```
#include <Wire.h>
#include <Adafruit_GFX.h>
#include <Adafruit_SSD1306.h>
#define OLED_RESET 4
Adafruit_SSD1306 display(OLED_RESET);

#include <Adafruit_Fingerprint.h>
#include <SoftwareSerial.h>
SoftwareSerial mySerial(2, 3);

Adafruit_Fingerprint finger = Adafruit_Fingerprint(&mySerial);
int fingerprintID = 0;
String IDname;

// Define the pin for the relay
int relayPin = 5; // Use any digital pin you prefer

void setup() {
  // Fingerprint sensor module setup
  Serial.begin(9600);
  // set the data rate for the sensor serial port
  finger.begin(57600);

  if (finger.verifyPassword()) {
    Serial.println("Found fingerprint sensor!");
  } else {
    Serial.println("Did not find fingerprint sensor :(");
    while (1) {
      delay(1);
    }
  }

  // Relay setup
  pinMode(relayPin, OUTPUT);
  digitalWrite(relayPin, LOW); // Ensure the relay is initially off

  // OLED display setup
  Wire.begin();
  display.begin(SSD1306_SWITCHCAPVCC, 0x3C);
  // displays main screen
  displayMainScreen();
}

void loop() {
  displayMainScreen();
  fingerprintID = getFingerprintIDez();
  delay(50);
  if (fingerprintID == 1 || fingerprintID == 3 || fingerprintID == 4 || fingerprintID == 5) {
```

```
    IDname = "Tejas";
    displayUserGreeting(IDname);
  } else if (fingerprintID == 2) {
    IDname = "Rui";
    displayUserGreeting(IDname);
  }
}

// returns -1 if failed, otherwise returns ID #
int getFingerprintIDez() {
  uint8_t p = finger.getImage();
  if (p != FINGERPRINT_OK) return -1;

  p = finger.image2Tz();
  if (p != FINGERPRINT_OK) return -1;

  p = finger.fingerFastSearch();
  if (p != FINGERPRINT_OK) return -1;

  // found a match!
  Serial.print("Found ID #");
  Serial.print(finger.fingerID);
  Serial.print(" with confidence of ");
  Serial.println(finger.confidence);
  return finger.fingerID;
}

void displayMainScreen() {
  display.clearDisplay();
  display.setTextSize(1);
  display.setTextColor(WHITE);
  display.setCursor(7, 5);
  display.println("Waiting fingerprint");
  display.setTextSize(1);
  display.setTextColor(WHITE);
  display.setCursor(52, 20);
  display.println("...");
  display.display();
  delay(2000);
}

void displayUserGreeting(String Name) {
  display.clearDisplay();
  display.setTextColor(WHITE);
  display.setTextSize(2);
  display.setCursor(0, 0);
  display.print("Hello");
  display.setCursor(0, 15);
```

```
  display.print(Name);
  display.display();

  // Activate the relay immediately upon displaying the user greeting
  digitalWrite(relayPin, HIGH);

  // Wait for a specified time (e.g., 5 seconds) before deactivating the relay
  unsigned long startTime = millis();
  while (millis() - startTime < 5000) {
    // Wait here without blocking the loop
  }

  // Deactivate the relay
  digitalWrite(relayPin, LOW);

  // Reset fingerprint ID
  fingerprintID = 0;
}
```