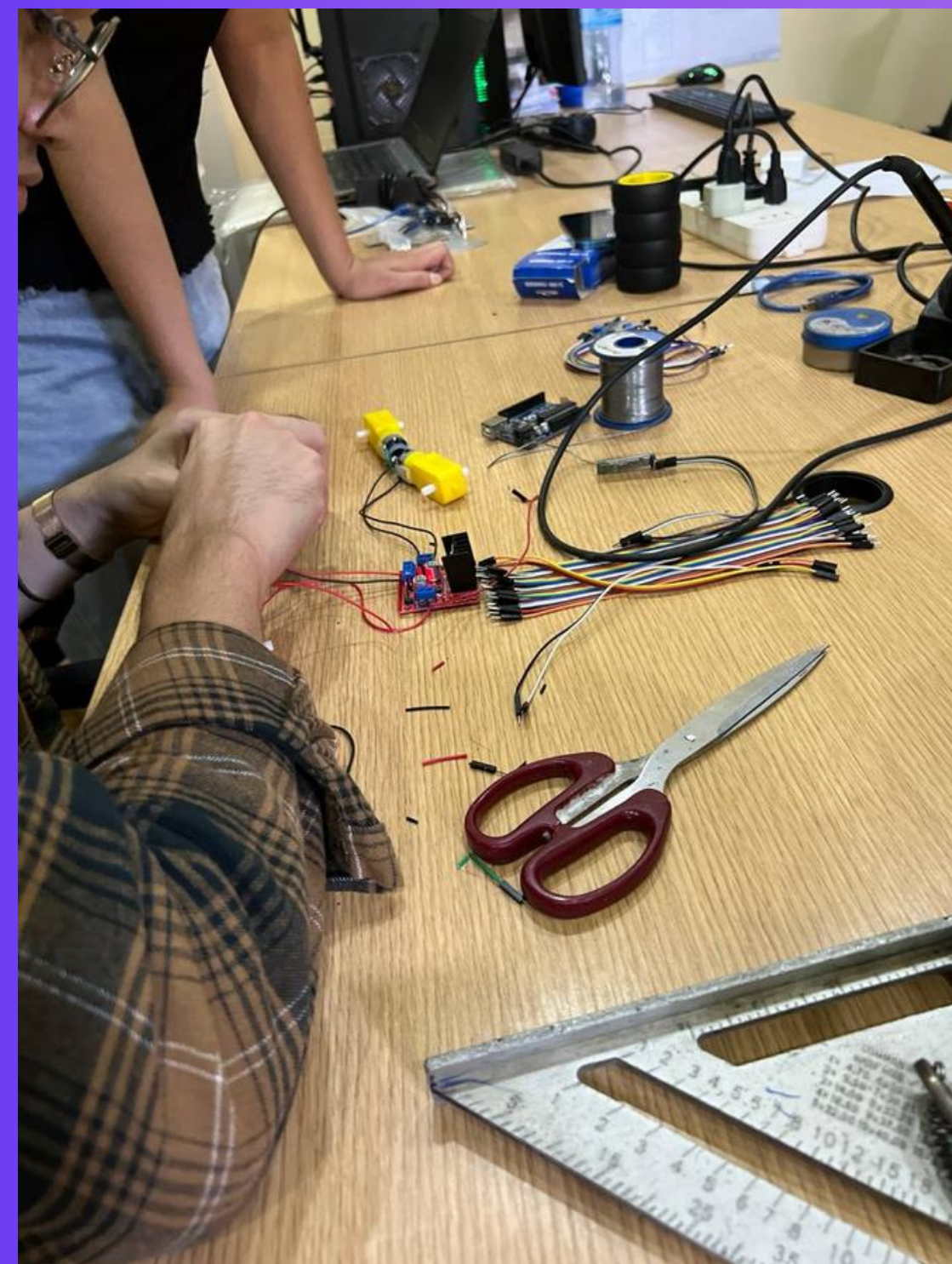
Process



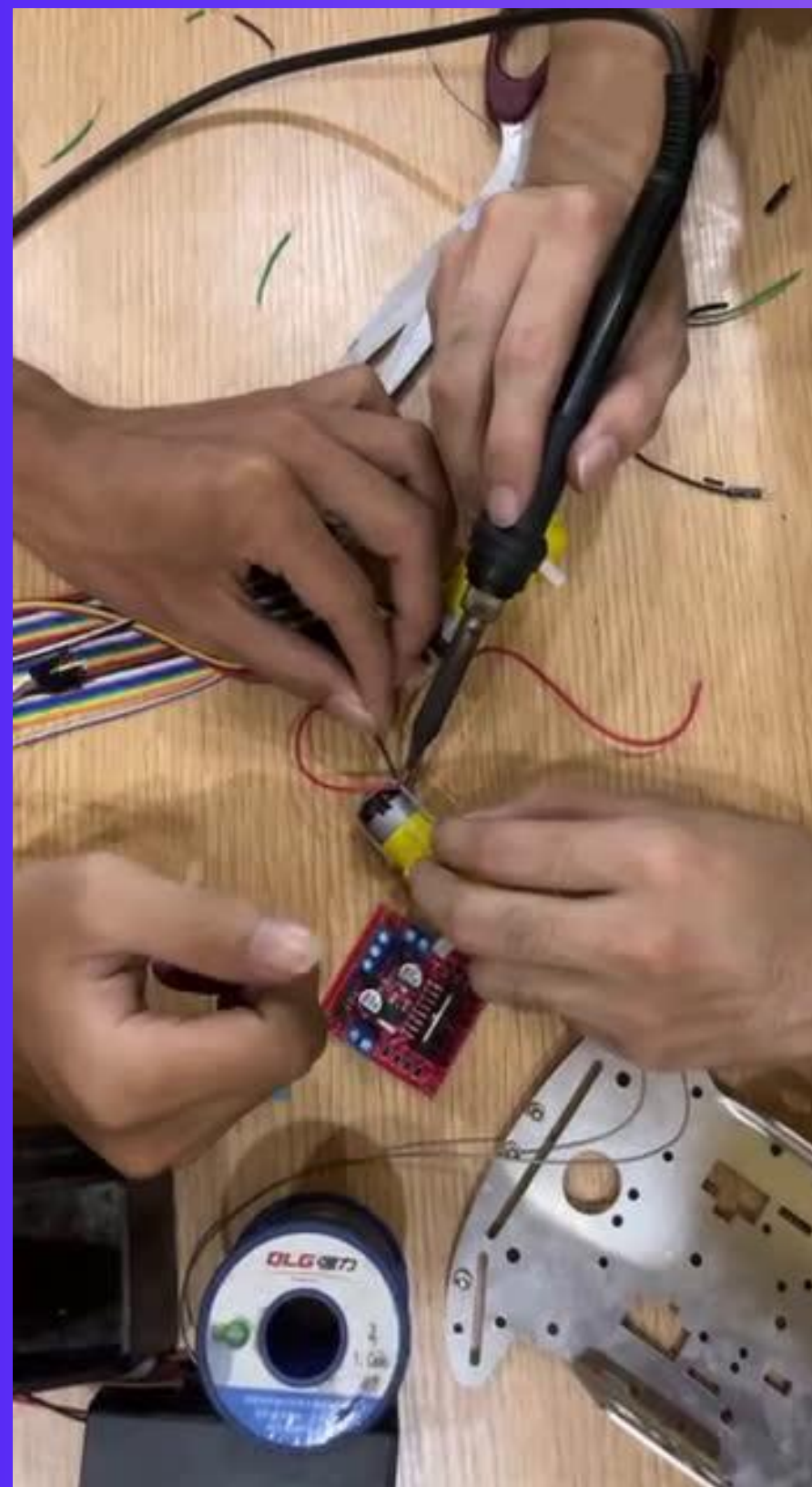
Set up



Set up



Set up



RESULTS

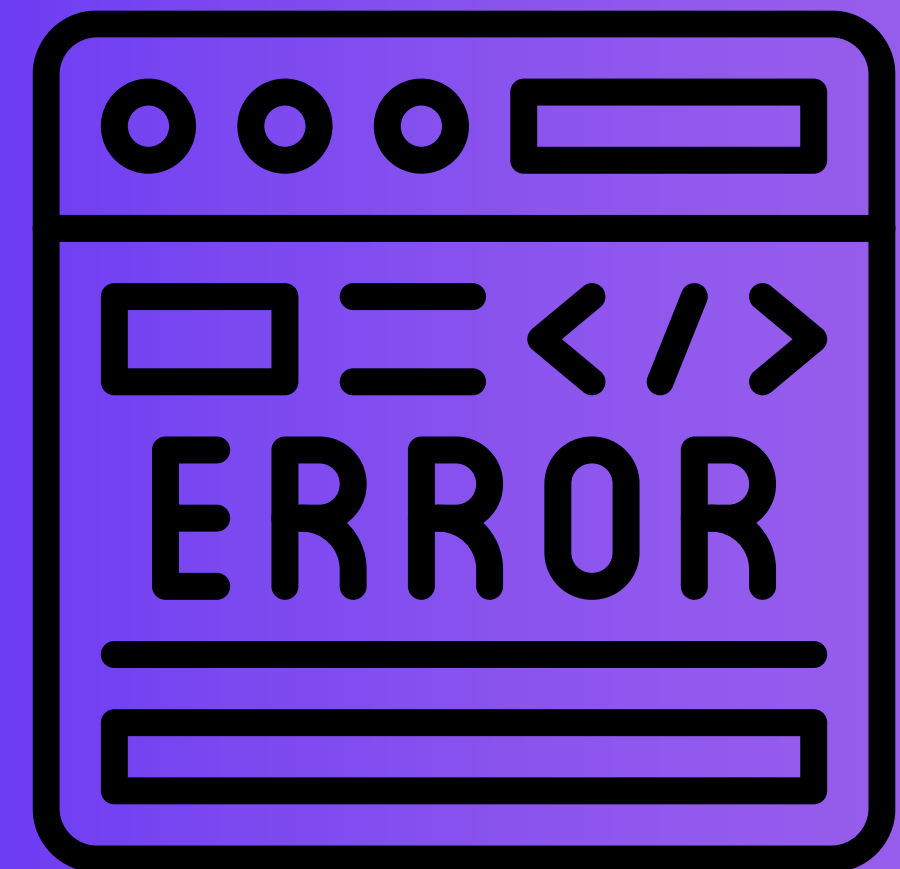


What we have learned

- Coding(Block/Arduino)
- Designing using SolidWorks
- Assembly using SolidWorks
- Cutting using machine
- Using bending machine
- Using hand drill machine
- Understanding the function of its components
- Wire connection
- Welding the electric wires

Challenge

- Coding: There are some mistakes we have made in the coding so we cannot enable the robot to work well especially when connecting using the bluetooth wireless.
- Practice cutting and bending machine for the first time.
- We have made 2 Arduino broken during our process of this project.
- So with these challenges we can improve ourselves and learn from our mistakes more during the next project.



Conclusion

- Thank you sir Dara for sponsoring us materials, labors, tools and equipment.
- And thanks to the staffs here for helping us with this project



RESOURCES LINKS

- MOBILE-SCISSOR-TABLES.CO.UK
- [HTTPS://WWW.DFROBOT.COM/BLOG-553.HTML](https://WWW.DFROBOT.COM/BLOG-553.HTML)
- [HTTPS://WWW.LINKEDIN.COM/PULSE/UAE-INCREASING-USE-ROBOTICS-HEALTHCARE-GOOD-FAST-COMPANY-ME](https://WWW.LINKEDIN.COM/PULSE/UAE-INCREASING-USE-ROBOTICS-HEALTHCARE-GOOD-FAST-COMPANY-ME)
- [HTTPS://YUJINROBOT.COM/EN/RESOURCE/BLOG/BLOG/HOW-HOSPITALS-CAN-BENEFIT-FROM-A-ROBOTIC-DELIVERY-SYSTEM#:~:TEXT=HOSPITAL%20ROBOTIC%20DELIVERY%20SYSTEMS%20ARE,HOSPITAL%20OPERATIONS%20CAN%20CONTINUE%20EFFICIENTLY](https://YUJINROBOT.COM/EN/RESOURCE/BLOG/BLOG/HOW-HOSPITALS-CAN-BENEFIT-FROM-A-ROBOTIC-DELIVERY-SYSTEM#:~:TEXT=HOSPITAL%20ROBOTIC%20DELIVERY%20SYSTEMS%20ARE,HOSPITAL%20OPERATIONS%20CAN%20CONTINUE%20EFFICIENTLY)

thank you!

