1

```
int ledPin = 7;  // Pin where the LED is connected

void setup() {
  pinMode(ledPin, OUTPUT);  // Set the LED pin as an output
  Serial.begin(9600);       // Start serial communication at 9600 baud
}

void loop() {

  if (Serial.available()) {              // Check if there is any user input
    String command = Serial.readString(); // Read the user input


    if (command.indexOf("ON") >= 0) {
      digitalWrite(ledPin, HIGH);          // Turn on the LED
    } else if (command.indexOf("OFF") >= 0) {
      digitalWrite(ledPin, LOW);           // Turn off the LED
    }
  }
}
```

2

```
int ledPin = 13;         // LED connected to pin 13
int irSensorPin = 3;     // IR sensor connected to pin 3


void setup() {
  pinMode(ledPin, OUTPUT);      // Set LED pin as output
  pinMode(irSensorPin, INPUT);  // Set IR sensor pin as input
}


void loop() {
  if (digitalRead(irSensorPin) == LOW) {
    digitalWrite(ledPin, HIGH);  // Turn on LED if IR sensor detects something
  } else {
    digitalWrite(ledPin, LOW);   // Turn off LED if nothing is detected
  }
}
```

3

```
const int trigPin = 9;  // Trigger pin
const int echoPin = 10; // Echo pin


void setup() {
  pinMode(trigPin, OUTPUT); // Set the trigger pin as output
  pinMode(echoPin, INPUT);  // Set the echo pin as input
  Serial.begin(9600);       // Start serial communication at 9600 baud
}


void loop() {
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);


  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);


  long duration = pulseIn(echoPin, HIGH);
  int distance = duration * 0.034 / 2;


  Serial.println(distance); // Print the distance to the Serial Monitor


  delay(500); // Delay for half a second before the next measurement
}
```

4

```
int sensor_pin = A0;
void setup() {
  // put your setup code here, to run once:
   Serial.begin(9600);
   pinMode(sensor_pin, INPUT);
}

void loop() {
  // put your main code here, to run repeatedly:
   int sensor_data = analogRead(sensor_pin);
   Serial.println(sensor_data);
}
```

5

```
#include <Servo.h>

// Define the servo motor pin
const int servoPin = 9;

// Create a servo object
Servo myServo;

void setup() {
  // Attach the servo motor to the pin
  myServo.attach(servoPin);
}

void loop() {
  // Rotate the servo motor to 0 degrees
  myServo.write(0);
  delay(1000);

  // Rotate the servo motor to 90 degrees
  myServo.write(90);
  delay(1000);

  // Rotate the servo motor to 180 degrees
  myServo.write(180);
  delay(1000);
}
```

6

```
#include <Servo.h>

// Define servo and sensor pins
Servo tap_servo;
int sensor_pin = 4;
int tap_servo_pin = 5;
int val;

void setup() {
  pinMode(sensor_pin, INPUT);          // Set sensor pin as input
  tap_servo.attach(tap_servo_pin);    // Attach the servo to the defined pin
}

void loop() {
  val = digitalRead(sensor_pin);      // Read sensor state

  if (val == 0) {                    // If sensor is LOW
    tap_servo.write(0);               // Move servo to 0 degrees
    delay(3000);                     // Delay for 3 seconds (if needed)
  } else if (val == 1) {             // If sensor is HIGH
    tap_servo.write(180);             // Move servo to 180 degrees
  }
}
```