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EXPERIMENT NO.– 12

Problem Statement:

Write an Arduino program that:

- Uses a piezo element to detect a knock.
- After detecting the knock, the piezo element plays a tune.

Components Required:

- Arduino Board (UNO, Mega, etc.)
- Piezo Element (Buzzer or Knock Sensor)
- 220∧ Resistor
- Breadboard
- Jumper Wires
- Arduino IDE

Circuit Connections:

1. Piezo Element
   - Positive Terminal → Analog Pin A0
   - Negative Terminal → GND
2. Buzzer
   - Positive Terminal → Digital Pin 9 (via 220Ω resistor)
   - Negative Terminal → GND

Arduino Code :

```
#define PIEZO_PIN A0
#define BUZZER_PIN 9
#define THRESHOLD 100

void setup() {
  Serial.begin(9600);
  pinMode(BUZZER_PIN, OUTPUT);
  Serial.println("Waiting for a knock...");
}

void loop() {
  int knockValue = analogRead(PIEZO_PIN);
  Serial.println(knockValue);

  if (knockValue > THRESHOLD) {
    Serial.println("Knock detected! Playing tune...");
    tone(BUZZER_PIN, 262, 300);
    delay(400);
    tone(BUZZER_PIN, 330, 300);
    delay(400);
    tone(BUZZER_PIN, 392, 300);
    delay(400);
    tone(BUZZER_PIN, 523, 500);
    delay(600);
    noTone(BUZZER_PIN);
    Serial.println("Waiting for next knock...");
}

delay(100);
}
```

Output:

1. When the piezo sensor detects a knock, it triggers the buzzer to play a short melody.
2. The Serial Monitor displays the knock values and status:

Waiting for a knock...

Knock detected! Playing tune...

Waiting for next knock...

Waiting for a knock...