A PROJECT REPORT ON

PICK N PLACE ROBOT

A PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF

BACHELOR OF TECHNOLOGY
IN
COMPUTER SCIENCE ENGINEERING

SUBMITTED BY

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UNDER THE GUIDANCE OF

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ASSISTANT PROFESSOR

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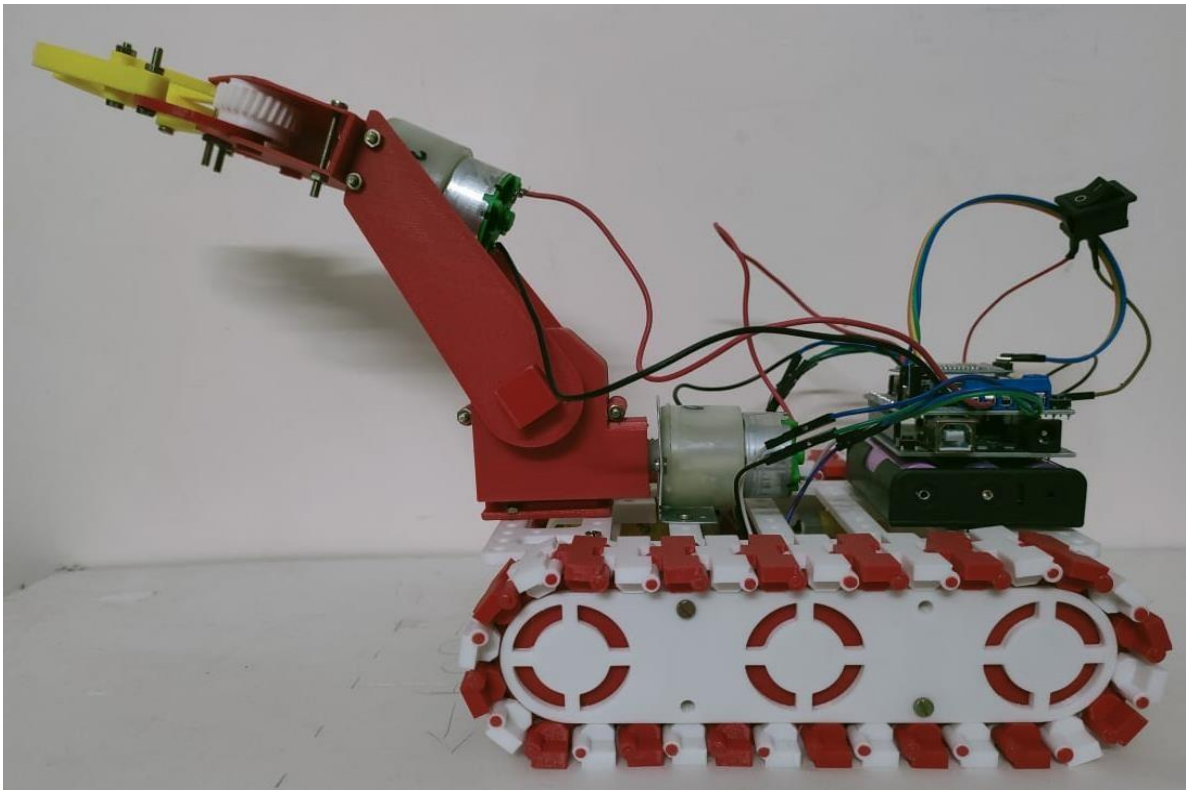
CMR TECHNICAL CAMPUS
Academic year(2021-2022)

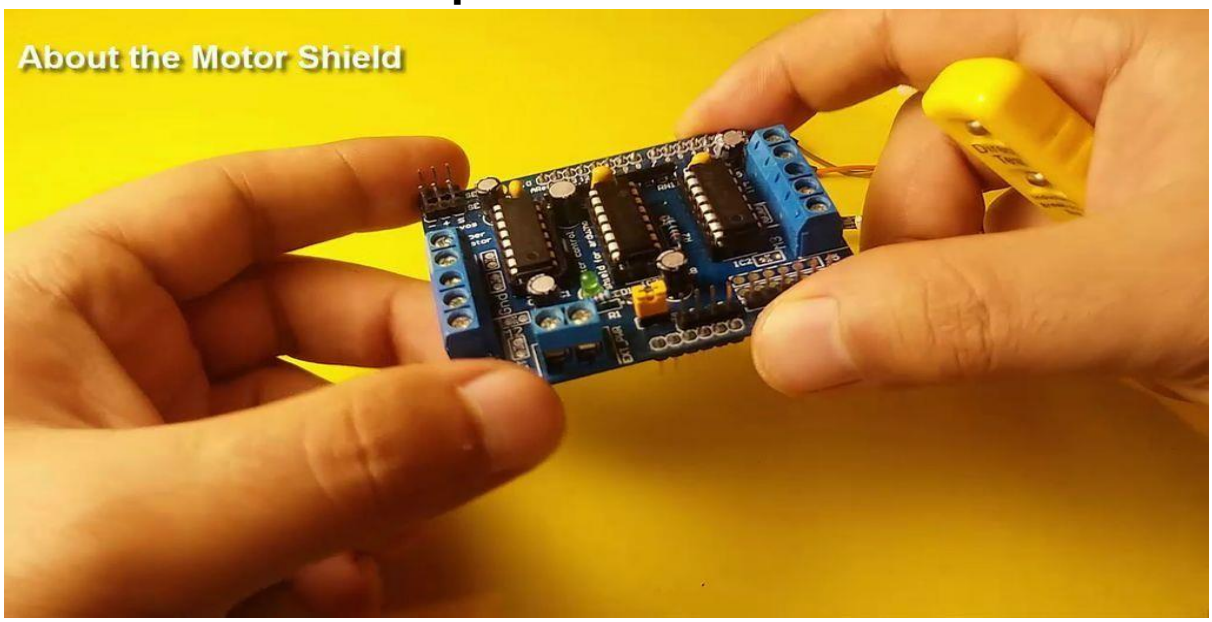
PICK N PLACE ROBOT

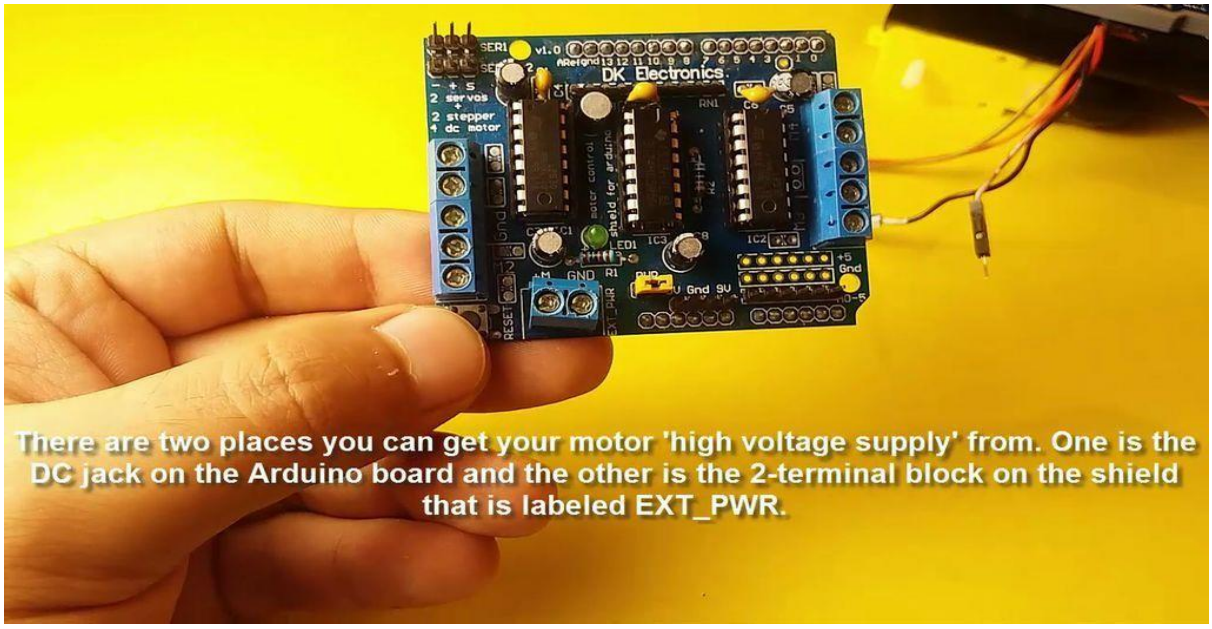


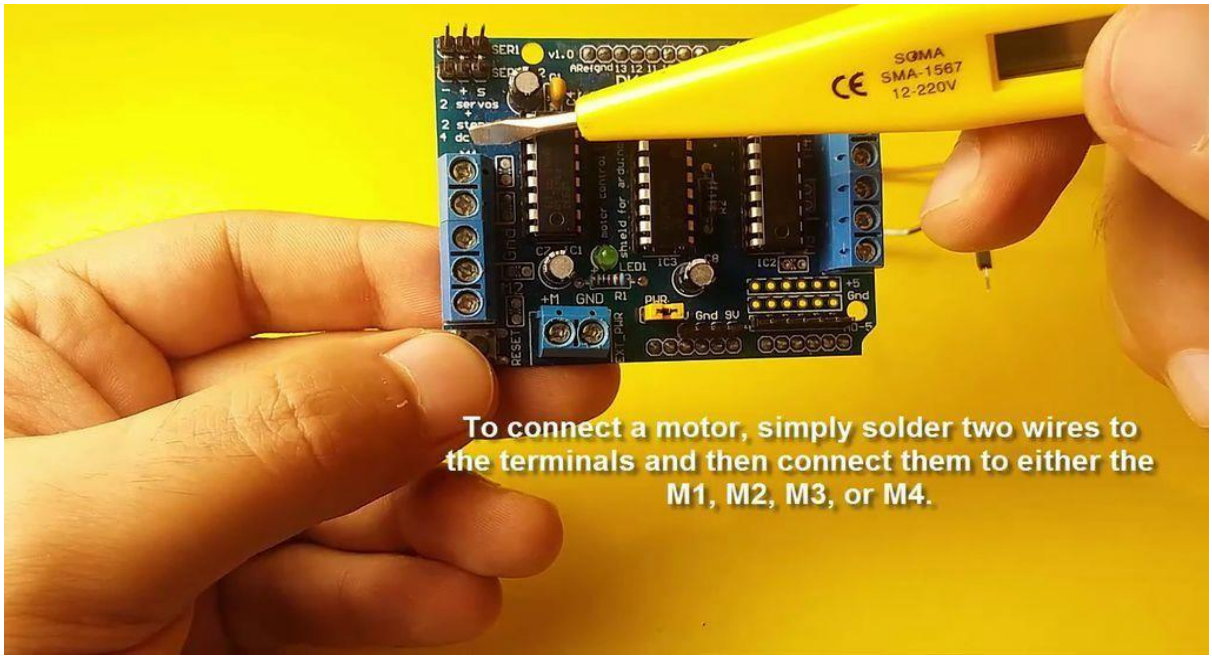
Step 1: Components Required

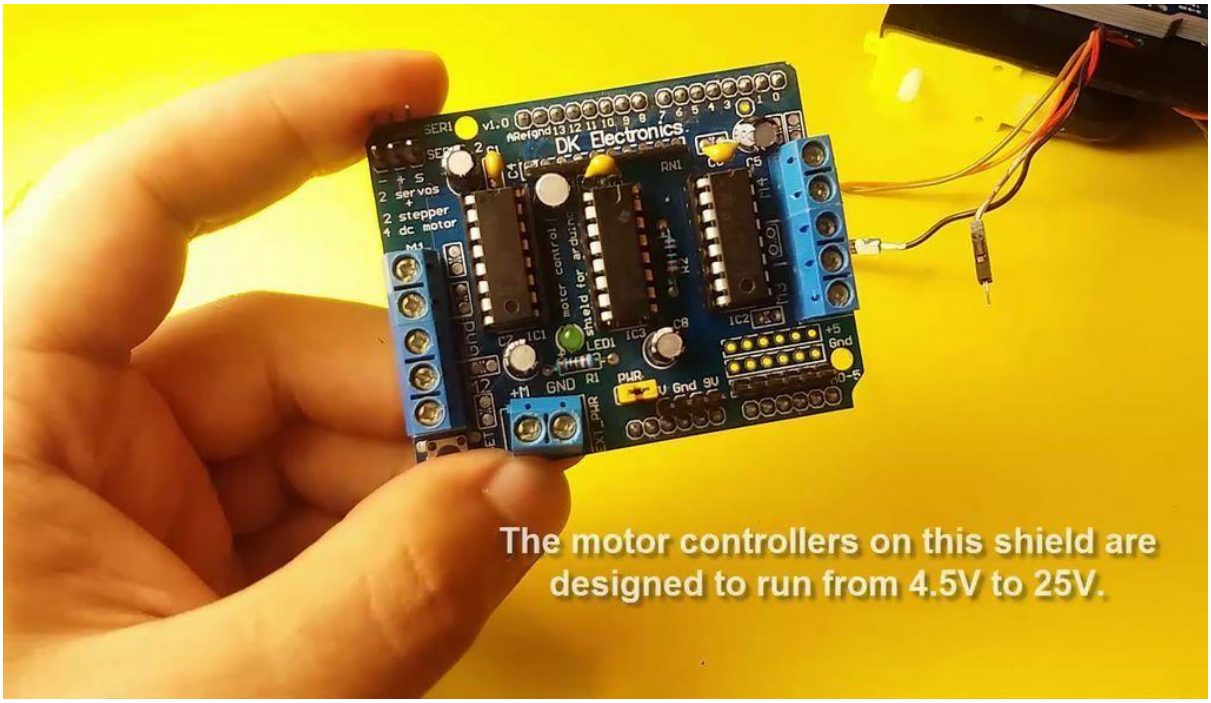
- Arduino uno
- Motor shield
- 18650 Batteries
- HC-05 Bluetooth module
- DC Gear Motors x 4 (60 RPM)
- DC Gear Motors x 2 (30 RPM)
- Wheels x 4
- ON/OFF Switch

Step 2: MOTOR SHIELD

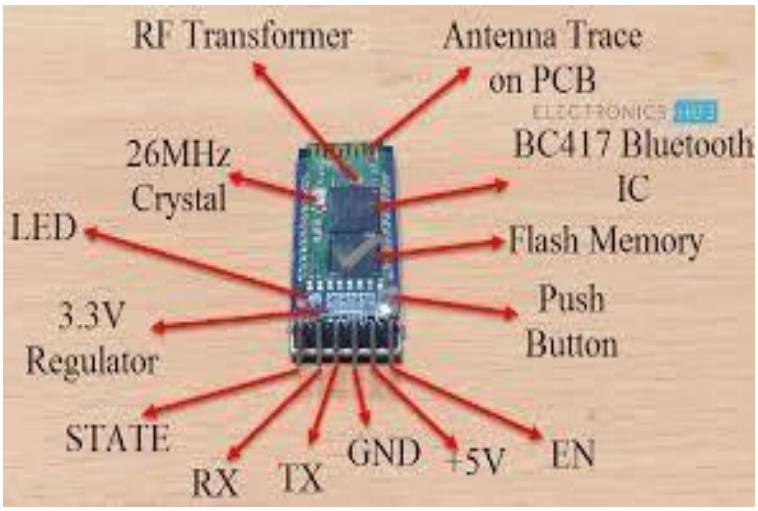






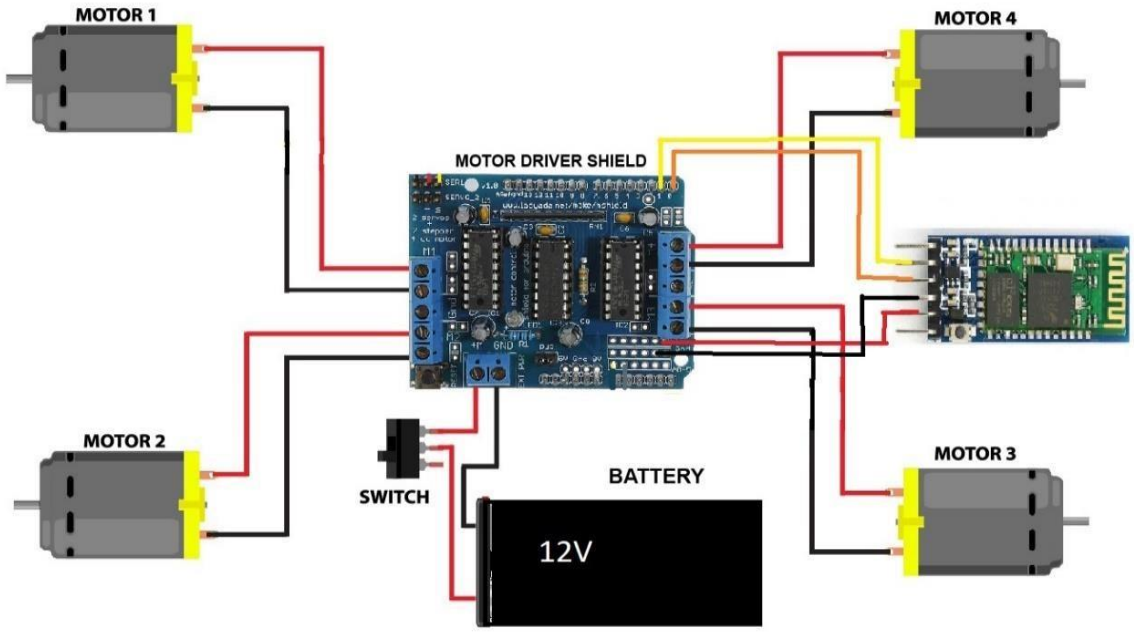


Step 3: HC-05 BLUETOOTH MODULE



- Take Bluetooth module
- Connect two female to female wire at +5v and GND
- Connect Bluetooth's +5v and GND with servo's + and - on motor shield as shown in picture.
- Connect RX of arduino to TX of Bluetooth module
- Connect TX of arduino to RX of Bluetooth module

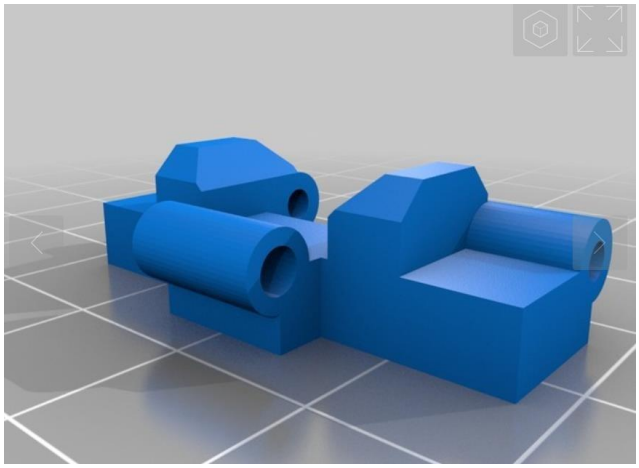
Step 4: Circuit Connections



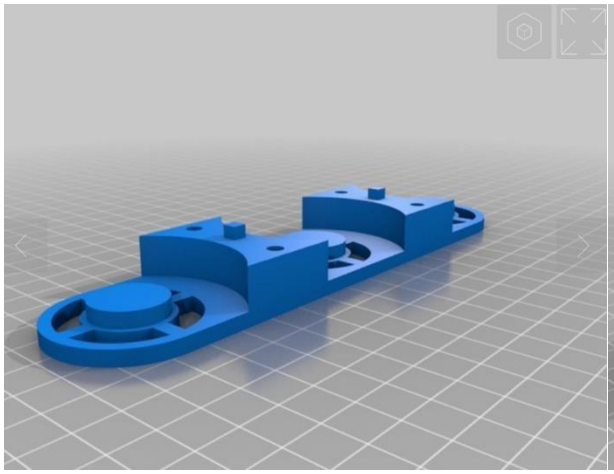
- Solder two wires at arduino's 0 and 1 pin that is RX and TX.
- Fix the motor shield on the top of arduino.
- Connect all motors on motor shield as given in circuit.
- Left side motors are connected to M3 and M4.
- Right side motors are connected to M1 and M2.
- If any motor is rotating in reverse direction then reverse the connection of motor.

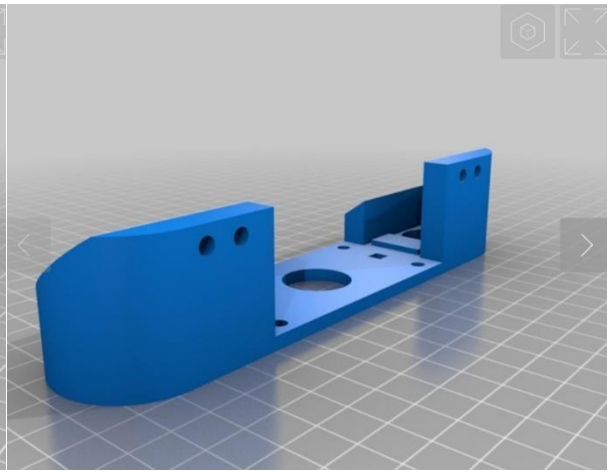
Connect the battery to motor shield.

Step 5: Design and 3D Print components

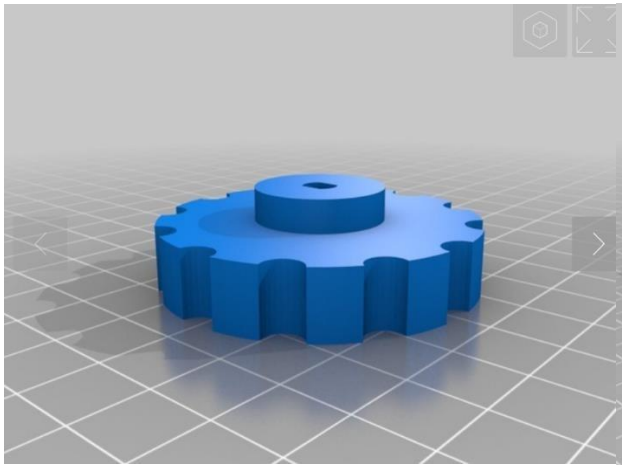


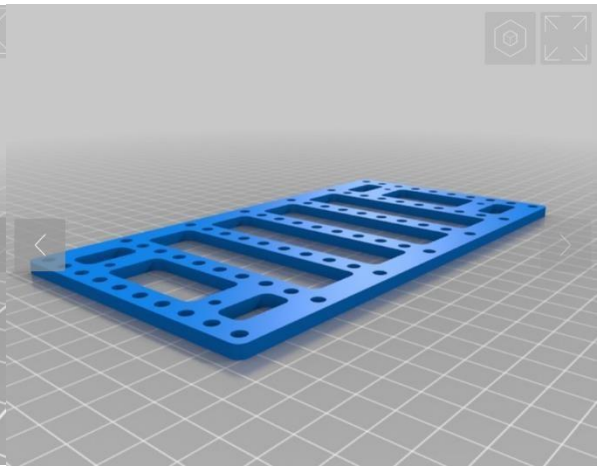
Track Link





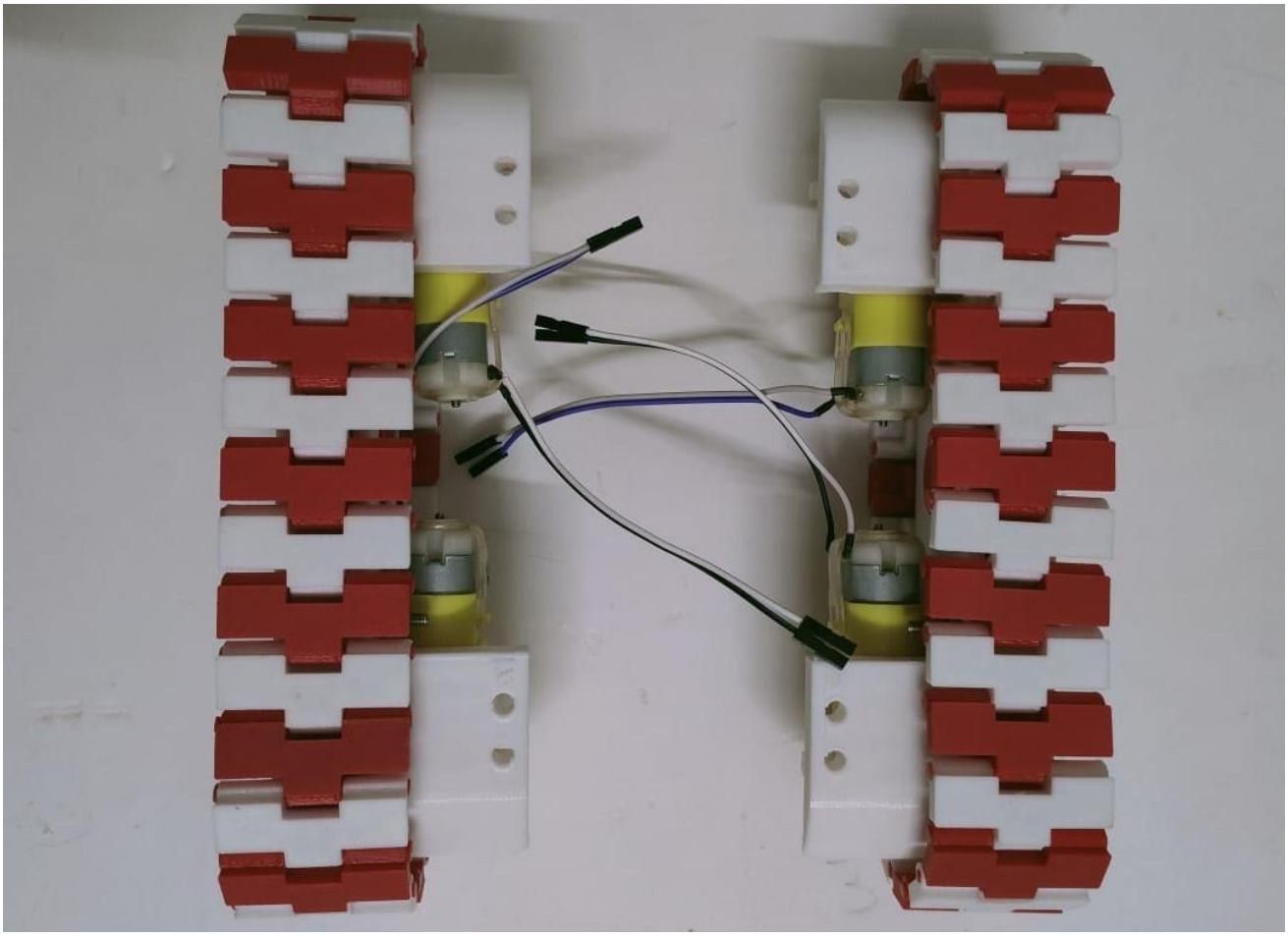
Motor clamping mount



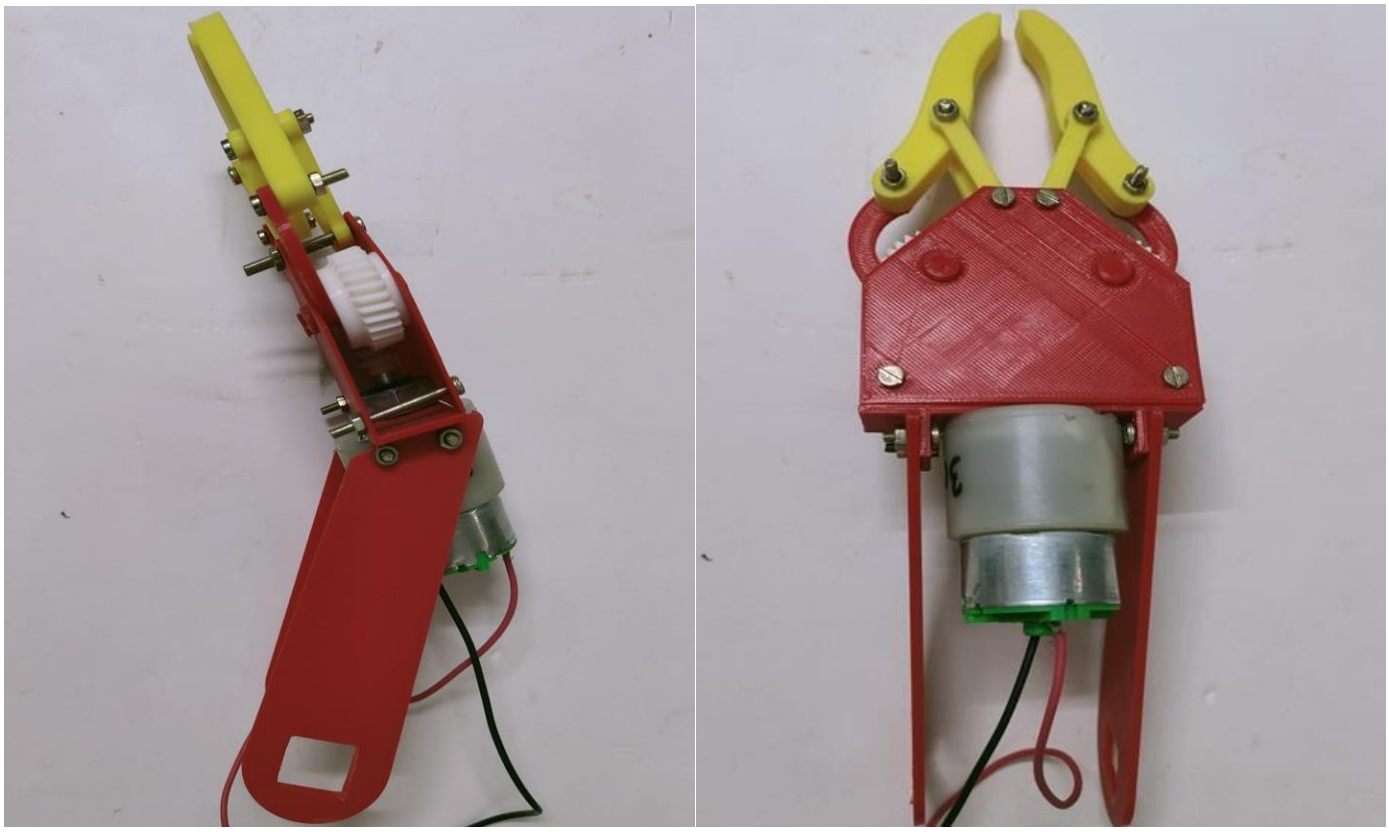


Track wheel chassis

Step 6: Assembly

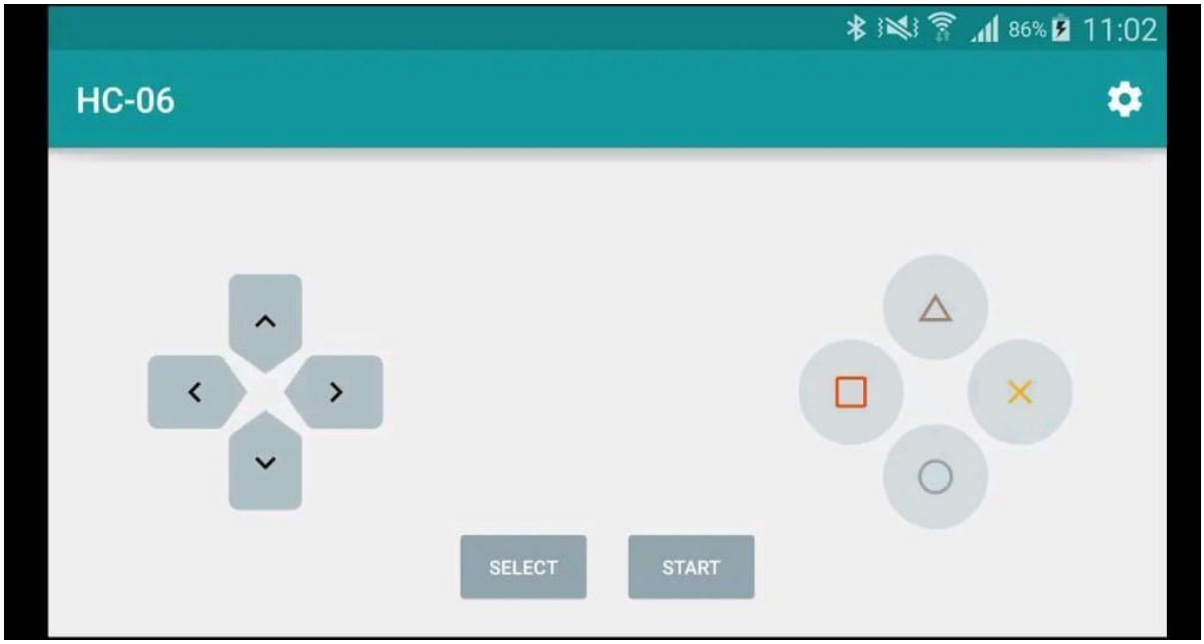


Track and motors assembly



Robot ARM assembly

Step 7: Connect the App



- open play store
- Search for arduino Bluetooth controller
- Download the app and open
- Turn on Bluetooth
- Click on hc-05
- Enter the password 1234
- Connect to Robot
- Once it paired, you can operate.

Step 8: Code

```
#include <AFMotor.h>
#include <SoftwareSerial.h>

SoftwareSerial bluetoothSerial(9, 10); // RX, TX

//initial motors pin
AF_DCMotor motor1(1, MOTOR12_1KHZ);
AF_DCMotor motor2(2, MOTOR12_1KHZ);
AF_DCMotor motor3(3, MOTOR34_1KHZ);
AF_DCMotor motor4(4, MOTOR34_1KHZ);
```

```
char command;

void setup()
{
  bluetoothSerial.begin(9600);  //Set the baud rate to your Bluetooth module.
}

void loop() {   if
(bluetoothSerial.available() > 0) {
    command = bluetoothSerial.read();

    Stop(); //initialize with motors stoped

    switch (command) {
case 'F':
forward();        break;
case 'B':
backward();
break;       case 'L':
left();         break;
case 'R':         right();
break;       case 'G':
front();         break;
case 'I':         back();
break;       case 'H':
clos();          break;
case 'J':         opn();
        break;
    }
  }
}

void forward()
{
  motor2.setSpeed(255); //Define maximum velocity
motor2.run(FORWARD);  //rotate the motor clockwise
```

```
motor3.setSpeed(255); //Define maximum velocity
motor3.run(FORWARD);  //rotate the motor clockwise   delay(50);
}

void backward()
{
  motor2.setSpeed(255); //Define maximum velocity
motor2.run(BACKWARD); //rotate the motor anti-clockwise
motor3.setSpeed(255); //Define maximum velocity
motor3.run(BACKWARD); //rotate the motor anti-clockwise
delay(50);
}

void left()
{
  motor2.setSpeed(255); //Define maximum velocity
motor2.run(BACKWARD); //rotate the motor anti-clockwise
motor3.setSpeed(255); //Define maximum velocity
motor3.run(FORWARD);  //rotate the motor clockwise   delay(50);
}

void right()
{
  motor2.setSpeed(255); //Define maximum velocity
motor2.run(FORWARD);  //rotate the motor clockwise
motor3.setSpeed(255); //Define maximum velocity
motor3.run(BACKWARD); //rotate the motor anti-clockwise
delay(50);
}

void front()
{
  motor4.setSpeed(255); //Define maximum velocity
motor4.run(FORWARD);  //rotate the motor clockwise   delay(50);
}

void back()
```

```
{
  motor4.setSpeed(255); //Define maximum velocity
motor4.run(BACKWARD); //rotate the motor anti-clockwise
delay(50);
}

void clos()
{
  motor1.setSpeed(255); //Define maximum velocity
motor1.run(FORWARD); //rotate the motor anti-clockwise
delay(50);
}

void opn()
{
  motor1.setSpeed(255); //Define maximum velocity
motor1.run(BACKWARD);  //rotate the motor clockwise
delay(50);
}

void Stop()
{
  motor1.setSpeed(0);  //Define minimum velocity
  motor1.run(RELEASE); //stop the motor when release the button
motor2.setSpeed(0);  //Define minimum velocity
motor2.run(RELEASE); //rotate the motor clockwise
motor3.setSpeed(0);  //Define minimum velocity
  motor3.run(RELEASE); //stop the motor when release the button
motor4.setSpeed(0);  //Define minimum velocity
  motor4.run(RELEASE); //stop the motor when release the button
}
```