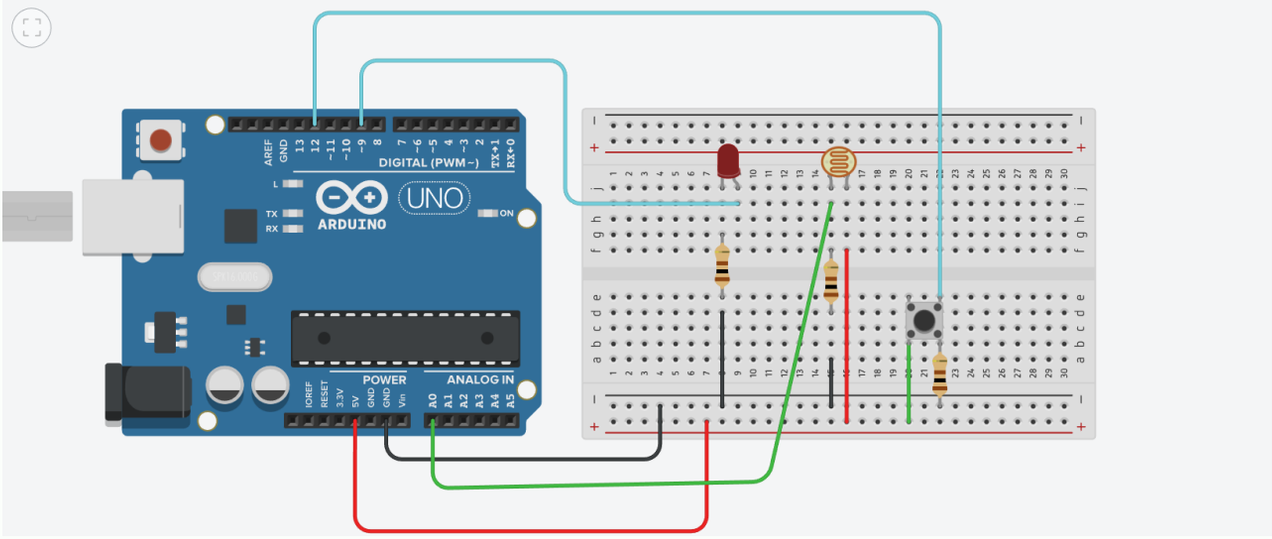
USE THE PUSH BUTTON TO CONTROL THE OPERATION OF THE ROBOT

Note:Suppose the LED is the robot to see the effect of the button and the sensor to control the on and off, and I also assumed the photogester is the sensor used to sense the robot's surroundings to automatically shutdown in the event that no one is present

without relay or transistor

Connecting



Code

```
const int photoresistor=A0;
const int led_pin = 9;
int output;
int led_value;
int boton;
 void setup()
 {
  pinMode(photoresistor, INPUT);
  Serial.begin (9600);
  pinMode(led_pin, OUTPUT);
  pinMode (12, INPUT);
  pinMode (2, OUTPUT);}
void loop()
{
  if (boton == INPUT){
   boton=digitalRead (12);
  digitalWrite(9, boton);
  }
  else {
  output = (analogRead(photoresistor));
  Serial.println (analogRead(photoresistor));
  delay(200);
led_value = map(output, 0, 1023, 0,255);
analogWrite (led_pin , led_value);
delay(1);
  }}
```

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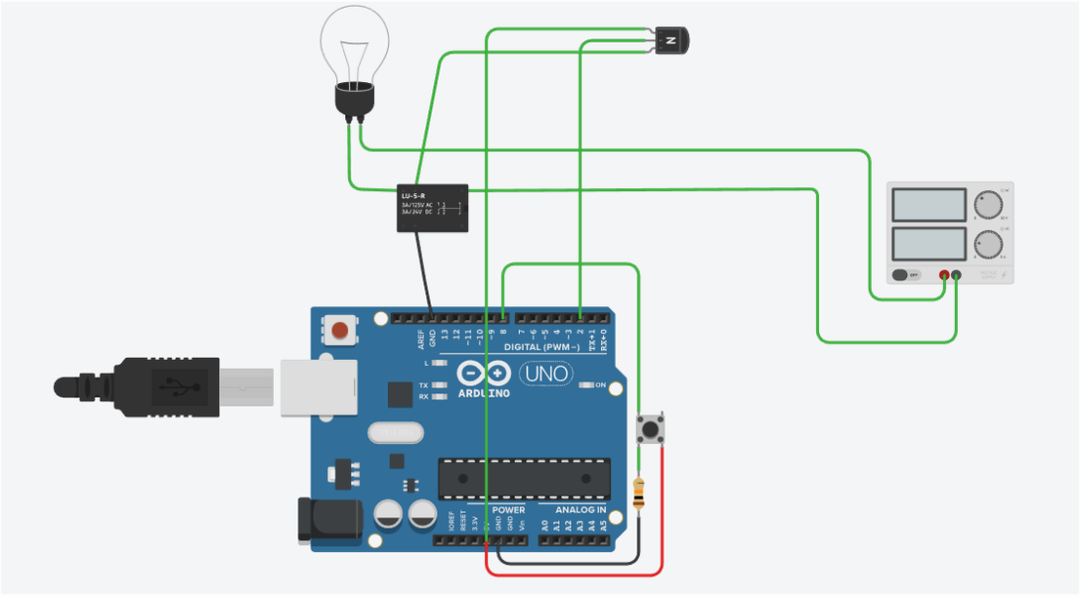
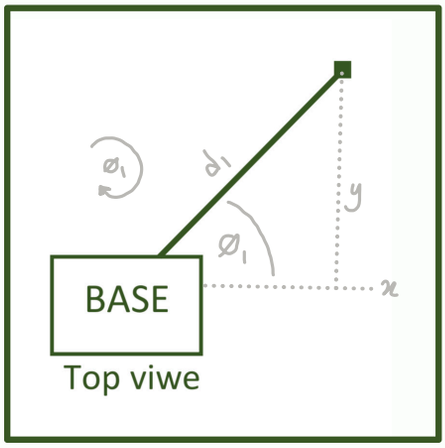
Connecting

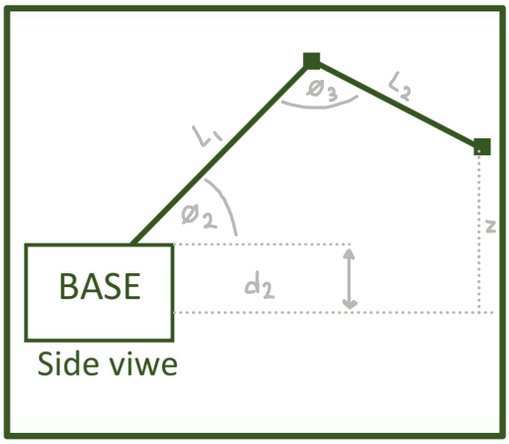


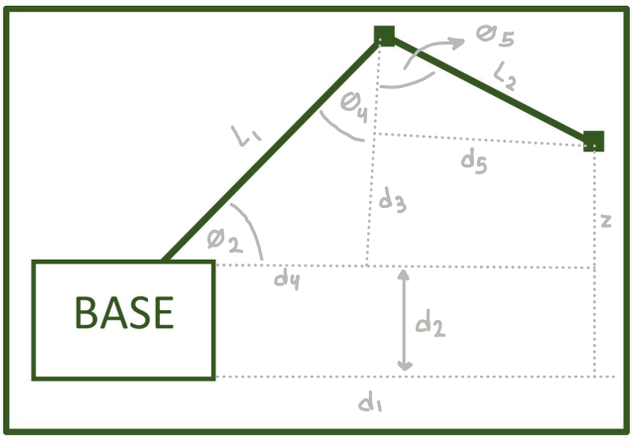
Code

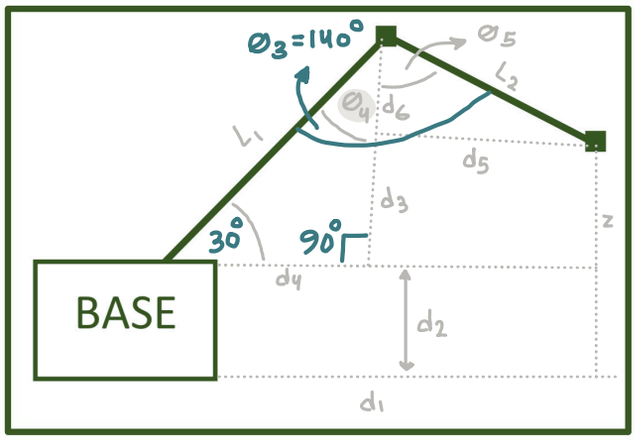
```
int pinButton = 8;
int Relay = 2;
int stateRelay = LOW;
int stateButton;
int previous = LOW;
long time = 0;
long debounce = 100;
int stayON = 5000;
void setup() {
  pinMode(pinButton, INPUT);
  pinMode(Relay, OUTPUT);
}
void loop() {
  stateButton = digitalRead(pinButton);
  if(stateButton == HIGH && previous == LOW && millis() - time > debounce) {
    if(stateRelay == HIGH){
      digitalWrite(Relay, LOW);
    } else {
       digitalWrite(Relay, HIGH);
       delay(stayON);
       digitalWrite(Relay, LOW);
    }
    time = millis();
  }
  previous == stateButton;
}
```

FORWARD KINEMATIC







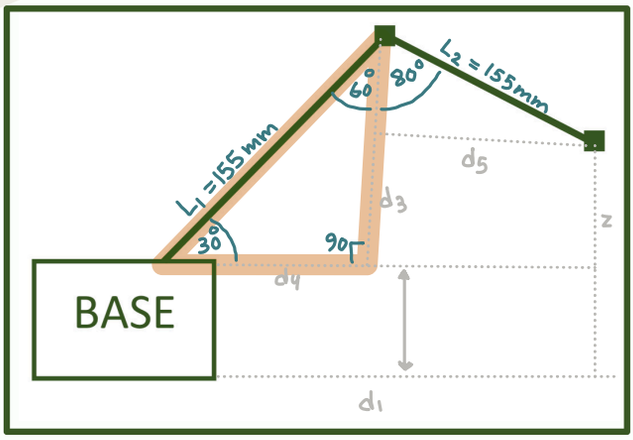


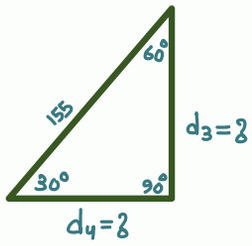
When I Suppose : $L_1 = L_2 = 155\,mm$, $d_2 = 120\,mm$

$\emptyset_1 = 60^\circ, \emptyset_2 = 30^\circ, \emptyset_3 = 140^\circ$

$\emptyset_4 = 180^\circ - 30^\circ - 90^\circ = 60^\circ$

$\emptyset_5 = \emptyset_3 - \emptyset_4 = 140^\circ - 60^\circ = 80^\circ$



① 

$$\sin\theta = \frac{d_3}{155}$$

$$\sin 30^\circ = \frac{d_3}{155}$$

$$155 \sin 30^\circ = d_3$$

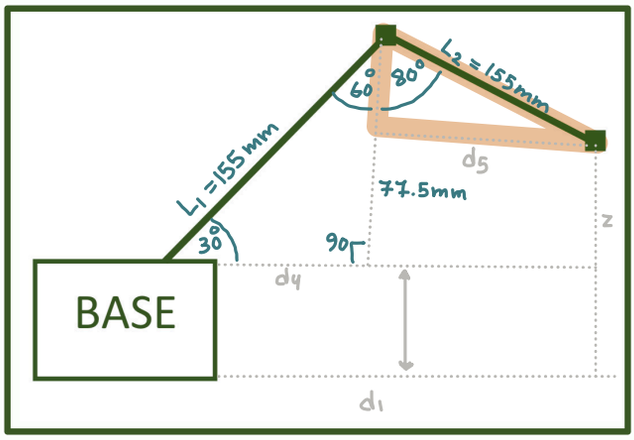
$$d_3 = 77.5\ mm$$

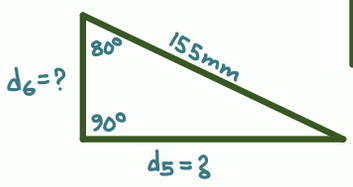
$$\cos\theta = \frac{d_4}{155}$$

$$\cos 30^\circ = \frac{d_4}{155}$$

$$155 \cos 30^\circ = d_4$$

$$d_4 = 134.23\ mm$$



② 

$$\cos\theta = \frac{d_6}{155}$$

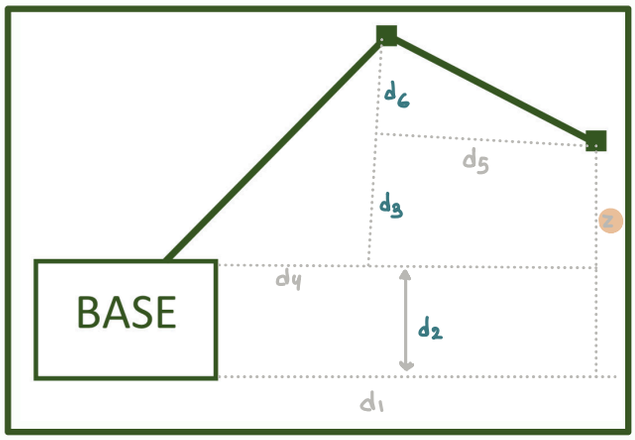
$$155 \cos 80^\circ = d_6$$

$$d_6 = 26.92\ mm$$

$$\sin\theta = \frac{d_5}{155}$$

$$155 \sin 80^\circ = d_5$$

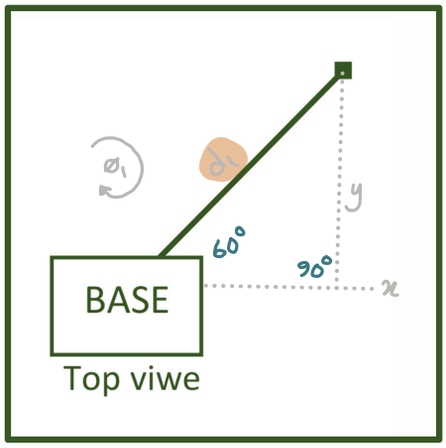
$$d_5 = 152.65\ mm$$

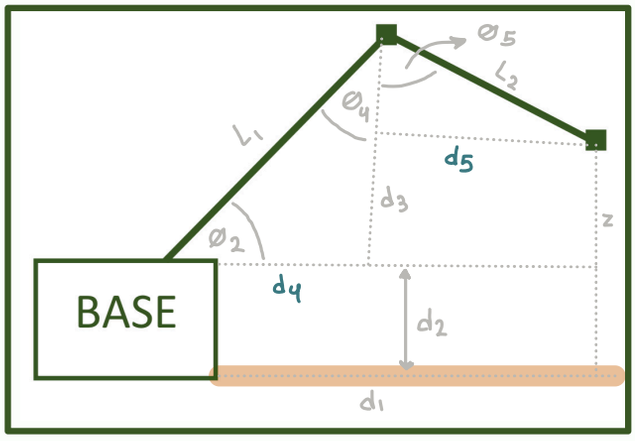


③ $Z = d_2 + d_3 - d_6$

$= 120 + 77.5 - 26.92 = 154.42\,mm$

$Z = 154.42\,mm$





④ $d_1 = d_4 + d_5$

$d_1 = 134.23 + 152.65 = 286.88m$

$d_1 = 286.88\,mm$

$\cos \emptyset = \frac{x}{286.88}$

$286.88 \cos 60 = x$

$x = 143.44mm$

$\sin \emptyset = \frac{y}{286.88}$

$286.88 \sin 60 = y$

$y = 248.44mm$

the tooltip (Endeffect) $= (x, y, z)$

$= (143.44, 248.44, 154.42)$