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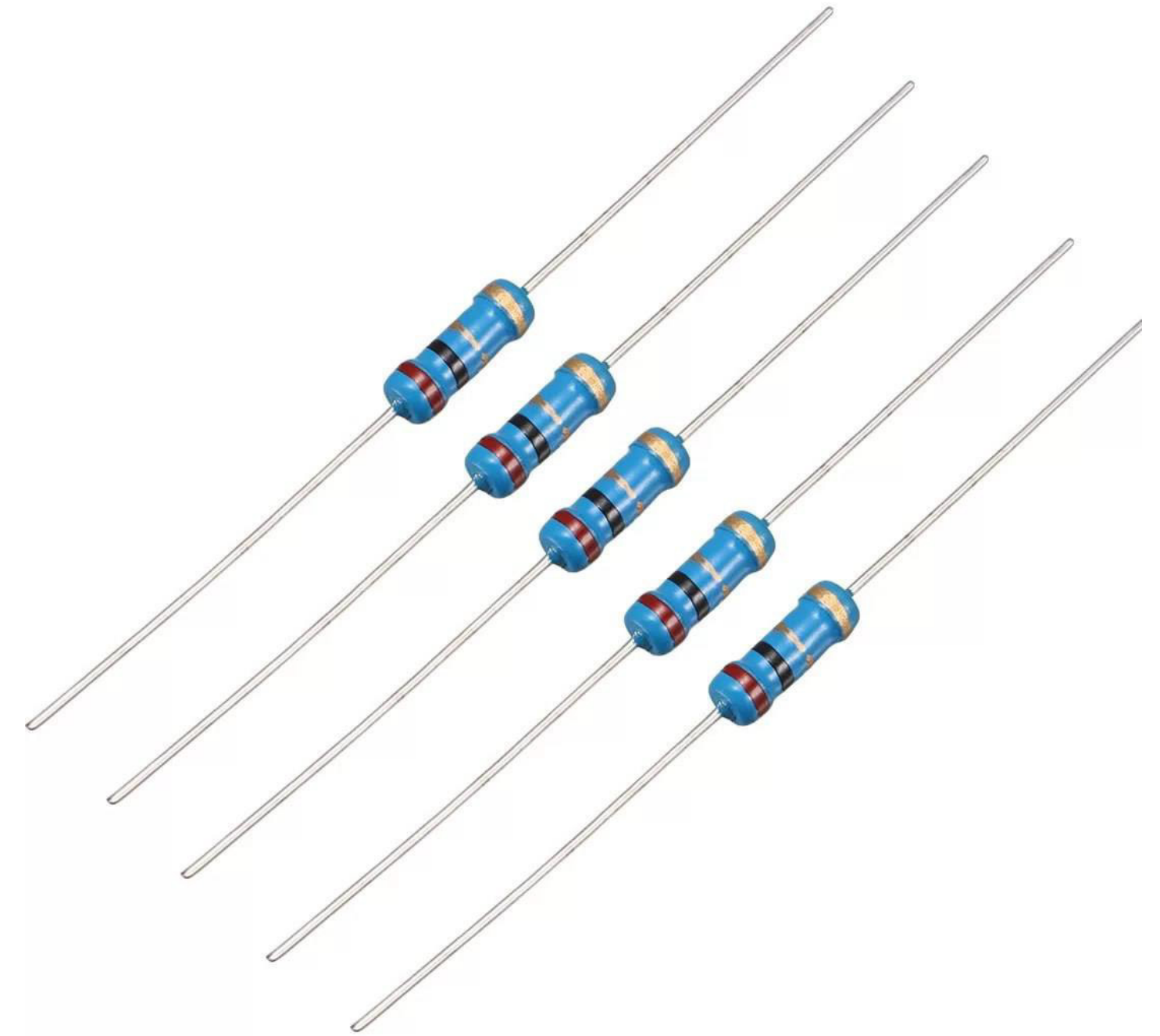
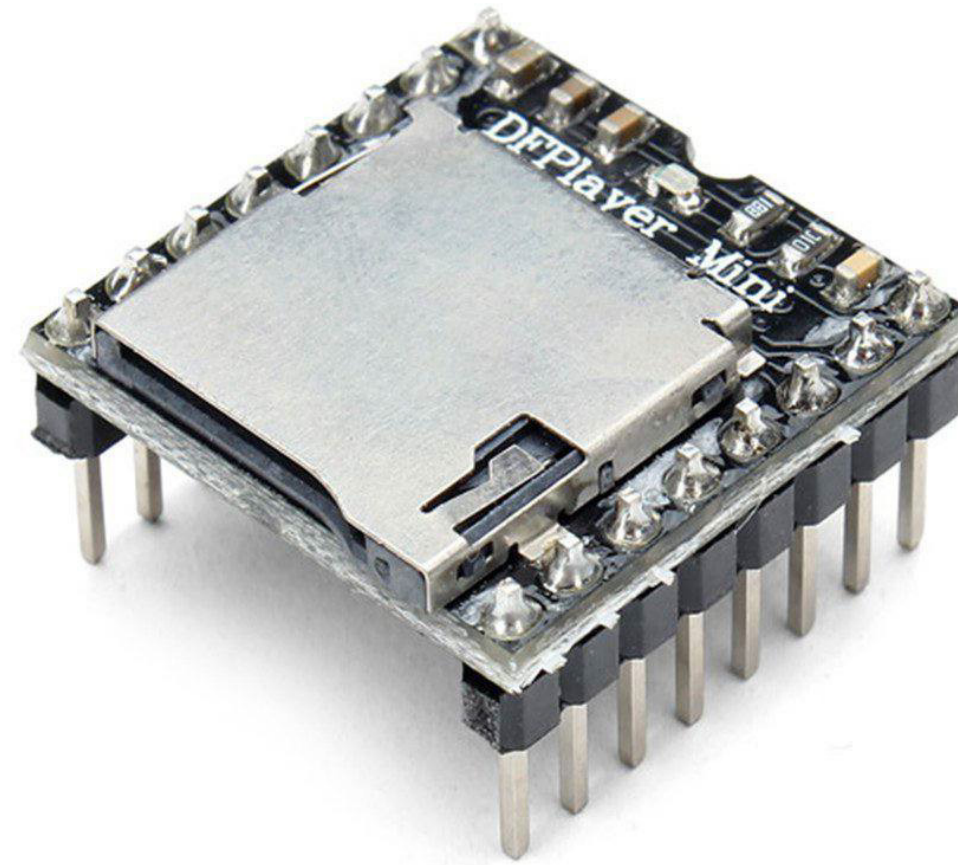
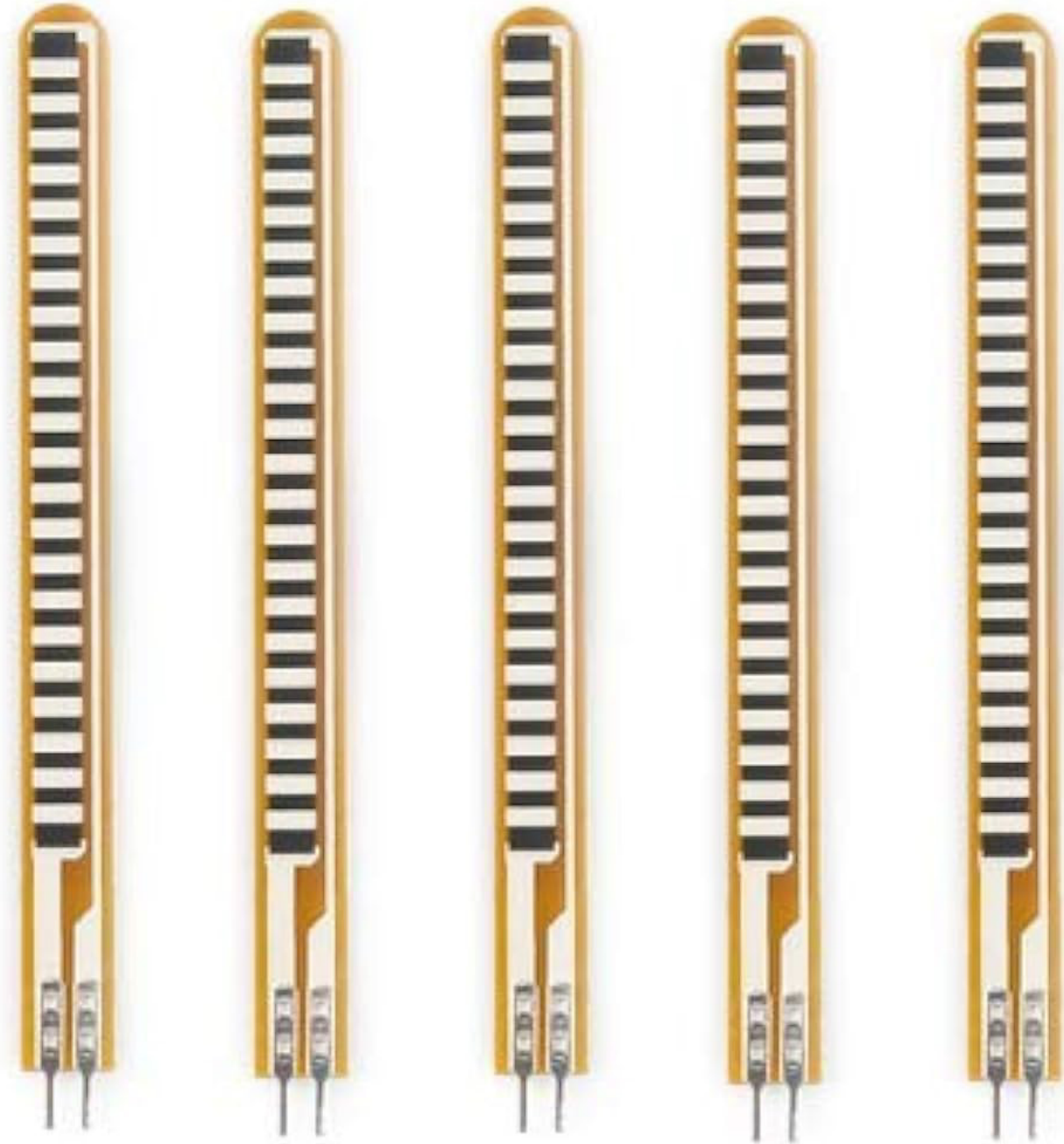
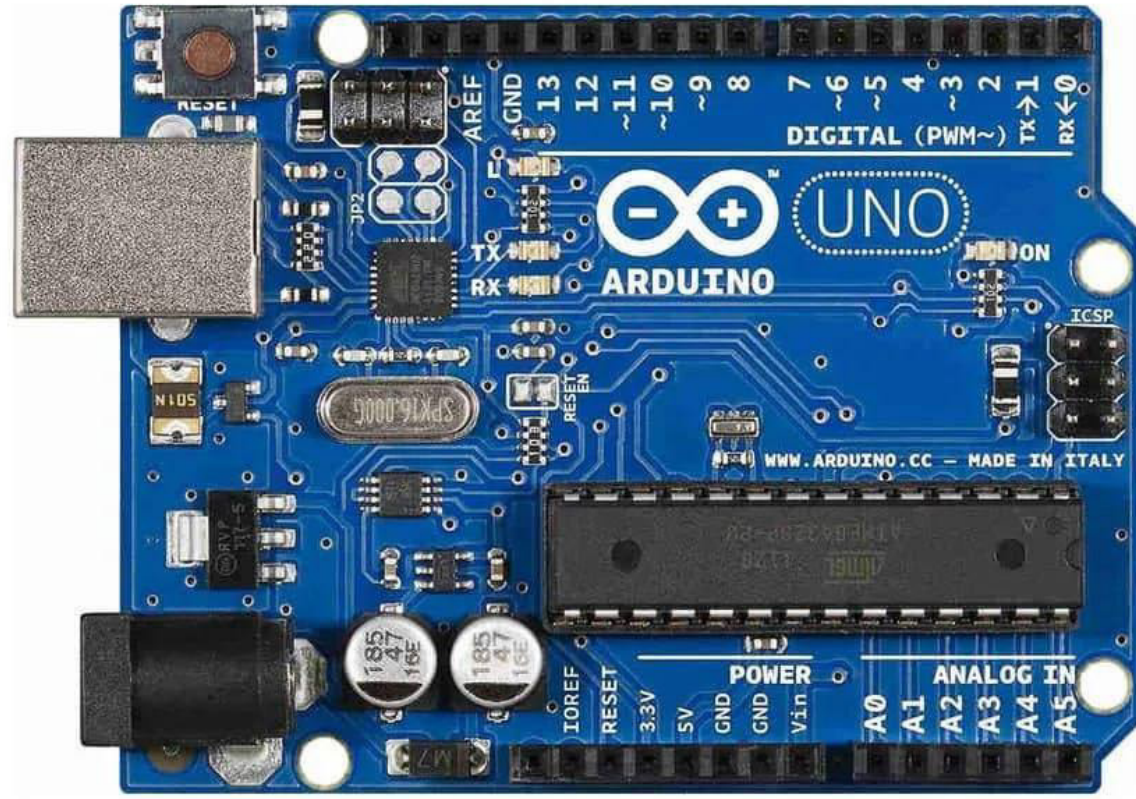
# SMART GLOVE



People with hearing and speech impairments have had difficulties communicating in society until now while others do not understand this sign language as it involves pointing and moving hands and arms/body and combining different hand shapes and facial expressions to express thoughts. A new communication medium has been developed that converts hand gestures into speech outputs enabling deaf and mute individuals to verbally interact with other people and share their thoughts and needs.



# COMPONENTS





# Connection steps



## 1. Connecting Flex Sensors:

Each Flex Sensor has two terminals:

First terminal: Connect it to an analog input on the Arduino (A0, A1, A2, A3, A4).

Second terminal: Connect it to a variable resistor (usually 10k $\Omega$ ) and then to ground (GND).

Common terminal between the resistor and the sensor: Connect it to the power source (5V).

## 2. Connecting the DFPlayer Mini:

RX and TX:

Connect the RX of the DFPlayer to digital pin 2 on the Arduino.

Connect the TX of the DFPlayer to digital pin 3 on the Arduino.

VCC and GND:

Connect VCC to 5V on the Arduino.

Connect GND to GND on the Arduino.

SPK\_1 and SPK\_2: Connect the terminals to the speaker.

## 3. Connect SD Card:

Make sure the SD card loaded with audio files is inserted into the DFPlayer Mini.

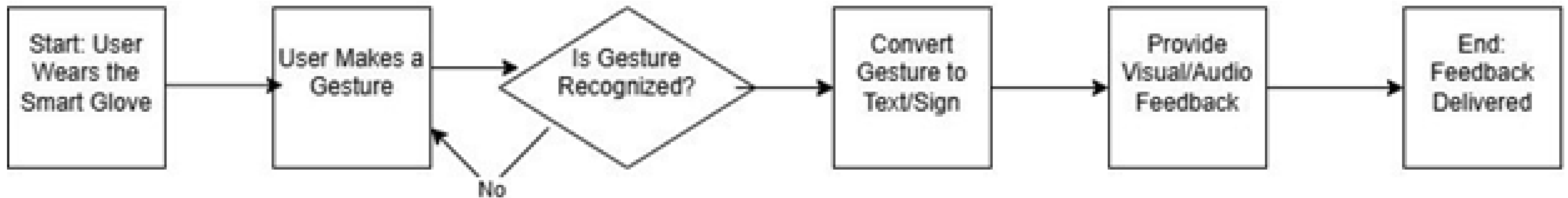
The audio files should be arranged in numbers (001.mp3, 002.mp3, etc.) to match the playback commands.

## 4. Connect Speaker:

Connect the speaker directly to the SPK\_1 and SPK\_2 ports on the DFPlayer Mini.

**5.Power:** Use a USB cable to power the Arduino Uno via a computer or an external power supply (5V)

# WORK FLOW



# CODE

- Initializing the DFPlayer Mini and Setting Volume

```
SoftwareSerial softwareSerial(3, 2); // RX, TX pins for communication

DFRobotDFPlayerMini player;

void setup() {

  softwareSerial.begin(9600);

  if (player.begin/softwareSerial)) {

    Serial.println("DFPlayer Mini initialized successfully!");

    player.volume(20); // Set the volume (0 to 30)

  } else {

    Serial.println("Failed to initialize DFPlayer Mini!");

    while (true); // Stop execution on error

  }

}
```

- Reading Flex Sensor Values

```
const int flexPin1 = A0; // Define flex sensor pins

int flexValue1;

void loop() {

    flexValue1 = analogRead(flexPin1); // Read sensor value

    Serial.print("Flex1: ");

    Serial.println(flexValue1); // Output value to the serial monitor

}
```

- Gesture Detection and Audio Playback

```
int threshold = 200; // Threshold for detecting bending

void loop() {

    flexValue1 = analogRead(flexPin1);

    if (flexValue1 > threshold) {

        Serial.println("Flex1 bent!");

        player.play(1); // Play the corresponding audio file

        delay(2000); // Prevent rapid repetitions

    }

}
```

# EyeNova: Revolutionizing Accessibility With AI-Powered Solutions For The Visually Impaired, Deaf, and Mobility Challenged



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